The American Society of Colon and Rectal Surgeons

Annual Meeting Abstracts

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April 27–May 1, 2013
Phoenix, AZ

FACTORS PREDICTING THE NEED FOR SURGICAL INTERVENTION IN PATIENTS WITH TOMOGRAPHIC EVIDENCE OF PNEUMATOSIS INTESTINALIS.

(GSF-1)

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Purpose: Pneumatosis intestinalis (PI) has historically been associated with transmural bowel ischemia requiring laparotomy. However, in the current era of computed tomography (CT), it is often incidentally found leading to unnecessary interventions. In this study we aim to delineate the factors that predict the need for surgical intervention.

Methods: We performed a systematic review of 217 consecutive cases with PI on abdominal CT over a 10-year period at a tertiary care hospital. Univariate analysis and multivariable logistic regression were used to assess the relationship between PI and clinical data. The primary outcome was need for surgical intervention, defined as positive findings at laparotomy.

Results: Of the 217 patients with PI, 39 patients were deemed terminal and made comfort care while 178 patients were treated with curative intent. Of these 178 patients, 82 underwent surgical exploration. 13 patients had negative laparotomies. 69 patients had positive operative findings: 64 patients required a bowel resection, 3 required adhesiolysis only and 2 required hernia repair only. Operative mortality was 17% in these patients. 96 of 178 patients were managed conservatively. Two of these patients died of unrelated causes following a prolonged hospitalization and the remaining 94 patients did well. In total, 49.5% of all patients who had radiographic evidence of PI were either managed conservatively and did well or underwent non-therapeutic laparotomies. On multivariate analysis coronary artery disease, tachycardia, and small bowel dilation were independently associated with the need for surgical intervention while patients with diabetes mellitus and abdominal surgery within the prior 30 days were less likely to require surgery.

Conclusions: We present the largest series to date of patients with tomographic evidence of PI. Contrary to prior belief, PI does not always mandate surgical exploration. In this series, the presence of tachycardia, small bowel dilation, and coronary artery disease predicted the need for surgical intervention, while patients with diabetes mellitus and abdominal surgery within the prior 30 days were less likely to require surgery for PI.

DOES INTRAMESORECTAL PROCTECTOMY PROVIDE IMPROVED SEXUAL FUNCTION COMPARED TO STANDARD TOTAL MESORECTAL EXCISION IN PATIENTS WITH ULCERATIVE COLITIS?

(GSF-2)

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Purpose: In patients with ulcerative colitis (UC), intramesorectal proctectomy (IMP) involves close dissection along the rectal wall. This may improve sexual function by avoiding sympathetic and parasympathetic nerves. We compared sexual quality of life among UC patients following IMP versus standard total mesorectal excision (TME).

Methods: Surveys were mailed to 201 patients who underwent IPAA surgery for active UC between 09/2000-03/2011. The Female Sexual Function Instrument (FSFI) and International Index of Erectile Dysfunction (IIED) survey were used to collect information on sexual function for females and males, respectively. Survey and clinical data were analyzed using univariate and multivariate regression statistics.

Results: 38/87 (44%; mean age 33±2 years; 92% white) females and 51/114 (45%; mean age 36±2 years; 92% white) males completed the survey. Mean time from proctectomy (62% IMP) was 5±0.3 years. IMP and TME patients had similar demographic and disease characteristics (including age, race, gender, smoking status, comorbidities, immunosuppression, disease severity, surgical staging and urgency, and surgeon experience), but IMP patients underwent open procedures more often (100% vs. 59%, $p<0.0001$) and had higher surgery apgar scores (6.7±0.2 vs. 6.1±0.2, $p=0.03$). Women reported similar overall sexual function regardless of IMP vs. TME technique ($p=0.4$), including scores on all FSFI subscales (desire, arousal, lubrication, orgasm, satisfaction, pain; $p\geq0.20$). Similarly, Men reported no differences in sexual function overall ($p=0.5$) or on the subscales of the IIED survey (erectile function, orgasmic function, sexual desire, intercourse satisfaction; $p\geq0.22$). On multivariate analysis controlling for baseline differences between groups, only higher surgical apgar scores were associated with better sexual function in women (Table 1).

Conclusions: Use of an IMP technique does not appear to affect sexual function in UC patients compared to standard TME. However, intraoperative hemodynamic stability may play a role in overall sexual quality of life among female patients, perhaps because sicker patients perceive greater post-operative improvement.

ROBOTIC RECTAL CANCER EXCISION: ARE THERE ADVANTAGES COMPARED TO LAPAROSCOPY?

(GSF-3)

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Purpose: Robotic surgery has been advocated for the radical excision of rectal cancer. The majority of data supporting its use have been reported from European and Asian centers with a paucity of data from the United States documenting clear advantages to the robotic technique. The aim of this study was to compare the short-term outcome of robotic with laparoscopic surgery.

Methods: A retrospective review was conducted of consecutive patients who underwent rectal cancer excision during a 2 year period. Group 1 consisted of all laparoscopic cases and Group 2 of all robotic cases. All operations were performed by 1 surgeon experienced in advanced laparoscopy at a tertiary institution. Once robotic surgery was introduced, all cases were performed robotically. Short-term outcome included intraoperative results and postoperative measures including immediate oncologic findings, complications, length of stay, re-admission rate, and re-operative rate. Statistical comparison was performed using Fisher's exact test and t test.

Results: 46 patients were analyzed (Table 1). The median operative time was shorter in Group 1 compared to Group 2 (244 vs. 271 minutes, p=0.05). No difference was noted in blood loss, transfusion rate, intraoperative complications, or conversion rate. The median number of lymph nodes was similar in both groups (15 nodes, p=0.29). There was no difference in distal or radial margin positivity between groups (p=1.00). Median length of stay was shorter in Group 1 compared to Group 2 (5 vs. 6 days, p=0.02). The 90 day complication rate was similar in both groups (34 vs. 35%, P=1.00) but there was a trend towards higher anastomotic leak/pelvic abscess rate in Group 1 (17 vs. 0%, p=0.14). Similarly a non-statistically significant trend towards a higher re-admission rate was noted in Group 1 (28 vs. 6%, p=0.12).

Conclusions: Early experience with robotic rectal cancer excision demonstrated longer operative time and length of stay. A trend towards a lower anastomotic complication rate and fewer re-admissions was noted with robotic surgery. Larger randomized studies are needed to confirm these findings and explain which aspects of robotic surgery may contribute to lower anastomotic complications.

LOCAL RESECTION COMPARED TO RADICAL RESECTION IN THE TREATMENT OF T1N0M0 RECTAL ADENOCARCINOMA: A SYSTEMATIC REVIEW & META-ANALYSIS.

(GSF-4)

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Purpose: Local resection in rectal cancer has become increasingly more important however the lack of lymph node sampling questions the oncologic adequacy of the procedures. The objective of this systematic review was to assess, in adult T1N0M0 rectal adenocarcinoma patients, how local resection compares to radical resection, on the patient-important outcomes of oncologic control (overall, disease-free and disease-specific survival and local recurrence), post-operative complications and the need for permanent ostomy.

Methods: A systematic review was performed of the Medline, Embase, CINAHL and Cochrane Library databases to identify comparative studies of local and radical resection in the treatment of T1N0M0 rectal adenocarcinoma. Two reviewers independently and in duplicate screened studies for inclusion, abstracted data and assessed for risk of bias. Metaregression was used to assess the influence of the distance within the rectum on overall survival.

Results: A total of 1 RCT and 12 observational studies contributed 2855 patients for analysis. The RCT was small and was not powered to show any difference. Meta-analysis of nonrandomized studies showed that local resection was associated with significantly lower 5-year overall survival (72 more deaths per 1000 patients, 95%CI: 30 to 120 more deaths per 1000). Local resection was also associated with lower 5-year disease-free and disease-specific survival and higher 5-year local recurrence. Local resection was, however, also associated with much lower rates of peri-operative mortality (RR=0.31, 95%CI: 0.14-0.71), major post-operative complications (RR=0.20, 95%CI: 0.10-0.41) and need

GSF-2 Multivariate regression analysis of factors affecting overall sexual function (estimate ± standard error)

	Overall Sexual Function (estimate ± standard error)			
	Females (FSFI)	p-value	Males (IIED)	p-value
IMP technique	2.40±.60	0.15	0.62±0.67	0.37
Laparoscopy	2.32±2.34	0.33	0.35±0.73	0.64
Surgical apgar score	2.75±1.26	0.04	-0.07±0.38	0.85
Follow-up time (years)	0.24±0.63	0.71	-0.26±0.18	0.16

FSFI: Female Sexual Function Instrument; IIED: International Index of Erectile Dysfunction survey; IMP: intramesorectal proctectomy

for permanent ostomy (RR=0.17, 95%CI: 0.09-0.30). Metaregression suggested a significant influence of the distance within the rectum on 5-year overall survival.

Conclusions: Local resection does not offer comparable oncologic control to radical surgery and is associated with lower 5-year survival and higher 5-year local recurrence. Survival data is however, dependent on the level from which the lesion was resected. It is however associated with much lower peri-operative complication rates and peri-operative mortality.

THE IMPORTANCE OF EXTENDED POSTOPERATIVE VENOUS THROMBOEMBOLISM PROPHYLAXIS IN INFLAMMATORY BOWEL DISEASE: A NSQIP ANALYSIS.

(GSF-5)

M. Gross, S. Vogler, M. Mone, X. Sheng, B. Sklow
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Purpose: Studies have shown that in colorectal surgery patients up to 25% of all venous thromboembolism (VTE) events occur in the early post-discharge period. The National Comprehensive Cancer Network recommends that patients with colorectal cancer receive up to 4 weeks of postoperative out-of-hospital VTE prophylaxis. Patients with inflammatory bowel disease (IBD) are at high risk for VTE, but presently there are no recommendations for routine post-discharge VTE prophylaxis in these patients. The purpose of this study is to compare the postoperative VTE rate in IBD vs colorectal cancer patients to determine if IBD patients warrant post-discharge VTE prophylaxis.

Methods: A retrospective review was performed using the American College of Surgeons National Surgical Quality Improvement Program (NSQIP) database. ICD-9 discharge codes were used to identify IBD and colorectal cancer patients. National participant data were obtained from 2005 to 2010 with cases being selected based on specific CPT codes for major abdominal surgical procedures related to each diagnosis group. Statistical analyses included univariate testing and stepwise logistic regression (forward and backward) to evaluate VTE risk factors including demographic, pre-morbid conditions, and perioperative variables.

GSF-3

	Group 1 (Laparoscopy)N=29	Group 2 (Robotic)N=17	P Value
Gender male/female	15/14 (52%/48%)	10/7 (53%/47%)	0.76
Median age, years [mean, range]	61 [61, 34-79]	58 [58, 48-71]	0.38
Median BMI, kg/m2 [mean, range]	27 [27, 17-42]	25 [25, 20-37]	0.21
Neoadjuvant chemoradiation	19 (66%)	15 (88%)	0.16
Low anterior resection	8 (28%)	3 (18%)	0.50
Proctectomy with coloanal	18 (62%)	7 (41%)	0.23
Intersphincteric proctectomy with coloanal	1 (3%)	2 (12%)	0.55
Abdominoperineal resection	2 (7%)	3 (18%)	0.34
Proctocolectomy	0	2 (12%)	0.13
Ileostomy	14 (48%)	11 (65%)	0.36
Median operative time, minutes [mean, range]	244 [243, 133-360]	271 [282, 189-449]	0.05
Median robot dock time, minutes [mean, range]	NA	10 [12, 5-23]	
Median robot work time, minutes [mean, range]	NA	65 [73, 38-124]	
Median estimated blood loss, milliliters [mean, range]	100 [246, 25-1200]	150 [307, 25-2000]	0.58
Intraoperative complications (bleeding with intraoperative transfusion)	1 (3%)	1 (6%)	1.00
Conversion to open	0	1 (6%)	0.37
Median number of lymph nodes [mean, range]	15 [15, 3-24]	15 [17, 8-44]	0.29
Number of patients with positive lymph nodes	7 (24%)	5 (29%)	0.73
Median number positive lymph nodes	6 [5, 1-10]	3 [3, 1-5]	0.54
Median length of specimen, centimeters [mean, range]	24 [24, 15-36]	27 [32, 14-110]	0.02
positive distal margin	1 (3%)	0	1.00
positive radial margin	1 (3%)	0	1.00
Median length of stay, days [mean, range]	5 [6, 3-14]	6 [9, 3-23]	0.02
Overall transfusion rate	4 (14%)	3 (18%)	1.00
Overall 90 day complication rate	10 (34%)	6 (35%)	1.00
Anastomotic leak and/or pelvic abscess	5 (17%)	0	0.14
90 day re-admission rate (excluding stoma reversal)	8 (28%)	1 (6%)	0.12
90 day re-operation rate (excluding stoma reversal)	2 (7%)	0	0.52

Results: A total of 45,964 patients were identified consisting of 8,888 IBD patients and 37,076 colorectal cancer patients. The 30-day postoperative rate of VTE in IBD patients was significantly higher than in colorectal cancer patients (2.7% vs 2.1%, p<0.001). In a model that included 15 significant covariates (see table), the odds ratio for VTE was 1.353 ([95% CI 1.095, 1.672], p=0.0051) for the IBD patients as compared to the colorectal cancer patients.

Conclusions: In a logistic regression model, IBD patients had a significantly increased risk for postoperative VTE when compared to colorectal cancer patients. Therefore, post-discharge VTE prophylaxis recommendations for IBD patients should mirror that for colorectal cancer patients. This would suggest a change in clinical practice to extend out-of-hospital VTE prophylaxis for 4 weeks in postoperative IBD patients undergoing major abdominal surgery.

PREDICTIVE FACTORS OF URETERAL INJURY IN COLORECTAL SURGERY.

(GSF-6)

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Purpose: Iatrogenic ureteral injury is one of the most serious complications of colorectal surgery. Since ureteral injuries are uncommon, the literature is dominated by series with less than 20 injuries available for analysis. The goal of this study is to determine the national incidence of ureteral injury during colorectal surgery and analyze the predictive risk factors.

Methods: A retrospective analysis of the Nationwide Inpatient Sample from years 2008-2009 was performed. All patients undergoing open, laparoscopic, or robotic colorectal resection were selected and cases of ureteral injury were identified through the use of International Classification of Diseases codes (ICD-9) for ureter repair or nephrostomy placement. Laparoscopic procedures that were converted to open were included in the laparoscopic group. Patient characteristics, type of pathology, type of resection, and type of admission were analyzed. A multivariate regression was performed to determine independent predictors of ureteral injury.

Results: A total of 481,727 patients underwent colorectal resection during this period. Overall the rate of ureteral injury during this period was 0.4%, with a total of 1,929 injuries noted. Laparoscopic colorectal resection was independently associated with a decreased risk of ureteral injury (OR 0.61, p < 0.01). We also found that metastatic cancer (OR 3.03, P < 0.01), proctectomy (OR 2.43, p < 0.01), sigmoidectomy (OR 1.80, p < 0.01), left colectomy (OR 1.42, p < 0.01), and female sex (OR 1.12, p < 0.01) were independent risk factors for ureter injury. Pathology (diverticulitis, malignancy, IBD) and emergent admission do not appear to be risk factors for ureteral injury.

Conclusions: The rate of ureteral injury for all patients undergoing colorectal resection is 0.4%. There is a reduced risk of ureteral injury in patients undergoing laparoscopic colorectal resection and there is a higher risk of ureteral injury in patients undergoing proctectomy, left colectomy, and sigmoidectomy. Females and patients with a diagnosis of metastatic disease are also at higher risk. These factors should be taken into consideration when planning for the procedure and patients should be informed in higher-risk circumstances.

GSF-5 Multivariate Analysis

Significant Covariates	Odds Ratio	P value
Group: IBD vs Colorectal	1.353	0.0051
Age	1.014	<0.0001
Female vs Male	0.808	0.0018
Body Mass Index	1.016	0.0027
Preoperative Hematocrit	0.958	<0.0001
Work RVU	1.016	0.0189
Emergency Surgery (No vs Yes)	0.652	0.0007
ASA Class (1-5)	1.171	0.0077
Anesthesia Time	1.001	0.0001
Steroids (No vs Yes)	0.548	<0.0001
Bleeding Disorder (No vs Yes)	0.733	0.0139
Weight Loss (No vs Yes)	0.795	0.0336
Ascites (No vs Yes)	0.671	0.0372
Preoperative Sepsis (p=0.0005)		
- SIRS vs None	1.595	0.0004
- Sepsis vs None	1.628	0.0189
- Septic Shock vs None	0.817	0.5602
Preoperative Functional Status (p=0.0264)		
- Partial Dependent vs Independent	1.364	0.0073
- Total Dependent vs Independent	1.040	0.8740

GSF-6 Table 1. Multivariate Analysis of Risk Factors for Ureteral Injury

Variables	Odds Ratio	CI (95%)	P Value
Metastatic CA	3.03	2.73-3.38	< 0.01
Proctectomy	2.43	2.12-2.77	< 0.01
Sigmoidectomy	1.80	1.58-2.05	< 0.01
Left Colectomy	1.42	1.21-1.68	< 0.01
Female	1.12	1.03-1.24	< 0.01
Laparoscopic	0.61	0.59-0.83	< 0.01
Robotic	2.46	1.28-4.73	< 0.07

INFLAMMATORY CHEMOKINE MIP-1α ENHANCES IMMUNITY AGAINST A MURINE COLORECTAL CANCER MODEL.

(RF-1)

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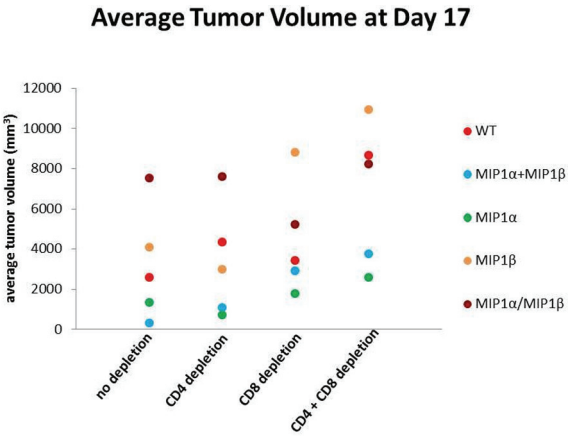
Purpose: Inflammatory chemokines Macrophage Inflammatory Protein-1 alpha and beta (MIP-1α and MIP-1β) are crucial in generating memory CD8 T cells via interaction with the receptor CCR5 on T cells during vaccinations. The current study seeks to determine the effect of tumor-secreting MIP-1α and MIP-1β on the generation of anti-tumor adaptive immunity in a murine colon tumor model, CT26.

Methods: Prior to tumor inoculation, age-matched recipient female BALB/c mice were depleted of T cell subsets with intraperitoneal injections of the following neutralizing antibodies on days -3, -1, and then weekly following tumor inoculation: 1) Phosphate Buffered Saline control; 2) anti-CD4 neutralizing antibody; 3) anti-CD8 neutralizing antibody; and 4) anti-CD4 and CD8 neutralizing antibodies. The treated groups were then injected subcutaneously on Day 0 with one million live cells as follows: A) CT26 wildtype (WT); B) CT26 secreting MIP-1α and MIP-1β; C) CT26 secreting MIP-1α only; D) CT26 secreting MIP-1β only; E) equal mixture of C and D. The mice were then monitored for tumor growth by palpation twice weekly for four weeks. Tumors were measured using a micro-caliper. The mice were sacrificed when tumors reached a diameter of 15 millimeters or larger, and the tumor nodules were removed for further analysis including histology, flow cytometry and ELISA assays. Additionally, the interactions between fluorescent-labeled T cells and tumor cells in the metastatic lymph node are visualized by performing 2-photon laser-scanning microscopy.

Results: Tumors that were engineered to secrete MIP-1α (subgroups B and C) displayed slowest growth kinetics, particularly in the absence of CD4 T cells. In contrast, MIP-1β secreting tumors (subgroups D and E) grew as aggressively as CT26WT, particularly in the absence of CD8 T cells (groups 3 and 4) (see Figure). Intriguingly, some mice either never developed tumors (in group B) or experienced dramatic tumor regression (groups B and C).

Conclusions: CT26 cells engineered to secrete MIP-1α or both MIP-1α and MIP-1β exhibited slow growth kinetics in vivo in a CD8-dependent manner, suggesting a protective role of MIP-1α in anti-CT26 CD8 T cell generation.



Growth kinetics of CT26 cell lines in vivo. Live CT26WT, MIP1α and/or MIPβ-secreting cells were injected subcutaneously in the left flank of BALB/c mice on Day 0. Tumor volume was measured using a micro-caliber. Shown are average tumor volumes in mm^3 of each group of 5 mice, obtained on Day 17 post injection, when several mice had to be sacrificed due to tumors reaching 15mm in diameter. Tumor volume = $\pi(D) \times (d)^2$, where D= largest diameter and d= smaller diameter.

EXPRESSION OF SPARC IN HUMAN COLORECTAL CANCER PREDICTS POSTOPERATIVE PROGNOSIS: A LARGE PROSPECTIVE STUDY BASED ON TISSUE MICROARRAY.

(RF-2)

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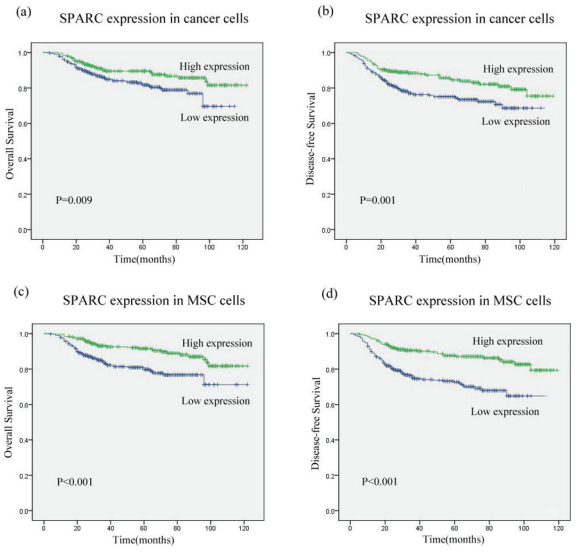
Purpose: Secreted protein acidic and rich in cysteine (SPARC) is an extracellular matrix glycoprotein involved in cell proliferation, migration and angiogenesis functions. The aim of this study was to assess SPARC expression in colorectal cancer and correlate it with clinicopathological features, as well as to evaluate its potential prognostic significance.

Methods: In this study, we examined the expression of SPARC using tissue microarrays containing 895 specimens by immunohistochemistry. SPARC expression was further correlated with clinicopathological and prognostic data. The prognostic significance was assessed using Kaplan-Meier survival estimates and log-rank tests. A multivariate study with the Cox's proportional hazard model was used to evaluate the prognostic aspects.

Results: Significant differences in SPARC expression were found between normal mucosa and carcinomas ($P<0.05$). Low SPARC expression was associated with poor prognosis, and it independently correlated with shortened overall survival and disease-free survival in colorectal cancer patients ($P<0.05$). More so, SPARC expression in the mesenchymal and stromal cells, bowel wall invasion, lymph node metastasis and distant metastasis were independent prognostic factors for disease-free survival. Additionally, significant differences in SPARC expression were observed in tumors from patients with familial adenomatous polyposis compared to matching adenomas and normal colon mucosa ($P<0.05$).

Conclusions: The results of this study indicate that SPARC downexpression in colorectal tumors is associated with poor prognosis, as well as aggressive clinicopathological features. Therefore, SPARC expression could be used as potential prognostic predictor in colorectal cancer patients.



RAPAMYCIN INHIBITION OF POLYPOSIS IN A MOUSE MODEL OF FAMILIAL ADENOMATOUS POLYPOSIS IS ASSOCIATED WITH EFFECTS ON APC-MUTANT COLON EPITHELIAL CELL PROLIFERATION AND DIFFERENTIATION.

(RF-3)

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Purpose: Familial adenomatous polyposis (FAP) is due to an inactivating mutation in the adenomatous polyposis coli (APC) gene, leading to severe polyposis and colorectal cancer (CRC) in nearly 100% of affected individuals unless proctocolectomy is performed. APC inactivation is also seen in 80% of sporadic colorectal adenomas and CRCs. Rapamycin (RAP) is an inhibitor of the mammalian target of rapamycin (mTOR) which is expressed in human adenomas and some mouse small intestine polyps with Apc defects. We tested RAP in a mouse model where both copies of the Apc gene were inducibly inactivated in colon epithelium to assess the ability of RAP to inhibit polyp formation.

Methods: We induced inactivation of Apc; two days later, we gave 3 mg/kg intraperitoneal (IP) RAP or vehicle daily for two weeks. We withdrew RAP for two weeks and cycled the treated mice on and off RAP every two weeks. We performed endoscopies to score colon polyps every 2 weeks. Mice were sacrificed when moribund or at 25 weeks for detailed tissue studies.

Results: The median survival of control mice was 6.5 weeks versus 21.5 weeks for mice receiving RAP. The survival curves of the two groups were different (p=0.03). The mice that were given RAP had lower polyp scores for every time point. Immunohistochemistry revealed decreased levels of the Sox9 cell fate marker, BrdU incorporation, β-catenin, phosph-S6, and p-cJun in the colons of the mice receiving RAP. In a second group of mice, to assess the mechanism of inhibition of polyposis, we induced polyposis and followed the mice endoscopically until they had confluent large polyps. The mice were then given RAP for 0, 1, 3, or 5 days and sacrificed and their colons were studied. The mice receiving RAP had decreased levels of phospho-S6, BRDU, and Sox9 and increased levels of Alcian blue staining over the 5 days, indicating decreased proliferation and increased differentiation of cells.

Conclusions: mTOR inhibitors may be useful in delaying polyposis in FAP. The effects of mTOR inhibition are linked to decreased proliferation and increased expression of differentiation markers in Apc-mutant colon epithelium.

MYOFIBROBLAST ACTIVATION IN COLORECTAL CANCER LYMPH NODE METASTASES.

(RF-4)

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Purpose: Myofibroblasts play an important role in regulating the normal colorectal stem cell niche. Whilst the activation of myofibroblasts in primary colorectal cancers (CRC) has been previously described, myofibroblast activation in lymph node metastases has not been described before.

Methods: 47 patients with macrometastases, micrometastases and isolated tumour cells from two European tertiary referral centres were identified based on pathology reports and confirmed on histological H&E examination. Paraffin embedded sections were stained for a-SMA to identify myofibroblasts, and also with a variety of other antibodies, to characterize the distribution of different cell types in tumour containing lymph nodes. The extent of myofibroblast presence was quantified and compared with the size of the metastasis and degree of proliferation and differentiation of the cancer cells.

Results: We show substantial activation of myofibroblasts, as measured by the substantial increase in their number in the presence of colorectal metastases in lymph nodes. This activation is intimately associated with glandular structures, both in micro- and macro-metastases. The degree of activation is positively associated with the size of the metastases (see table) and the proportion of Ki67+ve cancer cells (p<0.001), and negatively associated with the degree of enterocyte differentiation as measured by CK20 expression (p<0.0003).

Conclusions: The substantial activation of myofibroblasts in late stage cancers in lymph nodes strongly suggests that these metastatic cancer cells are still significantly dependent on their microenvironment. The presence of myofibroblast

activation even in micrometastases suggests that micrometastases are both viable and clinically significant. Further understanding of epithelial-mesenchymal interactions could lead to the development of new specific therapies targeting tumour-associated myofibroblasts in metastatic disease.

AUTOLOGOUS ADIPOSE TISSUE-DERIVED MESENCHYMAL STEM CELLS FOR THE TREATMENT OF COMPLEX PERIANAL FISTULAS.

(RF-5)

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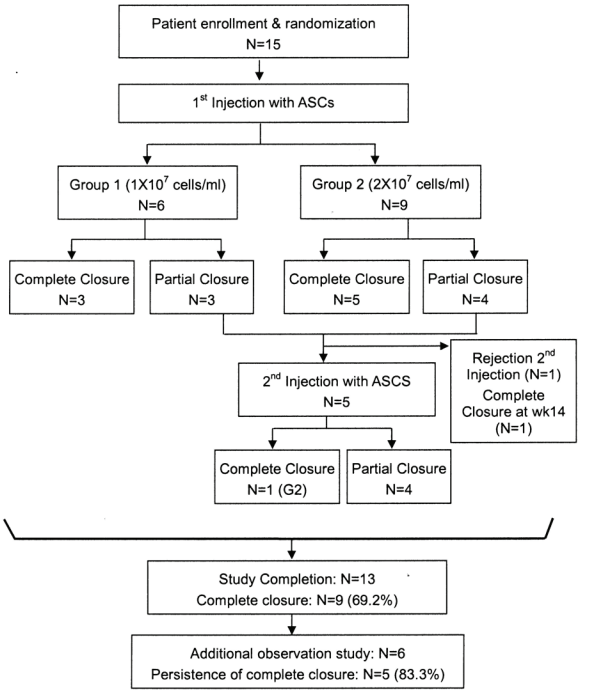
Purpose: We have previously demonstrated that the adipose tissue-derived stem cell (ASC) is effective for the treatment of perianal fistula in Crohn's disease. We aimed to evaluate whether the ASC is safe and efficient even in patients with complex anal fistula not associated with Crohn's disease.

Methods: We performed multicenter, randomized phase II clinical study to compare two different doses of ASCs (Group1: 1 x 10^7 cells/ml and Group2: 2 x 10^7 cells/ml). Eligible patients were randomized into two arms and were given ASCs based on the size of fistula tract. A subsequent administration of twice the concentration of ASCs was performed if complete closure was not achieved by week 8. Efficacy endpoint was complete closure at week 8 after injection, defined as reepithelialization of the external opening without drainage or sign of inflammation. Patients who showed complete closure at week 8 were followed up for an additional 6 months and monitored by MRI.

Results: Fifteen patients with complex fistula were injected with ASCs and 13 completed the study. The types of fistula consisted of 9 suprasphincteric (69.2%), 3 extrasphincteric (23.1%), and 1 high transsphincteric type (7.7%). Overall complete closure was observed in 69.2% (9/13) at 8 weeks after final dose injection. Three out of 5 patients in group1 and 6 out of 8 in group2 achieved complete closure, which did not lead to a significant difference between the groups. Six among 9 patients who showed complete closure were included in additional follow-up study and 5 out of these 6 patients (83.3%) showed persistence of complete closure at 6 months. There were no grade 3 or 4 severity adverse events and no events related to ASC. Mean investigator's satisfaction score was 1.8 (1: very satisfied, 2: satisfied, 3: moderately satisfied, 4: dissatisfied, 5: very dissatisfied).

Conclusions: ASC may be a good treatment option for complex perianal fistula where healing cannot be achieved by conventional operative procedures.



Flowchart of patients

VIRTUAL REALITY SIMULATION FOR LAPAROSCOPIC COLECTOMY: CAN METRICS HAVE CONSTRUCT VALIDITY?

(RF-6)

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Purpose: Virtual reality simulation (VRS) for laparoscopic colectomy has been utilized for training and more recently, the technical skills assessment of board eligible colorectal surgeons. However, construct validity (the ability to distinguish between skill levels) must be confirmed prior to widespread implementation. This study was designed to specifically determine which metrics for laparoscopic sigmoid colectomy have construct validity.

Methods: General surgeons that had performed less than 30 laparoscopic colon resections and laparoscopic colorectal experts (>200 laparoscopic colon resections) performed laparoscopic sigmoid colectomy on the LapMentor VRS model. All participants received a fifteen minute instructional warm up and had never used the simulator prior to

RF-4 Quantification of area of a-SMA staining for each metastatic group

	Single cells(n=13)	ITCs(n=13)	Micromet(n=6)	Macromet(n=6)
SMA (%)	16.7±12	17.8±16	23.3±3	40.0±24

ITCs = Isolated Tumour Cells

the study. Performance was then compared between each group for 21 metrics (Procedural: 14, Intra-Operative Errors: 7) to determine specifically which measurements demonstrate construct validity. Performance was compared with the Mann-Whitney U-test ($P < 0.05$ was significant).

Results: Fifty three (29 general surgeons (GS), and 24 laparoscopic colorectal experts (LC)) enrolled in the study. The VRS for laparoscopic sigmoid colectomy demonstrated construct validity for eight of fourteen procedural metrics by distinguishing levels of surgical experience ($p < 0.05$) (Table1). The most discriminatory procedural metrics ($p < 0.01$) favoring experts were reduced instrument path length, accuracy of the peritoneal/medial mobilization, and dissection of the inferior mesenteric artery. Intra-operative errors were not discriminatory for most metrics and favored general surgeons for colonic wall injury (GS: 0.7, LC: 3.5, $P = 0.045$).

Conclusions: The VRS for laparoscopic sigmoid colectomy demonstrated construct validity for eight procedure specific metrics. However, using VRS metrics to detect intra-operative errors did not discriminate between groups. If the VRS continues to be utilized for the technical assessment of trainees and board eligible surgeons, evaluation of performance should be limited to procedural metrics.

POLYMORPHISM WITHIN THE TNFSF15 GENE IS ASSOCIATED WITH DIVERTICULITIS REQUIRING SURGICAL INTERVENTION: A CONFIRMATORY STUDY.

(RF-7)

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Purpose: A role for genetics in diverticulitis is suggested by its association with hereditary connective tissue disorders, youthful onset in some patients and the observation of multiple affected individuals in a single family. The TNFSF15 gene has been associated with medically refractory ulcera-

RF-6 Table 1: Procedural Metrics and Intra-Operative Error Metrics Measured by VRS for General Surgeons and Laparoscopic Experts (Bold indicates p <0.05)

Procedural Metrics	General Surgeons (GS)	Laparoscopic Colorectal Experts (LC)	P Value
Operative Time (minutes)(mean)	35.5	37.4	0.943
Idle Time	7.8	6.3	0.652
Total Movements			
Right Hand (SD)	1937 (430)	1475 (352)	0.049
Left Hand (SD)	1486(278)	1395 (318)	0.123
Instrument Path Length (cm)			
Right Hand (SD)	5150 (720)	3540 (510)	0.0087
Left Hand (SD)	3227 (425)	1648 (170)	0.0074
Mobilization (Time In Correct Plane, %)			
Peritoneal (SD)	56 (31)	94 (20)	0.0093
Medial to Lateral (SD)	63 (26)	89 (21)	0.046
Lateral Colon (SD)	74 (15)	82 (9)	0.741
IMA Dissection			
IMA Exposure (%)(SD)	17 (8)	54 (25)	0.0057
IMA Division (mm from Aorta) (SD)	33 (20)	13 (9)	0.0072
Anastomosis			
Anastomosis Time(Mean: Minutes) (SD)	7.4 (5)	4.1 (1)	0.035
Right Hand Movements	5.2 (7.4)	4.5 (5.5)	0.713
Intra-Operative Errors			
Grasping The Tumor	1.8	1.4	0.767
Risk of Colon Wall Injury (Mean) (SD)	0.7 (1.0)	3.5 (3.7)	0.045
Injury to Major Vessel (IMA, LCA, IMV, SRV, or gonadal vessels)	1	1	1.0
Minor Bleeding Episodes (Mean)	23.4	21.5	0.845
Untreated Bleeding Episodes	20.5	17.2	0.742
Risk of Injury to Vital Structure (Seconds),(Mean)	52.5	44.0	0.083
Safe Use of Energy (Risk Time/Total Energy time) Mean (%)	52.5%	64.3%	0.076

tive colitis requiring surgery, a more severe disease course in Crohn's disease and pouchitis. Our group has previously shown the single nucleotide polymorphism (SNP) rs7848647 in the TNFSF15 gene to be associated with diverticulitis requiring surgery in a small 'discovery' group (n=21) (ACS podium presentation Oct 2012). The homozygous GG genotype in this SNP was found in 62% of surgical diverticulitis (S-D) patients vs 5% of healthy controls. The present study aimed to replicate this finding in a separate confirmatory group of surgical diverticulitis patients.

Methods: 34 patients (20 female, mean age 57.7 +/- 2) who underwent surgical treatment for S-D in the form of either percutaneous drainage or colonic resection were identified from our Division of Colon and Rectal Surgery Biobank. These patients were age matched to a control cohort of patients having no history of diverticulitis (26 female). Patients were genotyped using a Taqman assay for rs7848647. Significance was assessed by McNemar's test ($p < .05$ is significant).

Results: In this confirmatory group, the homozygous GG genotype was found in 56% of S-D patients compared to 17% of healthy controls (p=.022). Risk of S-D increased with number of the G alleles found in each individual with AA homozygotes having an 8% chance of S-D, AG heterozygotes having a 35% chance and GG homozygotes having a 56% chance of S-D .

Conclusions: The association between surgical diverticulitis and the GG homozygous genotype in rs7848647 in the TNFSF15 gene was confirmed in this study. The TNFSF15 gene is an immune regulator involved in T cell maturation, chemokine expression and the inhibition of angiogenesis. This finding suggests a fundamental role for TNFSF15 in the pathophysiology of diverticulitis. In addition, this SNP may possibly be used as a marker of disease severity that could assist in surgical decision making.

A NEW METHOD USING A BIOLOGIC TISSUE MATRIX STENT TO PROTECT BOWEL ANASTOMOSES.

(RF-8)

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Purpose: An anastomotic leak is a feared complication of bowel surgery. We present a novel method to achieve a tension-free, protected anastomosis with potential for lower leak rates. This method involves the use of a stent made of acellular collagen matrix (ACM) that is fixed inside the bowel using specially designed rings. The stent relieves tension at the anastomotic site and provides mechanical protection at the most critical stages of healing. This method is designed for stapled or sutured end-to-end anastomoses. To the best of our knowledge this is the first study that is using ACM as a reinforcement for bowel anastomosis.

Methods: This method was tested using 10 pig animal models. Two series were carried with 5 animals in each series. The ascending colon was divided. An ACM stent was fixed internally to the bowel wall prior to reconnecting the bowel with a single layer hand sewn anastomosis. In the first series the stent was sutured inside the bowel. In the second series the stent was fixed using specially designed and manufactured rings. A tie was placed on the external side of the bowel wall to hold the rings in place. The animals were euthanized at different time intervals ranging from 1 to 6 weeks. After euthanasia, a segment of bowel surrounding the anastomosis was resected. The anastomosis was tested for burst pressure followed by gross and histological analysis. No diet or activity restrictions were placed on the animals in the pre or post operative period.

Results: Using the rings, the method was easy to use adding an average 10 minutes of operative time. No serious complications were observed in any of the animals. The average burst pressure for the tested anastomoses was 62 mmhg. This value is comparable to other studies measuring this value. In gross analysis the stents were observed to be at different stages of decomposition. The anastomotic sites looked grossly healthy. Histological analysis conformed normal stages of bowel healing with epithelization.

Conclusions: Our described method is a safe anastomosis method in this model. It has the potential of improving outcomes of bowel resections by decreasing leak rates. Further studies are needed to determine if there is a significant merit to this method.

RF-7 Genotype in Surgical Diverticulitis Patients vs Healthy Controls in Discovery (n=21) and Confirmatory (n=34) Groups

Patient Group Genotype	Discovery S-D(n=21)	DiscoveryHealthy Controls (n=21)	p value	Confirmatory S-D (n=34)	Confirmatory Healthy Controls (n=34)	p value
AAn %	0	1 (5%)		3 (8%)	6 (17%)	
AGn %	8 (38%)	19 (90%)		12 (35%)	22 (65%)	
GGn %	13 (62%)	1 (5%)	.0006	19 (56%)	6 (17%)	.022

A PROSPECTIVE, MULTICENTER, RANDOMIZED, CONTROLLED, THIRD PARTY-BLINDED STUDY OF STRATTICE® FASCIAL INLAY FOR PARASTOMAL REINFORCEMENT IN PATIENTS UNDERGOING SURGERY FOR PERMANENT ABDOMINAL WALL OSTOMIES.

(1)

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Purpose: Compare the clinical outcomes of patients undergoing surgery for a permanent abdominal wall ostomy with and without placement of a Strattice ® fascial inlay, as measured by the occurrence of parastomal hernia. Secondary objectives are early and late ostomy related complications and stoma quality of life.

Methods: Patients, expected to have a stoma for greater than 1 year, were prospectively randomized to undergo standard end stomal construction (NR) or t undergo placement of a 6 cm x 6 cm square of Strattice ® tissue matrix reinforcement (S) at the time of stomal construction. The Strattice ® firm matrix with a central cruciate incision (@ cm diameter) was inserted through the stomal skin opening and placed in the space between the posterior sheath/peritoneum and rectus muscle. Patients were evaluated at 3, 6, 12 and 24 months for the occurrence of a parastomal hernia. Clinical suspicion was confirmed with an abdominal CT scan. The Stomal Quality of Life questionnaire was administered. Sample size: The baseline incidence of parastomal hernia formation was estimated to be 30% and hypothesized to be 5% with Strattice ® reinforcement. Therefore a sample size of 100 subjects (50/arm) was calculated to detect a difference with a power of 80% and two-sided significance level of 0.05.

Results: 113 patients were enrolled with 58 in the NR and 55 in the S group. Subject characteristics are listed in Table 1: With follow up of 24 months there was no difference in adverse or stomal related events. The mean quality of life scores were similar between the two groups (p=0.429)

Conclusions: The incidence of parastomal hernia formation in the control group was less than expected. Reinforcement of stomas with Strattice ® was safe but did not statistically reduce the incidence of parastomal hernia formation.

PROCALCITONIN, AS AN EARLY BIOMARKER OF COLORECTAL ANASTOMOTIC LEAK, FACILITATES ENHANCED RECOVERY AFTER SURGERY.

(2)

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Purpose: Procalcitonin (PCT) is a biomarker used to monitor serious bacterial infections and guide antibiotic therapy. Anastomotic leak (AL) after colorectal surgery is a severe complication associated with relevant short and long-term sequelae. Enhanced recovery after surgery protocols demand early patient discharge but this might be potentially associated with an increased risk of delayed diagnosis and treatment of AL. Hence, there is a strong need of an additional tool to early diagnose anastomotic leak, prior patient discharge. The aim of our study is to assess the predictive value of PCT level for early diagnosis of anastomotic leak after colorectal surgery.

Methods: Between September 2011 and September 2012, a series of 103 patients underwent colorectal surgery, either electively or in emergency setting. In all cases white blood count (WBC), C-reactive protein (CRP) and PCT levels were measured in 1st, 3rd and 5th postoperative day (POD). Anastomotic leaks and all other postoperative complications were recorded.

Results: We registered 7 (6.7%) anastomotic leaks. Increased procalcitonin levels had a significant negative predictive value for AL in 3rd and in 5th POD (respectively, 95.1% and 93.8%), with the best diagnostic performance compared to CRP and WBC (AUC=0.84). The remaining 96 patients, with normal PCT values, were discharged in 5th POD, without readmissions and/or any other complications.

Conclusions: Compared to more established biochemical values, such as CRP and WBC, PCT is an early, sensitive and reliable marker of anastomosis leak. Increased PCT levels in early postoperative days after colorectal surgery may provide a more effective way to detect AL,

S1 Table 1. Subject Characteristics

Variable	No Reinforcementn=55	Strattice ®n=58	p value
Age	59.1 +/- 14.3	60.2 +/- 15.5	0.578
Gender	0.578	30 males	0.708
BMI	24.7 +/- 4.1	26.1 +/- 4.5	0.079
Ileostomy	24	19	0.561
Colostomy	34	36	0.561
Parastomal Hernias	7	6	ns

before clinical symptoms appear. Moreover, normal PCT values might be also a useful marker to facilitate a safe and early discharge of selected patients after colorectal surgery.

URETERAL INJURIES IN COLORECTAL SURGERY: AN ANALYSIS OF TRENDS, OUTCOMES AND RISK FACTORS OVER A 10-YEAR PERIOD IN THE UNITED STATES.

(3)

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Purpose: Iatrogenic ureteral injuries during colorectal surgical procedures are rare. Little is known about the true incidence of these injuries, the outcomes associated with them, and the predisposing risk factors.

Methods: The Nationwide Inpatient Sample (NIS) database was retrospectively reviewed from 2001 to 2010 for iatrogenic ureteral injuries occurring in procedures performed for colon and rectal cancer, polyps, inflammatory bowel and diverticular disease. Trends were examined and outcomes were compared using multivariate regression analysis. The LASSO algorithm for logistic regression was used to build a predictive model based on the following: patient factors, hospital status, admission type, disease type, procedure type and the use of laparoscopy.

Results: In 10 years, a total of 1,494,041 colorectal surgical procedures were performed in the United States and 4,088 iatrogenic ureteral injuries occurred (0.27%). The rate of ureteral injuries was higher in the 2007-2010 period (3.3/1,000) compared to the 2001-2006 period (2.3/1000) ($p<0.001$). Ureteral injuries were independently associated with higher mortality (aOR=1.75; $p<0.01$), higher morbidity (aOR=1.46; $p<0.001$), longer hospital stay by 3.46 days ($p<0.001$) and hospital charges that were 31,205 US$ higher ($p<0.001$). The LASSO algorithm identified rectal cancer as the strongest predictor for injury (OR=1.84) followed by the presence of metastatic cancer (OR=1.46) and adhesions (OR=1.16). Age, gender, use of laparoscopy, hospital status, emergent cases and inflammatory bowel disease were not identified as risk factors. Right sided colonic resections appeared to be the least prone to ureteral injuries compared to all other procedures

Conclusions: This is the largest study to date on iatrogenic ureteral injury demonstrating an increasing incidence of this complication. Ureteral injuries are associated with higher mortality, morbidity, hospital charge and length of stay. Their incidence appears more frequent in the presence of adhesions, rectal cancer and advanced cancer.

REDUCING URINARY TRACT INFECTIONS IN COLON AND RECTAL SURGERY MAY BE EASIER THAN YOU THINK!

(4)

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Purpose: Urinary tract infection (UTI) in colon and rectal surgery (CRS) practice continues to be a significant source of perioperative infection with morbidity and increased costs. Recent studies using the National Surgical Quality Improvement Program (NSQIP) database indicate that UTI rates in CRS are higher than would be predicted by modeling. Perioperative management of indwelling urinary catheters (IUC) may be service and surgeon-dependent in many institutions. We aim to investigate whether standardized management of IUC could reduce the incidence of UTI in CRS.

Methods: An institutional program of daily reassessment of need for IUC was instituted at our tertiary care hospital across all service lines in 2010. In 2011, daily electronic order was required to maintain IUC for more than 24 hrs. All perioperative IUC were removed within 48 hours. In July 2012, we began service-specific sterile IUC placement. IUC was inserted after the surgeon had prepped the patient, scrubbed and then draped. We continued 100% compliance with perioperative antibiotic administration. We used NSQIP criteria to define UTI. Comparison was made to annual data from our institution's NSQIP report between July 2010-June 2011 (Y1) and July 2011-June 2012 (Y2). Rate of UTI in CRS patients before and after intervention was studied and risk factors for UTI identified.

Results: A total of 12/180 cases (Y1, 6.6%) and 12/357 (Y2, 3.3%) UTIs per year were reported, respectively. There was no change in the UTI rate with hospital specific initiatives in 2010 or 2011. After initiation of sterile intraoperative IUC placement, there were no NSQIP UTIs identified on the CRS service during our four-month study period (106 cases). All UTI patients were grouped as: no risk factors (46%), IUC > 48 hrs (21%) and reinsertion (33%). Among patients who required IUC reinsertion, 80% had pelvic surgery, and <10% had pelvic radiation therapy.

Conclusions: Adherence to best practices, including use of IUC<48 hrs and perioperative antibiotics, has been shown to reduce the risk of UTI in CRS patients. However, the somewhat simple change from preoperative to intraoperative sterile urinary catheterization had more impact in reducing UTI in our CRS patients.

INCISIONAL NEGATIVE PRESSURE WOUND THERAPY SIGNIFICANTLY REDUCES SURGICAL SITE INFECTION IN OPEN COLORECTAL SURGERY.

(5)

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Purpose: Surgical site infections (SSI) in colorectal surgery remain a common problem, and are associated with an increase in cost of care and length of stay. Application of a negative pressure wound dressing over a closed incision has been shown to reduce SSI in several orthopaedic series, but to the author's knowledge, has not been reported in patients undergoing colorectal operations. This study evaluates the effect of negative pressure wound dressings applied over closed incisions on SSI in open colorectal surgical procedures.

Methods: A chart review of all open colorectal resections at a single institution over a two year time period was performed. The following data were collected: age, sex, presence of diabetes, chronic kidney disease, smoking status, steroid use, immunosuppressant use, BMI, wound classification, blood loss, length of operation, presence of a stoma, type of operation, ASA classification, transfusion, use of incisional wound vac, and presence of SSI. Cases where the skin incision was left open were excluded. Multiple logistic regression analysis was then used to determine which of these factors had a significant effect on SSI.

Results: 254 patients were included in the study population; 32 patients underwent incisional vacuum therapy. Overall, 69 of the 254 patients (27.2%) experienced SSI. Four wound infections (12.5%) were seen in incisional vacuum patients, and 65 wound infections (29.3%) in standard closure patients. Multiple logistic regression revealed two significant factors: Diabetes Mellitus increased the chance of SSI (OR 2.2, $p < 0.05$); and use of Incisional Negative Pressure Wound Therapy decreased the chance of SSI (OR 0.26, $p < 0.05$). Obesity was associated with a trend towards increasing SSI (OR 1.7, $p = 0.10$).

Conclusions: This retrospective analysis suggests use of an incisional negative pressure wound dressing reduces the rate of SSI in patients undergoing open colorectal surgery. Given the high cost of SSI, consideration should be given to performing a randomized controlled trial to evaluate this intervention.

IMPACT OF PREOPERATIVE OPIOID USE ON PERIOPERATIVE OUTCOMES AND 30-DAY HOSPITAL READMISSION IN COLECTOMY PATIENTS.

(6)

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Purpose: The pharmacodynamic effect of postoperative narcotic administration is understood to be associated with prolonged return of bowel function. Enhanced Recovery after Surgery protocols, which attempt to eliminate postoperative opiates, demonstrate decreased morbidity and mortality. The effect of preoperative opioid use on surgical outcomes is unknown. This study was undertaken to gather demographic data and determine the impact of preoperative opioid use on perioperative outcomes in patients undergoing colectomy. We hypothesize that patients using opioids prior to surgery experience worse perioperative outcomes.

Methods: Using standard National Surgical Quality Improvement Project (NSQIP) protocol at our institution, we collected patient demographic and perioperative data for a cohort of 312 patients undergoing colectomy. Patient histories and an electronic prescription service were primary sources for data regarding opioid prescription. Cases were stratified by history of prescription 30 weeks prior to colectomy. Length of stay (LOS), NSQIP defined complications, and 30-day readmission were primary outcomes. Data managed using Microsoft Excel. Statistics generated using SAS 9.3.

Results: All data are shown in Table 1. Patients using opioids were younger and more likely to have IBD as indication for colectomy. They were also more likely to be taking steroids for chronic condition, have increased wound classification, and have higher incidence of tobacco abuse. This population had significantly increased postoperative LOS and risk of surgical site infection (SSI). Risk of complications and readmission rate were also increased in opioid prescribed patients, trending toward significance. Duration of postoperative PCA use was longer in opioid use patients.

Conclusions: Colectomy patients who use opioid analgesics within 30-weeks prior to surgery have a worse preoperative risk profile. This population has a higher risk of SSI, increased PCA duration, prolonged LOS, and

S4 Urinary Tract Infections before and after intervention

	Year 1	Year 2	Study Period
Total cases	180	357	106
Total UTI	12	12	0
UTI - No risk factors	3	8	0
UTI - Foley >48 Hours	3	2	0
UTI - Foley reinsertion	6	2	0

increased 30-day readmission. Further work must be done to delineate whether opioids themselves are associated with these adverse outcomes or if they are a marker of increased comorbidity severity.

OBESITY INCREASES THE RISK OF POST-OPERATIVE PERIPHERAL NEUROPATHY FOLLOWING MINIMALLY INVASIVE COLON AND RECTAL SURGERY.

(7)

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Purpose: Abdominal surgery in the obese can be a major challenge in the peri-operative period. Peripheral neuropathy is an uncommon but well-described complication following abdominal surgery. Our aim was to evaluate the incidence of post-operative peripheral neuropathy following colorectal surgery and to identify its risk factors.

Methods: A retrospective review of a prospectively maintained database of consecutive patients undergoing colorectal operations was performed. The incidence of postoperative nerve injury was compared between minimally invasive and open surgery. BMI and other potential risk factors for developing peripheral neuropathy were evaluated. IRB approval was obtained. Forward stepwise logistic regression was used for multivariate analysis.

Results: Over a seven year period, 1,514 colorectal operations were performed. 945 (62.4%) of these operations were performed either laparoscopically or via hand-assisted laparoscopy, 166 (11.0%) were robotic-assisted, and 403 (26.6%) were open procedures. 23 patients (1.5%) developed peripheral neuropathy in the postoperative period. All patients had sensory deficits and one patient had both sensory and motor deficits. All symptoms resolved without any residual neurologic deficits within one year. 22 of the 23 peripheral neuropathy occurred in the MIS group (incidence ~2%). 1 of the 23 peripheral neuropathies occurred in the open group (0.2%). MIS, age, lithotomy positioning, operative time, and Pfannenstiel incision all significantly increased the risk of peripheral neuropathy. By logistic regression analysis, only BMI was an independent predictor for peripheral neuropathy (P=0.016) in minimally invasive surgery.

Conclusions: The incidence of postoperative peripheral neuropathy is 2% in MIS and 0.2% in open surgery. MIS, age, lithotomy positioning, operative time, and Pfannenstiel incision all significantly increased the risk of peripheral neuropathy. However, only obesity was an independent risk factor for peripheral neuropathy in patients undergoing minimally invasive colorectal surgery. Preventive measures should be instituted and documented in obese patients undergoing minimally invasive colorectal procedures.

S6 Table 1: Patient Demographics and NSQIP Perioperative Outcomes

Demographics	No Opioid Use (n=208)	Opioid Use (n=104)	p-value
Age- mean (95% C.I.)	59.6 (57.6-61.6)	53.2 (50.3-56.1)	0.0003
Indication benign- n (%)	32 (15.38)	4 (3.85)	0.0026
Indication malignant- n (%)	119 (57.12)	38 (36.54)	0.0006
Indication Inflammatory bowel disease- n (%)	16 (7.69)	22 (21.15)	0.0006
ASA Classification > 3- n (%)	125 (60.10)	73 (70.19)	0.0808
Smoker- n (%)	23 (11.06)	22 (21.15)	0.0167
Cancer history- n (%)	15 (7.21)	14 (13.46)	0.0731
Steroid therapy- n (%)	18 (8.65)	17 (16.35)	0.0424
Weight loss- n (%)	10 (4.81)	16 (15.38)	0.0014
Sepsis- n (%)	12 (5.94)	16 (15.38)	0.0066
Prior surgery- n (%)	107 (51.44)	73 (70.19)	0.0016
Wound classification >2- n (%)	21 (10.10)	28 (26.92)	0.0001
NSQIP Perioperative Outcomes			
Postoperative LOS- days (95% CI)	8.3 (7.4-9.2)	11.8 (9.8-13.7)	0.0017
Postoperative PCA duration- days (95% CI)	3.9 (3.4-4.4)	4.8 (4.0-5.6)	0.0295
Superficial SSI- n (%)	28 (13.46)	24 (23.08)	0.0317
Any complication- n (%)	56 (26.92)	38 (36.54)	0.0810
Multiple complications- n (%)	21 (10.10)	17 (16.35)	0.1116
30-day Postdischarge reasmission- n (%)	24 (12.00)	18 (19.15)	0.1023

RISK FACTORS FOR READMISSION FOLLOWING ELECTIVE COLECTOMY: POSTOPERATIVE COMPLICATIONS ARE MORE IMPORTANT THAN PATIENT AND OPERATIVE FACTORS.

(8)

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Purpose: Colon resections are associated with significant morbidity and readmissions are a common occurrence postoperatively. A possible ground for denial of payment by Medicare and other payors, it is imperative to determine risk factors for readmissions, in order to improve patient care and avoid payment denial.

Methods: Elective ileocolic and segmental colectomies, both laparoscopic and open, were analyzed from the prospective, statewide multicenter Michigan Surgical Quality Collaborative (MSQC) database to determine risk factors for readmission within 30 days of the initial operation. Univariate analysis followed by a multivariate logistic regression model was used to determine the independent influence of patient characteristics, operative factors and postoperative complications on the incidence of postoperative readmission.

Results: The readmission rate among 4013 cases from 2008 through 2010 was 7.3% (N=293). Significant risk factors associated with readmission based on multivariate logistic regression were almost exclusively postoperative complications. The top three were stroke, (odds ratio [OR] 10.0, 95% confidence interval [CI] 2.70-37.0, p=0.001), venous thromboembolism (OR 6.5, 95% CI 3.7-11.3, p<0.0001), and organ-space surgical site infection (OR 5.6, 95% CI 3.4-9.4, p <0.0001). Important factors not found to be independently predictive of readmission were: diabetes, CHF within 30 days, MI within 6 months, octogenarian, anatomotic leak, fascial dehiscence, sepsis, pneumonia, unplanned intubation and length of stay.

Conclusions: Postoperative complications account for the major risk factors behind readmissions following elective colectomy, while preoperative risk factors have less influence. Current strategies addressing readmission rates should focus on reducing preventable complications while still accepting that some are not completely avoidable. Furthermore, denying payment for readmissions may only serve as a stimulus to avoid operations on patients who are considered high-risk for complications.

RECURRENT COLONIC DIVERTICULAR BLEEDING IS COMMON WITHIN THE FIRST YEAR AND REQUIRES SURGICAL INTERVENTION.

(9)

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Purpose: The incidence of recurrent colonic bleeding varies in the literature. A select group of patients with diverticular bleed will have recurrent, life threatening bleed and need surgical management. The aim of this study is to determine the incidence and risk factors that may identify this group of patients.

Methods: We reviewed patients with definitive diverticular hemorrhage from 09/93 to 06/12 from an IRB approved database at the Cleveland Clinic Digestive Disease Institute. Rebleeding was the main outcome measure. Potential risk factors for rebleeding including demographics, accompanying co-morbid factors, medications, smoking and drinking habits and the treatment rendered were analyzed. Log-rank test with Kaplan-Meier method was used to assess study variables.

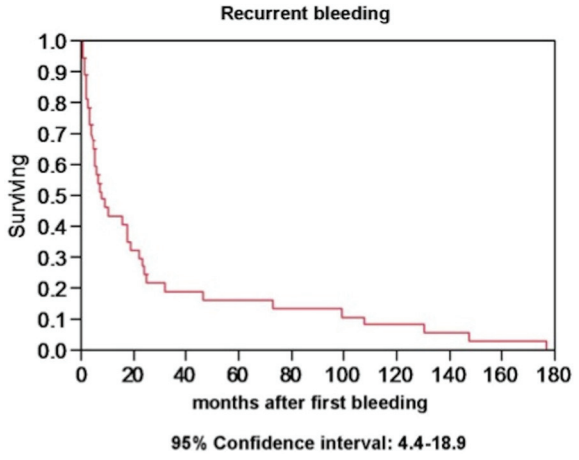
Results: We identified 78 patients with proven diverticular bleed who were treated nonoperatively and were

S8 Risk factors for readmission

Risk factor	Odds Ratio	95% Confidence Interval, lower	95% Confidence Interval, upper	significance
Smoker	1.12	1.04	1.21	.004
postop CVA	10.0	2.70	37.0	0.001
postoperative VTE	6.51	3.75	11.31	<0.0001
organ space SSI	5.63	3.38	9.37	<0.0001
postoperative progressive renal insufficiency	3.95	1.74	8.94	0.001
postoperative Clostridium difficile colitis	3.61	1.81	7.18	<0.0001
postoperative re-operation	3.12	2.03	4.79	<0.0001
superficial SSI	2.78	1.87	4.16	<0.0001
postoperative mechanical bowel obstruction	2.92	1.35	6.33	0.007
postoperative acute myocardial infarction	2.92	1.12	7.57	0.028
prolonged ileus	2.23	1.53	3.24	<0.0001
postoperative UTI	1.89	1.05	3.38	0.033

followed up for a median of 57.1 (1.3-196) months. Thirty-seven (47%) of these patients (16 females) with a median age of 67 (40-88) developed recurrent diverticular bleeding after a median time of 8.1 months (21 days-177 months). The site of index and recurrent bleeding were identical in 31 (84%) patients while 2 patients had recurrent bleeding in a different site and in the remaining 4 the exact site could not be determined. The bleeding originated from the left colon in 78 (83%) patients in the first and 31(84%) patients during the recurrent bleeding episode. Thirty-six patients (97%) with recurrent diverticular bleed required surgical intervention. There were no significant associations between incidence of recurrent bleeding and use of anticoagulants (p=0.82) or aspirin (p=0.19).

Conclusions: Recurrent diverticular bleeding rate is high (57%) within one year after the first bleeding episode. Left sided diverticular bleeding is more common than previously reported. Patients should not be discouraged from using necessary anticoagulants or aspirin because of a history of diverticular bleeding.



LAPAROSCOPIC EMERGENCY SURGERY FOR DIVERTICULAR DISEASE THAT FAILED MEDICAL TREATMENT: A VALUABLE OPTION?

(10)

F. Letarte, J. Hallet, R. Gregoire, C. Thibault, J. Gagne, S. Drolet, A. Bouchard, P. Bouchard
Quebec, QC, Canada

Purpose: Minimally invasive surgery (MIS) has become the standard for the treatment of elective diverticular disease. However, its use in the acute setting remains controversial. The objective of this study is to compare the outcomes of MIS to the open surgery (OS) in the acute management of diverticular disease that failed medical treatment.

Methods: We reviewed the charts of all patients who underwent surgery for complicated diverticular disease that an attempt at medical treatment failed from 2000 to 2011, in a single institution. Reviewers not involved in the treatment process extracted data using a standardized form. The primary outcome was overall 30-day perioperative morbidity. Secondary outcomes were 30-day mortality, length of stay, time to diet and need for a permanent stoma. Data were analyzed as intention to treat.

Results: Forty-two patients were retrieved: 24 MIS and 18 OS. Baseline demographics, ASA classification, APACHE scores and Hinchey classification did not differ between groups. The mean operative time was 36 minutes longer (p=0.05) and blood loss was 460 mL less (p<0.001) in the MIS group. The conversion rate was 8,3 % for laparoscopic approach. Overall morbidity was significantly lower for MIS compare to OS group(55.6% vs 16.7%; p=0.01), including 1 anastomotic leak with MIS and none with OS. Mean time to oral diet (3 vs 6.5 days; p<0.01) and length of stay (5 vs 8 days; p=0.04) were shorter for MIS group. Fewer permanent stoma were needed in the

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	minimally invasive surgery	open surgery	p value
n	24	18	
Lenght of medical treatment (days)	5.5 (4.0-9.0)	7.0(5.0-8.0)	0.837
Hinchey classification			
1	10 (41.7%)	4 (22.2%)	0.321
2	9 (37.5%)	11 (61.1%	0.129
3	1 (4.2%)	3 (16.7%)	0.297
4	1 (4.2%)	0 (0)	-
Mean operative time (min)	280.2	244.4	0.055
Blood loss (cc)	125	583.3	<0.0001
Conversion	2 (8.3%)	N/A	-
Overall morbidity-n(%)	4(16.7)	10 (55.6%)	0.019
Lenght of stay (days)	5 (4-8.2)	8 (7-13.2)	0.044
Mean time to oral diet (days)	3 (3-5)	6.5 (6-7)	0.001
Mortality	0 (0)	0 (0)	-
Permanent stomas (%)	1 (4.2%)	3 (16.7)	0.297

MIS group (4.2 vs 16.7%) at a 332 days median follow-up. No mortality occurred in either group.

Conclusions: MIS for patient that failed medical treatment for diverticular disease is a valuable and safe option that seems to offer the same benefits compared to OS recognized in elective MIS for diverticular disease, with a low conversion rate.

WHEN DOES DIVERTICULITIS PERFORATE?

(11)

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Purpose: Prophylactic sigmoid colectomy is routinely offered to patients who have had recurrent episodes of diverticulitis. Defining the characteristics of patients with perforated disease requiring emergent surgery may help to further guide disease management recommendations. The aim of this study was to evaluate which patients present with perforated diverticulitis requiring either emergent or urgent surgery.

Methods: After IRB approval, records of all patients who underwent surgery for sigmoid diverticulitis between 04/2007 and 09/2012 were reviewed. Data on demographics, comorbidities, steroid/immunosuppressant use, number of previous diverticulitis episodes, clinical presentation, and management were collected. Patients were divided into 3 groups according to surgery status: emergent, urgent and elective. Correlations between patient characteristics and management status were assessed using chi-square and Fisher's exact tests.

Results: 302 patients (51% males) of a mean age of 57 (20-89) years were included. 25 (8%) underwent emergent surgery, 22 (7%) urgent surgery after failed conservative management, and 255 (84%) elective resection. 19 (6%) patients had a history of diabetes and 24 (8%) used steroids or other immunosuppressants. The mean number of prior attacks was 4 (0 to 24); 72% of patients required 1 or more hospitalizations for a prior attack. There were no differences in age, gender, comorbidities, or immunosuppressant use among groups. Emergent patients were significantly less likely to have had a previous episode of diverticulitis (32% vs 77% urgent vs 98% elective) or previous hospitalization (4% vs 41% urgent vs 79% elective, $p < 0.001$). Similar to the emergent group, the urgent group had fewer previous episodes of diverticulitis than did the elective group ($p<0.007$), although the rate of prior hospitalization was not different ($p=0.18$).

Conclusions: Patients who present with perforated diverticulitis and require emergent or urgent surgery usually do so on the first presentation of symptomatic disease. Therefore, strategies to avoid perforation in patients with multiple episodes of diverticulitis are not warranted.

IS LAPAROSCOPIC COLECTOMY A CLINICALLY AND ECONOMICALLY FAVORABLE APPROACH IN THE MODERN HEALTH CARE ENVIRONMENT? RESULTS FROM A COHORT OF 56,000 PATIENTS.

(12)

E. Haas, R. Pedraza, M. Ragupathi, R. Carman, J. Nieto
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Purpose: Large population–based studies have revealed that laparoscopic colectomy results in improved outcomes at the expense of higher hospital costs when compared to open colectomy. These studies however, are dated prior to the introduction of the ICD- 9 laparoscopic colectomy codes in 2008. We aimed to provide the most recent and accurate reflection of clinical and financial outcomes comparing laparoscopic versus open colectomy utilizing the largest inpatient United States database.

Methods: Utilizing Premier Inc.® database, from October 2008 to June 2011, we identified either open or laparoscopic right, left, and sigmoid colectomies in the non-emergent setting. Demographics, clinical, and financial outcomes were analyzed. Using multivariate analysis, postoperative outcomes were adjusted based on age, gender, type of hospital, disease severity, and disease process.

Results: Of the 56,601 colectomies performed during the study period, 56% were open and 44% were laparoscopic. A higher percentage of cases identified as major and extreme severity were performed using open technique. There was a significantly higher incidence of open colectomy for cancer and inflammatory bowel disease and higher incidence of laparoscopy for diverticular disease. A significantly higher proportion of laparoscopic cases were performed in the urban setting as compared to open cases. Colorectal surgeons performed a significantly higher percentage of laparoscopic than open cases whereas general surgeons performed a higher percentage of open than laparoscopic cases. When compared to open surgery, laparoscopic colectomy resulted in statistically significant reduction in transfusion (20.0% vs 7.6%), complications (31.7% vs 19%), length of stay (9.6±10.0 vs 5.4±5.9) and mortality (3.1% vs 0.5%). Hospital costs of laparoscopic colectomy were significantly lower as compared to open colectomy ($23,545 vs $14,941)

Conclusions: This large, population-based study shows that clinical outcomes following laparoscopic colectomy compare favorably to open colectomy. Overall, laparoscopic colectomy is associated with enhanced recovery and overall cost savings

LAPAROSCOPIC LOWER GI SURGICAL TRIALS WITH NONSIGNIFICANT RESULTS: AN ASSESSMENT OF REPORTING AND INTERPRETATION OF THE PRIMARY OUTCOMES.

(13)

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Purpose: Spin has been defined as "specific reporting that could distort the interpretation of results and mislead readers". The purpose of this study was to identify how frequent "spin" occurs in laparoscopic trials with non-significant results.

Methods: A search of MEDLINE and EMBASE was completed to identify randomized controlled trials (RCTs) assessing laparoscopy in lower gastro-intestinal surgery. Trials were included if a non-significant (P > 0.05) result of the primary outcome(s) was found between laparoscopic and open approaches. Non-inferiority and equivalence trials were excluded. Spin was assessed based on previous definitions and categorizations.

Results: 564 studies were initially identified. There were 145 laparoscopic trials, with 61 (42%) having non-significant results. These trials evaluated patients with appendicitis (n = 27), colorectal cancer (n = 23), inflammatory bowel disease (n = 3), diverticular disease (n = 5), and other diseases (n=3). Of the 61 trials, 66% exhibited spin. In 41% of trials (n=25), only the significant results from multiple outcomes, secondary outcomes, subgroup analysis or modified populations were emphasized. In 96% of these trials (24 of 25), these outcomes were used to support the use of laparoscopy over the open procedure. In 34% (n = 21) of trials, non-significance was interpreted as equivalency between techniques. In 8% (n = 5) superiority or benefit was implied despite a non-significant result. In all 5 of these trials, laparoscopy was implied to be superior or beneficial. Spin was not associated with year of publication (Pre 2004 vs Post 2004, P = 0.46), number of patients enrolled (<100, 100 – 200, >200; P = 0.99), trial registration (P = 0.88) or number of primary outcomes (1 vs. multiple, P =0.17).

Conclusions: Distortion or misinterpretation of non-significant results in laparoscopic trials was highly prevalent in this review. Most commonly, this resulted in the support of laparoscopy over open procedures. Readers of trials with non-significant results should be cautious of authors' interpretations.

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Preoperative characteristics	Open (n=31,573)	Laparoscopic (n=24,488)	P value
Age (years)	64.4±14.4	62.1±13.9	<0.0001
Female	14,130 (44.8%)	11,573 (47.3%)	<0.0001
Severity of disease*			
Minor	7,288 (23.1%)	11,584 (47.3%)	<0.0001
Moderate	11,968 (37.9%)	9,406 (38.4%)	0.222
Major	7,916 (25.1%)	2,750 (11.2%)	<0.0001
Extreme	4,401 (13.9%)	748 (3.1%)	<0.0001
Diagnosis			
Cancer	11,356 (36.0%)	8,354 (34.1%)	<0.0001
Diverticular disease	9,856 (31.2%)	8,970 (36.6%)	<0.0001
Inflammatory bowel disease	972 (3.1%)	420 (1.7%)	<0.0001
Other	9,477 (30.0%)	6,784 (27.7%)	<0.0001
Type of hospital			
Urban	26,960 (85.4%)	22,618 (92.4%)	<0.0001
Teaching hospital	11,897 (37.7%)	9,275 (37.9%)	0.637
Surgeon specialty			
General surgeon	24,801 (78.6%)	18,029 (73.6%)	<0.0001
Colorectal surgeon	3,899 (12.3%)	5,139 (21.0%)	<0.0001
Other	2,873 (9.1%)	1,320 (5.4%)	<0.0001
Postoperative outcomes			
Transfusion	6,303 (20.0%)	1,869 (7.6%)	<0.0001
Length of hospital stay (days)	9.6±10	5.4±5.9	<0.0001
Complications	10,001 (31.7%)	4,713 (19%)	<0.0001
Mortality	989 (3.1%)	120 (0.5%)	<0.0001
Hospital costs (US dollars)	$23,545±21,466	$14,941±15,008	<0.0001

*Severity of disease according to APR-DRG.

LONGER OPERATIVE TIME: DETERIORATION OF CLINICAL OUTCOMES OF LAPAROSCOPIC COLECTOMY VERSUS OPEN COLECTOMY.

(14)

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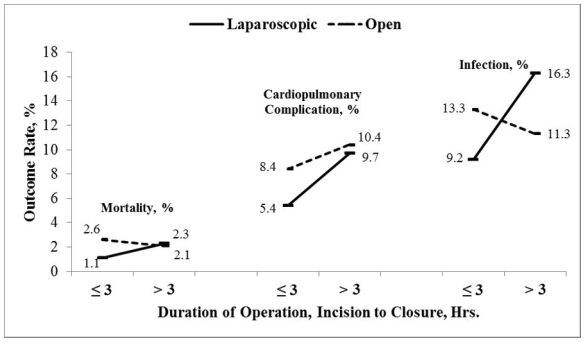
Purpose: The purpose of this study was to determine if the benefits of a laparoscopic right colectomy compared to open right colectomy are diminished by prolonged operative times.

Methods: We queried the ACS-NSQIP database for laparoscopic (LRC) and open right colectomy (ORC) with a diagnosis of colorectal cancer from 2005-2010. Patients were stratified by operative technique and by an operative time of three hours, and outcome was analyzed. Predictors of operative time >3 hours in the laparoscopic cohort were identified by cox regression.

Results: Of 4,273 patients, 50.1%(n = 2414) underwent LRC; 49.9%(n = 2132) underwent ORC. Operative duration (OD) was > 3 hours for 18.4%(n = 393) in LRC and 11.3%(n = 240) in ORC. ORC patients were 1.3 years older (p = .001) with higher ASA score 3-5(63.1% ORC vs. 53.3 % LRC, p < .001) and lower serum albumin (ORC 3.63 vs. LRC 3.8, p <.001). There was no benefit of LRC with OD > 3 hours over ORC with respect to mortality (2.3% vs. 2.1%, p = 0.864) and cardiopulmonary complications (9.7% vs. 10.4%, p = 0.761). As compared to ORC, infection rates were higher in LRC with OD > 3 hours (16.3% vs. 11.3%, p = .08). Independent predictors of OD> 3hours in the LRC cohort included morbid obesity(OR 3.03, CI 1.74-5.26, p < .001), recent radiotherapy(OR 6.51, CI 1.71-24.76, p .006), and peripheral vascular disease(OR 2.52, CI 1.07-5.90, p = .034).

Conclusions: At an OD of 3 hours, LRC has no benefit over ORC with regards to cardiopulmonary complications or mortality and is associated with higher infection rates than ORC. In patients at risk for prolonged LRC, early conversion to an open technique may be warranted.



BUILDING A BUSINESS CASE FOR COLORECTAL SURGERY QUALITY IMPROVEMENT.

(15)

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Baltimore, MD

Purpose: SSI reduction is a top priority. Quality improvement requires hospital resources. Comprehensive unit based safety program(CUSP) has been associated with reduction in healthcare-associated infections and cost savings in >100 ICUs. We recently described implementation of CUSP leading to a 33% reduction in colorectal SSIs. Nevertheless, It is unclear if surgical CUSP implementation led to cost savings.

Methods: 5 surgeons participated and 28 surgeons did not participate in CUSPat a large academic medical center. Patients undergoing major small and large bowel procedures between 7/10-6/12 were analyszed. Cases were risk-adjusted using 3M severity of illness score(SOI). SSI rate was determined by NSQIP. Institutional financial data was used to determine variable direct costs. Multivariate regression modeling was used. Cases with length of stay(LOS) >31 days were excluded.

Results: 626 patients underwent colorectal procedures. Of these, 502 patients were treated by participating surgeons and 124 by non-participating surgeons. The SOI and age were greater in the non-participating group(P<0.01). Although the overall SSI rate was similar(18.5%vs.20%,P=0.38), the organ space infection was lower in the participating group(3.2%vs.6.6%,P=0.05). LOS, ICU stay, and total variable direct cost were lower in the participating group(P<0.01). Adjusting for SOI and age, total variable direct cost was $2,033/case lower in participating group. Variable direct cost for operating room and supplies did not differ between two groups suggesting similar procedures. Median total variable direct cost per case in non-participating group was $11,939 and $2,033 potential cost savings per case, 17.0% reduction. Most significant potential cost savings($1,431 per case) were realized in room and board, lab, drug charges.

Conclusions: Economic impact of quality improvement programs is difficult to evaluate. Even without significant improvements in clinical outcomes, cost-savings may be realized by standardization of care. Evaluation of the financial impact of improvement programs is an important component to determine if a program is sustainable and scalable. CUSP implementation was associated with significant decreased LOS and ancillary costs.

ARE OUR PUBLICATIONS FAILING THE INSPECTION? A REVIEW OF THE PUBLICATIONS IN RECTAL CANCER SURGERY BETWEEN 2002 -2012.

(16)

M. Mora Pinzon, D. Hayden, K. Kosmidis, A. Evans, T. Saclarides
Maywood, IL

Purpose: Quality of publications is considered a subjective measurement, and more weight is placed on prospective studies, specially randomized clinical trials and meta-analysis. The purpose of this study is evaluate the type and quality of publications using an objective measurement.

Methods: We performed a search in Pubmed using the terms "rectal neoplasms/surgery". Quality assessment of a sample of articles was performed using checklist guidelines (CONSORT for Randomized Clinical Trials [RCTs], PRISMA for Systematic Reviews).

Results: 3603 articles were identified, 21.6 % were case report/series, 20% were retrospective reviews, 15.5% were reviews (Including 452 reviews, 37 Meta-analysis, 9 practice guidelines), 14.5% were prospective studies, 14.3% were other types of articles (Comments, letters, editorials), 6% were Clinical trials (phase I/II), 4.7% were RCTs and 3.6% were cross-sectional studies. The distribution of type of articles over the last 10 years showed a slight increase in prospective and retrospective studies and similar decrease in the amount of reviews and case/reports. Quality of meta-analysis or systematic reviews was assessed using the PRISMA guidelines, maximum score possible was 27 points. The average score was 11.09 (range 1 - 19), 60% of the studies were low quality (<50% of points). Quality of RCTs was evaluated according to CONSORT guidelines, the maximum score possible was 74. The average score was 52.6 (range 43 - 61), 46.6% scored above 75%, while the remaining 53.4 were average (50 - 75% of points).

Conclusions: 21.6% of the articles published were case reports, and just 25% of the articles were prospective or clinical trials. This results show that a shift of the type publication is required, multiple journals do not accept case reports or case series, which is a step forward in the improvement of research in rectal cancer surgery, which also will require a better use of the available guidelines and resources. Although RCTs, systematic reviews and meta-analysis provide the highest level of evidence, scores average or below average not only limit replication of the study but also it affects the generalizability of results to other populations

THE FIRST 1000 PATIENTS ON AN INTERNET BASED COLORECTAL NEOPLASIA DATABASE ACROSS PRIVATE AND PUBLIC MEDICINE IN AUSTRALIA: DEVELOPMENT OF A BINATIONAL MODEL FOR THE CSSANZ.

(17)

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Melbourne, VIC, Australia

Purpose: Collection of multi-institutional data pertaining to treatment of bowel cancer has been hindered by poor clinician compliance with data entry and lack of incentive to participate. Certain data points relating to operative technique and short term morbidity ideally require direct input from the treating clinician.

Methods: A browser based data collection interface was custom written and housed in a university deparment of epidemiology, offering automated reporting modules for clinical outcome to participants, across two private and one public hospital over a three year period. This was combined with a model of regular feedback and automated reminders to surgeons. Surgeons were provided with automated, contemporary clinical results summary relat-

S15 CUSP Participating Surgeons Had Significantly Lower Variable Direct Costs As Compared to Non-CUSP Participating Sugeons

	Coefficient	P-value
Surgical Site Infection	0.019	0.942
LOS	-0.677	0.108
ICU stay	-0.510	0.045
Total Variable DIrect Cost	-2033.6	<0.001
Drug Variable Direct Cost	-283.5	0.001
Lab Variable Direct Cost	-239.0	0.001
Operating Room Variable Direct Cost	-4.7	0.957
Other Variable Direct Cost	-172.4	0.001
Radiology Variable Direct Cost	-97.5	0.158
Room and Board Variable Direct Cost	-736.4	0.012
Supplies Variable Direct Cost	-333.9	0.148

Severity of Illness and Age as Covariates

ing to their own practice, compared with aggregated results. In addition the system incorporated an automated reminder system with direct linkage to deficient data. The software was combined with a clinical feedback system incorporating fortnightly data review meetings, at the time of clinical multidisciplinary meetings.

Results: 8 specialist colorectal surgeons across 3 campuses enrolled clinical data, with the assistance of a full time data manager. Since 2/2010, data has been entered on more than 1000 patients undergoing surgery for bowel cancer. Data entry completion for perioperative data (>27,000 data points) was 100%. Analysis of outcome (see Table 1) was performed on those patient with more than 45 days follow up post surgery (932).

Conclusions: The results confirm the safety and efficacy of colorectal cancer surgery in both the public and private sector in Australia, in this mixed patient cohort. The combination of a simple multiuser interface, defined data points, automated result reporting modules, and data-deficiency reminder module resulted in 100% data compliance in nearly 1000 clinical episodes. The unprecedented success of this model has lead to the Colorectal Surgical Society of Australasia (CSSANZ) adopting this model for data collection for Australia and New Zealand as the binational database.

S17 Clinical Outcome Data : the first 1000 patients

anastomotic leak	17	1.8%
Readmission within 30 days of surgery	63	6.8%
return to operating room	40	4.3%
30 day mortality (all causes)	6	0.6%

Note that 932 treatment episodes were included to ensure 45 day follow up post discharge

IMPACT OF UK NATIONAL BOWEL CANCER AWARENESS CAMPAIGN ON COLORECTAL CANCER SERVICES.

(18)

R. Pande, E. Leung, P. McCullough, C. Harmston
Warwick, United Kingdom

Purpose: Underutilization of screening and poor publicity is often considered to account for the advanced stage at diagnosis. Following the success of the UK government piloted initiative "Be clear on cancer", the publicity campaign was rolled out nationwide from January 2012. This study evaluates the impact of the campaign on our colorectal cancer services including the effect on the screening programme.

Methods: Information regarding all suspected cancer referrals, investigations, uptake on screening and staging of each detected cancer were collected during two 6-month periods: 1st February to 31st July 2011 and 2012. Significant comparisons were determined by chi-square test.

Results: The table below illustrates the differences between pre and post-campaign.

Conclusions: The campaign has led to a significant increase in number of referrals to the colorectal services, with resultant increase in demand on resources. Further study is warranted to investigate the potential benefits of this campaign with respect to clinical outcomes.

S18 Results

	Pre-Campaign	Post-Campaign	% Change
cancer referrals	834	1282	53.7%(p<0.001)*
(median age;range)	(69y;16-95)	(67y;18-94)	
(M:F)	(395M:475F)	(662M:620F)	
Total Cancers detected	131	173	32%(p=0.273)
Referrals	47	83	77%(p<0.001)*
Screening	13	13	0%(p=1)
Emergency	17	9	-47%(p=0.078)
Number of Investigations	926	1463	58%(p<0.001)*
Endoscopies	718	1121	56%(p=0.007)*
Computed Tomography	208	342	64%(p=0.006)*
Dukes A	14	22	57%(p=0.005)*
Dukes B	25	38	52%(p=0.015)*
Dukes C	20	37	85%(p<0.001)*
Dukes D	24	28	17%(p=0.697)
Unknown	48	48	0%(p=1)
Uptake of screening	58%	62.5%	4.5%(p=0.15)

MISSION CONTROL IN FAMILIAL ADENOMATOUS POLYPOSIS: AN ANALYSIS OF CANCER DEATHS IN FAMILIES, GENERATION BY GENERATION.

(19)

L. LaGuardia, M. O'Malley, C. Burke, M. Kalady, J. Church
Cleveland, OH

Purpose: The primary mission of the Polyposis Registry is to prevent death from cancer in patients affected by hereditary colorectal cancer syndromes. The Registry has been in existence for 33 years, and includes over 900 families and 4,590 affected individuals with familial adenomatous polyposis. Over these 33 years we have assumed responsibility for generations of patients. We conducted this study to examine the incidence of cancer in succeeding generations, to see how close we come to fulfilling our mission.

Methods: We identified all families with three or more generations enrolled in our registry. Only patients for whom disease status could be documented by medical records were included. We abstracted data on age at diagnosis of familial adenomatous polyposis, age at death, and cause of death.

Results: 12 of the 900 families consisted of three or more generations; 9 with three and 3 with four. Overall there were 100 affected individuals out of 335 family members. Size of families from oldest to youngest generation ranged from 1 to 23, 1 to 17, 2 to 36 and 4 to 20. 21/74 (28%)of the oldest generation were affected, 37/101 (37%) of the middle generation were affected, 35/133 (26%) of the third generation were affected and 7/27 (26%) of the fourth generation were affected. 10/21 of affected members of the oldest generation were dead, 6 from cancer. 8/37 of affected middle generation patients were dead, 6 from cancer. 3/35 of the youngest generation were dead, none from cancer. Ages at diagnosis and death, and types of cancer, are shown in the table.

Conclusions: In multigenerational families, FAP is now being diagnosed at puberty. Death rates are decreasing, and the registry is fulfilling its mission for these multigenerational families.

RACIAL DISPARITY IN COLORECTAL CANCER OUTCOMES: THE ROLE OF EQUAL TREATMENT.

(20)

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Purpose: Racial disparities exist in the outcomes of many malignancies including colorectal cancer. There are many plausible reasons for this disparity. A previous study from our institution showed that blacks had a 40% higher risk of mortality compared to whites. The main reason for this disparity was that blacks were less likely to receive chemotherapy and radiation. Our goal was to evaluate the role of equal treatment of blacks and whites in the elimination of racial disparity in colorectal cancer outcomes.

Methods: A retrospective analysis of 833 patients with colorectal cancer diagnosed between 1996 and 2008 was done at a University Tertiary Referral Center. Demographic variables including age, sex and race were abstracted. Tumor-specific variables including AJCC stage, anatomic tumor location, vital status and survival were obtained. Treatment-specific variables including surgery, chemotherapy, radiotherapy and follow up were also obtained. Racial differences in these variables were studied and their effect on overall survival was determined using univariate and multivariate analyses.

Results: Results: There were 182 (21.8%) blacks out of the total of 833 patients. Blacks were significantly younger at diagnosis compared to whites with a median (quartiles) age of 55 (47-64) years compared to 59 (51-68) years respectively (P=0.0005). The median overall survival was 3.32 (2.6-4.6) years for blacks and 3.69 (3.4-4.0) years for whites (P=0.61). Nearly equal proportions of Blacks (78%) and Whites (79%) underwent surgery (P=0.86), similar proportions of Blacks (57%) and Whites (60%) received chemotherapy (P=0.77), and similar proportions of Blacks (18%) and Whites (22%) received radiation therapy (P=0.30). There was no difference in overall survival between the two racial groups. Stage-stratified univariate and multivariate analyses showed surgery and chemotherapy as the only statistically significant determinants of overall survival.

S19

	Oldest Generation	Second Generation	Third Generation	Fourth Generation
Number affected	21	37	35	7
Number dead	10	8	3	0
Cancer deaths	6	6	0	0
Cancers	Duodenum 1, Pancreas 2 Colorectal 3	small cell, duodenum, adrenal, brain, rectal x 2		
Age at FAP diagnosis*	34 +/- 11	21 +/- 10	13 +/- 9	10 +/- 3
Age at cancer death*	49 +/- 19	37 +/- 12		

* mean +/- standard deviation

Conclusions: There were no differences in overall survival between blacks and whites and this may have resulted from identical treatment. The previously noted disparity has evaporated as a result of equal treatment.

COLORECTAL PREOPERATIVE SURGICAL SCORE: VALIDATING A PREOPERATIVE RISK STRATIFICATION MODEL FOR MAJOR COLORECTAL SURGERY.

(21)

C. Kong, G. Guest, S. Chan, D. Watters
West Melbourne, VIC, Australia

Purpose: Colorectal surgery is associated with significant mortality with reported rates between 1 to 2 percent in elective setting and 5 to 10 percent in emergency surgery. There are few risk stratification models that could predict mortality before major colorectal surgery. The aim is to develop a preoperative model suitable for our population and to perform an external validation of the model.

Methods: The model was developed from 474 consecutive major colorectal cases (2008-2010) and internally validated with 630 patients (2002-2007) at Geelong Hospital. Univariate and multivariate logistic regression analysis allowed identification of independent predictors for mortality. It was then externally validated with data from Western Hospital (389 patients). Discrimination (ROC) and calibration (p-value) techniques were utilized to measure the reliability of the model in predicting mortality.

Results: Significant predictors for mortality were; age≥70, urgent operation, albumin≤30 g/L and congestive heart failure (ROC=0.87, calibration p-value=0.68). The predicted risk of mortality was stratified according to the risk profile of 0.39% to 66.51%. When compared with other models, CrOSS had similar predictive power as P-POSSUM (ROC=0.801, calibration p-value=0.88) and Cleveland Clinic Foundation ColoRectal Cancer (CCF CRC) model (ROC=0.789, calibration p-value=0.62). The overall mortality rate was 5.16 percent (33 patients) at Geelong Hospital and 1.03 percent (4 patients) at Western Hospital. The higher mortality rate at Geelong Hospital was due to higher proportion of patients who were older, had higher ASA and POSSUM physiological score whereas Western Hospital had more urgent operations. Despite the differences, external validation showed CrOSS is a reliable model in predicting mortality (ROC=0.847, calibration p-value=0.2).

Conclusions: The results showed that it is possible to predict mortality in major colorectal surgery using only

S20 Table 1: Patient Characteristics and Treatment Modalities by Race

Characteristic or Treatment	Blacks(182)	Whites(651)	
Sex			0.12
Male	77 (42.3%)	318 (48.8%)	
Female	105 (57.7%)	333 (51.2%)	
Median age (quartiles)	55(47-64)	59(51-68)	0.0005‡
Tumor site			0.047
Colon	132 (72.5%)	421 (64.7%)	
Rectum	50 (27.5%)	230 (35.3%)	
AJCC stage			0.80
0-I	23 (12.6%)	96 (14.7%)	
II	37 (20.3%)	111 (17.1%)	
III	39 (21.4%)	142 (21.8%)	
IV	54 (29.7%)	186 (28.6%)	
X (Unknown)	29 (15.9%)	116 (17.8)	
Surgery			0.86
Yes	142 (78.0%)	516 (79.3%)	
No	40 (22.0%)	135 (20.7%)	
Chemotherapy			0.77
Yes	104 (57.1%)	391 (60.1%)	
No	56 (30.8%)	188 (28.9%)	
Unknown	22 (12.1%)	72 (11.1%)	
Radiotherapy			0.30
Yes	33 (18.1%)	141 (21.7%)	
No	115 (63.2%)	370 (56.8%)	
Unknown	34 (18.7%)	140 (21.5%)	
Median Survival	3.32 (2.6-4.6)	3.69 (3.4-4.0)	0.61

preoperative variables. These are readily available in any hospital setting and could be used as a guide for informed consent and to identify high risk patients for multidisciplinary attention.

FACTORS AFFECTING PROGRESSIVE DISEASE IN PATIENTS WITH SYNCHRONOUS COLORECTAL LIVER METASTASES: A PILOT STUDY.

(22)

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Purpose: The objective of this study was to determine the impact of the timing of a primary tumour resection on synchronous colorectal liver metastases.

Methods: We identified patients with synchronous colorectal liver metastases discussed in our hepatobiliary MDT between 2005 and 2010. Patients were analysed according to the following three groups: 1) a primary tumour resection; 2) chemotherapy only 3) neo-adjuvant therapy prior to a primary tumour resection. The size and progression of the liver metastases were compared between the 3 groups. A univariate and multivariate analysis was performed to identify factors significantly contributing to progressive disease.

Results: A total of 114 patients with synchronous colorectal liver metastases were identified. Initial treatment consisted of: 1) a primary tumour resection in 44 patients; 2) chemotherapy only in 55 patients and 3) neo-adjuvant therapy prior to a primary tumour resection in 14 patients. The incidence of disease progression was significantly greater in patients undergoing a primary tumour resection with progressive disease found in 31 patients compared to 11 and 4 patients in the groups receiving chemotherapy only or neo-adjuvant therapy prior to a primary tumour resection respectively ($p<0.001$). Univariate analysis demonstrated that a primary tumour resection ($p<0.001$, OR 8.7; 95% CI 4-20) and the use of chemotherapy ($p<0.001$, OR 0.2; 95% CI 0.08-0.4) were the two most significant variables to affect metastatic progressive disease. On multivariate analysis, a primary tumour resection significantly affected progressive disease ($p=0.012$, OR 5.9; 95% CI 5.4-21.2). There was significantly less overall regression of the liver metastases in patients undergoing neo-adjuvant therapy (group 2) or resection of the primary tumour compared with those patients receiving chemotherapy but not undergoing a primary tumour resection.

Conclusions: Our findings suggest that a primary tumour resection as part of a sequential resection in patients with synchronous colorectal liver metastases is an independent adverse prognostic factor and should be avoided. These preliminary findings need to be validated in a future independent study.

RIGHT COLECTOMY PROTECTS PATIENTS WITH METHYLATOR CANCERS AGAINST METACHRONOUS SERRATED NEOPLASIA.

(23)

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Purpose: Right-sided serrated polyps precede sporadic microsatellite unstable (MSI-H) colorectal cancers (CRCs) via the serrated pathway, and have a high rate of synchronous and metachronous lesions. Serrated polyps are also described in Lynch syndrome (LS), where right-sided MSI-H cancers are due to germline mutations in mismatch repair genes. This study compares serrated neoplasia in patients with sporadic and hereditary MSI-H CRC and examines the effect of right colectomy on the natural history of metachronous polyps and cancers.

Methods: MSI-H CRCs were identified from a clinically annotated, prospectively maintained frozen biobank where tumors were analyzed for MSI and the CpG island methylator phenotype (CIMP). MSI-H tumors were classified as sporadic, methylator pathway (MP) if they were CIMP-positive, and MSI-H tumors from patients with germline mismatch repair gene mutations were classified as hereditary (LS). Patient demographics, colonoscopic findings, operative reports, and pathology reports were reviewed.

Results: 85 patients were included: 47 MP, 38 LS. Median age for MP and LS patients was 75 years (range, 41-90) and 48 years (range, 27-77) respectively, $p<0.0001$. 47 (98%) MP patients and 27 (45%) LS patients underwent right colectomy, $p<0.0001$. Metachronous cancers occurred in 16/60 (21%) of LS cancers and no MP patient, $p<0.0001$. Four (9%) MP patients each had 1 metachronous serrated polyp, compared to 24 (63%) LS patients ($p<0.001$) who had polyps (median 2, range, 1-8). 34% of MP patients had colonoscopic follow-up, with a median of 2 scopes per patient over a 32-month follow-up (range, 1-136) and 63% of LS patients had colonoscopic follow-up; median 4 scopes per patient over 102 months (range, 1-462), $p<0.0001$. Characteristics of the associated polyps were similar between MP and LS patients (Table 1).

Conclusions: MSI-H cancers arise through two different molecular mechanisms. Right colectomy effectively protects patients with a colonic methylator milieu against metachronous serrated neoplasia, both benign and malignant. Lynch syndrome colons remain at high risk after index segmental colectomy.

CHORIONIC GONADOTROPIN-BETA MODULATES EPITHELIAL-MESENCHYMAL TRANSITION IN HUMAN COLORECTAL CARCINOMA METASTASIS.

(24)

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Purpose: Ectopic production of free beta human chorionic gonadotropin (hCGβ) has been associated with more aggressive behavior in non-trophoblastic tumors. Interestingly, hCGβ has common evolutionary sequences with transforming growth factorβ (TGFβ) which is a major driving force of the epithelial to mesenchymal transition (EMT). The aim of this study was to examine the biological role of hCGβ and its clinical significance in colorectal cancer (CRC).

Methods: Ninety-one cases of CRC specimens were immunohistochemically examined and the association between their expression and the clinico-pathologial features observed. Human CRC cells, LoVo, HCA7 and T84 cells stably overexpressing hCGβ were examined for invasiveness and tumorigencity by invasion assay, expression of proteins and genes associating EMT were also examined by Western blot and microarray analysis, and mouse tumor formation.

Results: Immunohistochemically, hCGβ was positively identified in 21 of 91 tumors (23.1 %), and was correlated with histological grade ($p = 0.041$) and the presence of liver metastasis ($p = 0.016$). LoVo, T84 cells stably overexpressing hCGβ demonstrated significantly increased invasion ($p < 0.05$), reduced expression of E-cadherin and increased expression of Snail2 compared to CRC cell lines with GFP control expression vector. Microarray and subsequent PCR analysis identified upregulation of Snail2 and Twist1 genes associtaed with hCGβ overexpression. Furthermore, HCA7 cells stably overexpressing hCGβ demonstrated significantly increased tumor growth in mouse peritoneal metastasis model ($p < 0.005$).

Conclusions: hCGβ plays an important role in mediating EMT and metastatic behavior in CRC. hCGβ may be a new therapeutic intervention target for patients with CRC.

EXPRESSION OF HER2 IN RECTAL CANCER WITH PREOPERATIVE RADIOTHERAPY POTENTIAL BIOMARKER TO PREDICT THE METASTASIS.

(25)

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Purpose: The aim of this study was to investigate the potential role of HER2 in predicting the clinical outcome of rectal cancer patients following preoperative radiotherapy.

Methods: 142 locally advanced rectal cancer patients who underwent total mesorectal excision after radiotherapy (30Gy/10f) were studies from May 2002 to Oct. 2005. Tissue specimen were collected before preoperative radiotherapy by endoscopic biopsy. HER2 overexpression was detected using immunohistochemistry. Tumor regression of the primay tumor was semiquantitatively determined by the amount of viable tumor, according to a modified pulished tumor regression grading scheme (TRG) advocated by the AJCC Cancer Staging Manual 7th edition.

Results: 106 samples (74.6%) showed barely perceptible positivity (0-1+), 15 samples (10.6%) showed moderate (2+) and 21 (14.8%) showed strong (3+). Significant correlation was found between HER2 overexpression and increased rate of distant metastasis ($p=0.04$). Subgroup analysis indicated in TRG negative subgroup, the correlation between HER2 overexpression and rate of distant metasis was even more significant ($p=0.02$). However, for all included patients, there was no relationship between HER2 overexpression and DFS or OS. In multivariate analysis, ypN stage (OR=0.499, $p=0.005$) and positive expression of HER 2(OR=3.434, $p=0.025$) and CEA level were identified as independent risk factor for distant metastasis and were retained in the regression model.

S23 Polyp Characteristics

	MP	LS	p-Value
Patients with at Least One Colonoscopy	47	38	
Total Number of Polyps	45	141	
Hyperplastic Polyp	20 (44%)	37 (31%)	0.2
Sessile Serrated Polyp	0	7	1
Total Adenomas	24	96	0.1
Tubular Adenoma	22	72	0.3
Tubulovillous/Villous Adenoma	2	24	0.3
High Risk Adenomas	22	75	0.7
Polyps with HGD	3	11	0.9
Carcinoma in situ	1	0	1

Conclusions: HER2 is overexpression in about 15% of rectal cancer patients. It may become a potential biomarker to predict the distant metastasis of rectal cancer patients after preoperative radiotherapy especially for those cases showing poor response to neoadjuvant radiotherapy.

EPIGENOMIC CHARACTERIZATION OF LOCALLY ADVANCED STAGE ANAL CANCER: AN RTOG 98-11 SPECIMEN STUDY.

(27)

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Purpose: The Radiation Therapy Oncology Group (RTOG) 98-11 clinical trial demonstrated the superiority of standard 5FU-Mitomycin C over 5FU-Cisplatin in combination with radiation in the treatment of anal squamous cell cancer (SCC). Tumor size >5 cm and lymph node metastases were associated with worse prognosis. Methylation is a critical epigenetic mechanism of gene silencing in cancer development. Using a recently developed technique for genome-wide methylation profiling of formalin-fixed paraffin-embedded (FFPE) tissues, we sought to characterize the epigenomic signatures associated with low (Stage I: T2N0M0) vs. high (Stage II-III: T3-4, N0-1, M0) risk anal cancer.

Methods: DNA was extracted from anal SCC FFPE tissues from 79 patients (Stage I n=40; Stage II n=16/Stage III n=23) from the Mitomycin C arm of the RTOG 98-11 trial. The methylation status of >450,000 CpG loci was determined by the Illumina HumanMethylation450 Array. Differential methylation between the two groups was analyzed using Mann-Whitney test with a p value of <0.001 being considered significant. Affected biological processes were identified by MetaCore (GeneGO) software.

Results: The patient population consisted of 51 women and 28 men with a median age of 53 years (range 25-78). There were a total of 137 CpG loci that were differentially methylated (21 increased, 116 decreased) in high vs. low risk cases. Selected genes harboring CpG sites that were among the most highly differentially methylated are shown in Table 1. Among the most highly impacted biological processes included regulation of integrin-mediated cell adhesion ($p=4x10^{-6}$), Wnt receptor signaling ($p=2x10^{-5}$) and cell-cell adhesion ($p=4x10^{-5}$)

Conclusions: To the investigators' knowledge, this is the first study to apply genome-wide methylation analysis to anal cancer. Biologically relevant alterations in individual methylated targets and cellular pathways were found to discriminate locally advanced from early anal SCC. Epigenetic events likely play a significant role in the progression of anal SCC and should be further investigated as prognostic and predictive biomarkers.

COMPLETE CYTOREDUCTION FOR PSEUDOMYXOMA PERITONEI IS OPTIMAL BUT MAXIMAL TUMOR DEBULKING IS BENEFICIAL WHERE COMPLETE TUMOUR REMOVAL CANNOT BE ACHIEVED.

(28)

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Purpose: Pseudomyxoma peritonei is a diffuse peritoneal malignancy that generally originates form a perforated appendix tumour. Optimal treatment requires extensive surgical resection to achieve complete cytoreduction combined with hyperthermic intraperitoneal chemotherapy (HIPEC). In a proportion of patients this is not possible, in particular due to irresectable small bowel involvement. There is ongoing debate as to the role of maximal tumour debulking (MTD) in such cases.

S27 Select Differentially Methylated Genes in High Risk vs. Low Risk Anal Cancer

Gene	Function	Methylation Status*	p-value
DACH1	Tumor suppressive; cell cycle regulator	↑	$3x10^{-5}$
WNT5A	Tumor suppressive; wnt pathway regulator	↑	$6x10^{-4}$
GPR68	Tumor suppressor in ovarian/prostate cancer	↑	$8x10^{-4}$
PAQR9	Tumor suppressive; adiponectin receptor-like	↑	$8x10^{-4}$
FAM150A	Methylated in aggressive renal cell cancer	↑	$9x10^{-4}$
PPARGC1A	Pro-tumorigenic; cell metabolism	↓	$7x10^{-5}$
RICH2	Candidate oncogene in osteosarcoma	↓	$7x10^{-4}$
IGF2BP2	Oncogenic/pro-metastatic; IGF2 binding	↓	$8x10^{-4}$
ATP2B2	Pro-tumorigenic in breast cancer; Ca+2 transport	↓	$9x10^{-4}$
PARP1	Pro-tumorigenic/anti-apoptotic; E2F1 coactivator	↓	$9x10^{-4}$

*In high risk (T3/T4, N0-N1, M0) as compared to low risk (T2N0M0) anal cancers

Methods: A prospective database of 953 consecutive patients with peritoneal malignancy undergoing surgery at a UK National referral centre between 1994 and 2012 was analysed. Of these 748 (78%) had surgery for pseudomyxoma peritonei of appendiceal origin. Patients who had complete cytoreduction were compared with those who had MTD.

Results: Complete cytoreduction was achieved in 543/748 patients and 205 (27%) had MTD. Median age was 56 years [172 (31.7%) males] in the complete cytoreduction group and 59 years [108 (52.7%) males] in the MTD group. Overall survival at 3, 5 and 10-years was 90%, 82% and 64% in the complete cytoreduction group and 47%, 30% and 22% in the MTD group. The median survival in the MTD group was 32.8 months (95%CI: 24.1 – 41.5). Multivariate analysis showed high grade mucinous carcinoma peritonei histology as a significant independent negative prognostic factor.

Conclusions: Unsurprisingly maximal tumour debulking resulted in inferior outcomes compared with complete tumour removal. However almost half survived 3 years with the potential for long term survival in some.

INCIDENCE AND SURVIVAL IN HINDGUT NEUROENDOCRINE TUMORS DEPEND ON PATHOLOGIC GRADE.

(29)

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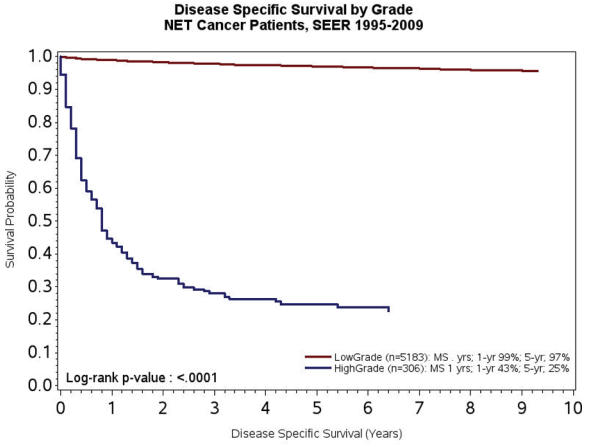
Purpose: Although neuroendocrine tumors (NETs) of the hindgut remain rare tumors, the incidence has increased in the last two decades. We sought to describe changes in incidence over time and elucidate demographic and prognostic factors predictive of cancer outcome.

Methods: Surveillance, Epidemiology, and End Results (SEER) data were analyzed to determine incidence, demographic factors, overall survival (OS) and disease specific survival (DSS) trends of hindgut NETs. SEER-coded grade data was grouped into well- or moderately-differentiated (WD/MD) versus poorly- or undifferentiated (PD/UD). Joinpoint regression models identified the year at which incidence changed most dramatically. Kaplan-Meier methods were used to assess OS and DSS and significance between groups was determined using the log-rank test. Multivariate analyses were performed using Cox proportional hazards models.

Results: We identified 5,385 patients with hindgut NETs from 1986-2009 using the SEER9 dataset. Joinpoint analysis identified 1995 as the time point at which the annual percent change (APC) significantly increased from 5.3% (pre-1995) to 6.1% (post-1995). Although the incidence of all NETs increased after 1995, the greatest change was seen in the WD/MD group (from 0.7 to 1.4/100,000). OS and DSS improved after 1995, but only for the WD/MD group. Using $\chi 2$ analysis, WD/MD patients were younger; had tumors<5cm; presented at earlier stages; were more likely to undergo surgery. Multivariate analysis confirmed that PD/UD tumors (HR 4.90, 95% CI 3.61-6.65), time period before 1995 (HR 1.24, 95% CI 0.98-1.57), age over 65 (HR 3.49, 95% CI 1.83-6.67), stage III (HR 16.16, 95% CI 6.31-41.37) or stage IV (HR 38.28, 95% CI 13.02-105.23) disease were predictive of worse DSS. After 1995, 1-yr and 5-yr DSS was 99% and 97% for the WD/MD group versus 43% and 25% for the PD/UD group (log rank p< 0.0001).

Conclusions: The incidence and survival of hindgut NETs have increased dramatically since 1995. Only WD/MD NETs demonstrated marked improvement in OS and DSS. Additional study is needed to understand the biology and to develop novel treatments to improve cancer outcome in PD/UD hindgut NETs.



DOES MECHANICAL BOWEL PREPARATION PRECEDING COLON CANCER OPERATION AFFECT 5-YEAR MORTALITY AND CANCER RECURRENCE RATE?

(30)

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Purpose: A Swedish randomized study was preformed 1999-2005 concerning mechanical bowel preparation (MBP) preceding colon resection, showing that MBP does not decrease the incidence of postoperative infections. This study evaluates whether MBP affects five-year mortality and cancer recurrence rate in colon resections due to cancer.

Methods: Patients with colon cancer (n=1009) that where randomized within the MBP study were followed 5 years postoperative and analysed, using the National Cause of Death Registry, and registers for out-clinic visits, and hospitalization. Statistical analyses were preformed using Chi square test.

Results: 56 patients with metastasis preoperative, and six patients that died within 30 days postoperative, were excluded. 947 patients remained for analyses (499 MBP, 448 non MBP). 5-year mortality in the MBP group was 29% (144/499) and 36% (163/448) in the non MBP group (p=0,014). 52% (76/144) in MBP and 68% (111/163) in non MBP had colon cancer as a contributing cause of death. 15% (75/499) in MBP and 22% (97/448) in non MBP developed a cancer recurrence (p=0,009)

Conclusions: Patient with MBP had lower five year mortality and a lower frequency of cancer recurrence. The explanation for this is uncertain and further analysis is necessary.

LOCAL EXCISION AFTER PREOPERATIVE RADIOCHEMOTHERAPY FOR RECTAL CANCER: A MULTICENTER PHASE II CLINICAL TRIAL WITH A 3-YEAR FOLLOW-UP.

(31)

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Purpose: To evaluate the impact on local control of transanal local excision performed in patients with rectal cancer who had a major clinical response after preoperative chemoradiotherapy (pCRT).

Methods: Patients with clinical T2-T3 rectal adenocarcinoma who received pCRT were eligible and, if they showed a major clinical response (no node involvement at imaging, scar or a residual ulcer ≤2 cm in diameter at endoscopy), underwent full thickness transanal local excision. Based on the histopathology, the patients staged as ypT0-1 were followed-up while the remaining were strongly suggested to undergo a subsequent total mesorectal excision. The trial was designed as a sequential two stage phase II study for early efficacy. A local recurrence rate of ≤5% was set up as a successful rate for stopping the trial early after the first stage.

Results: The study group included 63 patients. Before the pCRT, 42 patients were staged as cT3 and 21 as cT2. After the local excision, 43 patients fulfilled the criteria to be observed only (42 pathological complete response and 1 ypT1 with few residual cancer cells). Nine of the remaining 20 patients, for whom a subsequent radical surgery was planned, actually refused surgery. At a median follow-up of 36 months, 2 (4%) patients had a local recurrence, both had a ypT2 tumor and refused the radical surgery and both received a salvage surgery. The estimated 3-year overall and disease-free survival was 91.5 (CI 75.9 - 97.2) and 91.0 (CI 77.0 - 96.6), respectively.

Conclusions: Local excision seems a good option for patients with a major clinical response after pCRT. A longer follow-up is required to confirm these findings.

LOW RATES OF LOCAL RECURRENCE ARE ACHIEVABLE WITH A SELECTIVE APPROACH TO PREOPERATIVE RADIOTHERAPY IN LOCALLY ADVANCED RECTAL CANCER.

(32)

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Purpose: It is widely held that preoperative radiotherapy (RT) is necessary to obtain optimal outcomes in the treatment of rectal cancer based on trials demonstrating reduced rates of margin involvement and local recurrence. The morbidity associated with RT has tempered this view recently with a more selective approach being advocated. The aim of this study was to report outcomes after rectal cancer surgery in a unit that traditionally has low rates of use of preoperative RT.

Methods: Patients with rectal cancer were given preoperative RT (45Gy) and combination chemotherapy (5-FU) only for MRI-predicted circumferential margin involvement (CMI) or for high volume nodal disease (N2). Chemoradiation was not indicated solely for T3/4 or N1 disease. Data was retrieved from a prospectively maintained departmental database and verified with cancer registry and pathology data. Outcome measures were the use of preoperative chemo/radiotherapy and clinicopathological outcomes in patients having major curative resections, including multivisceral excision, for primary rectal carcinoma. Recurrent rectal cancers and patients having local excision, palliative or emergency surgery were excluded.

Results: Between 2002 and 2011, 374 rectal resections were performed (185 anterior resections, 93 abdominoperineal excisions, 65 multivisceral resections). Preoperative RT was given in 28% cases with 72% having primary surgery. Surgery without prior RT was performed in 37% T4 disease and 73% T3 tumours. Multivisceral surgery was performed without prior RT in 42% cases. Circumferential margin involvement was seen in 6% cases (4.7% CRT & surgery vs. 6.3% surgery alone, p=0.54,NS). The CMI rate in abdominoperineal excisions was 6.5%. Local recurrence occurred in 12 patients (3%) after a median follow up of 35 months (IQR 19-66). There was no significant difference in local recurrence (p=0.494) or overall survival (p=0.355) comparing CRT with surgery alone.

Conclusions: This study demonstrates that satisfactory local control can be achieved with a highly selective approach to preoperative radiotherapy in conjunction with optimal rectal cancer surgery.

THE CURRENT STATUS, CLINICAL AND FINANCIAL OUTCOMES OF OPEN, LAPAROSCOPIC, AND ROBOTIC SURGERY FOR RECTAL CANCER: RESULTS FROM A NATIONAL DATABASE.

(34)

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Purpose: Laparoscopic and robotic surgery have been reported to be safe and feasible for the management of rectal cancer. However, there is paucity of data regarding the current national status and incidence of these techniques for rectal cancer. We evaluated and compared clinical and financial outcomes following open, laparoscopic, and robotic surgery for rectal cancer.

Methods: Using the Premier database from October 2008 through June 2011 we identified non-emergent cases with rectal cancer cross-referenced with rectal or bowel resection codes. Those with robotic or laparoscopic codes were included in the robotic and laparoscopic arms, respectively. The remaining cases were included in the open surgery arm. Demographics, clinical, and financial outcomes were analyzed. Using multivariate analysis, postoperative outcomes were adjusted based on age, gender, type of hospital, disease severity, and disease process.

Results: A total of 8,954 rectal resections for cancer were identified, 7,775 (86.8%) open, 957 (10.7%) laparoscopic, and 222 (2.5%) robotic. Although open approach was performed in more extreme and major severity cases as compared to laparoscopy, severity of disease was similar between open and robotic. General surgeons performed most open (63.2%) and laparoscopic (64.2%) cases, whereas colorectal surgeons (54.5%) carried out the majority of robotic cases. Overall complications were lower in the robotic group, although not statistically significant. Length of stay was significantly longer in the open group (8.3 days) as compared to either the laparoscopic (7.0 days) or robotic groups (6.7 days). Hospital costs and hospital charges were significantly higher in the robotic group in comparison to either open or laparoscopic surgery.

Conclusions: Laparoscopic and robotic rectal surgery for cancer, although only performed in the minority of cases in the United States, these approaches are viable alternatives to open surgery resulting in quicker recovery with similar clinical outcomes. Robotic surgery, however, results in overall higher hospital costs.

S34

Preoperative characteristics (n=8,954)				
	Open (n=7,775) (86.8%)	Laparoscopic (n=957) (10.7%)	Robotic (n=222) (2.5%)	p value
Age (years)	63.4±12.7	62.7±13.1	62.3±12.2	OvsL=0.088 OvsR=0.189 LvsR=0.6853
Female	4,537 (58.4%)	551 (57.6%)	128 (57.7%)	OvsL=0.645 OvsR=0.836 LvsR=0.982
Severity of disease*				
Minor	2,312 (29.7%)	303 (31.7%)	73 (32.9%)	OvsL=0.220 OvsR=0.312 LvsR=0.725
Moderate	3,405 (43.8%)	451 (47.1%)	101 (45.5%)	OvsL=0.050 OvsR=0.615 LvsR=0.661
Major	1,530 (19.7%)	161 (16.8%)	38 (17.1%)	OvsL=0.035 OvsR=0.343 LvsR=0.725
Extreme	528 (6.8%)	42 (4.4%)	10 (4.5%)	OvsL=0.005 OvsR=0.180 LvsR=0.940
Hospital type				
Urban	7,116 (91.5%)	876 (91.5%)	218 (98.2%)	OvsL=0.990 OvsR=0.0004 LvsR=0.0005
Teaching	3,328 (42.8%)	433 (45.2%)	171 (77.0%)	OvsL=0.150 OvsR<0.0001 LvsR<0.0001
Surgeon Specialty				
General surgeon	4,912 (63.2%)	614 (64.2%)	39 (17.6%)	OvsL=0.552 OvsR<0.0001 LvsR<0.0001
Colorectal surgeon	2,364 (30.4%)	305 (31.9%)	121 (54.5%)	OvsL=0.353 OvsR<0.0001 LvsR<0.0001
Other	499 (6.4%)	38 (3.9%)	62 (27.9%)	OvsL=0.003 OvsR<0.0001 LvsR<0.0001
Postoperative outcomes				
Transfusion	1,321 (17.0%)	103 (10.8%)	28 (12.6%)	OvsL<0.0001 OvsR=0.094 LvsR=0.204
Length of hospital stay (days)	8.3±6.7	7.0±5.6	6.7±7.1	OvsL<0.0001 OvsR=0.003 LvsR=0.307
Complications	2,342 (30.1%)	269 (28.1%)	57 (25.7%)	OvsL=0.729 OvsR=0.207 LvsR=0.595
Mortality	77 (1.5%)	6 (0.6%)	0	OvsL=0.600 OvsR=0.983 LvsR=0.967
Hospital costs (US dollars)	$20,747±19,257	$20,196±15,879	23,510±19,145	OvsL=0.167 OvsR=0.0005 LvsR<0.0001
Hospital charges (US dollars)	$67,671±69,410	$66,810±63,718	$88,691±103,652	OvsL=0.715 OvsR<0.0001 LvsR<0.0001

OvsL= open versus laparoscopy; OvsR= open versus robotic; LvsR= laparoscopic versus robotic.

* Severity of disease according to APR-DRG

A NOVEL SCORING SYSTEM FOR RISK-STRATIFYING RECTAL CANCER PATIENTS PRIOR TO RADICAL RESECTION.

(35)

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Purpose: Local excision with or without concurrent chemoradiation is an alternative treatment modality to radical resection for stage I rectal cancer. The objective of our analysis was to better define clinical guidelines for the selection of appropriate patients for local excision of rectal cancer by identifying perioperative risk factors for postoperative complications after low anterior (LAR) or abdominoperineal resection (APR).

Methods: All patients from the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) Participant User File from 2005 through 2010 who underwent LAR or APR for rectal cancer were included for analysis. Forward stepwise multivariate logistic regression models were used to determine perioperative variables that are significantly associated with major complications after radical resection. These variables were then used to create a dynamic scoring system that can be calculated to preoperatively determine a patient's risk of complications after radical resection.

Results: 3,737 patients were included in this analysis with 1,534 treated with a LAR and 2,203 undergoing an APR. Significant predictors of major complications after radical resection for rectal cancer included male gender, dependent functional status, current tobacco use, ASA classification ≥ 3, Age > 60 years, need for APR, significant cardiac disease, >10% loss in body weight in last 6 months, and BMI > 30 kg/m2. Based on these predictive variables, a scoring system was derived which stratified major complication risk after radical resection from (11-32%). (Table)

Conclusions: The risk of a major complication after radical resection for rectal cancer is variable and dependent on multiple preoperative parameters. The scoring system proposed in this study provides surgeons a novel tool for estimating major complication risk in rectal cancer patients prior to radical resection. This risk-stratification score may be useful to determine when a local excision may be prudent to avoid unnecessary morbidity for high-risk individuals.

LOCATION OF LOCALLY-RECURRENT RECTAL CANCER PREDICTS ONCOLOGIC OUTCOME AND MAY BE RELATED TO TECHNICAL FACTORS ASSOCIATED WITH THE INDEX SURGERY.

(36)

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Purpose: Surgery for locally-recurrent rectal cancer (LRRC) is risky and rarely curative. Patient selection is vital to ensure an acceptable risk:benefit ratio and the location of pelvic recurrence has been shown to be an important prognosticator. The aims of this study were to seek predictors of the location of LRRC, define oncologic outcomes, and establish risk factors for survival in patients with LRRC.

Methods: 157 patients with LRRC after proctectomy were analyzed. Demographic, pathologic and follow-up information were evaluated to assess risk factors and prognosis associated with different recurrence patterns . Recurrence location was defined as axial, anterior, posterior or lateral. Survival analysis was by Kaplan-Meier method with log rank test. Multivariate analysis used Cox's proportional hazard model, $p < 0.05$ significant.

Results: Factors related to the index surgery were associated with location of LRRC; anastomotic leak predicted posterior recurrence (p=0.019) and retrieval of < 12 lymph nodes was associated with lateral/axial recurrence (p=0.036). 5-year survival rate for the entire cohort was 10.8% (mean follow-up 59.8 ± 50.1 months; mean time to recurrence 31.6 ± 30.1). 49/157 (31%) patients underwent intended curative resection; 5-year survival was higher in this group compared to those having palliative-intent- or no surgery (27.1% vs 2.8%, p<0.001). Axial recurrence

S35 Preoperative Risk Assessment prior to Radical Resection for Rectal Cancer

Score Value	Overall(n = 3,737)	Overall Complication(n = 1,255)	Major Complication(n = 823)	Death(n=31)
0	130 (3.5%)	26 (20%)	14 (11%)	0 (0%)
1	453 (12%)	97 (21%)	60 (13%)	0 (0%)
2	804 (22%)	231 (29%)	134 (17%)	0 (0%)
3	1,008 (27%)	329 (33%)	220 (22%)	4 (0.4%)
4	835 (22%)	238 (39%)	232 (28%)	13 (1.6%)
≥5	507 (14%)	32 (47%)	163 (32%)	14 (2.8%)

Score of 1 assigned for each of the following variables, when present: Male Gender, Dependent Functional Status, Current Tobacco Use, ASA classification ≥ 3, Age > 60 years, Need for APR, Heart Disease, >10% loss body weight in last 6 months, BMI > 30 kg/m2

patients had the highest rate of curative-intent surgery (45.5% vs 25.1%, p=0.016). In multivariate analysis, palliative surgery/no surgery (p<0.001), age at recurrence (p=0.008), early recurrence (<5 yrs, p=0.027), advanced cancer at index surgery (stage III/IV, p=0.034) and non-axial recurrence (p=0.014) were independent predictors of poor survival.

Conclusions: The strongest predictor of outcome in patients with LRRC is the abilility to undergo attempted curative resection, but tumor biology and recurrence location are also important. Axial tumors are more likely to undergo curative-intent surgery with resultant prolonged survival. Non-axial recurrences have a relatively poor outcome, and their occurance may be related to technical factors associated with the index surgery.

ACCURACY OF PREOPERATIVE MAGNETIC RESONANCE IMAGING IN PREDICTION OF PATHOLOGICAL STAGE IN RECTAL CANCER: NODE-FOR-NODE MATCHED HISTOLOGIC VALIDATION OF MRI IMAGING FEATURES.

(37)

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Purpose: Few studies that meticulously match individual lymph nodes seen on magnetic resonance imaging (MRI) with their precise histologic counterparts after total mesorectal excision have been reported. This study assessed the accuracy of preoperative high-resolution MRI in prediction of pathological staging in rectal cancer.

Methods: Thirty-four patients undergoing total mesorectal excision for biopsy-proven rectal cancer were assessed prospectively using high-resolution MRI for tumour (T) and mesorectal nodal (N) staging. After surgical resection of the tumor, the specimens were again imaged with ex vivo ultrasound scan at 2-mm intervals to localize the perirectal node. The location of each lymph node were precisely matched with its corresponding MR image to enable a node-for-node comparison of MR images and histologic findings.

Results: Agreement between MRI and histologic assessment of T stage was 91.1 %. Of the 328 nodes harvested, 165 were too small (<3 mm) to be depicted on MR images, and twenty of these contained metastasis. An accuracy rate for assessment of each nodal status was 87.5% (133/152 nodes, 12.1%). Preoperative MR imaging revealed a node-by-node sensitivity, and specificity of 62.5%, and 86.9%, perpectively. Fifteen patients had mesorectal lymph node metastasis and overall sensitive of preoperative MRI was 85.7%.

Conclusions: Preoperative MRI was moderately accurate for prediction of mesorectal lymph node metastasis and highly accurate regarding transmural invasion depth. However, high-resolution MRI was insufficient for detecting small lymph nodes with metastasis.

LYMPH NODE ASSESSMENT BY MRI AFTER NEOADJUVANT CHEMORADIATION FOR RECTAL CANCER - NO MEANS NO!

(38)

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Purpose: While maintaining curative intent, a select group of patients with locally advanced rectal cancer who have a favorable response to neo-adjuvant chemoradiation (CRT) might benefit from a local surgical approach rather than radical resection. In selecting these patients, the accuracy of preoperative imaging in determining nodal status is key. This study analyzed the predictive value of magnetic resonance imaging (MRI) in determining lymph node (LN) status after CRT for locally advanced rectal cancer.

Methods: This is a single-center retrospective case series of patients with locally advanced rectal cancer who

S36 Multivariate analysis of prognostic factors in relation to 5-year survival after local recurrence

Variable	Hazard Ratio (95% CI)	P-value
Palliative treatment for recurrence	3.51 (2.28-5.40)	<0.001
Age at recurrence >60 yr	1.62 (1.13-2.32)	0.008
Time from surgery to recurrence <5 yr	2.07 (1.09-3.95)	0.027
Site of local recurrence		
Axial	1.0	Overall=0.014
Posterior	1.71 (1.04-2.82)	0.035
Anterior	2.19 (1.33-3.59)	0.002
Lateral	1.70 (1.04-2.78)	0.033
Path stage of tumor at initial surgery		
I / II	1.0	0.034
III / IV	1.47 (1.03-2.10)	0.034

had a post-CRT pelvic MRI and went on to undergo a radical resection between January, 2004 and March, 2012. MRI reports were compared to the final post-operative histopathologic staging after total mesorectal excision. All MRIs were interpreted by radiologists at our institution. For the analysis, negative LN status by MRI (cN-Neg) was only granted when the MRI report explicitly stated that there was no evidence of local LN metastasis. All other exams (both frankly positive as well as indeterminate exams) were termed "cN-Pos." Outcome measures were sensitivity, specificity and predictive value of MRI LN negative (cN-Neg) status. Statistical analysis was done by Fisher's Exact Test.

Results: 52 patients were studied, of which 16 were staged cN-Neg and 36 staged cN-Pos on MRI. On pathologic evaluation, there were 36 patients without LN metastases (ypN-Neg) and 16 patients with positive LNs (ypN-Pos). Of the 16 cN-Neg patients, none had LN metastasis on final pathology. The average total LN harvest was 12 (2-34), and there was no significant difference between the groups. The sensitivity, specificity and predictive values are shown in the table.

Conclusions: This study, supported by recent European literature, confirms that LN staging by strict interpretation of MRI post-CRT is reliable in assessing negative LN status. Pelvic MRI could be used to select patients for consideration of local resection (ie. Transanal Endoscopic Microsurgery) after CRT, while preserving the potential for curative intent.

HIGH COST AND LOW YIELD: ROUTINE PREOPERATIVE RESTAGING CT IN LOCALLY ADVANCED RECTAL CANCER.

(39)

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Purpose: Restaging CT scans are routinely performed following neoadjuvant chemoradiotherapy for locally advanced rectal cancer. We hypothesized that these scans are of low diagnostic yield in identifying treatment-altering local or distant disease progression after neoadjuvant treatment.

Methods: Using our institution's tumor registry database and electronic medical record, a retrospective chart review was performed on all patients with newly diagnosed nonmetastatic rectal adenocarcinoma from 2007-2011.

Results: 185 patients (mean age 64, 56% male) were diagnosed with nonmetastatic rectal adenocarcinoma during the study period. 93 patients had locally advanced (preoperative clinical stage II-III) disease (mean age 59, 59% male) and received standard 5-FU-based chemotherapy and 5,040 cGy pelvic radiation. Restaging CT scans of the chest, abdomen, and pelvis were obtained on 83 (89%) of these patients. Radiographic evidence of local treatment response was noted on restaging CT for 33 patients (49%). New lesions suspicious for distant metastasis were noted in only 2 restaging scans (1 liver, 1 lung). 61 patients underwent LAR (66%), 29 APR (31%), and 3 TEMS/transanal excisions (3%). New intraoperative diagnosis of distant metastases occurred in only 1 patient. In no case did the findings on restaging CT scan result in a change in treatment (such as additional neoadjuvant therapy, delay or alteration in the planned operation, or palliation). Median final pathologic stage was II, with 14 complete responders (15.5%), 27 stage I (30%), 14 stage II (15.5%), 32 stage III (36%), and 3 stage IV (3%). While CT results did not influence the overall management, local treatment response was evident on 92% of the complete responders.

Conclusions: Our data suggest that routine use of restaging CT scans does not impact medical or surgical management of locally advanced rectal cancer. Minimal gains from this practice must be balanced against the risks, including incremental radiation exposure, delays in surgery, and reaction to IV contrast dye. As the rising cost of health care comes under greater scrutiny at the national level, current practice patterns must be redesigned to maximize utility and minimize cost.

S38 Sensitivity / Specificity Analysis Table

	ypN-Neg	ypN-Pos		
MRI LN Negative(cN-Neg)	16	0	16	100% Predictive value of cN-Neg in predicting ypN-Neg
MRI LN Indeterminate / Positive(cN-Pos)	20	16	36	44% Predictive value of cN-Pos in predicting ypN-Pos
	36	16	52 (Total)	
	44% Sensitivity	100% Specificity		

cN-Neg : Final MRI report explicitly stated that there was no evidence for local lymph node metastasis.
cN-Pos : All other MRI reports including those with indeterminate / positive LNs
ypN-Neg : No Lymph node metastasis on final histopathological review.
ypN-Pos : Lymph Node metastasis on final histopathological review

THE IMPACT OF PREOPERATIVE INFLIXIMAB TREATMENT ON RATES OF COLECTOMY IN SEVERE ULCERATIVE COLITIS.

(40)

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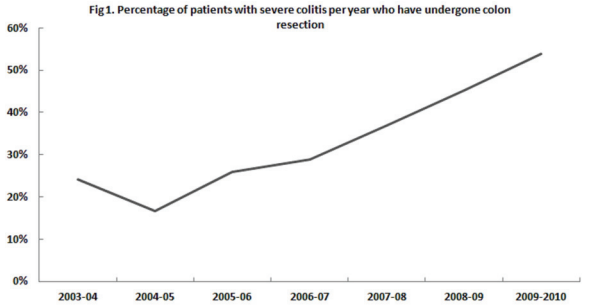
Purpose: Approximately 20% of patients with ulcerative colitis (UC) will require surgical treatment. Recent data suggest infliximab may reduce the need for surgery in patients with severe UC. However, it is unclear if data from these small trials will translate to reduced colectomy rates in populations of patients with UC. Our objective was to determine the impact of infliximab treatment on the rates of colectomy for UC in British Columbia, Canada.

Methods: Data from 3 province-wide population based databases were used: Medical Services Plan (MSP) billing data, CIHI hospital discharge data, and Pharmanet provincial pharmacy data. Patients with UC were identified using a previously validated strategy with ICD 9 and 10 codes. Patients with severe UC were defined by a course of corticosteroids during the study period. Patients treated with infliximab were identified using Pharmanet data. The primary outcome was surgery, determined by either an ICD 9/10 procedure code for partial or total colectomy and/or MSP billing code for same.

Results: Between 2003 and 2010, the number of patients with UC ranged from 3 186 to 5 052 per year in British Columbia. Those with severe UC ranged from 623 to 890 per year. The number of severe UC patients receiving infliximab per year was found to increase following its approval for UC in 2006, starting at 2 patients in 2003/04, to 36 patients in 2009/10. Despite the increase in infliximab availability, colon resection rates within the severe UC population increased over time (Fig 1). In 2008/09, 4.1% of patients treated with infliximab required colon resection, compared to 46.6% of patients not treated with infliximab. In 2009/10, these values were 11.1% and 55.7% respectively. The mean rates of colon resection in infliximab patients and non-infliximab patients from 2003/04 to 2009/10 were significantly different at the 95% confidence interval, indicating that severe UC patients not prescribed infliximab were more likely to require colon resection.

Conclusions: The early study of population level data suggests that infliximab is associated with lower rates of colectomy in the short term, however further analysis is required to understand the long term impact of its use.



DYSPLASIA IN ULCERATIVE COLITIS AS A PREDICTOR OF UNDETECTED SYNCHRONOUS COLORECTAL CANCER: IS THE RISK LOWER THAN WE THINK?

(41)

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Purpose: Endoscopic surveillance of patients with ulcerative colitis (UC) aims to prevent cancer-related morbidity, primarily through the detection of dysplasia. The literature to date varies widely with regard to the importance of dysplasia as a marker for colorectal cancer (CRC) at the time of colectomy. This study aims to accurately characterize the extent to which the pre-operative detection of dysplasia is associated with undetected CRC in patients with UC.

Methods: We reviewed the records of patients undergoing proctocolectomy, restorative proctocolectomy, or total colectomy for UC between August 1993 and July 2012 at 3 major academic medical centers. Abstracted data included patient demographics, presence/severity of pre-operative dysplasia, and operative pathology reports.

Results: Our review included 2130 patients, of which 67.1% were male, with a mean age of 49.4+/-15.1 years. Three-hundred and thirty one patients were identified (15.0%) as having at least one focus of colorectal dysplasia pre-operatively. Undetected CRC was found in 10 surgical specimens (ascending colon [three in situ, one T1, one T2 and one T3]; transverse colon [one T1 and one T4], descending colon [one T3]; rectum [one in situ]). No patients were identified with a diangosis of more than one cancer. Indeterminate dysplasia was not associated with CRC. Pre-operative low-grade dysplasia was associated with a 1.8% risk of undetected CRC, while 6.9% of patients identified pre-operatively with high-grade dysplasia harbored undetected CRC. Dysplasia was not detected pre-operatively in 62 (2.6%) cases.

Conclusions: This is the largest report to date analyzing the risk of undetected CRC in patients with UC and pre-operative dysplasia. The presence of dysplasia in our study was associated with a very low risk of CRC at the time of colectomy. Our findings will help inform the deci-

sion-making process for patients with UC who are considering intensive surveillance vs. surgical intervention after a diagnosis of dysplasia.

RESTORATIVE PROCTOCOLECTOMY IN THE SETTING OF RECTAL DYSPLASIA: GOOD IDEA OR BAD IDEA?

(42)

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Purpose: It has been hypothesized that patients with chronic ulcerative colitis (CUC) and rectal mucosal dysplasia have higher mortality rates from colorectal cancer following ileal pouch anal anastomosis surgery (IPAA) than patients without rectal dysplasia. This study looks at the survival outcome of patients with CUC and rectal mucosal dysplasia undergoing restorative proctocolectomy (RPC).

Methods: Patients found to have dysplasia or cancer in the pathologic specimen after RPC were extracted from a prospectively maintained database. Data concerning demographics, outcome, treatments, and functional results were gathered at hospital and office visits or by telephone interview.

Results: Of 1067 patients with a diagnosis of CUC, 193 (18.1%) were found to have dysplasia, cancer or both in resected specimens. The location of dysplasia was specified in the pathology reports of 175 patients. Among these patients, dysplasia was discovered in the rectum only in 33 (18.8%), in the colon only in 82 (46.9%) and both in the colon and rectum in 60 (34.3%). Long term data exists on 165 of the 193 patients. There were 18 deaths, 12 from colorectal cancer. Of these 12, the original path report showed cancer in 8 (66.7%), colonic dysplasia only/no cancer in 2 (16.7%), and colonic and rectal dysplasia/no cancer in 2 (16.7%). Rectal cancers coexisted with rectal dysplasia in 15.4 percent of cases where rectal dysplasia was present. Survival estimates for patients without cancer, but with colonic dysplasia, colonic and rectal dysplasia and rectal dysplasia were similar (P=0.4249). Survival was also similar for patients with high versus low or indefinite grade dysplasia in the rectum (P=0.0898).

Conclusions: Among patients with CUC undergoing IPAA, rectal dysplasia appeared to confer no greater risk of death due to colorectal cancer in the long term. A preoperative diagnosis of CUC with rectal dysplasia is not a contraindication to RPC. Rectal dysplasia in this setting should prompt a thorough search for coexisting rectal cancer as rates of coexistence are high. Long term follow-up of patients with dysplasia or colorectal cancer in surgical specimens is recommended.

OPERATIVE STRATEGY MODIFIES RISK OF POUCH-RELATED OUTCOMES IN PATIENTS WITH ULCERATIVE COLITIS ON PREOPERATIVE ANTI-TNF THERAPY.

(44)

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Purpose: The aim of the study is to evaluate the influence of preoperative anti-TNF treatment on outcomes in patients undergoing restorative proctocolectomy for medically refractory ulcerative colitis (UC) and whether or not a staged approach modifies any negative influence of such therapy.

Methods: Patients who were operated on for UC or indeterminate colitis (IC) after 2006 at this institution were first classified by initial surgery, whether subtotal colectomy (STC) or total proctocolectomy (TPC), and further categorized based upon whether or not biologics were used within 12 weeks prior to initial surgeries. Demographics, perioperative data, postoperative complications, pouch function, and QOL were compared between the subgroups. Long-term complications were estimated using Kaplan-Meier curve and independent predictors for infectious complications were identified using Cox proportional hazards regression models.

Results: From 2006-2010, 407 and 181 patients underwent initial STC with end ileostomy or TPC with ileoanal pouch-anal anastomosis (IPAA) respectively for medically refractory UC/IC. Within the STC group, there were no differences in intra-operative or short-term postoperative outcomes between patients on biologics (N=142) and not on biologics (N=265). Outcomes and QOL were also similar when biologics users (N=88) and non-users (N=164) underwent subsequent completion proctectomy with IPAA after initial STC. For the 181 patients who underwent TPC/IPAA, pre- and perioperative data were comparable for biologics users (N=25) and non-users (N=156). The 45-day estimated pelvic sepsis rate was significantly higher in patients on biologics (32% vs. 16%, P=0.012). Multivariate analysis demonstrated that preoperative anti-TNF therapy (HR=3.14, 95% CI: 1.34-7.34) and corticosteroid use (HR=3.04, 95% CI: 1.16-7.97) were both independent risk factors for postoperative pelvic sepsis (Table).

Conclusions: These findings suggest that preoperative exposure to biologics or corticosteroids is associated with an increased risk of pelvic sepsis after TPC/IPAA. This risk is mitigated by the performance of an initial STC.

EXTENT OF INFLAMMATION IS A PREDICTOR FOR OUTCOMES IN ILEAL POUCHES IN INFLAMMATORY BOWEL DISEASE.

(45)

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Purpose: Ileal pouch formation is the procedure of choice for patients requiring surgery for mucosal ulcerative colitis (UC) and indeterminate colitis (IC). This study evaluated pathological features of inflammatory bowel disease (IBD) to identify predictors of poorer outcomes for ileal pouches.

Methods: A retrospective review of clinical outcomes was obtained through review of database, surgeons and hospital records. End points included pouch failure, pouch-vaginal fistula, pouchitis, pouch-cutaneous fistula, anastomotic leaks and anal strictures requiring dilatation. Pathology reports of subtotal colectomy (STC), completion proctectomy (CP) and total proctocolectomy (TPC) specimens of all ileal pouch patients with IBD were reviewed for histopathological findings including depth of inflammation, submucosal lymphoid aggregates, type of ulceration, presence of ileal disease and presence of granulomas.

Results: Two hundred and seventy one consecutive patients had ileal pouch formation at Royal Prince Alfred Hospital between August of 1984 and November of 2011. Two hundred and seven patients had pouches constructed for UC or IC of which 142 had complete histopathological records. On univariate analysis, extension of inflammation into the muscularis propria on either specimens from STC or CP or TPC was found to be associated with higher rates of pouch- vaginal fistula (13.6% vs 2.5%, p=0.048) and pouch failure (10.8% to 0%, p = 0.004). Extension of inflammation into the muscularis propria on both the STC and CP specimens or TPC specimens were associated with higher rates of pouchitis (50.0% vs 25.8%, p= 0.039) and pouch-vaginal fistula (13.6% vs 2.5%, p= 0.048). Univariate analysis of any pouch complication (pouch failure, pouch-vaginal fistula, pouchitis, pouch-cutaneous fistula, anastomotic leaks and anal strictures requiring dilatation) as a single outcome showed strong association with extension of inflammation into the muscularis propria (63.6% vs 29.1%, p=0.007)

Conclusions: In patients who have had ileal pouch formation with a preoperative history of UC or IC, the extension of inflammation into the muscularis propria predicts for poorer outcomes.

POUCH VAGINAL FISTULA FOLLOWING RESTORATIVE PROCTOCOLECTOMY: PERSISTENCE PAYS.

(46)

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Purpose: The management of an ileoanal pouch-vaginal fistula (PVF) is challenging.The aim of this study is to evaluate outcomes after various techniques of PVF repair.

Methods: Patients with PVF following an ileal pouch anal anastomosis (IPAA) from 1983-2010 were identified. Timing of onset of the fistula, management and outcomes were determined. Factors associated with outcomes and the influence of timing of PVF development after IPAA were evaluated.

Results: 102 patients developed PVF, 59 within 12 months and 43 after >12 months following IPAA. 97 patients underwent surgery,75 (77.3%) underwent local repair (48 (49%) ileal pouch advancement flap (IPAF); 27(28.4%) transvaginal repair). Primary healing was achieved after initial local procedure in 35(36 %) patients, a further 17 patients with recurrent PVF healed after repeat procedures. At median follow-up 83 months, 56 (57.7%) PVFs healed while pouch failure occurred in 34(35 %) patients. Healing of the fistula was significantly lower (22% vs. 73%, p<0.001) and pouch failure higher

S44 Table. Cox Proportional Hazard Model evaluating Risk Factors for Pelvic Sepsis after initial Subtotal Colectomy or Total proctocolectomy and Ileal Pouch-anal Anastomosis

	Hazard Ratio, 95% Confidence Interval	P value
Subtotal Colectomy with End Ileostomy (N = 407)		
Preoperative use of anti-TNF biologics	0.42 (0.12 – 1.50)	0.18
Preoperative use of corticosteroids	0.22 (0.05 – 1.09)	0.06
Severe acute colitis	2.76 (0.63 – 12.2)	0.18
Total proctocolectomy with ileal pouch-anal anastomotosis (N = 181)		
Age at colectomy	1.00 (0.97 - 1.04)	0.88
Leukocytosis before surgery (WBC > 10.8 x 103/μl)	1.14 (0.48 - 2.72)	0.77
Preoperative use of anti-TNF biologics	3.14 (1.34 - 7.34)	0.008
Preoperative use of corticosteroids	3.04 (1.16 - 7.97)	0.023
Preoperative azathiopurine/6-mercaptopurine use	0.83 (0.34 - 2.02)	0.69
Omission of proximal ileostomy	0.74 (0.15 - 3.51)	0.70

(52.7% vs. 22.7%, p<0.001) with Crohn's disease (CD). On multivariate analysis, a delayed diagnosis of CD was associated with pouch failure (p=0.010). The healing rate of PVF for IPAF performed as primary procedure was 42%, and was 66% when performed secondarily after a different procedure. The healing rate for transvaginal repair was 55% when done as a primary procedure and 40% when performed secondarily after a different procedure. 19 patients underwent redo- IPAA (6 after IPAF, 3 after trans-vaginal repair and 10 without any prior repairs). The overall pouch retention rate was 40% following redo IPAA, with 3/6 (50%) patients retaining pouch when redo IPAA was performed after advancement flaps, 1/3 (33%) after transvaginal repair and 4/10 (40%) when redo IPAA was performed without any prior repairs.

Conclusions: PVF following IPAA surgery are indolent and persist after previous repairs. A delayed diagnosis of CD is associated with a poor outcome and a higher chance of pouch failure. Since repeated attempts at repair following initial failure are successful, an individualized approach to treatment with persistence and gradation of severity of surgery allows further healing and pouch salvage.

DO DISEASE LOCATION AND CLINICAL MANIFESTATION INFLUENCE POUCH SURVIVAL IN PATIENTS DEVELOPING SYMPTOMATIC POUCH CROHN'S DISEASE AFTER ILEAL POUCH-ANAL ANASTOMOSIS?

(47)

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Cleveland, OH

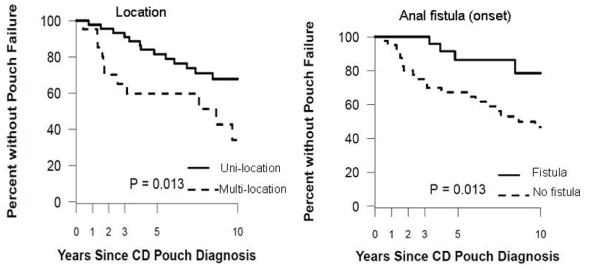
Purpose: Data on risk factors of pouch failure secondary to pouch Crohn's disease (CD) developing after restorative proctocolectomy with ileal pouch-anal anastomosis (IPAA) are limited. The aim of this study is to evaluate whether location or clinical features of CD are associated with pouch failure.

Methods: All patients diagnosed with clinically active pouch CD during follow-up after IPAA for ulcerative colitis (UC) or indeterminate colitis (IC) were identified from an IRB approved IPAA database. Asymptomatic disease only diagnosed pathologically was excluded. CD location based on endoscopic findings at the time of diagnosis was classified as proximal to the pouch (neo terminal ileum, afferent limb), pouch per se (inlet, outlet, and body of the pouch), anal transitional zone (ATZ), perianal region, and multi-location, defined as at least 2-site involvement. Clinical manifestations included inflammatory ulceration, stricture or perineal fistula. Pouch failure (need for permanent stoma diversion or pouch excision) was estimated using Kaplan-Meier curves.

Results: From 1993 to 2009, a total of 65 (28 males) eligible patients with pouch CD were identified. At disease onset, 15 patients (23 %) had CD proximal to the pouch, 32 (49%) in pouch per se, 20 (31%) in ATZ, 40 (62%) in perianal region, of these 21 (32%) had multi-location involvement. Pouch failure occurred in 28 (43%) patients after a mean of 7.9 years follow-up after IPAA. The mean duration from CD diagnosis to pouch failure was 2.5 (range: 0-12.5) years. Multi-location CD (HR=2.55, 95% CI: 1.19-5.47) and perineal fistula development either at the time of CD diagnosis (HR=3.57, 95% CI: 1.23-10.42) or during follow-up (HR=5.14, 95% CI: 1.21-21.77) was associated with a higher risk of pouch failure (Figure 1).

Conclusions: The risk of pouch failure in CD of the pouch is variable and dependent upon disease location and clinical presentation. Multi-location involvement of the pouch by CD and development of perineal fistula are risk factors for pouch failure in patients diagnosed with pouch CD after IPAA.

Figure1.Kaplan-Meier curves of pouch survival for patients with Crohn's disease of the pouch



DO BIOLOGICS CHANGE THE NATURAL HISTORY OF SEVERE PERIANAL CROHN'S DISEASE REQUIRING FECAL DIVERSION?

(49)

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Purpose: It is still unknown whether anti-tumor necrosis factor (TNF) therapy can change the natural history of severe perianal Crohn's disease (CD) requiring fecal diversion. The aim of this study is to evaluate the effect of anti-TNF therapy on disease control by comparing the rates of stoma closure and proctocolectomy in patients diverted for severe refractory perianal CD.

Methods: All patients who underwent stoma diversion for severe perianal CD in a single institution were identified and divided into 2 groups based upon whether or not biologics (infliximab, adalimumab or certulizumab pegol) were used. Demographics, clinical presentation, disease involvement, and use of other medications were compared between the 2 groups. Possible associations with long-term rates of stoma closure and proctocolectomy were estimated using Kaplan-Meier curves.

Results: From January 1994 to April 2012, of the 166 eligible patients identified, 120 (72%) received anti-TNF therapy treatment. Compared with those not on biologics, patients on biologics were younger (35. 5 ± 12.4 vs. 39. 8 ± 13.4 years old, P= 0.0461) and more likely on additional treatment with immunosuppressive agents (66% vs. 35%, P <0.001). There were otherwise no differences in patient characteristics, symptoms, extent of disease, and treatments received between biologic users and non-users. As shown in the table, patients treated with biologics and those treated without biologics had similar rates of stoma reversal (28% vs. 24%, P=0.64) and proctocolectomy (39% vs. 37%, P=0.79) after a mean 3.8 years follow-up.

Conclusions: Anti-TNF therapy dose not change the disease course by increasing the likelihood of restoring gastrointestinal continuity in patients undergoing stoma diversion for severe perianal Crohn's disease.

SINGLE NUCLEOTIDE POLYMORPHISM IN THE STAT5 GENE FAVORS COLONIC AS OPPOSED TO SMALL BOWEL INFLAMMATION IN CROHN'S DISEASE.

(50)

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Purpose: Crohn's disease (CD) is a multifactorial autoimmune disease with genetic, immune & environmental causal factors. The STAT5 gene has been shown to have a role in colonic permeability and healing, IL2 production and T cell proliferation. Presently, data explaining the development of colitis as compared to small bowel disease are lacking. The recent discovery of over 200 SNPs associated with CD suggests a genetic basis for these differing phenotypes. The present study sought to identify SNPs which are associated with Crohn's colitis as compared to Crohn's involving the small intestine, with the goal of further defining subcategories of CD and gaining insight into their differing pathophysiologies.

Methods: 173 CD patients were analyzed using our inflammatory bowel disease biobank. Patients were grouped based on distribution of disease:colitis (C n=28), ileocolic disease (IC n=116) and enteritis (SB n=29). Patients were genotyped for 258 CD-associated SNPs using a custom DNA microarray. Genotype and disease phenotype associations were assessed using logistic regression adjusting for covariates including age, gender, Montreal behavior and tobacco use. Statistical evaluation utilized an additive genetic model with corrections for multiple comparisons.

Results: SNP rs16967637 in the STAT5 gene was found to be associated with C and a preferential sparing of the small bowel when the SB group was compared to both a combined C/IC group (p=.025) and the IC only group (p=04). The homozygous CC genotype in this SNP was associated with colitis and a sparing of the small bowel. This genetic signature was present in 59% of CD patients with sparing of the small bowel. Of over 200 SNPs analyzed, rs16967637 was the only SNP associated with colitis.

Conclusions: 1) SNP rs16967637 in the STAT5 gene was strongly associated with CD affecting the colon while sparing the small intestine. 2) CD patients homozygous for the at risk allele C demonstrated the strongest association for C and IC disease with SB sparing 3) Mutations in the STAT5 gene are associated with a disease phenotype strongly weighted toward colitis, which is useful information for personalized medical and surgical therapies.

S49 Table. Effect of Anti-TNF Therapy on Patients Undergoing Diverting Stoma for Severe Peri-anal Crohn's Disease

	Biologics non-users (N=46)	Biologics users (N=120)	P
Time from diversion to initial closure (years, mean ± SD)	1.5 ± 2.0	0.9 ± 1.1	0.38
Initial stoma closure, n (%)	16 (35)	37 (31)	0.63
Re-diversion, n (%)	5 (11)	4 (3)	0.12
Final stoma closure, n (%)	11 (24)	33 (28)	0.64
Time from diversion to proctocolectomy (years, mean ± SD)	2.6 ± 2.5	2.2 ± 2.8	0.24
Proctocolectomy, n (%)	17 (37)	47 (39)	0.79

TNF: tumor necrosis factor

S50 All non small bowel (colonic + ileocolonic) disease vs small bowel disease

GenotypeDisease location	AA n/%	AC n/%	CC n/%
Colonic+ileocolonic n=144	7 (4%)	52 (36%)	85 (59%)
Small bowel only n=29	4 (13%)	20 (66%)	5 (17%)

p=.025

WHICH LESIONS SHOULD BE BIOPSIED DURING HRA? PROSPECTIVE DESCRIPTIVE STUDY OF SIMPLE MORPHOLOGICAL CRITERIA.

(51)

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Purpose: High-resolution anoscopy (HRA) is a useful screening tool for anal intraepithelial neoplasia (AIN), although reputedly challenging for interpretation of suspected lesions. The purpose of this study was to identify straightforward descriptive criteria predictive of the histological grade of suspected lesions visualized during HRA.

Methods: All patients undergoing HRA from November 2010 through March 2012 with a biopsy of a suspected AIN lesion were included prospectively. All procedures were performed by senior proctologists. The characteristic features of the suspected lesion were noted. The characteristic features were compared with the histology findings.

Results: Biopsy specimens were obtained from 168 suspected AIN lesions found in 103 patients (68% men) aged 49.8±9 years; 57.3% of patients were HIV-positive. Histologically, the lesions were classed: high-grade AIN (57.7%); low-grade AIN (35.6%); non-dysplastic tissue (23.8%, including 11.9% considered normal). The epithelium was irregular in 68.5% of the high-grade lesions and in 37.9% of the low-grade lesions. Similarly, the vascularization was irregular in 61.4% of the high-grade lesions and in 37.9% of the low-grade lesions. A flat surface was noted for 41.4% of the high-grade lesions versus 17.2% for the low-grade lesions. 91.4% and 94.8% of the high-grade and low-grade lesions respectively were acetowhite versus 70% of the normal specimens. Lugol's iodine staining was negative for 62.9% of the high-grade lesions versus 31% of the low-grade lesions. Combining the different criteria produced positive predictive values as follows:

Conclusions: Several simple morphological criteria significantly associated with high-grade AIN are found less often in low-grade lesions. Combining morphological criteria provides a satisfactory PPV for guiding HRA biopsies.

NEAR 100% PREVENTION RATES OF ANAL CARCINOMA ACHIEVED WITH HIGH-RESOLUTION ANOSCOPY-GUIDED ABLATION OF HIGH-GRADE DYSPLASIA.

(52)

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Purpose: To determine effectiveness of high-resolution anoscopy (HRA) guided ablation of anal high-grade squamous intraepithelial lesions (HSIL) and prevention of anal squamous cell carcinoma (SCC) in men who have sex with men (MSM).

Methods: We reviewed our 13-year experience of all MSM who had in-office (infrared coagulation or cautery) or surgical (CO2 laser) intra-anal HSIL ablation with ≥1 follow-up HRA between March 1998 and May 2012 (total n=734, 63% HIV+). MSM could be treated by multiple modalities and were followed for a median of 2 years (range (r) 0.2 – 13 yrs).

Results: Of 462 HIV+ MSM (mean age 45±9yrs), 1508 individual HSILs were treated. Median number of treatments was 2 (r 1-8). Of 272 HIV- MSM (mean age 41±11yrs), 681 individual HSILs were treated. SCC developed in 5 (0.7%) MSM. For HIV+ MSM, recurrence after 1st, 2nd, 3rd and 4th treatment was 66%, 64%, 62% and 50%, respectively (p=0.03). Recurrence rates by number of lesions/days followed decreased significantly from the 1st through 4th treatment (0.26%, 0.19%, 0.18% and 0.10%, respectively; p=0.004). Rates of metachronous lesions/days followed also decreased significantly from the 1st through 4th treatment (0.16%, 0.12%, 0.12%, 0.10%, respectively; p=0.02). For HIV- MSM, HSIL recurrence after the 1st, 2nd, 3rd and 4th treatment was 58%, 43%, 46% and 50%, respectively (p=0.06). Recurrence rates by lesions/days followed decreased significantly from 1st through 4th treatment (0.15%, 0.08%, 0.10% and 0.10%; p=0.02). Rates of metachronous lesions/days followed also decreased significantly from 1st through 4th treatment (0.11%, 0.07%, 0.06%, 0.04%, respectively; p=0.03). The cure rate of an individual lesion treated once in HIV+ and HIV- MSM was 73% and 84%, respectively. All MSM with SCC were HIV+: 3 were previously treated for extensive HSIL and then lost to follow-up for a mean 3.5 years before returning with SCC, while 2 (0.3%) underwent repeated treatments for persistent HSILs and ultimately progressed to SCC.

S51

Group	High-grade AINn=70	Low-grade AINn=68	PPV for High-grade AIN
I. Acetic acid-positive (single criterion)	64 (91.4%)	56 (94.6%)	43.2%
II. Acetic acid-positive + Lugol-negative + irregular epithelium	46 (65.7%)	20 (33.9%)	62.2%
III. Acetic acid-positive + Lugol-negative + irregular epithelium + irregular vascularization	35 (50%)	14 (23.7%)	68.6%

Conclusions: In the largest study with longest follow-up to date, anal HSIL recurrence decreases with continued HRA guided ablation of anal HSIL and yields almost 100% prevention of progression to SCC.

RESULTS OF ASCRS MEMBER SURVEY ON ANAL DYSPLASIA SCREENING: ATTITUDES AND PRACTICE.

(53)

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Purpose: To determine US ASCRS members' attitudes and practices about screening for anal dysplasia using high resolution anoscopy (HRA).

Methods: ASCRS member physicians received email requests to complete an online Survey Monkey questionnaire about attitudes and practices regarding screening for anal dysplasia. Univariable then multivariable analysis identified characteristics associated with performing HRA.

Results: Of 1655 email requests, there were 313 (19%) eligible responses. Most were male (75%), board-certified colon and rectal surgeons (88.6%) in group specialty practices (51%) and 48% graduated professional school after 1990. Almost all read medical literature on anal dysplasia (97%), treated anal dysplasia (93%) and condyloma (97%). In the prior year 32% had seen > 5 cases of anal cancer but only 2% had seen none. Of responders, 67% had not performed an anal pap smear, 64% had not performed HRA. At surgery, 71% use suboptimal or no technique to evaluate anal dysplasia. Of 100 respondents who perform HRA, 31% use the necessary acetic acid, and 83% perform it in the operating room. Of those who perform HRA, 55% received no formal training. Of all respondents without HRA training, 28% plan on becoming trained. When patients requested HRA, 19% of respondents without prior training would perform the test and 10% would say it was not necessary. Having 5% or more MSM in the patient population was positively associated with performing HRA [OR=2.12, 95% CI (1.18, 3.82), p=0.01]. Lack of supporting data [OR=0.09, (95% CI (0.03, 0.23) p<0.0001], lack of time [OR=0.25, (95% CI (0.08, 0.76) p=0.01], and not seeing the need [OR=0.39, (95% CI (0.17, 0.94) p=0.04] were negatively associated with performing HRA. Provider sex, US region of practice, year of graduation and type of practice were not associated with performing HRA.

Conclusions: While almost all respondent ASCRS member physicians treat anal dysplasia, few formally screen. Of those that perform HRA, <1/3 use correct technique and most utilize the very costly operating room. This study raises major public health concerns given the new ASCRS guidelines supporting screening using HRA and can provide guidance in developing intervention programs to increase screening.

PROSPECTIVE RANDOMIZED TRIAL COMPARING SHORT- AND LONG-TERM RESULTS OF DOPPLER-GUIDED TRANSANAL DEARTERIALIZATION AND HEMORRHOIDECTOMY FOR GRADE III HEMORRHOIDS.

(54)

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Purpose: There are no randomized trial available comparing postoperative pain, complications and long term results of doppler guided transanal hemorrhoid dearterialization with anopexy (THD) and excisional open hemorrhoidectomy (EOH), in patients with grade III hemorrhoids.

Methods: The study was registered at Clinical trials.gov. A power analysis was conducted to assess the sample size for the study. From July to November 2010 fifty consecutive patients, with grade III hemorrhoids, were randomly assigned to THD or EOH after having signed an informed consent. Primary end point was postoperative pain the first postoperative day. Secondary outcome measures were postoperative morbidity, resumption of working activity, patients' satisfaction at 1 and 24 months, symptoms relapse at 24 months. We also collected data on pain, bowel habit, assumption of painkiller and activity every day for the first week and every week for the first month. Chi square test, Mann-Whitney U test, Student-t test and regression model were used when appropriate. Values are reported as percentage, median and interquartile range [IQR].

Results: No serious complications occurred in both groups. Median of VAS pain at day 1, 7, 14 and 30 were 5.5 vs 7, 3 vs 2.5, 1 vs 2 and 0 vs 0 in THD and EOH respectively (p > 0.05 for all). The median day of resumption of work was the 10th in the THD group and the 22nd in the EOH group (p = 0.09). In a scale of four were 0 was not satisfied and 4 was very satisfy the median value at 1 and 24 month were 4 vs 3 and 4 vs 4 for THD and EOH respectively (p>0.05). The percentage of "very satisfied" patients in THD group fall from 71 to 51% and rose in EOH group from 37% to 73%. Four patients in the THD group experience relapse of the symptoms, none in the EOH group. No one required other surgical procedure for hemorrhoids or postoperative complications.

Conclusions: THD showed similar postoperative morbidity comparing to EOH. Nevertheless THD reduce postoperative pain, grant an earlier return to normal activities with and increased patient's sort term satisfaction. However it showed an higher rate of long term symptoms recurrence.

VIDEO-ASSISTED ANAL FISTULA TREATMENT: A NEW CONCEPT OF TREATING ANAL FISTULAS.

(55)

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Purpose: The surgical treatment of complex anal fistulas is very tricky because of the incidence of incontinence and recurrence after traditional approaches. Video-Assisted Anal Fistula Treatment (VAAFT) is a novel and promising endoscopic sphincter-saving technique developed by Piercarlo Meinero MD in our department. We report our results and describe the VAAFT advantages.

Methods: The Meinero fistuloscope is used (Karl Storz). VAAFT has two phases: diagnostic and operative. Spinal anesthesia is required. The fistuloscope is introduced through the external opening to identify the main tract, possible secondary tracts or abscess cavities and the internal opening. So, a new concept of fistuloscopy is introduced. By an electrode the fistula and its branches are visually destroyed and cleaned. The internal opening is located and closed by a stapler or a flap. A half milliliter of synthetic cyanoacrilate is used for the suture reinforcement.

Results: From February 2006 to February 2012, VAAFT has been performed on 203 patients (median age 42, range 21-77) suffering from complex anal fistula. 149 of them had already undergone surgery, eleven of them with a previous colostomy. We instituted a 2,4,6,12 and 24 month follow-up. The percentage of healing after 1 year was 76.1%. At the 2 year follow-up, 94.2% of 1 year healed patients had no recurrence. No major complications occurred. In most cases (71.4%), both short-term and long-term postoperative pain was acceptable (Visual Analogue Scale for pain under value 3). No patients reported post-operative Wexner's continence score decrement.

Conclusions: The main characteristic of VAAFT technique is the direct vision. So, the fistula is always treated visually. It is easier to find and successfully treat secondary tracts or chronic abscesses. The internal opening is precisely located and closed. At the end of the operation there are minimal surgical wounds on the perianal skin and no damage of the sphincters is caused, because of operating from the inside. Finally, it is not necessary to classify the fistula before the operation, thanks to the fistuloscope used as a diagnostic instrument during the first VAAFT phase. This technique is minimally invasive and safe.

MOLECULAR IMAGING OF DYSPLASIA AND CANCER USING FLUORESCENT LECTINS.

(56)

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Purpose: The development of an adjunct tool to identify colorectal dysplasia and cancer during colonoscopy has the potential to reduce the incidence of false negatives and guide resection margins in polypectomy. Lectins are specific carbohydrate recognition proteins that are found naturally and have previously been shown to delineate areas of dysplasia in Barrett's oesophagus, based on differential binding. Fluorescently labelled lectins therefore have the potential to distinguish dysplasia and cancer from normal colonic mucosa.

Methods: A panel of fluorescently labelled lectins was tested on a colorectal cancer tissue microarray. Both formalin fixed and fresh frozen samples were used to validate lectin binding. The degree of binding was assessed by comparing the amount of fluorescence between paired samples of normal and cancerous tissue from each case. Candidate lectins were identified and tested further on various grades of dysplastic tissue. Fresh whole-mount tissue was sprayed with lectins ex vivo and incubated at body temperature for 10-15 minutes to simulate in vivo colonoscopic conditions, and images were captured using fluorescent capable devices.

Results: Our initial microarray screen has identified Peanut agglutinin (PNA), Sambucus Nigra (SNA) and Wisteria floribunda (WFA) as potential candidates. PNA and SNA binding increases as normal colonic epithelium progresses from low grade dysplasia, to high grade dysplasia and through to invasive carcinoma. Conversely WFA binds more strongly to normal colonic epithelium than to cancer tissue from the same patient (mean fluorescence 27.6 versus 4.80 arbitrary units, $p<0.0001$, Figure 1). When examined under conditions simulating colonoscopy, these fluorescently labelled lectins provided sufficient signal that could be readily detected.

Conclusions: We have identified fluorescently labelled lectins that bind differentially to dysplastic and cancer tissue. These lectins may be used to identify abnormal tissue during colonoscopy. Further work is required to identify which combination of lectins provides the best diagnostic accuracy.

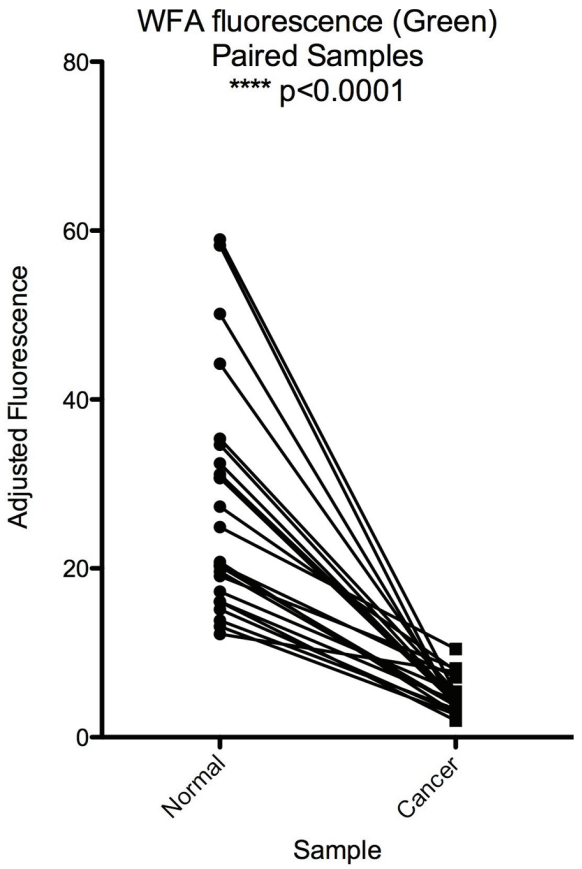

Figure 1: WFA binds more strongly to normal colonic epithelium than to cancer tissue, using paired specimens.

ENDOSCOPIC SUBMUCOSAL DISSECTION FOR COLORECTAL TUMORS: MID-TERM OUTCOMES.

(57)

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Purpose: Endoscopic Submucosal Dissection (ESD) is a very useful endoscopic technique, making it possible to perform an en bloc resection of a lesion regardless of the size. The aim of this study is to report the mid-term outcomes of our colorectal ESD experience.

Methods: Since the introduction of ESD to our hospital, we have performed about 1,300 colorectal ESDs over 6 years. Between October 2006 and October 2009, we performed ESD on 471 consecutive colorectal tumors in 452 patients. We evaluated the clinical outcomes and recurrence rate of these cases.

Results: The mean resected tumor size was 24.5(standard deviation: 22.0, range: 5-145) mm. Our overall endoscopic en bloc resection rate was 95.1% (448/471) and en bloc R0 resection rate was 89.0% (419/471), respectively. Our perforation rate was 7.0% (33/471). For 30 patients, perforation was managed by conservative management with/without endoscopic clipping while the other three patients received emergency laparoscopic operations. Pathological examination showed adenocarcinomas in 34.4% of the cases (162/471). Additional radical surgeries were performed in 35 cases (submucosal invasion less than 1 mm with unfavorable pathology: 10 cases, submucosal invasion ≥ 1mm: 19 cases, invasion to proper muscle: 2 cases, adjacent synchronous cancer: 4 cases). Follow-up colonoscopies were performed on 394 cases. During the median follow-up period of 28(3-61) months, there were two recurrences (0.5%).

Conclusions: Successful en bloc R0 resection through colorectal ESD can reduce tumor recurrence after endoscopic treatment and the resultant precise pathological assessment can avoid invasive surgical treatment.

TIMING OF COLONOSCOPY AFTER RESECTION FOR COLORECTAL CANCER: ARE WE LOOKING TOO SOON?

(58)

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Purpose: Based on current NCCN guidelines, colonoscopic surveillance after colorectal cancer resection should begin at one year. The aim of this study was to determine if the incidence of cancer or advanced polyp miss rate was high enough to justify colonoscopy at one year.

Methods: The Ochsner Clinic Tumor Registry Database was queried for patients that underwent a segmental colectomy or proctectomy between the years 2002 and 2010. Patients who had a pre-operative colonoscopy as well as at least one post-operative colonoscopy performed at this institution were included. We considered any new cancer or polyp >= 1cm as missed on the pre-operative scope.

Results: Five-hundred-twelve patients underwent a resection, and 151 met our inclusion criteria having both a documented pre- and post-operative colonoscopy. The average age of the study population was 68 and 52% of patients were male. There were 2.6% with Stage 0 disease, 30.5% with Stage I, 33.8% with Stage II, 27.8% with Stage III, and 5.3% with stage IV. 51.7% had a right colectomy, 7.3% left colectomy, 18.5% sigmoid colectomy, 21.2% low anterior resection, and 1.3% transanal resection. The average time to first post-operative colonoscopy was 460 days (SD +/-285d). Twenty-four patients had adenomatous polyps detected on their first surveillance colonoscopy but only 7 (4.6%) were 1 cm or larger and there was no statistical correlation between stage of cancer and finding a polyp. No new cancers were detected, but 4 (2.6%) had an anastomotic recurrence. There was no correlation between recurrence and stage however 75% were in rectal resections.

Conclusions: In our institution, performing surveillance colonoscopy at one year resulted in the detection of only 7 missed polyps >=1cm and no missed synchronous cancers. Anastomotic recurrences were rare and the vast majority were in the rectum which could be evaluated by an in-office flexible sigmoidoscopy. Extending the time to first colonoscopy after resection may be safe, and would help conserve valuable resources including physician and facility time which is imperative in the current health care climate.

DOES SEDATION TYPE AFFECT COLONOSCOPY PERFORATION RATE?

(59)

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Purpose: Our aim was to compare the perforation rate during colonoscopy by using sedation with or without propofol.

Methods: All patients who underwent a colonoscopic procedure at William Beaumont Hospital from January 2003 to October 2012 were analyzed. Data collected included: general demographics, method of intravenous sedation with propofol or non- propofol sedation (fentanyl, midazolam, diazepam, meperidine) and the type of endoscopic procedure performed (screening or therapeutic, the latter defined as including a biopsy or polypectomy). Perforation rates were expressed per 10,000 colonoscopies. Statistical tests included $\chi 2$ and multivariate logistic regression, with significant inferences based on $p < 0.05$.

Results: A total of 118,000 colonoscopies were performed during the study period with 48 (0.041%) iatrogenic perforations. Among all colonoscopies, there was a 2.5 increased rate of perforation based on use of propofol (6.9 vs. 2.7, p = 0.0015), but no significant increase in perforation rate based solely on screening vs. therapeutic colonoscopy (3.2 vs. 4.8, p = 0.22). In the propofol group, there was a non-significant trend towards higher perforation rate among patients undergoing therapeutic vs. screening colonoscopy (8.7 vs. 4.2, p = 0.16), while in the non propofol group there was no difference in their respective perforation rates (2.6 vs. 2.9, p = 0.95). The propofol group undergoing a therapeutic colonoscopy had a three-fold increased rate of perforation compared to the other groups (8.7 vs. 2.9, p = 0.0002.) In a multivariate analysis, each decade increase in age (AOR 1.32 [1.01-1.74]) and use of propofol (AOR 3.43 [1.60-7.34] were both predictors of perforation in patients who had a therapeutic colonoscopy.

Conclusions: This study is the first study showing that propofol administration is associated with increased iatrogenic perforation during colonoscopy. Our results show that the use of propofol carries a 2.5 increased perforation risk compared to other sedation modes and the risk is increased to three fold for subset of patients undergoing a therapeutic colonoscopy.

ACHIEVING A COMPLETE COLONIC EVALUATION IN PATIENTS WITH INCOMPLETE COLONOSCOPY IS WORTH THE EFFORT.

(60)

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Purpose: Efficient colonoscopy depends on examination of the entire colon but sometimes this is not possible. Patients with incomplete colonoscopy are potentially at risk of missed lesions but may be reluctant to submit to further examination of the large bowel. This study aims to identify the percentage of patients that undergo complete colonic evaluation following incomplete colonoscopy, the manner in which the evaluation was completed, and frequency with which significant pathology is found.

Methods: A prospectively maintained database containing 25,451 colonoscopies performed by colorectal surgeons from 1982 to 2009 was queried for incomplete colonoscopies. The reason for incompletion, secondary study offered, its success, and findings on the secondary study were abstracted.

Results: 242 patients with incomplete colonoscopies were identified, 166 (67%) were women. The average age of patients was 59 years. The most frequent causes for incomplete colonoscopy were inadequate bowel preparation (30%), pain (28%) and tortuosity (16%). The scope was not able to pass the splenic flexure in 163 (67%) patients. 218 (90%) patients were offered completion studies and 179 (82%) patients complied. 73/82 patients having surveillance colonoscopy had a follow-up examination (89%), compared with 72/83 (87%) being scoped for symptoms and 40/54 (74%) having screening. Barium enema was performed in 74 (41%), repeat colonoscopy in 71 (40%), CT colonography in 17 (9%), and colonoscopy under general anesthesia in 9 (5%). Resection with intraoperative colonoscopy was required in 8 (4%). Repeat colonoscopy found 27 lesions (21 tubular adenomas, 4 tubulovillous adenomas, and 2 sessile serrated polyps) in 19 patients (27%). Radiologic studies demonstrated new abnormalities in 11/91 patients (12%) prompting 7 colonoscopies. There were 4 false positives, but in 3 patients, colonoscopy showed an inverted appendix, a tubulovillous adenoma and a sigmoid stricture requiring resection. Overall, clinically significant lesions were found in 21 patients (12%).

Conclusions: Complete colonic evaluation in patients with an incomplete colonoscopy is important. Repeat colonoscopy is the most efficient way of achieving this.

DOES BASELINE FECAL INCONTINENCE SEVERITY INFLUENCE OUTCOME OF SACRAL NERVE STIMULATION?

(61)

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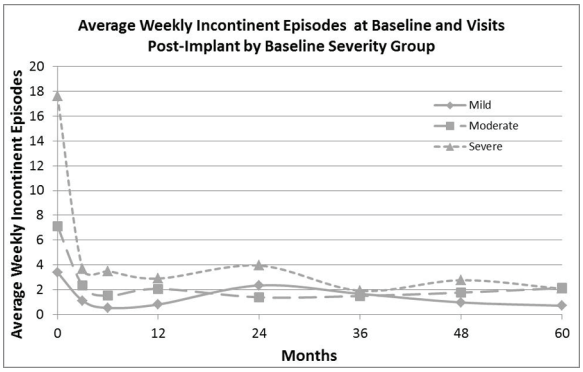
Purpose: Sacral nerve stimulation (SNS) is used to treat patients with a wide range of chronic fecal incontinence (FI), but there are limited data on the effectiveness of the treatment across different degrees of symptoms. This analysis sought to explore the effectiveness of SNS in patients with different degrees of baseline FI severity.

Methods: Patients participating in a multi-center, prospective study using SNS for treatment of FI were assessed with a 14-day bowel episode diary at baseline and 3, 6, and 12 months and annually thereafter. For this analysis, 120 implanted patients were equally divided into three groups based on the average number of FI episodes per week at baseline: mild (2-4.9), moderate (5-10), and severe (>10). Long-term response to SNS was compared between groups using Fisher-exact tests, Chi-square tests, and ANOVA.

Results: Overall, 120 patients were implanted and 72 patients provided data at 60 months of follow-up. Patients in all three severity groups showed a significant reduction in FI episodes from baseline to 60 months (Figure). The proportion of patients with complete resolution of FI did not differ between severity groups, 38-44% (P=0.84) at 12 months and 32-42% (P=0.77) at 60 months. The proportion of patients with unsuccessful stimulation (<50% reduction of FI episodes) was not different between severity groups, 14-24% (P=0.47) at 12 months and 8-17% (P=0.57) at 60 months. At 60 months, there was no difference in average weekly incontinence episodes between the groups (P=0.10; Figure).

Conclusions: SNS is effective in patients with chronic FI with varying degrees of FI severity. While patients with severe symptoms have the greatest degree of absolute improvement, patients with mild and moderate degrees of FI also benefit from the treatment.



EFFICACY OF SACRAL NERVE STIMULATION FOR THE TREATMENT OF FECAL INCONTINENCE IS NOT INFLUENCED BY THE SIZE OF ANAL SPHINCTER DEFECT.

(62)

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Purpose: Sacral nerve stimulation (SNS) has been shown to be an effective treatment for fecal incontinence (FI). Preliminary studies suggest that SNS be used in patients with sphincter defects less than 60-degrees. However, SNS may be efficacious in the presence of larger sphincter defects. The purpose of this study was to determine if size of the external anal sphincter defect affects SNS outcomes.

Methods: Data was prospectively collected on SNS patients from three institutions from 6/11 - 9/12. Patients were grouped by sphincter defect: no preoperative evaluation, no defect, < 100 degrees, 100-179 degrees and 180 degrees. Fecal incontinence episodes (accidents) were collected by self-reported patient bowel diary over two week intervals preop and postop. Data were analyzed using student's t-test and ANOVA, $p<0.05$ considered statistically significant.

Results: Seventy-seven patients were included in the study. Mean follow up was 5 months (0.5-16 months). There was a significant reduction in accidents after SNS implantation (20.7 +/- 19.5 vs. 1.9 +/- 3.3, $p < 0.01$). This improvement was seen across all groups and the magnitude of improvement was not sigificantly different

S62 Table 1

Sphincter defect group	N=	Average decrease in number of accidents from baseline
No preop evaluation	9	13.9
0 degree	24	20.6
<100 degrees	23	21
100-179 degrees	15	18.1
180 degrees	6	12.7

between groups (no eval - 13.9, no defect - 20.6, <100 degrees - 21, 100-179 degrees – 18.1, and 180 degrees 12.7; p=0.81).

Conclusions: Sacral nerve stimulation is efficacious regardless of the size of anal sphincter defect. An inverse relationship between larger EAS defects and clinical outcomes following SNS was not seen. We believe SNS represents appropriate treatment for FI even in patients with EAS defects of up to 180 degrees.

LONG-TERM EFFICACY OF PERCUTANEOUS TIBIAL NERVE STIMULATION FOR FECAL INCONTINENCE.

(63)

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Purpose: There is extensive evidence about the efficacy of percutaneous tibial nerve stimulation (PTNS) in urinary incontinence. Very little is known about its effectiveness in faecal incontinence (FI). The aim of this study was to assess the long-term efficacy of PTNS in FI and establish its position in the treatment algorithm.

Methods: A prospective cohort of patients with FI was studied. Incontinence scores were measured before treatment, following 12 PTNS sessions and before the last "top-up" session using a standard FI questionnaire [Cleveland Clinic Florida (CCF)-FI score]. The deferment time and average number of weekly incontinence episodes before, after 12 treatment sessions and following administration of the last "top-up" session were estimated from a prospective bowel dairy kept by the patient. Quality of life (QoL) was assessed at the above time points using a previously reported questionnaire (Rockwood Faecal Incontinence Quality of Life).

Results: A total of 150 patients were recruited to the study between January 2008 and June 2012. Approximately 80% (119/150) continued to receive PTNS after a median follow up of 26 (range, 6-42) months. The baseline CCF-FI score ±SD (12.0±3.9) improved after 12 PTNS sessions (9.4±4.6, p<0.0001) and following "top-up" treatment (10.0±4.3, p<0.0001). The increase in the CCF-FI between the end of the 12th session and the last "top-up" therapy was also significant (p=0.04). A similar pattern was seen in the deferment time and the QoL scores. The median time between "top-up" sessions was 12 months (range, 1-40), significantly longer than the recommended interval of six months.

Conclusions: PTNS is a well-tolerated treatment that has a high acceptability in the majority of patients. It provides a sustained improvement in faecal incontinence up to 42 months in a relatively non-invasive manner. Additional therapy sessions at 6 monthly intervals may result in even greater improvements. PTNS ought to be considered as the first step in all patients with faecal incontinence refractory to maximum conservative therapies.

SACRAL NERVE NEUROMODULATION FOR SLOW GUT TRANSIT CONSTIPATION: REAL WORLD RESULTS WITH A TRIAL OF EXTENDED PERCUTANEOUS NERVE EVALUATION.

(64)

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Purpose: Sacral nerve stimulation (SNS) has been widely used for treatment of faecal incontinence, urinary and sexual dysfunction and constipation. This study evaluates the effectiveness of permanent SNS implantation in patients with slow gut transit constipation with an extended trial of percutaneous nerve evaluation (PNE).

Methods: A review of our prospectively collected SNS database was performed. Patients with slow gut transit constipation were selected for inclusion and outcomes were assessed.

Results: 15 patients satisfying criteria were identified over a three year period (03/2009 to 05/2012). All patients were female with radiologically proven slow transit constipation. The median age was 41 years (range 18-59) and median follow-up period was 40 weeks (range 12-168). All patients had a positive S3 motor response to acute needle stimulation. All patients were implanted with a tined lead (not a simple wire) and underwent an extended four week PNE trial. One patient had a suboptimal result and did not proceed. Remaining patients were implanted with a permanent SNS device (Medtronic Interstim©) (93% device uptake). There was a significant reduction in Symptom Severity Score for constipation following implantation (p<0.001 t-test, means pre 20.07, post 10.36). Stool frequency was significantly increased after implantation (p<0.005 t test, means pre 2.5 movements per month, post 10.2 movements per month). Prior to SNS insertion 86% of patients used laxatives daily; following implantation 71% used laxatives less frequently than once per week. Overall 79% of patients reduced laxative usage and 30% were laxative free. Quality of life PAC-QOL scores were significantly improved following implantation (p<0.004, t-test). One patient suffered a lead displacement after 8 weeks and opted for device removal. There were no surgical site infections or other complications.

Conclusions: Our data suggests that SNS can give good results for patients with chronic constipation in the short and medium term with an acceptable complication rate. A more prolonged PNE with a tined lead yielded a higher than expected rate of implantation compared with published literature.

SACROCOLPOPEXY WITH RECTOPEXY FOR PELVIC FLOOR PROLAPSE IMPROVES BOWEL FUNCTION AND QUALITY OF LIFE.

(65)

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Purpose: Sacrocolpopexy with rectopexy (SR) is advocated for combined rectal and vaginal prolapse, but only limited outcome data have been reported. The purpose of this study was to evaluate the indications and outcomes of SR by comparing pre- and postoperative function and quality of life.

Methods: A retrospective review of prospectively collected data was performed of all women undergoing SR at our institution 2004-2011. Preoperatively, all patients underwent manometry, defecography, and four different validated questionnaires assessing bowel symptom severity and associated quality of life. Patients were asked to complete the same questionnaires in 2012.

Results: A total of 110 women (median age 55,years, range, 28-88) underwent a SR, 33 with concomittant hysterectomy. All patients had rectal prolapse (n=96) or rectal intussusception (n=14), and each also had either enterocele (n=86) or vaginal prolapse (n=48). Rectal prolapse with enterocele was the most common presentation (n=75). Prior surgery included rectal prolapse repair (21%) and hysterectomy (57%). Complications included presacral bleeding (n=2), ureteral injury (n=2), wound infection (n=8), and pulmonary embolism (n=2). There were no mortalities. 52 patients completed the follow up questionnaires, with a median follow up of 29 (range 4 - 90) months, and in 30 of these patients preoperative surveys were also available. Preoperatively, 93% reported constipation; 82% of whom reported resolution or improvement postoperatively. Constipation severity, measured with PAC-SYM, demonstrated improvement (1.86 to 1.17, $p<0.001$). Fecal incontinence severity scores (FISI) improved (39 to 24; $p<0.01$) and 82% of incontinent patients reported cure or improvement. Quality of life scores also improved significantly (Table). No patient developed recurrent rectal prolapse.

Conclusions: SR for combined middle and posterior compartment prolapse is a safe procedure, with low risk for recurrence, and improves patients' bowel function and quality of life in a majority of patients.

MARTIUS AND GRACILIS MUSCLE FLAP REPAIR OF COMPLEX RECTOVAGINAL FISTULAS.

(68)

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Purpose: Repair of complex rectovaginal fistula (RVF) is challenging The aim of this study was to examine the outcomes of RVF repair with Martius flap (MF) and gracilis muscle transposition (GMT).

Methods: A retrospective chart review was performed of all RVF repairs with MF and GMT by a group of colon and rectal surgeons from 1992-2011. Age, etiology of fistula, previous repairs, tobacco use, evidence of proctitis, diversion, and recurrence of fistula were documented.

Results: 41 patients underwent RVF repair with MF (n=21) and GMT (n=20). Median age was 45 (range, 18-84) years and median follow-up was 21 months (range, 1-106). The principal causes were obstetrical injury and Crohn's disease (CD). 32 out of 41 patients (78%) had previous failed repairs (range 1-8). 68% of patients were diverted prior to their repair (GMT 90%, MF 58%). Complications occurred in 20% following GMT and 43% after MF. The most common complication in both groups was delayed perineal wound healing. Dyspareunia developed in 9.5% patients (MF) and 5% (GMT). Successful closure of the fistula occurred in 52% following MF and 50% after GMT. 4 patients with GMT had resolution of their fistula with an additional procedure (sphincteroplas-

S65 Pre- and Post-Operative Quality of Life Scores

	Median Score (Range)		
Questionnaire Domain	Preop	Postop	P-value
PAQ-QOL			
Worries and Concerns	2.3 (1.6 - 2.8)	1.3 (0.5 - 2.2)	<0.0001
Physical Discomfort	2.4 (1 - 3)	1.8 (0.8 - 2.3)	<0.01
Psycosocial Discomfort	1.3 (0.5 - 2)	0.6 (0.3 - 1.5)	0.02
Satisfaction	3.2 (0.8 - 3.6)	2.4 (1.6 - 3.4)	0.06
Overall Score	1.9 (1.6 - 2.6)	1.6 (0.7 - 2)	<0.01
FIQOL			
Lifestyle	2.9 (2.4 - 3.5)	3.6 (3 - 4)	<0.01
Coping-Behavior	2.1 (1.7 - 2.6)	3 (2.1 - 3.7)	<0.0001
Depression	2.6 (2.2 - 3.1)	3.5 (2.4 - 3.8)	<0.01
Embarrassment	2.3 (1.7 - 3)	2.7 (2 - 4)	0.02

ty, advancement flap). Including them, GMT success rate was 70% (14/20). Repairs in CD patients failed in 50% (MF) and 75% (GMT) Diversion accompanied 90% (GMT) and 55% (MF) of the successful repairs. Of the 10 GMT failures, 4 failed as ano-perineal fistulas. 4 patients with GMT (2 anoperineal) had resolution of their fistula with an additional procedure (sphincteroplasty, advancement flap). There was significant difference in immediate GMT success for non-smokers ($p<0.05$). Diversion was significant for ultimate GMT success ($p<0.03$). There was no significant difference in success comparing early (1992-2006) and « late experience » (2006-2011) for either procedure.

Conclusions: Expectations for muscle transposition are high but success rates for MF and GMT are only moderate. Further studies are needed to determine which factors influence outcome of these flaps in complex RVF.

STATIN THERAPY IS ASSOCIATED WITH IMPROVED PATHOLOGIC RESPONSE TO NEOADJUVANT CHEMORADIOTHERAPY IN RECTAL CANCER.

(72)

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Purpose: Rectal cancer patients who achieve a pathologic complete response to neoadjuvant chemoradiation have an improved prognosis. Recently, statins have been shown to enhance the impact of treatment in several cancers. The goal of this study was to determine if concurrent statin use during neoadjuvant chemoradiation would improve pathologic response in rectal cancer.

Methods: A prospectively maintained single institution colorectal cancer database was queried for rectal cancer patients treated with preoperative chemoradiotherapy between the years 2000 and 2012. Patients who did not complete chemoradiotherapy or did not undergo proctectomy were excluded. Medical records were reviewed for statin use, including dates and duration of therapy. Patient demographics, comorbidities, and pathologic records were tabulated. Patients on a statin were compared to those not on a statin with a primary outcome of pathological response, defined according to AJCC grades 0 (complete response), 1 (single or small groups of tumor cells remaining), 2 (residual cancer outgrown by fibrosis), and 3 (extensive residual cancer).

Results: 407 patients were included, of which 99 were on statin therapy at the time of neoadjuvant chemoradiotherapy. Patients on a statin were older and had a significantly higher body mass index, but the two groups were not statistically different in terms of clinical staging or other parameters. Patients on a statin had a significantly better response to therapy as measured by ypT stage and AJCC regression grade (see table). Specifically, patients in the statin group were more likely to respond (defined as AJCC grade 0-2) to neoadjuvant therapy (88.9% vs 80.2%, $p=0.049$) and a higher percentage had better responses (AJCC grade 0 or 1) than those not taking a statin (65.7% vs 48.7% respectively, $p=0.004$).

Conclusions: Stain use during neoadjuvant chemoradiation in rectal cancer is associated with improved pathological response in this retrospective study. This data encourages design of prospective investigation combining statins and neoadjuvant chemoradiation as a way of potentially improving treatment response.

CLINICAL CRITERIA UNDERESTIMATE COMPLETE PATHOLOGICAL RESPONSE IN RECTAL CANCER TREATED WITH NEOADJUVANT CHEMORADIOTHERAPY.

(73)

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Purpose: Accurately determining a clinical complete response (cCR) for rectal cancer after neoadjuvant chemoradiotherapy is the cornerstone of the 'watch and wait' approach. Recently published criteria propose that the presence of any residual mucosal ulceration or polypoid tissue immediately precludes a cCR. The goal of this study was to determine the performance of these criteria to identify a pathologic complete response (pCR).

Methods: Histopathology reports were retrieved for consecutive stage II or III rectal cancer patients that underwent neoadjuvant chemoradiation followed by proctectomy between 1997 and 2007 from a single institution. Gross description of any residual mucosal abnormality were recorded and compared to the final pathological stage.

Results: The study population included 238 patients, of which 61 (26%) patients achieved pCR. The remaining 177 patients had histological residual adenocarcinoma. Of those attaining pCR, 45 of 61 (74%) had a residual mucosal abnormality that precluded the classification of cCR by published criteria. Specifically, of the 61 patients with pCR, 40 (66%) had residual ulcers (up to 10mm in depth) and 5 patients (8%) had polypoid lesions. The remaining 16 patients with pCR did fulfil criteria for cCR and had either flat fibrotic scars or no visible tumor. Of the 177 patients with residual disease 3 (2%) patients also fulfilled criteria for cCR. Overall sensitivity, specificity, PPV and NPV were 26%, 98%, 84% and 79% respectively.

Conclusions: Although published criteria to determine rectal cancer cCR are highly specific, these criteria are not sensitive and may miss the majority of patients with a true pCR. If rectal conservation is to be pursued, alternative means of restaging are required to fully maximize the population who might benefit from this approach.

PREDICTIVE FACTORS AT PET/CT FOR COMPLETE RESPONSE AFTER NEOADJUVANT CRT FOR DISTAL RECTAL CANCER – RESULTS FROM A PROSPECTIVE STUDY USING SEQUENTIAL PET/CT.

(74)

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Purpose: Molecular imaging with FDG and PET/CT may provide relevant information regarding tumor metabolism and response to various treatment types. The purpose of this study was to search for PET/CT-related information associated with complete tumor regression in rectal cancer following neoadjuvant chemoradiation (CRT) at two different intervals from CRT completion.

Methods: 99 consecutive patients with cT2-4N0-2M0 with distal rectal cancer (≤7cm from anal verge) were included. Patients underwent baseline PET/CT followed by 54Gy and 5FU-based neoadjuvant CRT. After completion of CRT, patients underwent 6-week and 12-week PET/CT. Clinical assessment of tumor response was performed at 12 weeks. Patients with incomplete clinical response were managed by radical surgery. Patients with complete clinical response (cCR) were managed without immediate surgery. Clinical assessment information was blinded to radiological information obtained from all PET/CT studies. Patients with cCR or pCR were grouped as complete responders and were compared to incomplete responders in order to identify PET/CT features predictive of response to CRT.

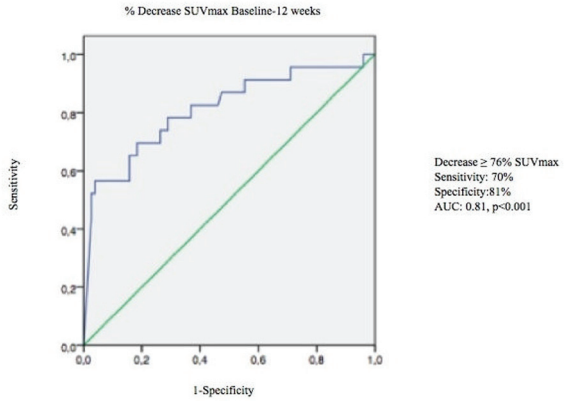
Results: There were 23 complete responders (cCR or pCR). At multivariate analysis, depth of rectal wall FDG uptake at baseline PET/CT (p=0.002) and variation between 12-week and baseline SUVmax of primary tumor (p=0.001) were independent predictors for complete response. A decrease greater than 76% between baseline

		Statin Therapy During Neoadjuvant Chemoradiotherapy			
Variable		Overalln=407	Non=308 (75.7%)	Yesn=99 (24.3%)	p-value
Sex	Female	114 (28.2%)	94 (30.8%)	20 (20.2%)	0.053
	Male	290 (71.8%)	211 (69.2%)	79 (79.8%)	
Age (years)		59.4 +/- 11.8	58.3 +/- 12.4	62.9 +/- 8.8	<0.001
BMI (kg/m2)		28.3 +/- 5.5	27.7 +/- 5.2	30.2 +/- 6.1	<0.001
Tumor Size (cm)		2.8 +/- 3.1	2.8 +/- 3.3	2.5 +/- 2.2	0.15
Tumor Distance from Anal Verge (cm)		5.6 +/- 2.8	5.6 +/- 2.8	5.4 +/- 2.8	0.52
Clinical Stage	I	8 (3.2%)	6 (3.3%)	2 (2.9%)	0.81
	II	111 (44.4%)	81 (44.8%)	30 (43.5%)	
	III	118 (47.2%)	86 (47.5%)	32 (46.4%)	
	IV	13 (5.2%)	8 (4.4%)	5 (7.2%)	
ypT	T0	52 (13.2%)	33 (11.2%)	19 (19.2%)	0.015
	T1	22 (5.6%)	17 (5.8%)	5 (5.1%)	
	T2	99 (25.1%)	78 (26.4%)	21 (21.2%)	
	T3	177 (44.9%)	140 (47.5%)	37 (37.4%)	
	T4	20 (5.1%)	15 (5.1%)	5 (5.1%)	
Final Pathological Stage	0	71 (17.4%)	47 (15.3%)	24 (24.2%)	0.49
	I	96 (23.6%)	76 (24.7%)	20 (20.2%)	
	II	96 (23.6%)	74 (24.0%)	22 (22.2%)	
	III	111 (27.3%)	85 (27.6%)	26 (26.3%)	
	IV	33 (8.1%)	26 (8.4%)	7 (7.1%)	
AJCC Response Grade	0	89 (21.9%)	64 (20.8%)	25 (25.3%)	0.025
	1	126 (31.0%)	86 (27.9%)	40 (40.4%)	
	2	120 (29.5%)	97 (31.5%)	23 (23.2%)	
	3	72 (17.7%)	61 (19.8%)	11 (11.1%)	
Average AJCC Response Grade (mode)		1	2	1	n/a
Degree of Response to Neoadjuvant Therapy	AJCC Grade 0 or 1	215 (52.8%)	150 (48.7%)	65 (65.7%)	0.004
	AJCC Grade 2 or 3	192 (47.2%)	158 (51.3%)	34 (34.3%)	

Comparison of groups was performed using a chi-square or Fisher's exact test for categorical variables and a Wilcoxon rank sum test for quantitative variables. Quantitative variables are represented as mean +/- standard deviation, unless otherwise indicated.

and 12-week SUVmax was associated with complete response (70% sensitivity and 81% specificity, AUC=0.81, p<0.001).

Conclusions: PET/CT at baseline and 12 weeks may provide objective information regarding patients at increased risk for developing complete tumor regression following neoadjuvant CRT.



CAN BIOMARKERS-BASED SCORING SYSTEM PREDICT PATHOLOGIC COMPLETE RESPONSE AFTER PREOPERATIVE CHEMORADIATION THERAPY FOR RECTAL CANCER?

(75)

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Purpose: Numerous molecular markers have been investigated as potential predictors of tumor response after preoperative chemoradiation therapy (preCRT) for rectal cancer. The aim of this study is to develop the prediction system of pathologic complete response using biomarkers.

Methods: From June 2008 to February 2012, 81 patients who underwent curative resection after preCRT were retrospectively studied. Expression of twelve biomarkers (P53, P21, Bcl2, Bax, EGFR, COX-2, MLH-1, MSH-2, Ku70, VEGF, TS, Ki-67) were evaluated in paraffin embedded tumor tissue obtained before preoperative CRT by tissue microarray and were correlated with the pathological response, as assessed by histopathological staging (pTNM) and tumor regression grade (TRG).

Results: The median age of patients was 59 years, consisted of 47 male and 34 female. Of 12 biomarkers, four biomarkers (Cox-2, VEGF, p21, Ki67) were found to correlate with pathologic complete response (pCR). Only Ki67 was significantly correlated with all pathologic responses including T and N-downstaging, TRG response, and pCR. Patients showing low expression of p53 and high expression of VEGF, p21, and Ki67 presented a higher pCR rate. One point was given to each expression of biomarkers correlated with pCR, and zero point to non-pCR. The sum of points of each biomarker was ranged from 0 to 4. Only one patient of 26 patients with scores of 0 to 1 showed pCR. However, 26/55 patients with scores of 2 to 4 exhibited a significantly greater pCR rate (3.8% vs. 47.3%, p<0.001). For assessment of pCR, the scoring system showed 96.3% in sensitivity, 46.3% in specificity, 47.3% in positive predictive value, and 96.2% in negative predictive value.

Conclusions: We validated four biomarkers correlated with pCR after preCRT for rectal cancer. The scoring system combining values of biomarker expression showed a higher sensitivity and negative predictive value to predict pCR.

S75 Biomarkers and scoring system for prediction of pathologic complete response

		Pathologic complete response		
Scoring system		Yes (N=27)	No (N=54)	P
p53	High(N=49)	12 (24.5)	37 (77.5)	0.037
	Low(N=32)	15 (46.9)	17 (53.1)	
VEGF	High(N=50)	21 (42.0)	29 (58.0)	0.036
	Low(N=31)	6 (19.4)	25 (80.6)	
p21	High(N=39)	18 (46.2)	21 (53.8)	0.018
	Low(N=42)	9 (21.4)	33 (78.6)	
Ki67	High(N=42)	19 (45.2)	23 (54.8)	0.018
	Low(N=39)	8 (20.5)	31 (79.5)	
Score	0~1	1 (3.8)	25 (96.2)	0.000
	2~4	26 (47.3)	31 (79.5)	

All numbers in parentheses are percentages

PREDICTION OF RESPONSE TO PREOPERATIVE CHEMORADIOTHERAPY IN RECTAL CANCER USING REVERSE TRANSCRIPTASE-POLYMERASE CHAIN REACTION ANALYSIS OF FOUR GENES.

(76)

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Purpose: Patients with rectal cancer exhibit a wide spectrum of responses to chemoradiotherapy. Several gene-expression signatures have been reported to predict response to chemoradiotherapy in rectal cancer, but the lack of practical assays has restricted the clinical use of this technique. We therefore aimed to identify a set of discriminating genes that can be used for the clinical prediction of response to chemoradiotherapy in rectal cancer.

Methods: Sixty-two patients who underwent preoperative chemoradiotherapy were studied. Gene expression was initially studied in 46 training samples by microarray analysis, and the association between gene expression and response to chemoradiotherapy was evaluated. Quantitative reverse-transcriptase polymerase chain reaction (RT-PCR) was performed to validate the microarray expression levels of the discriminating genes. We developed a gene-expression model for the prediction of response to chemoradiotherapy based on the RT-PCR findings and validated it using 16 independent test samples.

Results: We identified 24 discriminating probes with expression levels that differed significantly between responders and non-responders. Among 18 genes identified by Gene Symbol, real-time RT-PCR showed significant differences in the expression of 16 genes between responders and non-responders. We constructed a predictive model using different sets of these 16 genes, and the highest accuracy rate (89.1%) was obtained using LRRIQ3, FRMD3, SAND5 and TMC7. The predictive accuracy rate of this four-gene signature in the independent set of 16 patients was 81.3%.

Conclusions: The four-gene signature identified in this study is closely associated with response to chemoradiotherapy in rectal cancer.

WATCH AND WAIT APPROACH FOLLOWING EXTENDED NEOADJUVANT CHEMORADIATION FOR DISTAL RECTAL CANCER – ARE WE GETTING CLOSER TO ANAL CANCER MANAGEMENT?

(77)

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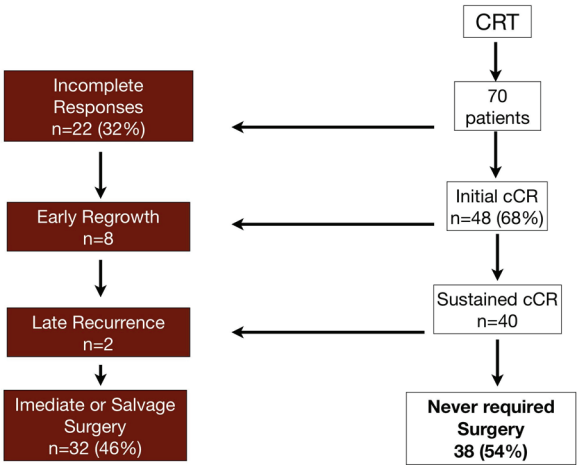
Purpose: Neoadjuvant CRT may result in complete tumor regression in up to 30% of patients with rectal cancer. No immediate surgery (Watch & Wait) has been considered in select patients with complete clinical response in order to avoid postoperative morbidity and functional disorders after radical surgery. The purpose of this study was to demonstrate long-term results of patients with complete clinical response following an alternative chemoradiation regimen managed non-operatively.

Methods: 70 consecutive patients with T2-4N0-2M0 distal rectal cancer were prospectively studied. Neoadjuvant CRT included 54Gy and 5FU/lecuvorin chemotherapy delivered in 6 cycles every 21 days. Patients were assessed for tumor response at 10 weeks from CRT completion. Patients with incomplete clinical response were referred to immediate surgery. Patients with complete clinical response (cCR) at 10 weeks were not immediately operated and were closely followed. Patients who maintained cCR after 12 months of follow-up were considered as sustained cCR.

Results: 48 (68%) patients had initial cCR. Of these, 8 developed local regrowth requiring radical surgery within the first 12 months of follow-up. 40 patients had sustained complete clinical response at a median follow-up of 44 months. Additional 2 patients (4%) developed late local recurrences (>12 months of follow-up) requiring salvage procedures. Overall, 38 patients never underwent surgery (54%).

Conclusions: Extended CRT with additional chemotherapy cycles and 54Gy of radiation may result in over 50% of sustained (>12 month) complete clinical response rates that may ultimately avoid radical rectal resection. Local failures occur more frequently during the initial 12 months of follow-up in up to 17% of cases whereas late recurrences are less common. Strict follow-up may allow early detection of recurrent disease allowing appropriate salvage therapy in the majority of these patients.



EXTENDED SACROPELVIC RESECTION FOR LOCALLY RECURRENT RECTAL CANCER: CAN IT BE DONE SAFELY AND WITH GOOD ONCOLOGIC OUTCOMES?

(78)

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Purpose: A multimodality approach that includes surgery in patients with recurrent rectal cancer is associated with a significant survival advantage when negative margins are achieved. In some, it is necessary to perform an extended sacropelvic resection to achieve negative margins, but this approach may be associated with significant morbidity/mortality and uncertain survival advantage. Our aim was to assess the safety, feasibility, and oncologic outcomes in patients with recurrent rectal cancer undergoing extended sacropelvic resection.

Methods: A retrospective review identified 406 patients who underwent surgery for recurrent rectal cancer from 1997 to 2007. From this group, all patients who underwent a curative-intent resection that included a sacropelvic resection were included.

Results: Thirty patients (24 male) were identified. Median age was 59 years (range 25-84). The majority (n=23) of operations were performed for the 1st local recurrence; 5 were performed for a 2nd recurrence and 1 for a 3rd recurrence. Twenty patients (67%) received intraoperative radiation therapy (median dose 1250 cGy). All sacropelvic resections were done en-bloc using a multidisciplinary surgical team. An R0 resection was achieved in 90% (10% R1). Mean blood loss was 2663mL (range 400-6950mL). The most proximal level of spinal resection was the 4th lumbar space and 4 patients underwent concomitant hemipelvectomy. Direct sacral involvement by tumor was seen in 90% (n=27). Thirty-day mortality was nil; 1 patient died in the hospital (postop day 123) from leptomeningeal metastases. Thirty-day morbidity occurred in 76% (Table). Median follow-up after sacrectomy was 2.7 years (range 0-10.8). Overall 2 and 5 year survival was 73% and 36%, respectively. Disease-free survival at 2 and 5 years was 65% and 25%, respectively.

Conclusions: An extended sacropelvic resection for recurrent rectal cancer can achieve a negative margin resection in 90%. Overall and disease-free survival rates are comparable to those seen in patients undergoing non-sacropelvic surgery for recurrent rectal cancer. Early post-operative morbidity is high mainly due to wound-related complications.

IT'S NOT JUST AN INFECTION: WOUND DEHISCENCE AFTER APR FOR RECTAL CANCER IS ASSOCIATED WITH DECREASED SURVIVAL.

(79)

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Purpose: Abdominoperineal Resection (APR) for low lying rectal adenocarcinoma can be complicated by dehiscence of the perineal wound, which can then delay post operative chemoradiation. We aim to evaluate risk factors for dehiscence and subsequent effect on survival.

Methods: Consecutive patients undergoing APR for rectal adenocarcinoma were studied retrospectively. Chi-square test and Student's t-test were used to assess the significance of pre-and peri-operative risk factors for wound dehiscence. Multivariate logistic regression analysis was performed for wound dehiscence using a forward stepwise regression. Post-operative difference in survival was assessed using a Kaplan-Meier curve and the log rank test.

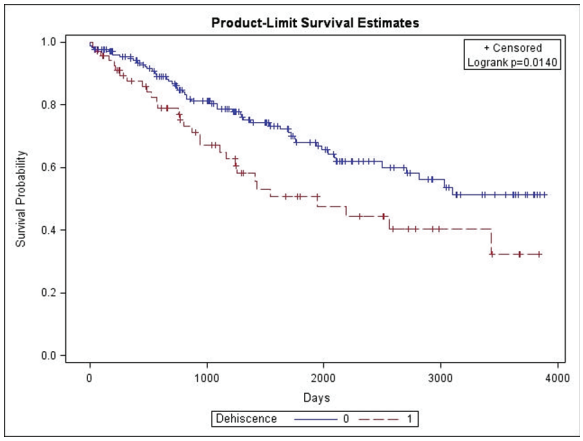
S78 30-Day Morbidity Following Sacropelvic Resection

30-Day Morbidity	No. Patients	Clavien Grade
Any Complication	22	
Wound or flap breakdown	10	
Nonoperative management	4	I
Operative management	6	IIIb
Wound infection	9	II
Hemorrhage	5	II
Abdominal or pelvic abscess	5	IIIa
Ileus	5	II
Urinary tract infection	3	II
DVT/PE	3	II
Pneumonia	2	II
Cardiac arrhythmia/MI	2	II
Anastomotic leak	1	IIIb
Ureteral obstruction	1	IIIa

A Cox proportional hazard regression was performed to assess independent risk factors for survival.

Results: Between 2001 and 2011, 250 patients underwent APR for rectal carcinoma. The mean age was 62.6 years (range 23-98) 159 (63.6%) were male and the mean body mass index (BMI) was 27.9 (range 16.7-58.5). 153 (61.1%) patients survived for 5 years after surgery. 69 (27.7%) patients developed wound dehiscence. Multivariate analysis revealed a number of associations with dehiscence including: Charlson score (OR 1.30; 95% CI 1.06-1.60; p=0.012), BMI (OR 1.09; 95% CI 1.03-1.15; p=0.004), inflammatory bowel disease (IBD) (OR 6.75; 95% CI 1.37-33.32; p=0.019) and APR for cancer recurrence (OR 2.68; 95% CI 1.16-6.16; p=0.021). In the survival analysis, wound dehiscence was associated with decreased survival (mean survival time for dehiscence vs. no dehiscence: 66.6 vs. 76.6 mo; p= 0.014). This relationship persists in the multivariate analysis (HR 1.75; 95% CI 1.08-2.84; p=0.024), which included age (HR 1.04; 95% CI 1.02-1.07, p=0.001), Charlson score (NS), and stage of disease (HR 8.19 for stage IV vs. I; 95% CI 3.10-21.61; p<0.001).

Conclusions: Post operative wound dehiscence increased the risk of death by 67%. Attention to perineal wound closure with consideration of flap creation should be given to patients with increased Charlson scores, those with IBD, those with cancer recurrence, and females undergoing posterior vaginectomy. Pre-operative weight loss should also reduce dehiscence risk.



Survival following APR for Cancer by Dehiscence

ROTOBIC VERSUS LAPAROSCOPIC PROCTECTOMY FOR RECTAL CANCER: SHORT-TERM OUTCOMES AND COST ANALYSIS OF A CASE MATCHED SERIES.

(80)

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Purpose: Robotic surgery offers enhanced visualization and improved dexterity compared to laparoscopic surgery, however, the clinical benefits and cost effectiveness have yet to be firmly established in colorectal surgery. The purpose of this study is to evaluate the perioperative outcomes and cost effectiveness of robotic proctectomy in patients treated for rectal cancer.

Methods: A retrospective review of the electronic medical records of 50 patients treated for rectal cancer between 2008 and 2012 with robotic low anterior resection (LAR) or abdominoperineal resection (APR) was performed. A case-matched cohort of patients treated with laparoscopic LAR or APR was then identified. Patients were matched for diagnosis, age, gender, and body mass index. Perioperative outcomes and costs were compared.

Results: Operative time (257 vs. 224 min, p=0.003) and blood loss (312 vs. 224 ml, p=0.003) favored laparoscopy. There were no differences in rates of involved distal or circumferential margins, or lymph nodes harvested. There were significantly more conversions to open surgery in the laparoscopy group (2 vs. 20%, p=0.004). There were no differences in hospital length of stay, 30-day total complications, anastomotic leak, readmission rates, or mortality. The laparoscopic approach incurred lower direct perioperative costs ($40,234 vs. $30,034, p<0.0001) and total hospitalization costs ($62,347 vs. $55,880, p=0.008). There was no difference in cost of readmissions.

Conclusions: In patients treated with proctectomy for rectal cancer, the robotic and laparoscopic approaches yielded similar lengths of stay, complications, readmissions, and mortality. Short-term oncologic outcomes were also similar with respect to margins and lymph nodes. The costs associated with robotic surgery were significantly higher. The conversion rate was higher in the laparoscopic cohort. As this is a retrospective case matched comparison, the higher conversion rate for laparoscopy patient may represent selection bias. A prospective trial is necessary to further understand if the higher costs of robotic surgery justify the decreased conversion rate.

SURGERY FOR CONSTIPATION IMPROVES SYMPTOMS: EVALUATING POSTOPERATIVE SYMPTOM SEVERITY AND PATIENT SATISFACTION WITH VALIDATED SCORES.

(P1)

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Purpose: Total abdominal colectomy is a surgical option for patients with chronic constipation who have failed medical therapy. Few studies have looked at changes in validated symptom severity scores after surgery. The aim of this study was to compare constipation scores before and after colectomy for constipation to assess the impact of surgery and evaluate patient reported symptom relief.

Methods: IRB approved study which included patients who underwent total abdominal colectomy with ileorectal anastomosis (TAC-IRA) for constipation from 2009 to 2012 with preoperative and postoperative validated constipation severity index (CSI). The CSI score (range 0-73, 0= no symptom, 73 = severe symptoms) is divided into 3 subscales, obstructive defecation, colonic inertia and anorectal pain. The patient global impression of change (PGIC) scale was administered atleast 6 months following surgery (range 1-7, 1= No change, 7= considerable improvement). Demographics, perioperative details and follow-up were collected from the electronic medical records.

Results: 39 patients (38 female) qualified. Median age at surgery was 42 yrs. Mean BMI was 26. Seven(18%) patients had open TAC-IRA, 32 (82%) had laparoscopic TAC-IRA. Mean length of stay was 7 days. Mean post-op follow-up was 8 months when questionnaires were collected. 20 patients completed both preop and postoperative CSI scores. The CSI scores were significantly decreased pre and post operatively (39 preop, 23 post op, p=0.018) indicating a decrease in the severity scores . PGIC scores at follow up were 6.22 in 19/39 indicating a high level of improvement.

Conclusions: Surgery for constipation results in a significant decrease in the patient reported constipation severity scores indicating a good outcome after surgery. Patient's reported a definite improvement in their symptoms after surgery reflected in the PGIC scores. Patient's improvement of symptoms using validated tools justifies major surgery for this seemingly benign condition.

EFFICACY OF SACRAL NERVE STIMULATION FOR SEVERE SLOW TRANSIT CONSTIPATION: A RANDOMISED, DOUBLE-BLIND, PLACEBO-CONTROLLED, CROSSOVER STUDY.

(P2)

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Purpose: Sacral nerve stimulation (SNS) is a potential treatment for constipation refractory to standard therapies. Uncontrolled studies have shown promise, however, there have been no randomized controlled studies of its efficacy. Aim: In patients with slow transit constipation (STC), was to evaluate the efficacy of suprasensory and subsensory SNS compared with sham, in a prospective, 18 week randomised, double-blind, placebo-controlled, 2 phase crossover study. The primary outcome measure was the proportion of patients who, on more than 2 days/wk for at least 2/3 weeks, reported a bowel movement associated with a feeling of complete evacuation . (ANZ CT Registry; 00347680).

Methods: 50 patients would detect a 20% increase in response from sham(80% power 95% confidence). Following a 3 weeks of temporary peripheral nerve evaluation (PNE) patients underwent a permanent implantation. Patients were then randomized into a double blind, cross-over study in which subsensory and suprasensory stimulation were compared to sham stimulation (Fig1). All patients kept daily stool dairies. Quality of life (QoL; SF36) was measured at the end of each treatment arm.

Results: Of 58 patients with scintigraphically confirmed STC and no evidence of rectal evacuation disorder enrolled (4 male; 44 ± 15 yrs), 33% met the primary outcome measure during the PNE. 55 of these had permanent SNS implanted and were randomized into cross over study. The proportion of patients that satisfied primary outcome measure did not differ between suprasensory (30%) and sham (21%) stimulation nor between subsensory (25%) and sham (25%) stimulation. 8/16 PNE responders also responded to suprasensory stimulation. General health (SF36) improved during suprasensory stimulation (P=0.02).

Conclusions: In patients with refractory STC, SNS did not improve the frequency of complete bowel movements over the 3-week active period, but did result in a modest improvement in general health. Secondary outcomes (pain, bloating, laxative-free days) and longer term responses of primary outcomes are awaited. (Supported by NMHRC Australia and Medtronic Australasia/USA).

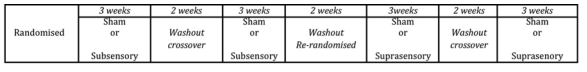

Fig 1. Schematic diagram showing order of SNS settings

ANTEGRADE COLONIC ENEMA VIA CHAIT CECOSTOMY CATHETER. IS IT A VIABLE OPTION FOR ADULT BOWEL MANAGEMENT?

(P3)

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Purpose: Antegrade colonic enemas (ACE) are used in adult patients with evacuatory disorders, administered into the right colon via a conduit. Some conduits are associated with high rate of complications, including infection and stenosis. Aim: To assess quality of life and clinical outcomes of adults administering ACE via Chait cecostomy catheter (CCC).

Methods: Patients with CCC were sent a postal survey asking about irrigation techniques, patient satisfaction, St Mark's and FIQL scores. Non responders were followed-up by telephone.

Results: 37 patients (32 female; mean age 56 yrs) had constipation (22), incontinence (6), obstructed defaecation following gracilis neosphincter (4), congenital anomaly with both incontinence and constipation (5). Twenty six (70%) patients were irrigating at mean follow-up of 3yrs (range 2wks-7.5yrs). The mean enema volume used was 1279ml (350-4000ml); 92% use tap water, and half add bisacodyl to the irrigation. Mean total toileting time was 57mins (range 15-120mins). 68% of patients had incontinence between irrigations. Mean FIQL scores ranged 2.6 - 2.9. Complications included: CCC dislodgement, wound infection, para-track hernia, excess granulation tissue, but no strictures of the track. Mean patient satisfaction (0-10 VAS) was 7.1. There was a significant correlation between patient satisfaction and faster toileting time (p=0.03), but no correlation between continence score and satisfaction.

Conclusions: Adult patients using the Chait cecostomy catheter for bowel management mostly use tap water with bisacodyl and take an average of 57mins for the irrigation. Complication rate with CCC compares favourably with other conduits. Despite incontinence, patients are mostly satisfied. Antegrade colonic enema via Chait cecostomy catheter is a viable option for adults with colonic disorders.

LAPAROSCOPIC PERITONEAL LAVAGE VERSUS HARTMANN PROCEDURE FOR NON-FECULENT PERFORATED DIVERTICULITIS WITH EQUIVALENT HINCHEY CLASS: IMPROVED OUTCOMES WITH LAPAROSCOPY.

(P4)

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Purpose: Recent studies suggest that LP for perforated diverticulitis may be an acceptable alternative to conventional surgery, such as HP. However, data comparing LP and HP with respect to disease severity according to Hinchey class are lacking. We hypothesized that LP for non feculent perforated diverticulitis would confer less morbidity vs HP in spite of similar disease severity. The aim of this study is to compare the outcome of patients undergoing LP compared to HP for non feculent perforated diverticulitis with equivalent severity.

Methods: A retrospective medical record review of patients who underwent surgery for perforated diverticulitis during 2007 – 2012 at a single institution was performed. Patients' demographic, clinical, and imaging data were reviewed. IRB approval was obtained. Data were compared with Mann Whitney U and Fisher exact test where appropriate.

Results: 79 patients underwent operative management for perforated diverticulitis. Patients with feculent peritonitis (Hinchey class IV, n=15) were excluded, resulting in 13 (20%) in LP and 51 (80%) in HP. Patients were similar in age, gender and ASA class. Disease severity (Hinchey class) and mortality were similar in both groups, whereas length of stay and complications were significantly lower in LP (see table). Two patients in LP had prolonged ileus requiring parenteral nutrition, one developed atrial fibrillation, and the fourth died from cardiomyopathy. Of the 37 patients with complications in HP, 16 developed incisional hernia (31%) and six patients (12%) developed stoma complications (necrosis, retraction, or stricture). Four patients in LP (31%) developed recurrent diverticulitis and all were subsequently managed with laparoscopic sigmoid resection and primary anastomosis.

P4 Results

	LP, n=13	HP, n=51	Total, n=64	p value
Hinchey Class	n (%)	n (%)	n (%)	*0.33
I	1 (8)	6 (12)	7 (11)	
II	3 (23)	21 (41)	24 (37.5)	
III	9 (69)	24 (47)	33 (51.5)	
Length of stay, days	6.8	13.4	12.0	†0.001
Complications (%)	4 (31)	37 (73)	41 (64)	*0.009
Mortality (%)	1 (7.7)	2 (4)	3 (4.7)	*0.5

*Fisher exact test comparing LP vs HP

†Mann-Whitney U- test

Conclusions: This analysis suggests that patients undergoing LP compared to HP for perforated non feculent diverticulitis with equivalent severity are, 1) less likely to develop abdominal wall complications, 2) have shorter length of stay, and 3) despite one third of patients in LP developing recurrence, all can be managed with subsequent resection and anastomosis and avoid colostomy.

TO SCOPE OR NOT TO SCOPE: LAPAROSCOPIC VERSUS OPEN COLECTOMY FOR COMPLICATED DIVERTICULITIS.

(P5)

A. Mabardy, J. Lee, P. Miller, P. Bhurtel, A. Hackford
Boston, MA

Purpose: The role of laparoscopy in the setting of complicated diverticulitis is not well described. Our objective is to compare laparoscopic to open colectomy for patients with complicated diverticulitis having peritonitis, fistula, abscess, obstruction, and perforation.

Methods: Patients were identified in the Nationwide Inpatient Sample database from 2005 through 2009 who had complicated diverticulitis. Laparoscopic colectomy was compared with open colectomy for demographics, length of stay (LOS), total hospital charges (THC), and post-operative complications according to the intention-to-treat principle. Subgroups of complicated diverticulitis defined above were then compared for post-operative complications.

Results: During the study period, 31,029 patients underwent colectomy for complicated diverticulitis, and 5.1% (n=1,567) were performed laparoscopically. Conversion to an open procedure was performed in 68.1% of these cases. Laparoscopy was associated with the teaching hospital setting, private insurance, and minority status. The median hospital LOS and THC were lower for the laparoscopic group (8 vs. 10 days; $55,087 vs. $58,790). Patients in the laparoscopic group had lower mortality (0.8% vs. 4.1%, $p < 0.0005$) and fewer postoperative complications (25.5% vs. 29.5%, $p = 0.001$). The laparoscopic approach was associated with a lower risk of infection for patients with perforation (1.4% vs. 5.8%, $p < 0.0005$) and a higher risk for patients with abscess (17.7% vs. 10.3%, $p < 0.0005$). Iatrogenic injury was significantly higher in the laparoscopic group for patients presenting with obstruction (7.9% vs. 5.0%, $p = 0.015$) or fistula (9.6% vs. 5.6%, $p = 0.001$). The highest rate of conversion to an open procedure was for patients with obstruction (76.1%), while the lowest was for patients with fistula (63.1%).

Conclusions: Laparoscopic colectomy in the setting of complicated diverticulitis was attempted in 5.1% of patients and successfully performed in 1.6% of patients. For all patients attempted laparoscopically, there was a lower overall complication rate, decreased mortality, and lower associated costs. All subgroups had a high rate of conversion to an open procedure.

LAPAROSCOPIC WASHOUT FOR DIVERTICULITIS IN THE ERA OF LAPAROSCOPY.

(P6)

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Boston, MA

Purpose: Laparoscopic washout and placement of drains without resection or colostomy has been utilized in numerous small studies with promising results. Our goal was to compare laparscopic washout versus resection or colostomy for diverticulitis in the United States in recent years.

Methods: The Nationwide Inpatient Sample database was used to identify all urgent or emergent hospital admissions for diverticulitis from 2005 through 2009. Patients were identified who underwent laparoscopy without resection, diversion, or conversion to an open procedure. Unrelated laparscopic procedures were excluded. Multivariate regression analysis was used to identify predictive variables for laparoscopic washout. Variables associated with complication and cost were compared between the groups.

Results: During the study period, 112,649 patients were taken to the operating room after an urgent or emergent hospital admission for diverticulitis. Of these patients, 1.0% (n=1,104) underwent laparoscopy alone, and the most frequently performed procedures were peritoneal lavage (8.8%), incidental appendectomy (8.6%), and lysis of adhesions (3.8%). The laparoscopy group had lower overall mortality (0.8% vs. 3.1% $p < 0.0005$), fewer postoperative complications (5.9% vs. 22.9%, $p < 0.0005$), shorter median hospital length of stay (5 vs. 10 days),

P5 Postoperative Complications for Laparoscopic Versus Open Colectomy in Complicated Diverticulitis

	Laparoscopic Colectomy	Open Colectomy	p value
All Complications	25.5%	29.5%	0.001
Respiratory Complications	9.6%	19.6%	<0.0005
Myocardial Infarction	0.3%	1.6%	<0.0005
Infection	13.1%	8.3%	<0.0005
Wound Complications	5.2%	3.8%	0.005

lower median total hospital charges ($24,570 vs. $50,185), and a lower rate of discharge to a rehab facility (3.1% vs. 16.8%, p < 0.0005). Positive predictors of laparoscopic washout included highest income quartile and private insurance, while negative predictors included perforation, abscess, fistula, peritonitis, or obstruction.

Conclusions: Despite growing evidence for laparoscopic washout with placement of drains in the setting of diverticultis, only a small percentage of patients in the United States undergo this procedure. For select cases of diverticulitis, laparoscopic washout appears to be safe and cost-effective, though further study is needed to identify which patients are most appropriately managed in this way.

RISK OF INCISIONAL HERNIA IS HIGHER AFTER COLECTOMY DONE FOR DIVERTICULITIS VERSUS CANCER.

(P7)

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Hershey, PA

Purpose: The pathophysiology of diverticulitis is poorly understood, but may involve a collagen vascular abnormality. The present study tested the hypothesis that there is an increased incidence of incisional hernias in patients undergoing sigmoidectomy for diverticulitis versus cancer.

Methods: This was an IRB approved, single-institution retrospective cohort study analyzing patients ≥18 years of age who underwent both elective and emergent sigmoid colectomies for either diverticulitis or cancer performed between January 2003 and September 2012. Exclusion criteria included the development of surgical-site infections and the use of neoadjuvant chemoradiotherapy. The primary study end point was the development of postoperative incisional hernias. A multivariate logistic regression was used with covariate adjustments for diabetes mellitus (DM), chronic obstructive pulmonary disease (COPD), body mass index (BMI), smoking, and steroid use.

Results: A total of 467 patients were analyzed (mean age: 59.2 years; sd=13.9). The median follow-up was 30.5 months. Incidence of incisional hernia was 15.9% in diverticulitis versus 5.5% in the cancer cohort (46/288 vs. 10/179; p<0.001). Factors associated with incisional hernia included; steroids (p<0.009), DM (p<0.002), BMI >30 (p<0.02) and COPD (p<0.02). After controlling for these covariates, multivariate logistic regression demonstrated a persistent association between diverticulitis and hernia (p<0.001). Odds of hernia following sigmoidectomy for diverticulitis was 2.8 times greater than in the cancer cohort (95% CI: 1.34-6.36). No statistically significant difference in hernia rates was noted when comparing elective and emergent surgeries within either cohort.

Conclusions: 1) The incidence of incisional hernia following a sigmoid colectomy is significantly higher when performed for diverticulitis as compared to cancer. 2) This may be due to a connective tissue disorder which predisposes to the development of both diverticulae as well as hernias. 3) Laparoscopic approach had a lower overall incidence of incisional hernias and should be the preferred approach to minimize this complication specially in patients with diverticulitis.

P6 Laparoscopic Washout Versus Resection or Diversion for Diverticulitis

	Laparoscopic Washout	Resection or Diversion	
Mortality	0.8%	3.1%	p < 0.0005
Post-operative Complications	5.9%	22.9%	p < 0.0005
Median Length of Stay	5 days	10 days	significant for alpha = 0.05
Median Total Hospital Charges	$24,570	$50,185	significant for alpha = 0.05
Discharge to Rehab Facility	3.1%	16.8%	p < 0.0005

P7 Patient Characteristics

	Diverticulitis	Cancer	P value
Total cases	288	179	
Laparoscopic	47	32	0.76
Mean Age (years)	56.6 (sd=13.1)	63.4 (sd=14.0)	<0.0001
Gender: Female	136	88	0.75
Open	241	147	0.76
Mean f/u (months)	37.6 (sd=30.8)	35.7 (sd=27.4)	0.49
Total hernias	46 (15.9%)	10 (5.5%)	<0.001
Lap Hernias	3 (6%)	1 (3%)	0.32
Open Hernias	43 (18%)	9 (6%)	<0.002

A COMPARISON OF ROBOTIC AND LAPAROSCOPIC COLON RESECTION FOR DIVERTICULAR DISEASE. SHOULD WE MOVE ON?

(P8)

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Purpose: Robotic surgery is a new approach for diverticular disease and has not been tested against laparoscopy. A comparison between these two modalities was studied in order to assist surgeons when making a choice between robotic versus laparoscopic surgery for the treatment of diverticular disease. We hypothesize that robotic colon resection offers improved outcomes over traditional laparoscopic surgery.

Methods: A retrospective chart review of prospective data was conducted of robotic and laparoscopic colon resections performed at three teaching hospitals between 2007 and 2012. Medical records were analyzed for the following data: patient demographics, operative time, conversions, complications, and length of stay.

Results: A total number of 233 cases were studied (134 underwent robotic surgery and 99 had traditional laparoscopic surgery). Patient variables such as age (mean for robotic group was 60 years versus 58 years for laparoscopic group), body mass index (mean of 27 for robotic group versus 28 for laparoscopic), estimated blood loss (mean of 97 cc for robotic versus 91 cc for laparoscopic (p value 0.326), were not statistically significant. Operative times for both groups were similar (135 minutes for robotic versus 126 minutes for laparoscopic). Complications such as surgical site wound infection, ileus, obstruction, postoperative pain (requiring readmission or increased length of stay), and urinary retention were decreased for the robotic group (8.8 % versus 14.1 %, p value 0.498). There were no conversions in either group. Anastomotic leak, requiring re-exploration and additional procedures such as diversion were fewer for robotic procedures (2.9% versus 5.1%, P value 0.442). Robotic colon resection had a decreased length of stay (p value 0.004).

Conclusions: Robotic surgery for the treatment of recurrent or complicated sigmoid diverticulitis is a valid surgical option offering a decreased length of stay and a trend toward fewer complications.

USE OF ANTIBIOTICS BEFORE ELECTIVE SURGERY FOR DIVERTICULITIS: WHAT IS THE IMPACT?

(P9)

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Purpose: Delayed elective sigmoidectomy in patients with diverticulitis carries risks of complications requiring urgent resection with consequent high morbidity. Whether the use of antibiotics (ABX) between the acute episode(s) and definitive surgery is unknown. This study aimed to assess the impact of ABX use on disease complication during the waiting period. A secondary aim was to correlate ABX use and perioperative outcomes.

Methods: From 01/08 to 06/12, all patients who underwent elective surgery for diverticulitis were identified from an IRB-approved prospective database. The use (group A) or non-use (group B) of ABX within a period of 6-8 weeks before surgery was correlated with disease complications. Perioperative outcomes were compared between groups. Chi-square, likelihood ratio chi-square, Fisher's exact, Student's t test, ANOVA, Mann-Whitney, Kruskal-Wallis and logistic regression analyses were applied.

Results: 248 patients (56 years, 50.4% male) underwent elective surgery for diverticulitis. 46.8% (n=116) were in group A. The mean number of days of ABX use was 22.5 (range 3-45). 28 patients (11.3%) used ABX for the entire waiting period. Patients who recieved ABX had significantly more colonic fistula and predrained abscesses than did patients in group B, 46 (40.4%) vs 33 (24.6%), respectively, p=0.008. 21 patients in group A (18.4%) vs 5 (3.7%) in group B presented with disease complications including recurrent local pain, pericolic abscess, obstruction, bleeding or perforation, p< 0.0001, OR=5.8 (CI 95% 2.1 to 16.0), and 7 patients required earlier surgery due to complications, 6 vs 1, respectively from group A and B. There was no difference in type of approach (lap vs open), conversion rates, intraoperative complications, estimated blood loss, length of stay or ≤ 30 days postoperative complications including C. difficile colitis between groups.

Conclusions: The use, type, or duration of ABX treatment does not appear to impact perioperative outcomes.

PERCUTANEOUS DRAINAGE OF DIVERTICULAR ABSCESS SHOULD BE LIMITED TO 2 ATTEMPTS FOR RECURRENT DIVERTICULAR ABSCESS.

(P10)

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Purpose: A diverticular abscess >2cm is drained percutaneously with the aim to perform a definitive single-stage operation, thus avoiding an ostomy.Currently there are no guidelines for the number of percutaneous drainages to be performed in recurrent diverticular abscesses before attempting surgery. To formulate a guideline on percutaneous drainage, we reviewed patients who presented with a diverticular abscess.

Methods: All patients (n=117) who presented with computed tomography scan-proven diverticular abscess from July 2008 to June 2011 were studied. Forty-two patients underwent percutaneous drainage of their diverticular abscess: 6 patients underwent ≥3 drainages, 9 patients underwent 2 drainages and 27 patients had 1 drainage. Aspiration of pus with needle without placement of drainage catheter, re-adjustment of drain, and upgrading the drain size were not considered as separate drainage procedures. The patients were divided into 4 groups based on the number of drainages.

Results: There was no difference between the distribution of patients in groups with regards to their age or sex (Table). The average number of days between drains for patients with more than 1 drain was 72 days (range 20-180). The size of abscess cavity was significantly higher for the patients who had ≥3 drainages (P<0.001). A Hartmann's procedure was performed in the majority of patients in the ≥3 drainage group (83%), but in decreasing frequency as the number of drainages performed dropped: 2 drainage (44%), 1 drainage (15%) and no drainage group (19%). There was a significantly higher pre-operative hospital stay in the patients from the ≥3 drainage group (P<0.001).

Conclusions: Patients with a recurrent diverticular abscess are very likely to undergo a Hartmann's procedure after 2 attempted drainages. By performing additional percutaneous drainages in an attempt to avoid ostomy, we are prolonging the inevitable and increasing morbidity. Furthermore, patients are at an increased risk of sepsis and peritonitis, with prolonged antibiotics and increased healthcare costs. We recommend limiting percutaneous drainage procedures to 2 attempts to cool down recurrent diverticular abscess prior to definitive surgery.

PREDICTORS OF POSTOPERATIVE OUTCOMES FOR PATIENTS WITH DIVERTICULAR ABSCESS INITIALLY TREATED WITH PERCUTANEOUS DRAINAGE.

(P11)

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Cleveland, OH

Purpose: Percutaneous drainage (PCD) is the recommended initial treatment for large diverticular abscess, ideally followed by restorative sigmoidectomy. The aim of our study was to evaluate postoperative outcomes in patients initially approached with PCD and to identify factors associated with complications and need for ostomy after sigmoidectomy.

Methods: Data for patients with diverticular abscess ≥3 cm in diameter treated with initial PCD from 1994-2012 were obtained from an institutional, IRB-approved database. Abscesses were characterized as single or multiloculated, Hinchey I or II, pelvic or intrabdominal. Univariate and multivariate analyses were used to identify associations with postoperative morbidity, overall and permanent stoma rates.

Results: 114 patients (54% male) with a mean age of 57 years and a mean abscess diameter of 7.1±2.4 cm were identified. After an interval of 4-6 weeks from PCD, 93 patients (82%) underwent elective surgery (sigmoidectomy:62; with diversion:24; Hartmann:7) while PCD failure required urgent surgery in the remaining 21 (18%) patients (sigmoidectomy:1; with diversion:6; Hartmann:14). Overall morbidity and stoma creation rates were 37% (N=42) and 45% (N=51), respectively. Reported reasons for stoma creation were urgent surgery (n=20), residual abscess (n=12), comorbidity (n=8), poor tissues (n=7), low anastomosis (n=2) and intraoperative adverse events (n=2);16 patients (14%) either died (n=8) or remained with a stoma (n=8) because of comorbidity. On multivariate analysis, factors associated with postoperative morbidity included PCD failure (P=0.02) and older age (P=0.04), while risk for stoma creation was associated

P10 Comparision Between Drainage Groups.

	Drainage groups (number of drainages)				
	3 or more	2	1	None	P value
Age: mean years (range)	61 (33-85)	55 (26-88)	63 (41-91)	62 (25-92)	0.68*
M:F (n)	2:4	5:4	10:17	29:46	0.7 #
Maximum Size of abscess cavity: mean cm (range)	8 (4.1-19.1)	5 (2-8)	6 (2.3 – 11.8)	3 (0.7- 8)	<0.001*
Hartmann-Single stage (yes:no, n)	5:1	4:3	4:10	14:32	0.04 #
No definitive surgery (n)	0	2	13	29	
Pre-op Hospital stay: mean days (range)	18 (5-60)	14 (3-42)	11(1-34)	7(1-36)	<0.001*

* ANOVA

\# Chi Square test

with older age (P<0.001), Hinchey II (P= 0.03) and increased BMI (P=0.01). The only factor associated with permanent stoma risk was ASA 4 score (P=0.02).

Conclusions: In patients with large diverticular abscess, a successful PCD is associated with reduced postoperative morbidity. However, the need for stoma creation remains substantial and the ostomy may become permanent in case of significant comorbidity.

LAPAROSCOPIC VERSUS OPEN COLECTOMY FOR DIVERTICULITIS IN THE ERA OF LAPAROSCOPY AND OBESITY.

(P12)

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Purpose: Use of laparoscopic colectomy (LC) for diverticulitis has been increasing. We evaluated outcomes of LC compared with open colectomy (OC) for diverticulitis in the obese population.

Methods: Obese patients undergoing LC and OC for diverticulitis from 2008 to 2009 were selected from the Nationwide Inpatient Sample database. Data analysis included demographics, complications, length of stay (LOS), and total hospital charges (THC).

Results: A total of 13,189 obese patients underwent colectomy for diverticulitis during the study period. LC increased near three-fold, 636 (9.3%) to 1,754 (27.8%), P<0.001. LC was associated with a lower overall complication rate (11.7% vs 17.2%, P<0.001), shorter median LOS (5 days vs 8 days, P<0.001), and lower mean THC ($53,377 vs $71,429, P<0.001) when compared to OC. Adjusted for emergency cases however, benefits of LC were not statistically significant: overall complication rate (21.8% vs 21.1%, P=0.795), median LOS (10 days vs 10 days, P=0.663), and mean THC ($87,543 vs $97,142, P=0.090). Emergency LC cases were associated with a lower ostomy formation rate, (32.4% vs 67.0%, P<0.001).

Conclusions: In the era of laparoscopy, the utilization of LC for diverticulitis in obese patients has increased significantly. Elective LC for diverticulitis appears to be safe with lower cost of care in obese patients. Benefits of LC in the setting of emergency however remain to be further explored.

LAPAROSCOPIC APPROACH IN COMPLICATED DIVERTICULAR DISEASE.

(P13)

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Purpose: To analyze the results of laparoscopic colectomy in complicated diverticular disease and secondarily to determine feasibility of emergency laparoscopic sigmoid colectomy in patients Hinchey III / IV.

Methods: Patients who underwent laparoscopic colectomy for diverticular disease between July 2000 to June 2010 were included. The series was divided into two groups. G1: patients with complicated disease (abscess, perforation, fistula, or stenosis) and G2: patients undergoing surgery for recurrent diverticulitis. Two groups were compared. Furthermore sigmoidectomies without ostomy in Hinchey III / IV (G1A) versus other complicated diverticular (G1B) were compared.

Results: 205 patients were included; G1: 56 (27%) and G2: 149 (73%). G1 consists of: 8 (14%) pericolonic abscesses or severe inflammatory sequelae, 12 (21%) Hinchey II, 16 (29%) Hinchey III / IV, 12 (22%) Fistulas (9 colovesical / 3 colocutaneous), and 8 (14%) stenosis. Procedures performed in G1 were: 49 (87%) sigmoidectomies; 5 (9%) with proximal ileostomy and 2 (4%) Hartmann`s procedures. Patients in G2 presented more previous episodes of diverticulitis (G1: 1.5 vs G2: 2.6, p<0.05). G1 had longer operating time (G1: 203 vs G2: 159 minutes, p<0.05) and higher conversion rate [G1: 11/56 (20%) vs G2: 5/149 (3.3 %), p<0.05]. There were no differences in complications. G1 had longer hospital stay (G1: 4.7 vs. G2: 3 days, p<0.05) and more postoperative complications [G1: 14/56 (25%) vs G2: 18/149 (12%), p=0.04], but there were no differences in major complications. Comparing G1A (n = 10) vs G1B (n = 39) vs G2 (n = 149), G1B had longer operative time (G1A: 159 vs G1B: 205 vs G2: 159 minutes, p<0.05). There were no differences in intraoperative complications between the groups. G1B showed higher conversion rate [G1A: 0/10 (0%) vs G1B: 11/39 (28.2%) vs G2: 5/149 (3.3%), p<0.05] and G1A showed increased hospital stay (G1A: 5.1 vs G1B: 4.1 vs G2: 3 days, p<0.05). No differences in postoperative complications were identified.

Conclusions: Laparoscopic approach can be performed safely in patients with complicated diverticular disease. In turn, laparoscopic sigmoid resection without ostomy in patients Hinchey III / IV is feasible with acceptable results.

SURGICAL TREATMENT OF DIVERTICULITIS: HAND-ASSISTED AND OPEN METHODS ARE PREDOMINANTLY USED FOR MORE DIFFICULT CASES AND ARE ASSOCIATED WITH MORE COMPLICATIONS AND LONGER LOS (VERSUS LAPAROSCOPIC).

(P14)

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Purpose: Laparoscopic (LAP) colorectal resection (CR) is the "default" technique for elective CR for diverticulitis in many centers. The role of hand-assisted (HAL) and Open methods today is less clear. This retrospective study assessed the practice patterns of a surgical group that utilized all 3 methods.

Methods: A prospective database and hospital/office charts were used for this 9 year review. Details regarding demographics, co-morbidities (assessed with the Carlson Comorbidity Index (CCI)), surgical methods, operation performed, short term outcome and complications were analyzed.

Results: A total of 282 patients had CR for diverticulitis: LAP, 125[44.3%]; HALS, 125[44.3%], Open, 32[11.3%]. The HAL mean BMI (29.3) was higher than the LAP group's (25.9, p<0.0001). There were significantly more older patients (LAP median age 52 vs HAL, 60; Open, 62) and high risk patients (CCI>2) in the HAL (18.3%) and Open groups (17.4%) vs the LAP group (5.2%, p<0.05 vs HAL, Open). The percent with complicated diverticulitis was: LAP, 12%; HALS, 24.8%, and Open, 53% (p<0.05 for all comparisons [FAC]). The diversion rates were: LAP, 3.2%; HAL, 9.6%; and Open, 37.5% (p<0.05 FAC). The mean incision lengths (cm) were: LAP, 6.2 +/- 3.3; HAL, 10 +/-3.3; OPEN, 20.7 +/- 5.6 (p<0.05 FAC). The mean time to first BM (days) was: LAP, 3.0+/-1.1; HAL, 3.3+/-1.4; Open, 3.5+/-1.5 (p=ns FAC). The LOS results (days) were: LAP, 5.7+/-3; HAL, 7.6 +/-5.9; Open, 13.3 +/- 15.2 (p<0.05 FAC). The wound infection rates were: LAP, 5.6%; HAL, 12.8%, Open 18.8%(p<0.05, LAP vs others). The overall complication rates (minor + major) were: Lap, 12.8%; Open 42.4%; Open, 46.9% (p<0.05 Lap vs others)

Conclusions: There was a stepwise increase in age, disease complexity, comorbidities, diversion rate, and LOS when the LAP, HAL, and Open cases are considered in order. Selective use of HAL methods likely contributed to the high MIS utilization rate (88%). The HAL's and Open LOS was significantly longer and the rate of complications higher (vs LAP). In this series, LOS was not dependent on ileus resolution.

P14

		LAP (n=125)	HAL (n=125)	OPEN (n=32)	LAP vs HAL *p* value	LAP vs OPEN *p* value	HAL vs OPEN *p* value	
Gender	Male/ Female	64/ 61	64/ 61	20/ 12	n.s.	n.s.	n.s.	‡
Age(years)	Median(range)	52(28-88)	60(31-83)	62(37-86)	0.0004	0.0003	n.s.	†
BMI(kg/m^2)	Mean±SD	25.9 ±4.3	29.3 ±6.5	27.7±6.2	<0.0001	n.s.	n.s.	†
CCI	<2/ >=2	110/ 6	94/ 21	19/ 4	0.0020	n.s.	n.s.	‡
	n/a	9	10	9				
Complicated Diverticulitis		15 (12.0%)	31 (24.8%)	17(53.1%)	0.0091	<0.0001	0.0019	‡
Type of resection	AR/LAR	11(8.8%)	12(9.6%)	5(15.7%)	n.s.	n.s.	n.s.	‡, §
	Sigmoi-dectomy	99(79.2%)	101(80.8%)	24(75.0%)				
	Other	15(12.0%)	12(9.6%)	3(9.3%)				
Stoma formation		4(3.2%)	12(9.6%)	12(37.5%)	0.0385	<0.0001	0.0001	‡
Length of surgery(days)	Mean±SD	273±73	289±91	269±129	n.s.	n.s.	n.s.	†
Length of Incision(cm)	Mean±SD	6.2±3.3	10.0±3.3	20.7±5.6	<0.0001	<0.0001	<0.0001	†
Length of stay(days)	Mean±SD	5.7 ±3.0	7.6 ±5.9	13.3±15.2	0.0160	<0.0001	<0.0001	†
Time to first BM(days)	Mean±SD	3.0±1.1	3.3 ±1.4	3.5±1.5	n.s.	n.s.	n.s.	†
All complication		16 (12.8%),	53 (42.4%),	15(46.9%)	<.0001	<.0001	n.s.	‡
Abscess/Leak		3(2.4%)	7(5.6%)	1(3.1%)	n.s.	n.s.	n.s.	‡
SBO		2(1.6%)	6(4.8%)	1(3.1%)	n.s.	n.s.	n.s.	‡
Superficial wound infection		7(5.6%)	16(12.8%)	6(18.8%)	0.0488	0.0160	n.s.	‡

n.s.: not significant, BMI: Body Mass Index, CCI: Charlson Comorbidity Index, n/a: not available case, †: Mann-Whitney U test, ‡: 2-sample test for equality of proportions, AR: anterior resection, LAR: low anterior resection, §: p value only for AR/LAR proportion, SBO: small bowel obstruction

LONG-TERM OUTCOMES OF PERCUTANEOUS DRAINAGE WITHOUT SURGERY FOR PATIENTS WITH DIVERTICULAR ABSCESS.

(P15)

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Purpose: The standard of care in the treatment of abscess complicating sigmoid diverticulitis is percutaneous drainage (PCD) followed by elective surgery. Data on PCD followed by observation is scant.

Methods: All cases of diverticular abscess of at least 3 cm in diameter treated with PCD alone evaluated from 1993-2012 were identified from an institutional diverticular disease database. All patients either refused surgery or had prohibitive comorbidity.

Results: A total of 19 patients (12 surgery refusal, 7 comorbidity) were followed-up until death, surgery for recurrent diverticulitis or for a median of 90 (10-139) months. Five patients had had previous episodes of diverticulitis. The mean abscess size was 5.6±1.7 cm and the location was pelvic in 8 cases and intrabdominal in 11. The mean duration of drainage was 20.5±1.3 days, except for 2 patients who only had aspiration of the abscess due to technical difficulty in drain placement. There was one case of small bowel injury complicating PCD, managed nonoperatively. Three patients died because of preexisting comorbidity between 2 and 8 months after PCD. Half of the surviving patients (8/16) experienced recurrent diverticulitis, 4 of whom required surgery between 1 month and 7 years after index PCD. The indications for surgery were diverticular abscess in 3 patients (one urgent Hartmann, 2 repeat PCD and elective sigmoidectomy) and uncomplicated diverticulitis in one. Of the remaining 4 cases of recurrence, one abscess was treated with repeat PCD alone and 3 patients had uncomplicated diverticulitis treated with antibiotics. There were no significant associations between long-term failure of PCD and location of abscess (P=0.54) or previous episodes of diverticulitis (p=0.9).

Conclusions: Long-term follow-up indicate that PCD alone was successful in avoiding surgery in the majority of this selected patient population with sigmoid diverticular abscess. Future studies should assess the appropriate indications for a more liberal use of PCD not followed by elective surgery.

DOES SIGMOIDECTOMY FOR RECURRENT DIVERTICULITIS HAVE AN IMPACT ON PATIENTS' QUALITY OF LIFE?

(P16)

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Purpose: The indication of surgical treatment for recurrent diverticulitis has had changed and at present there are still some imprecisions. For these reasons it would be important to know if patients undergoing surgery for recurrent diverticulitis have any significant variation in their quality of life.The aim of this study is to evaluate if sigmoidectomy for recurrent diverticular disease has an impact on patients' quality of life.

Methods: Between December 2003 and April 2012 the patients undergoing surgery for recurrent diverticulitis (G1) were analyzed. The SF-36 quality of life questionnaire was used for such assesment. This questionnaire was also taken by people who've never had diverticulitis (G2). Raw punctuations between 0 and 100 were analyzed for each dimension. The SF-36 quality of life questionnaire data was obtained through an electronic survey. The T Student test was used to evaluate the differences among the SF-36 dimensions. All statistical data with $p < 0.05$ was considered significant. The "SPSS 19" statistical package was used for the statistical analysis.

Results: In the period of time referred above, 322 patients with diverticulitis were admitted. One hundred seventy eight of them underwent elective laparoscopic sigmoid resection. One hundred and seventy three questionnaires were completed, 123 (71%) from G2 and 50 (29%) from G1. Three patients from G1 (6%) had recurrent diverticulitis symptoms after surgery. The results of the comparison between the means of the questionnaire's dimensions were: physical functioning: 54.0 vs 47.6; role-physical: 52.8 vs 49.2; bodily pain: 28.0 vs 31.5; general health: 40.8 vs 41.4; vitality: 47.7 vs 49.8; social functioning: 35.3 vs 35.2; role-emotional: 48.8 vs 47.4; mental health: 33.9 vs 34.2; physical component summary: 47.2 vs 44.8; mental component summary: 38.2 vs 39.7. None of these parameters were statistically significant between the groups.

Conclusions: Patients underwent laparoscopic sigmoid resection for recurrent diverticulitis have a similar post operatory quality of life than general population. There is a minority of patients who will have diverticulitis recurrence after surgery.

ARE LENGTH AND COST OF STAY FOR THE NONOPERATIVE MANAGEMENT OF DIVERTICULITIS AFFECTED BY THE SERVICE OF ADMISSION?

(P17)

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Purpose: This study investigated the length and cost of stay (LOS and COS) for patients admitted with nonoperative diverticulitis to Internal Medicine (IM), Colorectal Surgery (CRS) and General Surgery (GS) services.

Methods: The charts of 1010 patients admitted for nonoperative management of diverticulitis from January 2010 to August 2012 to a tertiary referral hospital were retrospectively reviewed. 210 patients underwent surgery and were excluded. Age, sex, admitting service, number of consults and day of week admitted were collected on the remaining 800 patients. CT findings for diverticulitis were graded by severity from 1-5. Univariate and multivariate analyses were used to examine the influence of those covariates on LOS and COS. Rank tests were used to compare medians where appropriate.

Results: Most patients (71.1%) were admitted to IM, with CRS and GS admitting a similar percentage of patients (14.5% vs 14.4%). The IM cohort was significantly older and had more men than the two surgical groups. Univariate analysis indicated that the IM cohort had shorter LOS (4.4 ± 2.3 days) than CRS (5.3 ± 3.5, $p<0.01$) or GS (6.5 ± 5.6, $p<0.0001$). IM admissions had more consults (1.0 ± 1.0) than did CRS or GS (0.5 ± 0.9 vs 0.6 ± 1.0, both $p<0.0001$). CT scan severity was significantly less for the IM group (1.1 ± 0.6) than for either CRS (2.2 ± 1.1) or GS (2.5 ± 1.3, both $p<0.0001$). Weekend admissions were equally likely for all services. Median COS for IM was lower compared to GS ($10,603 vs $13,389, $p<0.001$), but not significantly less than CRS ($11,204, $p=0.16$). A multivariate regression model retained sex, admitting service, number of consults and CT scan severity as significant independent predictors for LOS ($R=0.511$, $p<0.001$) and COS ($R=0.493$, $p<0.001$). As service of admission increased from IM to CRS to GS, LOS and COS increased stepwise by 0.99 ± 0.32 days ($p<0.0001$) and $3,516 ± $1,259 ($p<0.0001$).

Conclusions: Patients admitted to Internal Medicine for nonoperative management of diverticulitis had a shorter LOS and a less expensive COS than patients admitted to a surgical service.

MODERN TRENDS IN THE TREATMENT OF DIVERTICULITIS: A SERIES OF OVER 1,000 PATIENTS.

(P18)

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Purpose: Current management trends have shifted toward more non-operative management of diverticulitis. Operation has become reserved for failure of medical therapy and treatment of complications. Current practice guidelines have a large amount of latitude and rely on the clinician to determine when surgery is needed. The aim of this study is to review the current outcome measures at a large volume single institution.

Methods: We performed a single center, retrospective review of all patients admitted to the Los Angeles County Medical Center from 1/1/2003 to 12/31/2011 with a diagnosis of diverticulitis. We evaluated their demographics, comorbidities, CT scan appearance, type of procedure performed (if any), length of stay, complications, and number of readmissions.

Results: A total of 142 patients underwent same-hospitalization resection (13.9%) out of 1019 total patients treated during the observed period. 67.6% of these surgical patients had a primary anastomosis, with the remaining having a Hartmann's resection. Modified Hinchey Classification had no bearing on the type of procedure performed. 14% of these procedures were performed laparoscopically, and <1% required proximal diversion after anastomosis. Patients undergoing Hartmann's procedure (vs. primary anastomosis) were more likely older than age 50 ($p=0.016$) and with glucose levels >200 ($p<0.008$). There was no difference in postoperative wound infections, abscesses, in these treatment groups. Length of stay and ICU stay were significantly longer in the Hartmann's group. A subset of patients <40 years were more likely male, Hispanic, non-diabetic, and had a higher number diverticulitis readmissions. Diabetic patients were more likely to have all forms of complications.

Conclusions: Expectant management of diverticulitis results in an acceptable rate of emergency surgery with a high rate primary anastomosis and low complication rate. Diabetes was a significant risk factor for all forms of postoperative complications. A Hartmann's procedure resulted in a significantly increased length of stay. Hispanics under age 40 were more likely to have refractory disease requiring multiple readmissions for diverticulitis.

DIVERTICULAR FISTULAS TO THE FEMALE REPRODUCTIVE TRACT: A CASE SERIES OF COLO-UTERINE AND COLO-TUBO-OVARIAN FISTULAS.

(P19)

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Purpose: With the exception of colovaginal fistulas, fistulas from the colon to the female reproductive tract are unusual, and are extremely rare in diverticular disease. This study highlights a series of patients with these unusual fistulas treated at a single institution.

Methods: Six consecutive cases of colon to female reproductive tract fistulas were identified from Jan 2011 to Oct 2012. Age, location of fistula, diagnosis, and treatment were evaluated.

Results: Six patients with colon-reproductive tract fistula were identified. Median age was 50 (range 34-67). Two had sigmoid colo-uterine fistulas, 4 had sigmoid colon to tubo-ovarian fistulas. Only one patient had prior history of diverticulitis. Patient symptoms, diagnosis, location of fistula, need for stoma, and hysterectomy/oophorectomy can be seen in the Table. Preoperative workup included CT scan in 6 patients, colonoscopy in 5, and contrast enema in 3. Fistula was identified preoperatively in 3 patients: 1 was identified by preoperative colonoscopy; 1 identified on contrast enema study; CT scan was suggestive of fistula in all 3. One patient underwent surgery for presumed Tubo-ovarian abscess with total abdominal hysterectomy/bilateral oophorectomy with diagnosis of colo-tubo-ovarian fistula made postoperatively; another underwent emergent resection for large bowel obstruction with colouterine fistula identified intraoperatively. Additional patient underwent resection for presumed colovaginal fistula, and was found to have fistula to right tube intraoperatively. Five patients have undergone definitive surgical resection; one patient who underwent diversion is awaiting definitive surgery.

Conclusions: Diverticular fistulas to the female reproductive tract are rare and can be difficult to diagnose, with only 50% of our patients diagnosed preoperatively and only 1 pt having a history of diverticular disease. A combination of diagnostic modalities should be employed for definitive diagnosis and treatment. The majority of patients require a stoma as part of the surgical treatment, and most require hysterectomy or oophorectomy.

LAPAROSCOPIC LAVAGE FOR PERFORATED SIGMOID DIVERTICULITIS WITHOUT GROSS FECAL CONTAMINATION (HINCHEY III).

(P20)

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Purpose: Sigmoid diverticulitis is very common in Western countries. The standard treatment of perforated diverticulitis with generalized peritonitis is exploratory laparotomy with sigmoid resection, Hartmann procedure and colostomy. However, a less aggressive surgical approach on selective patients without gross fecal contamination (Hinchey III) using laparoscopic lavage has emerged in recent years. There are multiple studies investigating the outcome, morbidity and mortality associated with this promising less invasive therapy. Minimally invasive surgery offers many potential advantages and laparoscopic lavage avoids the bowel resection and daunting colostomy, which appears to be very attractive option to patients as well as health providers. However, most of these studies are conducted in single institution with limited experiences. And the lack of well designed clinical trial data makes it critical to assess its safety. Therefore, in the article, we performed a systematic literature review of laparoscopic lavage as the primary treatment of perforated sigmoid diverticulitis (Hinchey III).

Methods: Total 14 studies of 799 laparoscopic lavage cases between 1991 to 2010 were reviewed. The variants such as blood loss, operation time, major complications

P19 Table

Patient	Symptoms	Diagnosed Preoperatively?	Location of Fistula	Stoma?	Hysterectomy or salpingo-oophorectomy?
1	Abdominal pain, constipation, air per vagina	No	Colo-uterine	Yes	No
2	Abdominal pain, stool per vagina	Yes	Colo-uterine	Yes	Pending definitive surgery
3	Abdominal pain/mass	Yes	Colo-ovarian	Yes	Yes-TAH/BSO
4	Abdominal pain	Yes	Colo-tubo-ovarian	Yes	Yes-LSO
5	Abdominal pain	No	Colo-tubo-ovarian	Yes	Yes-TAH/BSO
6	Abdominal pain/stool per vagina	No	Colo-tubo-ovarian	Yes	Yes-RSO

TAH=Total abdominal hysterectomy;
LSO/RSO/BSO=Left, right or bilateral salpingo-oophorectomy

such as wound infection and multiple organ failure, length of hospital stays and mortality were analyzed.

Results: Laparoscopic lavage appears to be an acceptable treatment for hemodynamically stable Hinchey III perforated diverticulitis patients.

Conclusions: Laparoscopic lavage is a less aggressive surgical treatment for perforated acute diverticulitis without gross fecal contamination. However, more research is needed to compare the outcome of laparoscopic lavage v.s traditional sigmoidectomy and Hartmann procedure. Our results can be used as the scientific proof for the future well designed multiple center, randomized, double blind comparative studies.

THE INCIDENCE OF PUBOVISCERAL MUSCLE DEFECT AFTER VAGINAL DELIVERY. IS THERE CORRELATION WITH FECAL INCONTINENCE?

(P21)

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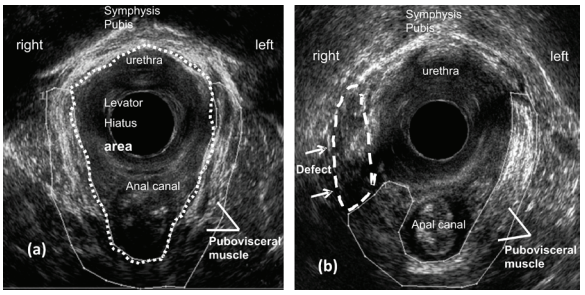
Purpose: To evaluate the pubovisceral muscle(PVM) defect of incontinent women with previous vaginal delivery and correlate the anatomical findings with fecal incontinence(FI) symptoms using the 3D anorectal and transvaginal ultrasound(3D-US).

Methods: 52 females with previous vaginal delivery and FI symptoms were assessed with Cleveland Clinic Fecal Incontinence score(CCFIS), and 3D-US and were grouped according to the presence of PVM defect. The control group included 17 healthy nulliparous. A US score from 0 to 8 was used to describe the extent of US defects (partial or total length of the external(EAS), internal(IAS) anal sphincters and uni/bilateral PVM defects). The Biometric indices of the levator hiatus(LH), anorectal junction position(AJP) and bladder neck position(BNP) were measured. Intraclass Correlation Coefficients(ICC) were used.

Results: 14 subjects (mean age:56y) had PVM defect, 10(71%) were unilateral (partial,n=8/total,n=2) and 4(29%) (bilateral and totally injured). Of them, 6 had intact sphincters, 6 combined EAS/IAS defects and 2 EAS defects. 38 (mean age:57y) had PVM intact, of which 17 had intact sphincters, 16 had EAS defects and 5 had EAS/IAS defects. The CCFIS and the US score were significantly higher in the PVM defect group. Additionally, the latero-lateral diameter and the area of the LH were significantly larger. A significant correlation was found between the CCFIS and the US score but there was no correlation between the scores and LH area. Of the females with PVM defects, there was a correlation between the volume of the PVM defect and LH area. In the PVM intact group, there were correlation between the length of the anterior EAS and the CCFIS. The biometric indices of the LH were significantly larger and the AJP and BNP were lower in subjects underwent a vaginal delivery compared with nulliparous. The mean ICC ranged from 0.923 to 0.987 for 3D-US measurements.

Conclusions: The PVM defects are identified in 27% of incontinent subjects who underwent a vaginal delivery and a direct correlation is found between the CCFIS and the US score. In addition, vaginal delivery results in enlargement of the LH and lower position of the AJ and BN compared with nulliparous



3D transvaginal US- a-Pubovisceral muscle intact (nulliparous)
b- Pubovisceral muscle defect (right -side) (arrows)

QUALITY OF LIFE MEASURES IN FECAL INCONTINENCE: IS VALIDATION VALID?

(P22)

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Purpose: Multiple health measurement scales have been used to study patients with fecal incontinence (FI) but none have met the needs for clinical use and research perfectly. These include severity scales, generic and condition specific quality-of-life (QOL) scales. As a step towards an improved QOL instrument for FI, the present study aimed to provide a critical review of the psychometric methodology of existing generic and condition-specific QOL scales using a standard measurement model.

Methods: Using established psychometric methodology, we identified 2 reliability and 7 validity criteria to evaluate each of the scales. Two investigators independently reviewed source publications of commonly used FI QOL scales for evidence of reliability and validity.

Results: A total of 13 scales that are frequently used to evaluate patients with FI were identified (Table 1). The reported methodology varied considerably. Most scales demonstrated convergent validity and test-retest reliability, while very few scales demonstrated internal consistency or predictive validity. Generic scales were found to be reliable and valid, but not responsive to condition severity. There was a wide range of methodology used in scale development and a wide diversity in the psychometric rigor.

Conclusions: Variations in scale construction, data reporting, and validity testing methodology make standardized evaluation of FI QOL scales difficult. Identifying deficiencies in validity testing and reporting of existing scales is vital for future creation of a useful validated instrument to measure QOL in patients with FI.

FIRST EXPERIENCES AFTER 15 IMPLANTATIONS OF THE MAGNETIC ANAL SPHINCTER IN PATIENTS WITH SEVERE FECAL INCONTINENCE.

(P23)

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Purpose: Fecal incontinence (FI) is a distressing condition that can lead to complete social isolation. If there is no improvement with conservative treatment, surgical treatment offers a last treatment option. Magnetic sphincter augmentation is established in gastroesophageal reflux surgery for several years. The present study examines the initial results for the implantation of the newly developed magnetic anal sphincter (MAS) in patients with severe FI.

Methods: A MAS was implanted in patients with severe FI und unsuccessful further treatment. The implantation was performed as described before by P. A. Lehur only with a single perineal incision. After tunneling and determining the size of the device, the MAS was placed around the anal canal and closed. Data were collected retrospectively with primary focus on reduction of CCIS.

Results: Between January and October 2012 16 patients received an MAS. Patient characteristics: 13 female, 3 male, age 67±14, follow-up 184±82 days, prior peripheral nerve evaluation test in 11 (69%) patients and 1 (6%) prior implantation of an artificial bowel sphincter (ABS). Mean CCIS was 17.5±1.8. In all patients the implantation was performed without intraoperative complications. The mean number of beats used for the implantation was 18±1. No explantation was performed during the follow-up. Adverse events: 5 (31%) patients had pain and 5 (31%) patients had swelling and erythema in both gluteal regions within the second and third week after the implantation. By conservative treatment both dropped completely during further follow-up. Vaginal bleeding, that stopped spontaneously, was noticed in 1 (6%) patient. CCIS decreased to 7.8 ± 4.4. 13 (81%) patients reported an improvement of FI.

Conclusions: The newly developed magnetic anal sphincter shows good results for the treatment of severe FI in this small patient group within the short follow-up period. Compared to other possible devices for surgical treatment of FI the implantation is easier and the complication rate seems to be low. Further comparative studies between the magnetic anal sphincter, sacral nerve stimulation and other surgical options for the treatment of severe FI are required

P22 FI QOL Scales Reviewed for Reliability and Validity

Name	Test-retest reliability	Internal Consistency	Construct Validity	Content Validity	Convergent Validity	Divergent Validity	Criterion Validity	Predictive Validity	Discriminative Validity
EuroQOL	+	+	+	–	–	–	–	–	–
MOS SF-36	+	+	+	–	–	–	+	–	–
Working Party on Anal Sphincter Replacement	–	–	–	–	+	–	–	–	–
Memorial Sloan Kettering Cancer Center Bowel Function Assessment	+	–	–	–	+	–	–	–	+
International Consultation on Incontinence Modular Questionnaire–Bowel Symptoms	–	–	–	–	+	–	–	–	–
InternationalConsultation on Incontinence Modular Questionnaire–Bowels	+	+	+	+	+	–	–	–	–
Direct Questioning of Objectives	–	–	–	–	+	–	+	–	–
Modified Manchester Health Questionnaire	+	+	–	+	+	–	–	–	–
Gastrointestinal Quality of Life Index	+	–	–	+	+	–	+	–	+
Fecal Incontinence Quality of Life Scale	+	–	+	–	+	–	+	–	+
Childhood Incontinence Quality of Life	–	–	–	+	–	–	–	+	–
Fecal Incontinence Quality of Life Scale for Spina Bifida	+	–	–	+	–	–	–	–	+
Hirschprung's Disease-Specific Scale	–	+	+	–	–	–	–	–	–

LONG-TERM OUTCOMES OF REDO SPHINCTEROPLASTY.

(P24)

K. Hong, J. Dollerschell, G. da Silva, D. Maron, S. Wexner
Weston, FL

Purpose: The functional outcomes of anal sphincter repair deteriorate with time. However, there are limited data regarding the long-term outcomes of patients who undergo redo sphincteroplasty. Therefore, this study aimed to investigate these long-term outcomes.

Methods: Patients with fecal incontinence who underwent redo sphincteroplasty between 11/1988 and 12/2011 were identified from an IRB-approved prospective database. Patients who did not have a documented preoperative Cleveland Clinic Fecal Incontinence Score (FIS; best 0, worst 20) were excluded. A questionnaire and phone survey assessed current FIS and Fecal Incontinence Quality of Life score (FIQL; 4.1 best, 1 worst). Success was defined as no further continence surgery, no stoma and FIS < 9 at the end of follow-up.

Results: The records of 56 (67%) of 84 patients who underwent redo sphincteroplasty were available for evaluation at a median follow-up of 74 (range, 12-283) months. Forty-three and 16 patients, respectively, had 1 or ≥ 2 previous sphincteroplasty procedure(s). The mean FIS decreased from 16.5 ± 3.7 to 11.9 ± 6.6 ($p < 0.001$) at the end of follow-up. Twelve patients (21%) underwent further continence surgery for failed sphincteroplasty, 3 (5%) of whom had a permanent stoma; 18 patients had an FIS of < 9 at the end of follow-up and the long-term success rate was 29%. Twenty-three patients (41%) were evaluated with FIQL; the median value was 3.0 (range, 1.0-4.1). Postoperative FIS was correlated with FIQL (Spearman's correlation coefficient = −0.854, $p<0.001$). Logistic regression analysis did not reveal any significant predictive variables for success of redo sphincteroplasty.

Conclusions: Based on our objective criteria of success, the long-term success rate of redo sphincteroplasty over a median of 74 months was poor.

SUBOPTIMAL RESULTS AFTER SPHINCTEROPLASTY: ANOTHER HAZARD OF OBESITY.

(P25)

K. Hong, J. Dollerschell, G. da Silva, D. Sands, S. Wexner
Weston, FL

Purpose: Recent studies have shown a high prevalence of fecal incontinence (FI) in the obese population. The impact of obesity in patients who undergo sphincter repair is less well defined. Therefore, this study was conducted to investigate outcomes of sphincteroplasty in obese patients.

Methods: Patients with FI who underwent sphincter repair from 1/2000 to 12/2011 were identified from a prospective IRB-approved database. Patients were divided into 2 groups: obese (BMI≥30 kg/m^2) and nonobese (BMI<30 kg/m^2). A questionnaire was used to assess current Cleveland Clinic FI scores (FIS: 0 best, 20 worst) and FI quality of life (QL) scores (mean global FIQL: 4.11 best, 1 worst). Wilcoxon and Mann-Whitney U tests were used to compare quantitative variables; Fisher's exact tests were used for categorical variables.

Results: 79 patients (78 females) of a mean age of 57±15 years were included: 15 obese and 64 nonobese individuals. The median follow-up was 64 (13-138) months, with no difference between groups. The groups were similar in age, FI etiology, physiologic parameters, and preoperative FIS. There were 3 (25%) and 11 (17%) complications in the obese and nonobese groups, respectively ($p=0.68$). The most common complication was wound infection. Four (29%) obese and 11 (17%) nonobese patients required additional surgery for failed sphincter repair ($p=0.45$). The procedures were SNS (2), sphincteroplasty (1) and stoma (1) in the obese, and SNS (5), sphincteroplasty (3), ABS (1) and stoma (2) in the nonobese. The mean FIS decreased from 16.0±3.9 to 11.5±6.5 in the obese ($p<0.001$) and from 16.2±3.4 to 8.4±5.0 in the nonobese groups ($p<0.001$). Postoperative FIS was correlated with FIQL (Spearman's correlation coefficient = -0.738, $p<0.001$). Nonobese patients had a significantly higher rate of FIS improvement (48% vs 28% $p=0.04$) and a superior mean global FIQL score (2.19±0.9 vs 2.93±0.8, $p<0.01$) compared to obese patients.

Conclusions: The risk of complications and incidence of additional surgery were similar between obese and nonobese patients. However, the degree of improvement after sphincteroplasty was significantly less in obese patients.

WHAT IS THE BEST OPTION FOR FAILED SPHINCTER REPAIR?

(P26)

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Purpose: The best surgical option for a failed sphincter repair is unknown. This study was conducted to evaluate the outcomes of different procedures for failed sphincteroplasty.

Methods: Patients who underwent surgery for failed sphincteroplasty from 1/2000-6/2012 were identified from an IRB-approved prospective database. Demographics, type of operation and outcomes were collected. Only patients with a preoperative documented Cleveland Clinic Fecal Incontinence Score (FIS) were included. A questionnaire was used to assess current FIS and FI quality of life (FIQL: 0 best, 4.1 worst).

Results: 59 patients (97% females) of mean age of 52 (25-81) years underwent redo sphincteroplasty (RS; n=33), artificial bowel sphincter (ABS; n=11) or sacral nerve stimulation (SNS; n=15). The median follow-up was 31 (3-138) months. The groups had similar demographics, pudendal nerve latency values, and FIS before redo surgery and follow-up. The RS group had significantly wider external sphincter defects and fewer previous sphincteroplasty procedures. The most common complication was infection in all groups. Overall, complications occurred in 8 (24%) patients in the RS, 8 (73%) in the ABS and 5 (33%) in the SNS groups (p=0.01). 17 (29%) patients required reoperations for complications or failure; the rate was lower in the RS group (12%, 55% ABS, 47% SNS; p=0.004). The ABS and SNS groups did not differ in rates of device explantation (40-55%). Ten (17%) patients underwent further continence surgery/device reimplantation with no difference among the 3 groups. At the end of follow-up, 5 (45%) ABS and 10 (67%) SNS patients had a functioning device (p=0.4).The mean FIS decreased from 17.5 to 11.5 in RS, 18.7 to 8.6 in ABS, and 17.6 to 9.1 in SNS groups after surgery (all $p \leq 0.02$). There were no differences in FIS improvement or FIQL (RS 2.6, ABS 2.0, SNS 2.7) among groups.

Conclusions: RS, ABS and SNS are associated with similar improvements in continence for patients with failed sphincteroplasty. Due to increased complication rates and need of reoperation associated with ABS and SNS, redo sphincteroplasty might be considered as the first step in the management of patients.

NEUROVASCULAR ANTROPYLORUS PERINEAL TRANSPOSITION USING PUDENDAL NERVE ANASTOMOSIS FOR TOTAL ANORECTAL RECONSTRUCTION: PRELIMINARY REPORT IN HUMANS.

(P27)

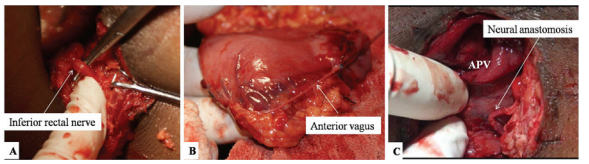
A. Chandra, A. Kumar, M. Noushif, V. Kumar, U. Ghoshal, M. Kumar, R. Srivastava
Lucknow, India

Purpose: We have reported the initial outcomes of perineal transposition of antropyloric valve for end stage fecal incontinence. The problem with neural control of the perineally transposed antropyloric valve still remains. Pudendal nerve anastomosis of the perineal antropyloric segment has been shown in cadavers. This is the first report of using this procedure in humans.

Methods: Five patients with end stage fecal incontinence [abdominoperineal resection for anorectal carcinoma (n=3); congenital absence of anal sphincter (n=1); perineal injury requiring sphincter excision (n=1)] were selected. Antropyloric valve with its intact anterior vagus branch was transposed to perineum based on left gastroepiploic arterial pedicle. This anterior vagus nerve was anastomosed by epineural technique to inferior rectal nerve branch in the perineum. A diverting proximal colostomy was maintained and a time lag of 6 months allowed for the neural regeneration. Anatomical integrity of the transposed pyloric graft (on MRI), its arterial pedicle (on celiac CT angiogram), vascular inflow (on perineal Doppler ultrasound) and neural continuity (on high resolution USG) was assessed. Functional assessment was performed with barium retention studies, endoscopy, antropyloric manometry and fecal incontinence scores.

Results: The median age of patients was 35 years (all males). Tension free end to end anastomosis of anterior vagus nerve to inferior rectal nerve (right =1; left =4) was achieved. Intact left gastroepiploic pedicle, healthy graft and neural continuity were visualised on imaging. High velocity vascular inflow (median 24.2 cm/sec) was demonstrated on perineal Doppler. Endoscopy and barium retention studies showed voluntary contraction and contrast retention in all patients. The median resting and squeeze pressures were 23 mmHg (17-62) and 56 mmHg (37-113) respectively. St. Mark's incontinence scores varied from 7 to 12. There were no major surgical complications.

Conclusions: Neural anastomosis of the perineally transposed antropyloric valve in total anorectal reconstruction is feasible in selected patients of end stage fecal incontinence.



Technique of neurovascular antropylorus perineal transposition - (A) inferior rectal nerve in perineum; (B) antropyloric valve with anterior vagus branch; (C) neural anastomosis of anterior vagus to inferior rectal nerve.

NEUROMODULATION OF PERINEALLY TRANSPOSED ANTROPYLORUS AFTER PUDENDAL NERVE ANASTOMOSIS FOR TOTAL ANORECTAL RECONSTRUCTION.

(P28)

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Lucknow, India

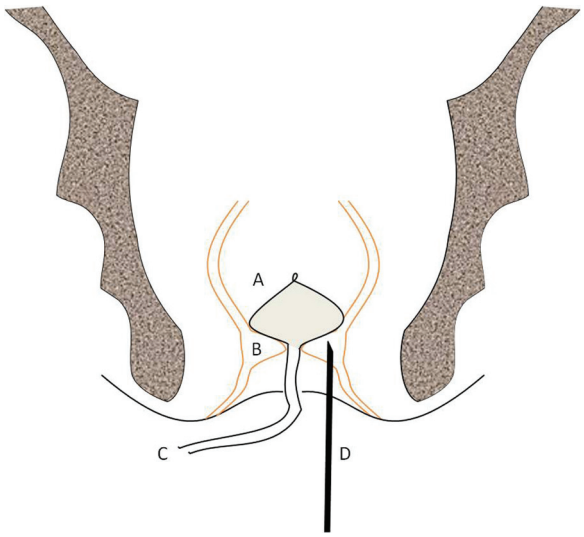
Purpose: We have earlier reported pudendal nerve anastomosis to vagus nerve branch of perineally transposed antropyloric valve in cadavers in an attempt to improve the neural control of the sphincter. Herein we report the results of neuromodulation of the perineal neosphincter after total anorectal reconstruction in humans.

Methods: Five carefully selected patients with end stage fecal incontinence were selected. APV with its anterior vagus branch was transposed to perineum and neural anas-

tomosis performed with inferior rectal nerve branch. A diverting proximal colostomy was performed and a lag time of 6 months permitted for neural regeneration. After localisation of the neural anastomosis by perineal USG, nerve stimulation was done using surface stimulation technique. Initially antral pressures were recorded along with electromyography (EMG) of the antro-pyloric junction using stimulation frequency ranging from 10 to 150 Hz (smooth muscle protocol; 30 seconds/'frequency under study' with a stimulus duration of 200 ms), followed by antropyloric pressure measurement alone. Voluntary neosphincteric control was assessed by recording the generated pressure or the summated myogenic potentials on command to squeeze the anal canal.

Results: Transposed APV segment showed a basic rhythm of 2-3 contractions per minute in all patients. On stimulation, antral pressure recordings showed an average latency of 10 seconds with a maximum pressure rise up to 29 cm H2O. Rise in antral pressures was also observed on attempted voluntary contraction. Stimulated antropyloric EMG showed a latency of 2-5 seconds with a differential rise in amplitude according to the frequency of stimulation. Maximal manometric changes and corresponding EMG amplitudes were observed a frequency of 20 Hz with a similar rise obtained after 100 Hz stimulation. Triggering of intrinsic rhythm was observed in two patients on stimulation and was recorded at 2-3 contractions per minute.

Conclusions: The intrinsic rhythm as well as pressure variations on stimulation and voluntary contraction shows the neurovascular integrity of the transposed APV. Neuromodulation of the transposed APV augments the neosphincter pressures in perineum.



Technique of recording antropyloric pressure and electromyography. (A - antrum; B - pylorus; C - Foleys catheter; D - EMG needle)

HISTOLOGICAL AND FUNCTIONAL ALTERATION IN THE EXTERNAL ANAL SPHINCTER MUSCLE FOLLOWING EXPERIMENTAL SURGICAL MYOTOMY IN AN ANIMAL MODEL.

(P29)

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Purpose: Childbirth related injury/trauma to the external anal sphincter injury (EAS) is common; however its role in the development of anal incontinence is not clear. A recent study in women with anal incontinence reveals impaired length tension property of the EAS and puborectalis muscle. The goal of our study was to examine the regenerative process and functional impact of an experimental surgical injury to the EAS muscle.

Methods: New Zealand White female rabbits (n=6) were anesthetized and subjected to surgical myotomy by a cranio-caudal incision that extended along the entire length and thickness of the EAS muscle. The skin was sutured back and the animals were allowed to recover. Physiological measurements (manometric studies of anal canal) were recorded at weekly intervals for 12 weeks post-myotomy. Anal canal pressures were measured using a 3 mm diameter sleeve sensor placed in the custom designed probes of 4.5 mm, 6 mm and 9 mm diameter to determine length-tension property of the EAS. Animals were sacrificed at pre-determined time points and anal canal was harvested and processed for histochemical studies (Masson trichrome stain for muscle /connective tissue and Sirius red for collagen). In addition, magnetic resonance diffusion tensor imaging (MR- DTI) was performed to determine myo-architechtural changes in the EAS muscle.

Results: Surgical myotomy of the EAS resulted in significant impairment in its length-tension property that showed minimal recovery during the 12 week study period (Fig 1A). Histology revealed a marked and progressive increase in the fibrosis (72 % connective tissue vs 30% in controls) at 3 weeks, which persisted at 12 weeks (Fig. 1B). Immuno-staining studies confirmed the deposition of collagen I in the fibrotic tissue. DTI studies revealed disorganized muscle fiber orientation in the regenerating muscle (Fig. 1C).

Conclusions: Loss of normal myoarchitecture and collagen deposition in the EAS muscle is most likely the cause of impaired length-tension property of the EAS muscle following surgical trauma.

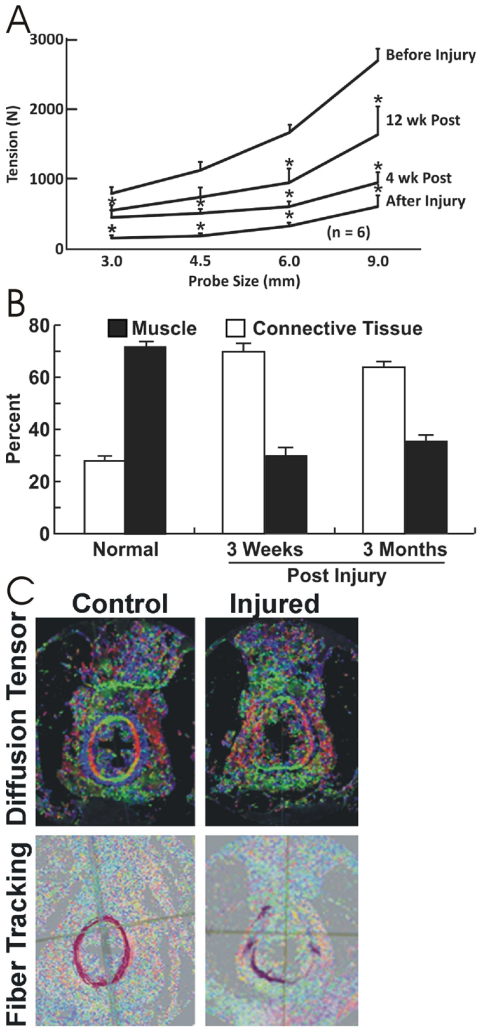

Figure 1: EAS L-T function and myoarchitechture

HEMODYNAMIC ALTERATIONS DURING ANTROPYLORIC PEDICLE TRANSPOSITION FOR FECAL INCONTINENCE: AN OBJECTIVE ASSESSMENT.

(P30)

A. Chandra, A. Kumar, M. Noushif, R. Srivastava, M. Kumar, P. Srivastava, V. Gupta
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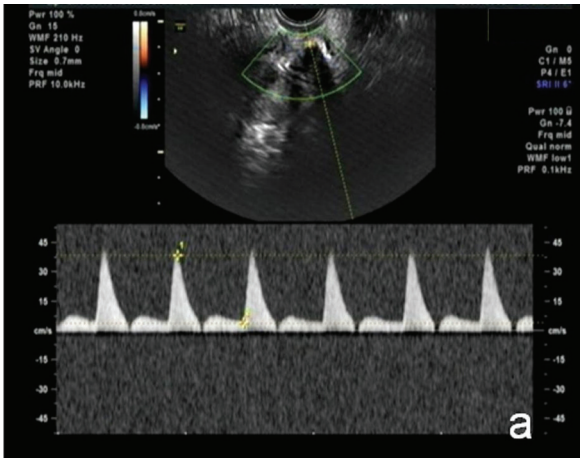
Purpose: We have previously described the use of antropyloric valve (APV) for replacement /reconstruction of the anal sphincter in patients with end stage faecal incontinence. Anatomically this pedicled transposition is based on left gastroepiploic artery. Here we describe the objective in vivo assessment of the haemodynamic changes that occur during the perineal transposition of the antropyloric segment.

Methods: Eight patients undergoing APV transposition were included in this study. An intra-operative colour Doppler ultrasound using a 6 MHz linear probe was performed by direct contact scanning technique. The flow velocities were recorded in the gastroepiploic arcade around the greater curvature at three stages: at initial stage of pedicle harvesting (without any vessel ligation), after ligation of the perforating branches of left gastroepiploic artery and after ligation of main gastroduodenal artery. A follow up perineal Doppler was performed at 1 month interval for documentation of the final flow velocities.

Results: A triphasic arterial flow pattern was recorded at all stages. The maximum and mean flow rates (cm/sec) were 80.8 and 52.9 at the initial stage with a significant rise (96.2 and 65.8) after ligation of the perforating branches of left gastroepiploic artery. After ligation of the main gastroduodenal artery there was a fall in the flow rates (maximum 24.1 cm/sec; mean 18.4 cm/sec) with a reversal of flow from left to right towards the APV. After perineal transposition, the effective flow velocity ranged from 9.8-38.4 cm/sec. Follow up perineal Doppler showed excellent graft uptake with good arterial inflow with average flow velocities varied between 3.1 to 46.5 cm/ sec which corresponded very closely with the intra operative values.

Conclusions: During the harvesting of APV for perineal transposition there was effective increase in blood flow after disconnection of perforating branches of left gastroepiploic artery. Although there was decrease in blood flow towards APV after ligation of gastroduodenal artery, the final velocities were sufficient for the graft survival and corresponded closely with the post operative flow velocities on perineal Doppler.



Perineal doppler showing vascular flow to the transposed antropyloric valve from left gastroepiploic artery pedicle.

HOW NONABLATIVE RADIOFREQUENCY SPHINCTER REMODELING (SECCA PROCEDURE) IMPROVES FECAL INCONTINENCE. CLINICAL AND ANORECTAL PHYSIOLOGY RESULTS.

(P31)

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Purpose: To elucidate the impact of Radiofrequency Sphincter Remodeling / Secca procerdure/ on specific physiologic parameters associated with improvement in FI symptoms as measured by validated clinical scoring systems.

Methods: We performed a prospective, single center, cohort study of 32 patients with FI. After obtaining IRB approval, all patients underwent SECCA procedure .The primary end point of the study was FI assessement: CCF FI, FISI, and FIQOL at 6,12, 24 and 36 months after RF. Physiologic assessments included: s-EMG, anorectal manometry, rectal barostat, RAIR, and anorectal electro/ thermo-sensitivity

Results: Therapy required 46 +/- 9 min. There were no intra-procedure complications only 3 minor delayed complications (submucosal haematoma, fever, superficial mucosal lesion). Comparison to baseline at 6, 12, 24 and 36 mos after, procedure produced the following results: Incontinence scores improved steadily and significantly: CCF-FI 12,1 - 10,4 - 9,1 - 9,3 - 6,8 ; FI-SI 36,9 - 38,6 - 34,9 - 35,2 – 30,8 ;FIQoL / LS: 2,5-3,1; C: 1,6-2,6; D: 2,2-3,4;E: 1,5 -2,4/. After RF all physiologic parameters improved 1) EMG amplitude and frequency increased 2) anal manometry showed a significant increase in sphincter length (1,9 vs 2,5 cm) and vector volume (330units vs 430); 3) resting and squeeze anal pressure increased from 30,0 to 43,4,and 73,0 to 96,2mmHg/pre vs 36 mos/ respectively.;4) anorectal electrosensitivity/23 vs 53 mA /and thermosensitivity decreqased. In the barostat study, rectal compliance was reduced (from 5,6. to .4,2) and rectal threshold volume decreased (MTV from 216 to 185) . The recto-anal inhibitory reflex was restored in 9 of 16 patients following the procedure.

Conclusions: Non-ablative RF Anal Sphincter Remodeling is a safe and effective method of FI treatment improvements in which is collaborated by numerous physiologic parameters.

USE OF ANORECTAL MANOMETRY IN OBESE PATIENTS WITH FECAL INCONTINENCE.

(P32)

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Cascavel, Brazil

Purpose: The purpose of this study was to evaluate the use of anorectal manometry in obese fecal incontinence (FI) patients without previous anorectal surgery.

Methods: Data were collected prospectively for obese FI patients (BMI>30) submitted to physiological proctological evaluation at our service from July 2010 to July 2012. FI was quantified with the Wexner score and clinical and obstetric information was collected. The patients were submitted to anorectal manometry using an 8-channel water-perfused system (Dynapack MPX 816, Dynamed). The study parameters included maximum mean resting pressure, maximum mean squeeze pressure, maximum rectal volume, presence of anismus and sustained squeeze pressure. FI patients with a history proctological surgery and/or obstetric trauma were excluded.

Results: The initial sample included 186 obese subjects, 36 (19.35%) of whom were diagnosed with FI (32 women). The average age was 51 (19-81) and 48 (28-65) years for female and male patients, respectively. The average BMI was 35.4 (31-42) kg/m. Ten women were nulliparous, 5 had one vaginal delivery and 17 had two or more vaginal deliveries. Fourteen subjects (38%) had normal manometric findings or resting/straining hypertonia, while 22 had findings compatible with FI. Among FI patients, 20 were women, 13 (59%) had anismus, 16 (72%) had poor sustained squeeze pressure, and 2 (9%) had reduced rectal sensitivity. Among patients without FI, 6 (42%) had anismus, 9 (64%) had poor sustained squeeze pressure and 3 (21%) had reduced rectal sensitivity and volume. The groups did not differ significantly with regard to parity, Wexner score or BMI.

Conclusions: FI may have a greater prevalence and occur at a younger age in obese populations than in the general population. The study shows that manometric findings do not correlate well with FI symptoms, probably because the technique fails to adequately evaluate anal continence in these patients.

INCIDENCE OF WOUND BREAKDOWN AND IMPACT ON FUNCTIONAL OUTCOME AFTER ANAL SPHINCTEROPLASTY WITH PRIMARY CLOSURE FOR FECAL INCONTINENCE.

(P33)

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Shreveport, LA

Purpose: Fecal incontinence is a common problem associated with significant social implications, and anal sphincteroplasty is the surgical treatment of choice for patients with an anal sphincter defect. The purpose of this study was to determine the rate of wound complications and impact on functional outcome following anal sphincteroplasty.

Methods: Data from patients who underwent anal sphincteroplasty between 2006 and 2011 were analyzed as a retrospective chart review. Outcomes of wound healing were compared with respect to patient demographics, medical comorbidities, and prior surgical history. Patients were asked to evaluate their functional outcome using the fecal incontinence severity index (FISI) and the fecal incontinence quality of life instrument (FIQLS).

Results: 92 patients underwent 95 anterior overlapping anal sphincter repairs during the study period. All patients had an anal sphincter defect documented by US and/or physical exam, and all procedures were performed using an overlapping sphincteroplasty. All wounds were closed primarily at the time of repair. 33 patients (35%) healed well without wound complications, while 62 patients (65%) had wounds that broke down. 13 patients (13.7%) also developed a wound infection. No patients had a dehiscence of the muscle repair. Tobacco use and medical comorbidities were not associated with a significant increase in wound breakdown. 44 patients returned surveys. Of those, 16 healed without wound breakdown with an average FISI of 32.12 and FIQLS score of 9.17. 28 experienced wound breakdown, with an average FISI of 30 and FIQLS score of 10.39. There was not a significant difference between the two groups ($p=0.63$ for FISI, $p=0.26$ for FIQLS).

Conclusions: Anal sphincteroplasty is associated with a high rate of wound breakdown. Primary wound healing can be achieved roughly one-third of the time, but wound breakdown should be considered an expected and acceptable outcome which should be discussed with the patient preoperatively. We believe this has no effect on functional outcome. With appropriate pre-operative counseling, this knowledge should help offset some of the anxiety associated with delayed wound healing.

DOES INTERNAL SPHINCTER DEFECT LENGTH CORRELATE WITH SPHINCTEROPLASTY OUTCOMES? A 3D ENDOANAL ULTRASONOGRAPHY VIEW.

(P34)

S. Takano, G. da Silva, D. Sands, S. Wexner
Weston, FL

Purpose: Studies have reported a positive correlation between internal anal spincter (IAS) and external anal sphincter (EAS) defect size, measured with 3-dimensional endoanal ultrasonography (3D-EAUS), and fecal incontinence (FI) status. This study assessed the relationship between internal anal sphincter (IAS) defect length and functional outcomes of sphincteroplasty for FI.

Methods: Patients with fecal incontinence who underwent 3D-EAUS before sphincteroplasty from 4/2010-7/2012 were identified from an IRB-approved database. The length and angle of IAS defects were measured with a longitudinal (Figure 1) and horizontal view using 3D-EAUS. FI was assessed by the Cleveland Clinic Florida Fecal Incontinence Score (FIS). Success was defined as a postoperative score of ≤ 8. The rate of FIS improvement was calculated as follows: (preoperative FIS – postoperative FIS) / preoperative FIS. Univariate analyses were performed to determine general predictors of successful outcome. Spearman's correlation analyses were performed to assess the relationship between IAS defect size and FIS improvement.

Results: 29 female patients of a mean age of 59.3 (32-89) years were included. At a mean follow-up of 11.7 (1-28) months, the success rate was 65.4%. The mean IAS defect length and angle were 13.2 (2.8-36.3) mm and 123.9 (43-285), respectively. All patients had an intact repair at follow-up. In univariate analysis, patients with successful or failed outcomes were similar in age, gender, ASA, past surgical history, BMI, preoperative FIS, number of vaginal deliveries, diabetes, pudendal nerve terminal motor latency and length and angle of IAS defect. The IAS defect length was significantly correlated with the rate of FIS improvement ($r = -0.511$, $p<0.01$) and angle of the defect ($r = 0.401$, $p<0.05$).

Conclusions: There is an inverse correlation between the length of IAS defect and the functional outcome after sphincteroplasty for FI.

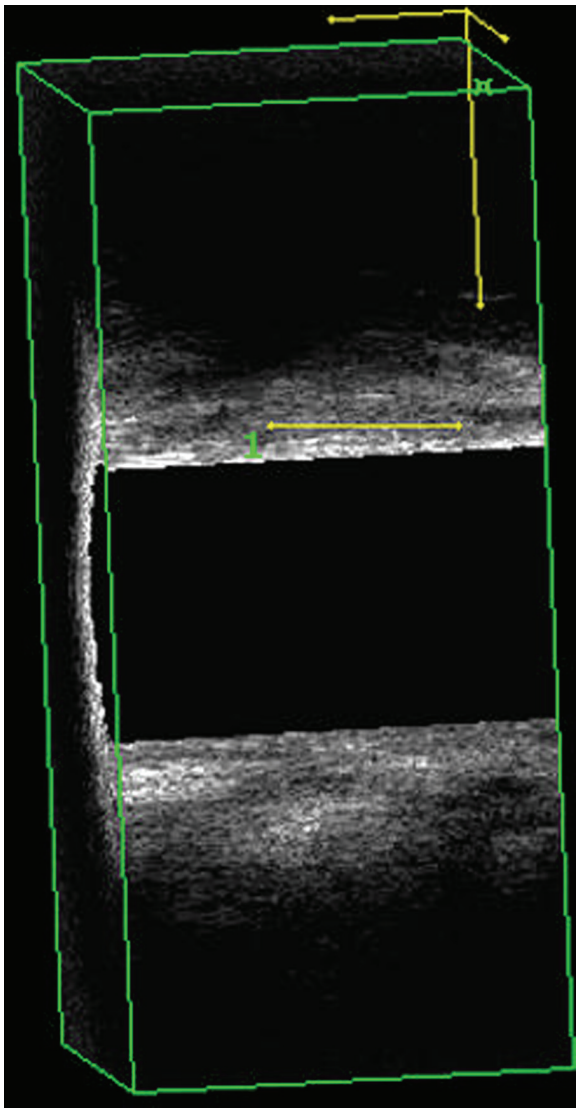

Figure1: Anal canal on 3D-EAUS (sagittal view). Line 1 shows the longitudinal length of IAS defect.

INITIAL EXPERIENCE WITH THE TOPAS® SYSTEM FOR THE TREATMENT OF FECAL INCONTINENCE.

(P35)

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Minneapolis, MN; Minnetonka, MN; Allentown, PA; Spokane, WA; Cincinnati, OH; Cambridge, MA

Purpose: The TOPAS® System is a new, minimally invasive, self-fixating polypropylene mesh intended to treat fecal incontinence (FI) in women who have failed conservative therapy. It is designed to support the puborectalis muscle by potentially restoring the anorectal angle. This is a report of an initial investigation conducted to obtain long term clinical experience with TOPAS®.

Methods: This was a prospective study conducted at five centers in the United States. A total of 29 women, with a mean age of 60.6 years, were implanted with TOPAS® after failing conservative medical treatment. FI was assessed with a 14 day bowel diary, Cleveland Clinic Incontinence Scores (CCIS) and Fecal Incontinence Quality of Life (FIQOL) questionnaires and patients were followed prospectively up to 24 months. Treatment success was defined as a reduction of FI episodes by ≥ 50%. Missing bowel diary data at follow-up visits were imputed using a modified worst case method.

Results: Mean surgical time was 23 minutes (range, 14-42) and mean hospital stay was 22.6 (range, 3.8-54.2) hours. Mean number of FI episodes per week decreased from 3.5 at baseline to 1.7 at 24 months of follow-up ($p < 0.001$; Table). 55.6% of subjects reported treatment success. CCIS and FIQOL scores for all domains were significantly improved at 24 months of follow-up ($p < 0.001$). A total of 12 subjects experienced procedure and/or device-related adverse events; the most common AEs were de novo urinary incontinence (n=4), worsening FI (n=2), and bladder spasms (n=2).

Conclusions: Initial experience of the TOPAS® system demonstrated a significant improvement in FI symptoms and a benign safety profile. These results indicate that TOPAS® has potential as a new therapeutic option for FI, but needs to be confirmed in a larger study.

P35

Visit	Number Subjects	FI Episodes (2 weeks)	CCIS	Treatment Success
Baseline	29	6.9 ± 5.1	13.2 ± 2.6	
12 Month	21	3.7 ± 5.0	8.7 ± 4.0	44.4%
24 Month	24	3.5 ± 3.4	9.9 ± 4.4	55.6%
p value		p < 0.001	p < 0.001	

ASSESSING FECAL INCONTINENCE: DOES QUANTITY PREDICT QUALITY?

(P36)

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Purpose: Fecal incontinence (FI) can be assessed using both severity and quality of life (QOL) indices but the relationship of these two is poorly understood. We sought to correlate baseline measures of FI severity with baseline measures of QOL. A secondary goal was to determine the internal consistency of the four scales utilized in the Fecal Incontinence Quality of Life (FIQOL) assessment.

Methods: Patients entered in a multi-center, prospective study for fecal incontinence (FI) completed baseline assessments to determine the number of FI episodes per week, fecal incontinence severity, and quality of life. Bowel episode diaries were used to record all bowel evacuations for a 14-day period. FIQOL, Fecal Incontinence Severity Index (FISI), and self-rated bowel health (SRBH) measures were collected using questionnaires. Pearson correlation coefficients were calculated between each of the baseline assessments.

Results: Of the 285 enrolled subjects, 173 completed multiple baseline assessments. Overall, greater degrees of FI severity (as measured by the Bowel Episode Diary and FISI) were inversely correlated with QOL measurements. Bowel episode diary data had a weak correlation with FISI (r=0.192, Table). Agreement between SRBH and the FIQOL scales was moderate (r=0.318 to 0.474). FISI (r=-0.207 to -0.263) and bowel episode diary data (r=-0.163 to -0.235) both had weak correlations with the FIQOL scales. Agreement among the individual FIQOL scales was moderate to strong (r=0.484 to 0.742).

Conclusions: The correlations between current FI severity measures and QOL at baseline were weak, and other factors such as urgency need to be considered. The internal consistency of the FIQOL scales suggests that it might be possible to create a valid single composite score.

Pearson Correlation Coefficients

Baseline Measurement	Wk IE	Scale 1	Scale 2	Scale 3	Scale 4	S-R BH	FISI (P)
Weekly Incontinent Episodes	1						
Scale 1 - Lifestyle	-0.235	1					
Scale 2 - Copying/Behavior	-0.176	0.742	1				
Scale 3 - Depression/Self-Perception	-0.201	0.630	0.541	1			
Scale 4 - Embarrassment	-0.163	0.484	0.578	0.536	1		
Self-rated Bowel Health	-0.219	0.474	0.444	0.446	0.318	1	
FISI - Patient Weighting	0.192	-0.207	-0.219	-0.263	-0.232	-0.213	1

THE EFFECT OF ANAL SPHINCTER REPAIR ON FEMALE SEXUAL FUNCTION.

(P37)

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Purpose: Few studies have evaluated changes in sexual function after sphincter surgery. The aim of this prospective study was to assess sexual function before, 3 and 12 months after anal sphincter repair and identify possible relations between functional outcome and changes in sexual function.

Methods: Twenty female patients scheduled for anal sphincter reconstruction were included, one was reoperated with a colostomy and 4 were lost to follow-up leaving a study group of 15 patients. All patients completed a validated bowel function questionnaire and a specifically designed sexual function form at baseline, as well as 3 and 12 months after overlap repair. The study was approved by the institutional review board and all subjects provided written informed consent.

Results: Mean age was 37 (range 30-56). All subjects had an external sphincter defect on anal ultrasound. The etiology was obstetric injury in 14 and injury after fistula surgery in one case. Five (33%) had previously undergone an unsuccessful attempt of sphincter reconstruction. Preoperatively, 6 patients reported incontinence to solid stool, at 12 months 5 subjects stated leaks of solid stool. The mean incontinence scores at baseline, at 3, and 12 months were 10.1, 8.3, and 8,7. Mean deferring time increased from 2.2 minutes before surgery to 3.2 and 4.2 at 3 and 12 months, respectively. Three women were sexually inactive during the course of the study. Out of the 12 who were active, 4 stated dyspareunia now and then at baseline, after one year only one still complained of dyspareunia. One patient reported decreased sexual activity, 9 unchanged and 5 an increase. The change in incontinence score did not differ between those with decreased, stable or increased sexual activity.

Conclusions: The improvement of incontinence symptoms was limited in this study. The incidence of pain during intercourse decreased after surgery. Only one patient stated decreased sexual activity whereas a third reported increased activity, but this was not related to improvement in incontinence. Improved sexual capacity might thus be more related to restored anatomy than to improved bowel function.

SACRAL NERVE STIMULATION: WHY DO PATIENTS FAIL PNE TESTING?

(P38)

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Purpose: Sacral nerve stimulation is an accepted treatment for faecal incontinence, involving a two stage procedure; initial trial with peripheral nerve evaluation (PNE), and progression to permanent implant (SNS) if PNE is successful. Some patients fail PNE because of equipment (usually lead) failure, while others fail to show clinical improvement. There is little information about the clinical characteristics and subsequent progress of patients who fail PNE, and this study reports the preoperative findings in this group of patients (PNE-F), in order to look at predictive factors for failure.

Methods: Patient demographics including preceding surgery, preoperative anal manometry, endoanal ultrasound, anal mucosal sensitivity, pudendal nerve terminal motor latency, and St Mark's continence severity score were measured. The results in the PNE-F group were compared with those in group where test stimulation was successful (PNE-S). Two subgroups were identified from PNE-F: technical failure or clinical failure.

Results: A total of 111 patients were treated. PNE was inserted in 102 patients, of which 27 failed PNE, 74 were successful and progressed to SNS and one awaits SNS . Nine patients had SNS without preceding test PNE. In the 27 failed PNE, 5 were technical failures and 22 clinical failures. When compared to PNE-S, the PNE-F group had higher frequency of EAS defect (25.9% vs 7.1% p=0.001), reduced anal mucosal sensitivity in the upper canal (p=0.04, suggesting either prolapse or neuropathy), higher voltage threshold in OT (p<0.001), and fewer had undergone postanal repair (3.7 vs 11.9%, ns). After failed PNE 3 had ACE, 1 graciloplasty, the remaining conservative management

Conclusions: Predicting patients who will fail PNE is not possible by clinical characteristics alone. Those who have a higher stimulation voltage threshold in OT, a sphincter defect or reduced anal mucosal sensitivity are more likely to fail. Ongoing follow-up of this group of patients is required to determine their clinical outcome.

SACRAL NERVE STIMULATION FOR FECAL INCONTINENCE: PROSPECTIVE MULTICENTER TRIAL IN JAPAN.

(P39)

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Purpose: The use of Sacral Nerve Stimulation (SNS) to treat fecal incontinence (FI) has been officially approved in the EU since 1994 and the US since 2011. The purpose of this trial, the first prospective study conducted in Asia, was to determine the safety and efficacy of SNS in accordance with government approval protocol in Japan.

Methods: Candidates for SNS who provided informed consent were enrolled in this institutional review board-approved multicenter prospective trial. Experiencing more than two incontinent episodes per week, not just staining, was part of the inclusion criteria. Patients showing ≧50% improvement during test stimulation received chronic implantation of the InterStim System (Medtronic; Minneapolis, MN). The primary efficacy objective was to demonstrate that ≧50% of subjects would achieve therapeutic success, defined as ≧50% reduction of incontinent episodes per week at 6 months compared with baseline.

Results: A total of 22 patients underwent test stimulation with a 95% success rate, and 21 (12 females) of a mean age of 66.7 years and a mean duration of FI of 4.9 years received chronic implantation. At 6 months, 86% of subjects achieved therapeutic success. Incontinent episodes decreased from a mean of 14.8 per week at baseline to 2.8 at 6 months. Anal manometry showed that preoperative maximum resting pressure (28.4mmHg) had significantly increased (39.2mmHg) at 6-month follow-up (p=0.02). There were no reported unanticipated adverse device effects associated with InterStim Therapy.

Conclusions: Sacral nerve stimulation using InterStim System is a safe and effective treatment for Asian patients with FI.

CAN WE USE A SHORTER TEST PERIOD BEFORE DEFINITIVE SACRAL NEUROSTIMULATION FOR FECAL INCONTINENCE?

(P40)

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Purpose: Sacral neuromodulation (SNM) may be proposed for fecal incontinence after failure of medical treatment and rehabilitation. A 3-week test period is usually proposed. The length of the test period is a compromise

between the variability of soiling frequency and the risk of material-related infection.The purpose of this study was to present a week-by-week analysis of response to SNM during the screening period in order to determine whether early response is predictive of the final implantation decision.

Methods: From May 2010 through July 2012, 25 patients scheduled for SNM screening for severe fecal incontinence were asked to complete a bowel-movement-soiling diary before and during the test period. An exploitable diary was finally available for 12 of these patients (50%).

Results: After one week of SNM, 50% of patients (6/12) had a 50% reduction in soiling frequency. This percentage reached 66.7% (8/12) at two weeks and 83.3% (10/12) at three weeks. Among those patients whose soiling frequency fell off rapidly (50% reduction after one week of SNM), the decline was considerable (89% reduction) and remained so for the next two weeks (92% and 97% reduction). The decline was also considerable (83%) when the response to SNM took longer (2 or 3 weeks). Retention time for urgency episodes increased 5.4 (0-22.5) minutes the first week, 3.1 (-9-9.5) the second week, and 16.3 (4.1-36) minutes the third week. Urgency frequency fell off by 0.5 (-6-5.3) episodes per week the first week (22.2% reduction), 0.15 (-7-6.3) the second week (26.4% reduction) and 1.9 (4.1-36) the third week (59.6% reduction). There was however a very wide variation in the number of urgency episodes per week: two patients exhibiting a very positive screening response for this variable without reaching the main outcome (50% reduction in soiling frequency). There were no problems with infection.

Conclusions: Rapid improvement in soiling frequency during the first screening week was sustained the next two weeks so that early implantation could be proposed in half of the patients without waiting for the end of the 3-week screening period, thus reducing the risk of material-related infection.

SACRAL NERVE STIMULATION FOR THE TREATMENT OF FECAL INCONTINENCE? DO THE RESULTS OF CLINICAL TRIALS APPLY TO ROUTINE CLINICAL PRACTICE?

(P41)

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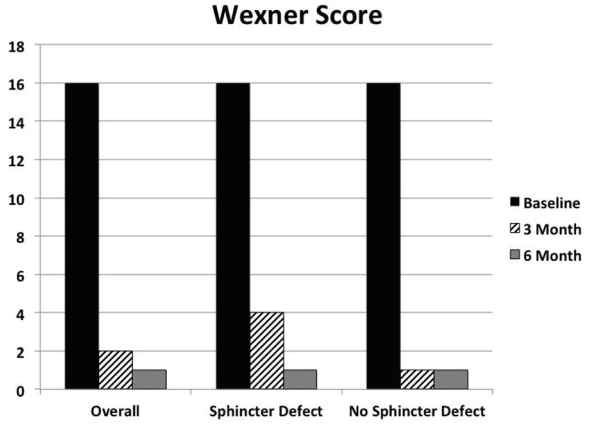
Purpose: To determine the safety and efficacy of Sacral Nerve Stimulation (SNS) for fecal incontinence (FI) in a colorectal surgical practice.

Methods: We used a prospectively maintained database to collect demographics, preoperative, and postoperative characteristics of patients who underwent SNS for FI from December 2011 to November 2012. The Wexner score was used to quantify patients' symptom severity over time. Patients who had at least 3 months of follow up data were included in the study. The primary endpoints were 3 and 6-month Wexner scores. Secondary endpoints were the proportion of patients who achieved a 50% or 100% improvement in disease severity.

Results: Thirty patients underwent test stimulation with a 91% success rate. Of these, 24 patients had at least 3 months of follow up data. The patients were all women with a median age of 68.5 years. A total of 37.5% had an external sphincter defect. The baseline Wexner score of the group was 16 (14-18 interquartile range). Wexner scores at 3 and 6 months decreased to 2 (0-6) and 1 (0-2) respectively. No differences were seen at 6 months in those with a sphincter defect vs. those without (Figure 1). At 3 months, 83.3% of the patients achieved a ≥ 50% improvement and 37.5% achieved a 100% improvement. After 6 months, 100% of the patients achieved a ≥ 50% improvement and 50% achieved a 100% improvement. There were no patient factors or physiologic testing data that were predictive of response to treatment. Overall, 39.1% of the patients required reprogramming of the device. One adverse event occurred; an infection during a phase 1 implant, requiring removal of the device.

Conclusions: SNS is safe and effective with 50% of the patients experiencing 100% improvement in this series. There were no clinical predictors to determine which patients would benefit the most from this treatment. Nearly 40% of patients require reprogramming of the device over time, highlighting the need for ongoing follow up.



CLEVELAND CLINIC FLORIDA/WEXNER FECAL INCONTINENCE SCORE IS EASIER TO USE AND BETTER CORRELATES WITH FECAL INCONTINENCE IMPROVEMENT FOLLOWING SACRAL NERVE STIMULATION COMPARED TO A 2-WEEK BOWEL DIARY.

(P42)

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Purpose: Fecal incontinence (FI) improvement following sacral nerve stimulation (SNS) was assessed during the initial trials by the decrease in number of FI episodes/14 days, as documented in a bowel diary (BD). However, the FIS is a widely used, repeatedly validated clinically easily used instrument for assessment of FI. We aimed to assess which of the two instruments is better for FI assessment following SNS.

Methods: An IRB approved retrospective chart review was conducted at 2 centers performing SNS from 7/11-10/12 to obtain FIS and BD at preSNS, SNS stage 1 (SNS1) and most recent follow-up (FU). A 10 question survey about FIS and BD for FI assessment was administered (34 out of 59 patients, 57% response rate). Answers were obtained on a likert scale of 1 (easy/agree) to 5 (difficult/completely disagree). Patients were also asked at survey about their perception of improvement with SNS. Patients' perceptions of improvement were correlated to the percentage of FI improvement calculated with FIS and BD at FU. Percentage of FI improvement using either method at SNS1 was compared to FU. Paired t-tests and Pearson's correlation were used to compare BD, FIS and patient perception.

Results: 73 patients (mean 62 years old, 93% female) underwent SNS of whom 59 had functioning devices in situ at a mean follow up of 7.2 month. Patients' perceptions of improvement at FU (n=34) correlated with FIS ($r=0.62$, $p<0.0001$), but did not correlate with BD ($r=0.23$, $p=0.2$). There was no difference ($p=0.89$) in FI improvement from SNS1 to FU (n=20) when FI assessed with FIS. There was a significant difference ($p<0.05$) from SNS1 to FU (n=20) when FI assessed with BD. Patients found FIS an easier tool to assess their FI than BD (1.4 vs 1.9, $p<0.05$).

Conclusions: Patients find FIS easier to use than the BD. Moreover, although the FIS was predictive of long term outcome, the BD was not. In addition, although the FIS correlated with patient perception of FI improvement, the BD did not. The FIS is a better tool than 2-week bowel diary for assessing FI prior to and following SNS.

INITIAL AMERICAN EXPERIENCE AND RESULTS WITH SACRAL NERVE STIMULATION FOR FECAL INCONTINENCE IN A COMMUNITY SETTING.

(P43)

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Purpose: Sacral nerve stimulation (SNS) was recently approved in the USA for the treatment of fecal incontinence (FI) in patients unresponsive to medical therapy. We report the first American experience of SNS for FI in a community setting outside an investigational protocol.

Methods: All consecutive patients who underwent SNS test stimulation for FI between July 2011 - November 2012 were included. All patients had failed conservative medical management and had ≥2 FI episodes per week. At baseline, patients completed a 14-day bowel diary and Cleveland Clinic Fecal Incontinence (CCF-FI) score was calculated. Patients with ≥50% reduction of FI episodes during the test period were offered permanent implant. Objective data regarding the number of incontinence episodes, CCF-FI scores, and complications were prospectively collected. At follow-up, improvement was categorized as no improvement, slight improvement, significant improvement, and complete continence.

Results: Sixty two patients (55 females) underwent SNS test stimulation. Mean age was 61.9 (range, 39-87) years. At baseline, mean number of FI episodes was 13.7 (range, 3-77) per week and mean CCF-FI score was 15.7 (range, 9-20). During the test phase, mean number of FI episodes per week decreased significantly to 2.9 ($p<0.0001$). Sixty patients underwent permanent implantation. One patient did not achieve 50% improvement of symptoms and one patient sustained an infection. Follow-up after implantation was achieved in 54/ 60 patients after mean 7.0 (range, 0-15) months. At follow-up, CCF-FI score was significantly improved ($p<0.001$) at mean of 7.1 (range, 0-16). Subjectively, 4 patients reported complete continence, 40 significant improvement, 9 slight improvement, and 1 no improvement of symptoms. Nine developed complications including 5 patients with infections necessitating explantation (2 subsequently re-implanted), 1 patient with device migration (underwent repositioning of stimulator), and 1 patient required re-positioning for pain.

Conclusions: Our initial American experience confirms that SNS provides a simple, effective, and safe option for treatment of patients with FI that does not respond to medical therapy.

EFFICACY FOLLOWING SACRAL NERVE STIMULATION FOR THE TREATMENT OF FECAL INCONTINENCE IS NOT INFLUENCED BY PUDENDAL NERVE DYSFUNCTION.

(P44)

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Purpose: Evaluation of pudendal nerve terminal motor latencies (PNTML) are frequently included in the workup of fecal incontinence (FI). There is little information regarding any impact of PNTML abnormalities on the results of sacral nerve stimulation (SNS) for FI. The purpose of this study was to determine if there is any correlation between pudendal nerve dysfunction and improvement following SNS.

Methods: Data were prospectively collected from 3 institutions on patients undergoing SNS from 6/2011-9/2012. Pudendal nerve dysfunction was defined as > 2.2 milliseconds. Three groups (no pudendal nerve dysfunction, unilateral dysfunction and bilateral dysfunction) were compared regarding improvement in number of accidents following SNS. One way ANOVA analysis was used to determine significance.

Results: 56 patients had adequate information to be included in this analysis at a mean follow up of 5.6 (0.5-16) months. There was a significant improvement in the mean number of accidents from baseline (20.2 +/- 17.1 vs. 2.1 +/- 3.5, $p < 0.01$). We found no correlation between pudendal nerve dysfunction and change in number of accidents (none – 18.2, unilateral – 15.3, and bilateral – 20.4; $p = 0.66$).

Conclusions: The presence of pudendal nerve dysfunction does not impact the likelihood of improvement in FI following SNS. We believe SNS represents appropriate treatment for FI regardless of PNTML abnormalities.

INSERTION OF TEMPORARY ELECTRODES FOR SACRAL NERVE STIMULATION UNDER LOCAL ANESTHESIA IS FEASIBLE AND EFFECTIVE.

(P45)

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Purpose: SNS has recently been approved for the treatment of fecal incontinence in the United States. Most of the temporary stimulation in the US is performed with tined leads under general anesthesia. The aim of this study was to assess whether the insertion of temporary leads under local anesthesia (LA) is feasible.

Methods: We have earlier shown that there is no difference in effectiveness whether temporary leads are inserted under local or general anesthesia. We have adopted the practice of insertion of all temporary leads under LA in our tertiary referral center. We reviewed our experience to assess failure rates, complications and effectiveness of this procedure.

Results: 363 temporary lead insertions have been performed in 337 patients since the publication of the initial comparison which included data until 2008. Majority, were women (309/337) and the median age was 62 years (26-84). Median of 9 ml of 1% lignocaine (6-20 cc) was used for the procedure, 9 patients required additional sedation (midazolam 2-4 mg). One patient did not tolerate the procedure under LA and was rescheduled for GA. The success rate after temporary stimulation was 69%. 347 patients (95.6%) patients went home on the day of surgery. In this period 18 patients chose to have temporary stimulation under general anesthesia. There were no demographic differences from the patients who chose LA.

Conclusions: Temporary stimulation can be safely and effectively performed under local anesthesia. It has acceptable success rate and high acceptance by patients. There is low conversion to GA. This can lead to better safety, reduced costs and better utilization of operative time for SNS.

EFFECTS OF SACRAL NERVE STIMULATION ON THE RECTAL BARRIER. RESULTS FROM A PRECLINICAL PORCINE MODEL OF ACUTE AND CHRONIC STIMULATION.

(P46)

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Purpose: Although sacral nerve stimulation (SNS) is a validated treatment option for severe fecal incontinence, its mechanisms of action are poorly understood. The aim of our study has been to develop a preclinical porcine model of SNS and to characterize its effects upon the rectal mucosa in acute and chronic period of stimulation in terms of intestinal barrier permeability and inflammatory response.

P44 Table 1

Pudendal Nerve Dysfunction	N =	Average decrease in number of accidents from baseline
None	17	18.2
Unilateral	18	15.3
Bilateral	21	20.4

Methods: A total of 34 animals have been included. Successively, acute 3 hour-period (n=18) and a chronic 7 day-stimulation (n=14) periods have been tested. Rectal biopsies were performed before and after 3h / 7 days stimulation. Paracellular permeability, mucosal morphology, inflammatory cytokines and junction protein have been assessed.

Results: After 3h stimulation, SNS induced a significant decrease in paracellular permeability as compared to control. This decrease was larger for bilateral as compared to unilateral stimulation. After 7days of stimulation, SNS did not change paracellular permeability nor rectal morphology as compared to control. However, SNS prevented PAR-2 agonist induced increase in paracellular permeability ex vivo and regulated tight junctions mRNA expression. IL-6 production from biopsies maintained in organ culture was lower from SNS pigs than from controls. In addition, SNS reduced systemic inflammatory response observed at 7days in pigs.

Conclusions: In conclusion, our data suggest that SNS reinforces barrier functions in the rectum and also exerts anti-inflammatory effects. This study sets in part the scientific rationale for extending SNS indications to pathologies with barrier dysfunctions such as IBD or IBS.

SACRAL NEUROMODULATION AND DIARRHEA: IS THERE A BENEFIT?

(P47)

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Purpose: Sacral neuromodulation (SNM) is effective in treatment option for patients with bowel accidents. However, its role for patients with diarrhea and associated fecal incontinence (FI) who fail medical management has not been determined. The aim of this study is to evaluate if patients who have FI and concomitant diarrhea have any benefit from sacral neuromodulation with respect to change in the bowel frequency.

Methods: Patients undergoing SNM for FI between March 2012 and October 1, 2012 with a comcomittant diagnosis of medically refractory diarrhea were evaluated. The endpoint was a decrease in bowel movements. The fecal incontinence severity index (FISI) was collected prior to surgery. The Patient Global Impression of Change Scale (PGIC) was used to describe changes in activity, limitations, symptoms, and quality of life related to the procedures (scored from 1 to 7; 1 = no change; 7 = considerable improvement).

Results: Five female patients met the criteria and underwent SNM stage 1 and 2. The average age was 41 years. All patients were female. The etiology of FI was idiopathic (n-=3), Irritable bowel with gastric bypass (n=1), total abdominal colectomy (n=1).The total number of preoperative bowel movements ranged from 6-25 bowel movements per day. After SNS implantation all patients reported a reduction in the number of daily bowel movement to 2-4 per day. Preoperative FISI scores ranged between 20-61. Fecal accidents decreased from multiple daily episodes to 1-2 times per week. The average PGIC score was high, reported at 6.6 at follow up.

Conclusions: In this series of 5 patients, SNM appeared to control the symptoms of diarrhea, leading to a decrease in symptoms of FI. Long-term evaluation is needed to determine if the results are sustained. Patients with diarrhea can be offered SNM to treat symptoms of FI. Future studies should be powered to evaluate the effectiveness of SNM based on the etiology of the diarrhea.

CLOSED LATERAL INTERNAL SPHINCTEROTOMY VERSUS ANAL SPHINCTEROLYSIS FOR CHRONIC ANAL FISSURE: A PROSPECTIVE, RANDOMIZED AND CONTROL TRIAL.

(P48)

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Purpose: The aim of this randomized, prospective study was to compare the results of closed lateral internal sphincterotomy with the author's innovative approach of finger fragmentation of internal sphincter fibers in the left lateral position termed as 'Sphincterolysis' in the treatment of chronic anal fissure.

Methods: Patients with chronic anal fissures were randomly assigned to undergo closed lateral sphincterotomy or sphincterolysis. The patients were re-examined at 4 and 54 weeks. Postoperative pain, complications and fissure healing were prospectively assessed.

Results: 102 patients were randomly assigned to either group. Eight patients developed complications in the postoperative period; two patients from sphincterolysis group had a perianal hematoma, which was treated conservatively. 6 patients in the sphincterotomy group had complications. At four weeks postoperatively, fissures in 96 percent of patients in both groups were healed. At the 4-week follow-up, 7 patients from the closed sphincterotomy group and 6 patients from the sphincterolysis group reported deterioration in the continence.

Conclusions: The procedure of sphincterolysis seems to be equally effective when compared with closed sphincterotomy. It is safe and easy to learn with less incidences of postoperative complication and no significant continence defect.

COMPARISON OF CLOSED AND OPEN LATERAL INTERNAL SPHINCTEROTOMY FOR CHRONIC ANAL FISSURE.

(P49)

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Purpose: Lateral internal sphincterotomy (LIS) is the standard surgical treatment for chronic anal fissure. This study was designed to assess the results between closed and open LIS.

Methods: A retrospective study was performed using a prospective collected database. All patients with idiopathic fissure in ano who underwent LIS between July 2004 and July 2011 were included. The series was divided into two groups (G1: closed techniques; G2: open techniques). Postoperative outcomes were compared between groups.

Results: There were included 162 patients (G1: 68; G2: 94). Preoperative variables were homogeneous between groups, but G1 showed higher women proportion [G1: 41 (60%) vs. G2: 36 (38%), p <0.05]. G2 had higher rate of postoperative complications [G1: 1.4% (1 abscess) vs. G2: 10.6% (2 thrombosis, 4 abscesses, 4 fistulas), p <0.05]. At a mean follow-up of 39 months, G2 had higher rate of recurrence requiring new sphincterotomy [G1: 2 (2.9%) vs. G2: 7 (7.4%), p <0.05] and G1 had higher percentage of patients with incontinence [G1: 8 (11.7%) vs. G2: 2 (2.1%), p <0.05]. The mean incontinence score in these patients was 7.8 in G1 and 5.5 in G2.

Conclusions: Open LIS show more postoperative complications and recurrence than closed techniques, but has less rate of postoperative incontinence.

BOTOX FOR ANAL PAIN: IS IT EFFECTIVE?

(P50)

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Purpose: Botox blocks acetylcholine release and causes reversible denervation of muscles, leading to relief of the anal spasm and pain. The aim of this study was to evaluate symptom relief after treatment with Botox.

Methods: Patients who were treated with botox injections for anal pain due to a medically refractory anal fissure (AF) or Levator Ani syndrome (LS) from 2005-2012 were included. Demographics and relevant clinical data was collected from the electronic medical record (EMR). Phone interview was conducted with patients who had no follow up in the EMR. Patient satisfaction after treatment was assessed with visual analog pain scores for anal pain(0:no pain;10:worst pain).

Results: 66 patients (54 female) with AF and 37 patients (28 female) with LS with mean ages of 44 years and 54 years respectively were included. Duration of symptoms for AF was 1 month to 36 months and for LS 1 to 72 months. 64% AF patients had a posteriorly located anal fissure. The minimum/maximum dose of botox for AF was 20/100 units and for LS was 50/200 units with a majority of AF patients receiving 100 units and LS patients receiving 200 units.18(27%) patients with AF and 28(76%) patients with LS received >1 Botox treatment. Time interval between injections varied between 1-12 months. Mean follow-up was 6 months for AF and 9 months for LS. Symptom resolution was noted in 59%AF and 43% LS patients. Mean pre/post treatment pain scores for both groups were 5.46 and 2 (P <0.001) for AF and 6 and 4 (P= 0.02) for LS. Overall <30 days complications were recorded as pain and bleeding in 15.3% and 2.8%. 9/12(75%) patients were relieved after a failed sphincterotomy.11 AF patients (17%) had a sphincterotomy after a failed botox treatment. Temporary fecal incontinence was reported in 3/66 (4.5%) AF and 3/37(8%) LS patients. 13/19(8 LS/5 AF) patients recommended botox treatment, 14 /19(9 LS/5 AF) patients were happy with the treatment.

Conclusions: Botox has more effect in symptom relief in AF than LS especially after failed sphincterotomy. Botox injections have an over all low complication rate. Botox is an option in medically refractory cases of LS. Higher doses of Botox are safe to use in LS however their efficacy needs to be evaluated.

P50 Results

	Overall n = 103	Anal fissuren = 66	Levator aniSyndrome n = 37
Previous Treatment - Surgical	12(11.6%)	12 (18%)	0
Patients receiving >1 injection	46(45%)	18(27%)	28(76%)
Concurrent steroid injection	27(26%)	5 (7.5%)	22(59.4%)
Symptom resolution	55 (53.3 %)	39(59%)	16 (43%)
Botox recommended : Phone Interview	13/19 (68%)	5/7 (71.4%)	8/12 (66.7%)
Symptom Improvement: Phone interview N=19			
Improved/Much improved	11 (58%)	5/7 (71%)	6/12(50%)
Same	7 (36.8%)	2/7 (28.5%)	5/12 (41%)

A NOVEL TECHNIQUE OF ANAL STRICTUREPLASTY: HEINEKE-MIKULICZ PRINCIPLE.

(P51)

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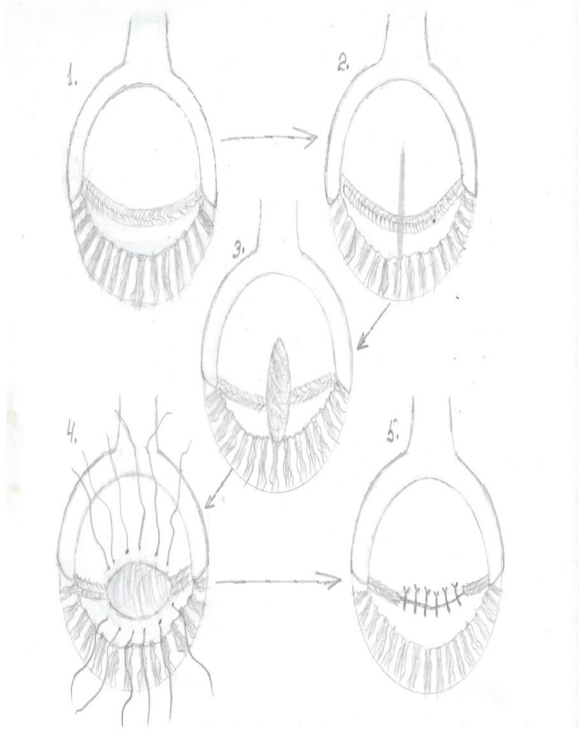
New York, NY

Purpose: Anal dilation for anal strictures has a very high recurrence rate. Different local flaps have been described, but they are technically difficult and take time to perform. We describe a new, easy and simple, technique of anal strictureplasty using Heineke-Mikulicz principle.

Methods: 6 patients with anal strictures secondary to Crohn's disease (2), stapled IPAA (1), handsewn IPAA with mucosectomy (2) and stapled hemorrhoidopexy (1) were treated with a stricturoplasty according to Heineke-Mikulicz principle. This was achieved by identifying the most affected stricture area, dividing it longitudinally, and closing it transversely (Figure 1). In very tight strictures the strictureplasty was performed in two separate places.

Results: Mean follow up was 17.5 months (range: 3-48 months). There were no immediate or early postoperative complications. 5 out 6 patients were successfully treated with the initial procedure. One patient with a Crohn's stricture developed a recurrence. This was treated once again with the same technique resulting in a resolution of the stricture.

Conclusions: The preliminary surgical results of the anal strictureplasty using Heineke-Mikulicz principle are promising. This technique is easy to perform and yields good outcomes.



Anal Strictureplasty: Heineke-Mikulicz Principle

TRIAMCINOLONE INJECTION: AN ALTERNATIVE MUSCLE-SPARING TREATMENT FOR ANAL FISSURE.

(P52)

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Purpose: Symptomatic anal fissure can severely affect quality of life, with pain and bleeding being the most common symptoms. Non-operative treatment with topical agents is usually initially considered. Treatment failure leads to consideration of invasive procedures, particularly botulinum toxin injection or sphincterotomy. While sphincterotomy leads to excellent rates of fissure healing, it is associated with a risk of incontinence. Here we report a novel treatment for anal fissure using triamcinolone.

Methods: A prospectively maintained colorectal surgery database was queried to identify patients undergoing surgical treatment for symptomatic anal fissure over a four-year period. Patients with Crohn's disease were excluded. All procedures were performed on an outpatient basis, and consisted of anal dilation, curettage of the fissure and injection of 50mg triamcinolone into the base of the fissure. Patients were instructed to continue all preoperative topical treatments. A fecal incontinence severity score (FISI) was calculated for most patients preoperatively and postoperatively.

Results: 100 consecutive patients were identified. Of these, 53% failed initial topical and/or botulinum toxin treatment, and 2% failed sphincterotomy. 72% had single fissures in the posterior midline, with 8% having > 1 fissure. 73% of patients reported resolution of symptoms after triamcinolone treatment. Of the 67% of patients for whom "time to symptom relief" was identified, the mean time to complete symptom relief was 2.4 weeks, with the majority resolving within 1 week. An additional 5% of patients reported symptom improvement after treatment. 13% of patients reported recurrent or persistent symptoms. Four patients were diagnosed with perianal abscesses and 3 developed hemorrhoid thrombosis postoperatively. No patients with complete FISI score data (n=79) reported a decrement in continence. Mean follow up was 6.4 months.

Conclusions: Triamcinolone injection for anal fissure can lead to significant improvement in symptoms, particularly after failure of non-operative treatments. The majority of patients who respond do so quickly. For patients in whom symptoms persist or recur, additional treatments or sphincterotomy can still be performed.

LATERAL INTERNAL SPHINCTEROTOMY FOR CHRONIC ANAL FISSURE: 10-YEARS' EXPERIENCE IN A SPECIALIST COLORECTAL UNIT.

(P53)

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Purpose: Lateral internal sphincterotomy is the procedure of choice to treat chronic anal fissure (CAF), but stable incontinence can be as high as 10%. The aim of the study was to determine the long-term outcome, recurrence rate and faecal incontinence after lateral internal sphincterotomy for chronic anal fissure (CAF) after failure of conservative treatment.

Methods: One-hundred-ten consecutive patients underwent surgery for a medically resistant CAF between 2002 and 2012. All data were prospectively collected and entered in a database including demographics, type of surgery, complications, healing time, incontinence (FISI score) and satisfaction with the operation (score 1-4). All patients were seen after surgery at 1 week, 1 month, six months and annually thereafter for 5 years.Patients were then contacted by phone.

Results: Median follow-up was 3.5 years. Eleven patients were lost at the follow-up. Overall complications rate was 5% (6 out of 110). Postoperative incontinence was 4.5% (5 out 110 patients). At the end of the follow-up 1 patient (1%) experienced significative incontinence (FISI score >5). Overall healing was achieved in 95% (94/99 patients). Ninety-one per cent of patients would have consented to the operation again if necessary.

Conclusions: In our experience LIS remains the treatment of choice for medically resistant CAF, recurrence rate is low with a minimal impact on continence.

LONG-TERM FOLLOW-UP OF BOTOX AND BOTOX + FISSURECTOMY FOR CHRONIC ANAL FISSURE.

(P54)

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Purpose: Anal fissures are associated with a hypertonic internal anal sphincter (IAS). Treatment options are designed to decrease resting sphincter pressure and promote fissure healing. The standard of care has been lateral internal sphincterotomy (LIS) with a 95% success rate. Patients often wish to avoid this procedure due to risk of incontinence. Other therapies include topical agents, botulinum toxin A (Botox) injection and fissurectomy. The purpose of this study was to determine the long-term effectiveness of Botox injection alone or combined with fissurectomy (Botox/F) as a treatment for chronic anal fissures (CAF).

Methods: Retrospective review of CAF pts treated at our institution between January 2007 and March 2012. The diagnosis of chronic fissure (CF) was made in pts with >6 weeks of symptoms and physical exam findings of rolled fissure edges, sentinel tag and/or visible IAS. Review of pt records included demographics, fissure type, location and treatment. Primary end-point was fissure healing, defined as resolution of symptoms and re-epithelialization on exam. Treatment failure was categorized as either persistence (not healed within 12 weeks) or recurrence (presenting more than 12 weeks after procedure) of symptoms. F/U period was 6 to 48 months.

Results: A total of 136 patients were identified (33% men). Mean age was 42.5 years. There were 53 CAF pts treated with Botox alone and 83 treated with Botox/fissurectomy. Overall, 25 pts (18%) were lost to followup. Botox alone had a success rate of only 17% for CF. Botox/F was 47% successful for CAF (39/83). Of those who failed, persistent symptoms were noted in 64% of Botox (34/53) and 15% of Botox/F (12/83) pts within 9 to 12 weeks of treatment. Recurrence was noted at mean of 13 months in Botox pts (23%) and 22 months in Botox/F pts (22%).

Conclusions: Botox+fissurectomy offers reasonable success for CAF, albeit with a high risk (37%) of recurrence. It is a reasonable alternative to LIS in pts with CAF who fail medical management. Our data reveals that there is <20% success with Botox therapy alone for chronic anal fissure. Botox injection alone is futile and not cost-justified.

IMPROVED OUTCOMES WITH THE SYNTHETIC BIOABSORBABLE SCAFFOLD (GORE FISTULA PLUG): A SINGLE INSTITUTION EXPERIENCE.

(P55)

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Purpose: Traditional surgical approaches to anal fistula repair, including the cutting seton, direct fistulotomy have been plagued with unacceptably high rates of incontinence, especially in the setting of complex disease. In this study, we present our experience with bioabsorbable synthetic scaffold (Gore), and demonstrate improved outcomes using a modified "submucosal pocket" technique.

Methods: We conducted a retrospective review of data for all patients undergoing fistula repair with the Gore plug between March 2010 and December 2011. Anal fistula patients who presented with abscesses or purulent exudate were initially treated with debridement and prolonged seton drainage. After placement of plug a submucosal flap was raised over the internal opening.

Results: Twenty five patients underwent fistula repair with gore plug. Healing after first surgery was significantly higher for single fistulas (16/19) compared to multiple (3/6) (84% vs 50%). All patients with recurrence were

treated with Gore plug. Overall healing rate after replugging was 88% with higher closure rate for single (18/19) as compared to multiple fistulas (4/5) (94% vs 80%). Patient with Crohns disease did not heal after replugging. Only 1 patient had perianal abscess after surgery (Table 1).

Conclusions: Biosynthetic plugs offer a promising, sphincter-sparing solution for the management of complex fistulous disease. To our knowledge, we are presenting largest series for bioabsorbable plug with modified technique using the submucosal pocket, which we believe contributed to our high healing rates. Whether this plug and our operative approach will yield reproducibly superior outcomes compared to traditional methods remains to be seen in future randomized trials.

ACCEPTANCE OF INDWELLING SETONS FOR COMPLEX ANAL FISTULA: THE PATIENT'S PERSPECTIVE.

(P56)

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Purpose: Data on patient satisfaction of loose seton treatment (LST) for complex anal fistulae are limited. The aim of this study was to evaluate clinical and patient-reported outcomes after LST for the management of complex anal fistulae.

Methods: All patients who underwent LST for the management of complex anal fistula/e were identified by reviewing a prospectively maintained database. Patient demographics, clinical and operative notes were reviewed. All patients were administered a treatment-specific questionnaire, which evaluated their satisfaction with LST, quality of life, and seton-related symptoms such as pain, anal irritation and incontinence.

Results: From 2002 to 2010, 316 patients underwent LST for anal fistulae at our institution. The questionnaire response rate was 33% (N=104). The median age at the time of seton insertion was 39 years. Sixty-two patients (60%) were female and 77% (N=80) of fistulae were IBD-related. Trans-sphincteric fistulae accounted for the majority (N=76, 73%) of cases. The median duration between initial presentation with fistula and seton placement was 6 months. Placement of setons was uneventful in all cases with only 2 patients requiring drainage for recurrent peri-anal abscesses within 3 months post-op. At the time of initial seton placement, 55% of patients (N=57) were on antibiotic treatment, 12% (N=12) were taking oral steroids and 34% (N=35) were on anti-TNF agents. The median duration of seton placement was 15.5 months (range 1-220). At the time of survey, 44% of patients (N=45) still had a seton in-situ. Over half of survey responders (N=53, 51%) had their seton replaced at least once during their treatment. As shown in the table, the median satisfaction score was 7 (on a scale from 0-10, with 10 being the best). Though peri-anal pain and irritation scores were 4 and 5, and 14 patients (14 %) reported significant incontinence, nearly 90% of the patients (N=93) reported that they would receive seton treatment again and 86% (N=89) would recommend the procedure to other patients with anal fistulae.

Conclusions: LST may cause peri-anal discomfort, but it is well accepted by patients with complex anal fistulae.

HOW COMMON ARE LONG-TERM MOTOR AND SENSORY COMPLICATIONS OF GRACILIS MUSCLE TRANSPOSITION?

(P57)

L. Haubert, J. Van Koughnett, M. Alvarez-Downing, G. da Silva, S. Wexner
Weston, FL

Purpose: There is limited literature on complications of harvesting and transposing the gracilis muscle for perianal fistulas and fecal incontinence. This study was performed to determine the incidence of thigh numbness and hip, knee, and thigh weakness and pain after gracilis transposition.

P56 Patient reported outcomes after loose seton treatment for complex anal fistula (N=104)

Satisfaction score*, median	7
Peri-anal pain score*, median	4
Peri-anal irritation score*, median	5
Incontinence ‡, N (%)	14 (14)
Work †, N (%)	5 (5)
Social activities †, N (%)	8 (7)
Travel †, N (%)	7 (6)
Willing to have seton treatment again, N (%)	93 (89)
Would recommend to others, N (%)	89 (86)

*1 - minimal, 10 - maximum

† 'extremely' restricted

‡ 'Mostly' or 'always'

P55 Table 1

Type of Fistula	Number of Patients	Recurrence	Recurrence Treated	NonHealed afterReplugging	Overall Success
Single	19	16%(3/19)	Gore Plug	33%(1/3)	94%(18/19)
Multiple	5	40%(2/5)	Gore Plug	50%(1/2)	80%(4/5)
Multiple withCrohns Disease	1	100%(1/1)	Gore Plug,Remicaide	100%(1/1)	0

Methods: Patients who underwent gracilis transposition between 12/2003 and 8/2011 were identified from an IRB-approved prospectively collected database. Patients were contacted by phone and asked to respond to a 10-item Likert-style questionnaire designed to assess postoperative motor and sensory outcomes.

Results: Twenty of 29 patients (69%) eligible for inclusion were contacted including 10 females and 10 males of a mean age of 51 (17-82) years. Fifteen patients underwent interposition (20 surgeries; 5 bilateral) and 5 underwent a wrap (6 surgeries; 1 bilateral). The indications for surgery included fecal incontinence (20%); rectourethral (40%), rectovaginal (25%) or pouch (5%) fistulas; and reconstruction after APR (10%). The mean follow-up was 4.3 (1.2-8.8) years. Only 1 patient was dissatisfied secondary to cosmesis and weakness. Forty percent of patients strongly agreed that they were satisfied with their leg condition. Overall, 35% of patients reported no sensory or motor complications from the surgery. Minor complications that did not affect activities of daily living (ADL) included thigh, knee and calf pain and cramping while walking. These symptoms were reported by ≤ 10% of patients. One-third of patients reported numbness, although all stated that it did not affect ADL. Six patients reported difficulty in squatting or bending over, 3 indicating related effects on ADL. Three patients reported post-surgery difficultly in walking up and down stairs; 3 patients indicated difficulty in running after the surgery.

Conclusions: Gracilis transposition can be performed with minimal effects on ADL and a high level of patient satisfaction with their leg after surgery. However, patients should be counseled about the risks of complications observed in this study, which are much higher (65%) than previously reported.

SETON PLACEMENT PRIOR TO LIFT: DOES IT AFFECT THE OUTCOME?

(P58)

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Weston, FL

Purpose: Ligation of the intersphincteric fistula tract (LIFT) is a relatively new procedure for anal fistulas. Seton placement before LIFT is a common practice to better define the fistula tract. However, whether seton use impacts surgery outcomes is unknown. Therefore, the aim of this study was to assess the outcomes of the LIFT procedure in patients with and without prior seton placement.

Methods: After IRB approval, medical records of patients who underwent LIFT in 2 institutions between 3/2011 and 8/2012 were reviewed. All patients had high transsphincteric fistulas; patients with Crohn's disease were excluded. Demographics, complications, previous surgeries and surgical outcomes were recorded. Success was defined as closure of the external opening without any drainage for > 90 days. Patients were divided into 2 groups based on whether or not a preliminary seton was placed before LIFT. Statistical analyses were conducted by independent t-tests and chi-square tests; a p value <0.05 was considered significant.

Results: Seventy-one patients (77.5% males) of a mean age of 41.3 (18-71) years were included in the study: seton (n=18) and no seton (n=53). Sixteen (22.5%) patients had previous fistula treatment at least 3 months before LIFT. The mean BMI was 26.5 kg/m^2. There were no differences in demographics, comorbidities, or number of previous surgeries between groups. The mean interval between seton placement and LIFT procedure was 137 (47-284) days. There were 2 complications including 1 abscess in the seton group and 1 hematoma in the no-seton group. At a mean follow-up of 134.4 (81-388) days, success rates were 83.3% (n=15) in the seton group and 88.7% (n=47) in the no-seton group (p=0.7). Overall, 9 patients did not heal; all underwent further surgery with no difference between groups. The cumulative success rates were 88.9% and 98.1% in the seton and no-seton groups, respectively (p=0.16).

Conclusions: LIFT is a promising and safe sphincter-preserving procedure for high transsphincteric fistulas, the success rate of which is not influenced by prior seton placement.

DOES THE INTERNAL OPENING LOCATION IMPACT THE OUTCOMES OF ANAL FISTULA PLUG?

(P59)

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Weston, FL

Purpose: Anal fistula plug has a success rate from 14% to 86%. This wide variation in success rates has led to concerns about which factors may influence the results. Besides factors such as smoking and multiple or short fistulas tracts, the internal opening location (IOL) might impact outcomes. Whereas the anterior and posterior aspects of the external sphincter are relatively fixed, the lateral part is voided of attachments allowing both sphincters to move to the same extent, which may be favorable to the plug, which passes through both sphincters. The aim of this study was to determine whether the IOL influences the outcomes of the plug procedure.

Methods: Medical records of patients who underwent plug placement for complex anal fistula between 03/2004 and 08/2012 were reviewed from an IRB-approved database. Demographics, fistula etiology, IOL, previous surgeries, previous seton placement, and success rates were recorded. Success was defined as closure of the external opening and cessation of drainage for > 90 days. Statistical

analysis was conducted with independent t-tests and $\chi 2$ tests; a p value < 0.05 was considered significant.

Results: 106 patients (68% males) of a mean age of 47 (14-80) years were included. 98% of the fistulas were high transsphincteric. 14 patients (13.2 %) had Crohn's disease, 9 (8.5%) previous fistula repairs and 78 (73.6%) loose seton before plug procedure. The IOL was anterior in 52 (49.1%), posterior in 44 (41.5%) and lateral in 10 (9.4%) patients. The mean follow-up was 20.5 (3-82) months. There were 11 (10.4%) complications: 6 abscesses and 5 plug dislodgments with no correlation with IOL. The overall success rate was 19.8% (21 patients). Fistulas with a lateral IOL had higher healing rates compared to those located anteriorly or posteriorly (60% vs 15% vs 15%; p=0.008). Success rates did not differ between anterior and posterior IOL. There was no correlation among demographics, fistula etiology, use of seton before plug, previous fistula repairs, and success.

Conclusions: Anal fistulas with lateral internal openings are significantly more likely to heal after plug placement than are fistulas with anterior or posterior internal openings.

SHORT-TERM OUTCOMES FROM THE LARGEST CLINICAL EXPERIENCE WITH THE GORE BIO-A FISTULA PLUG.

(P60)

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Purpose: This study was designed to analyze the efficacy of the GORE Bio-A anal fistula plug in the management of complex fistulae.

Methods: This study is a retrospective review of all patients who underwent treatment from our institution using the GORE Bio-A anal fistula plug between March 2010 and August 2012. Patient demographics, fistula etiology, and success rates were evaluated. The plug was placed in accordance with the inventor's guidelines. We deemed success at interval post-operative follow-up as closure of external openings, absence of drainage, and no creation of abscess.

Results: Twenty-eight patients underwent twenty-eight plug insertions, without any patients being lost to immediate post-operative follow-up. The fistula etiology was cryptoglandular in 26/28 patients and Crohn's disease-associated in other 2/28. Only one patient was a diet-controlled diabetic. The mean follow-up time was 78 days, and the overall success rate at the time of last follow-up was15/28 (54%). The 2 Crohn's-associated fistulae healed. The reasons for failure were infection requiring drainage and seton placement, and plug dislodgement in one patient.

Conclusions: The succcess rate for GORE Bio-A anal fistula plug for the treatment of complex anal fistulae was 54% in our experience, which represents the largest published clinical experience. This overall procedural success rate is very similar to initial, smaller series that are presented by other institutions.

SURGICAL TREATMENT FOR COMPLEX PERIANAL FISTULAS COMBINED WITH PLATELET-RICH PLASMA: LONG-TERM RESULTS.

(P61)

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Maastricht, Netherlands; Stadskanaal, Netherlands; Heerlen, Netherlands

Purpose: Developing a surgical treatment for complex perianal fistulas with long-term low recurrence and complication rates.

Methods: All patients presenting with complex perianal fistulas, defined as fistulas involving the middle or upper third of the anal sphincter complex, were included. Patients with inflammatory bowel diseases, low platelet levels or other bleeding disorders, haematological or local malignancies, and pregnant patients were excluded. First all patients were treated with a seton. After at least 2-3 months, later if inflammatory activity was still present, the patients were treated with a mucosa advancement flap (MAF). The external fistula opening was excised and left open. A debridement of the fistula tract is performed. Platelet-rich plasma (PRP), centrifuged from 55mL of the patient's blood, is left in the fistula tract. No activating agent is added. Treatment failure was defined as absent closure of the fistula within 3 months.

Results: We operated 25 patients between 2006 and 2012. All were treated according to the protocol. One patient (4.0%) was lost to follow-up after 4 months. The median follow-up period was 27 months. The recurrence rate was 16%. Of the 4 patients with a recurrence, two (8.0%) were treated with a MAF and PRP again and both healed. One (4.0%) patient refused another treatment, but agreed to stay in follow-up. One patient (4.0%) requested a colostomy, resulting in closure of the fistula afterwards. In one (4.0%) patient the treatment was complicated by a perianal abscess, which was drained twice. This was one of the patients with a recurrence. No other complications were seen. Incontinence numbers were low with a median Vaizey score of 3.0 out of a maximum of 24. The median maximum and minimum Visual Analogue pain Scores (VAS) were both 0.

Conclusions: This study shows that treating patients with complex perianal fistulas with a MAF and PRP, preceded by seton treatment, results in low recurrence, complication and incontinence rates in the long-term. This technique therefore seems to be a valid option for the treatment of perianal fistulas. Larger and randomised studies are needed to further explore this two-staged surgical technique.

IS IT TIME TO PULL THE PLUG ON THE PLUG? OUTCOMES OF THE LIFT, BIOLIFT, AND PLUG FOR COMPLEX ANAL FISTULAS.

(P62)

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Purpose: This study aimed to determine the outcomes of the anal fistula plug (AFP), ligation of the intersphincteric fistula tract (LIFT), and LIFT reinforced with a bioprosthetic graft (BioLIFT) for complex anal fistulas.

Methods: A retrospective review included all AFP, LIFT, and BioLIFT procedures performed between 2007 and 2012 by two colorectal surgeons at a single institution. All cases involved complex fistulas that were not suitable for fistulotomy. Patients with Crohn's disease were excluded. Patient and fistula characteristics, prior history of fistula surgery, clinical healing, and complications were reviewed.

Results: Thirty-two AFP (22 male, 10 female; mean age 50), 14 LIFT (7 male, 7 female; mean age 49), and 9 BioLIFT (4 male, 5 female; mean age 43) procedures were included. Repair had been previously attempted for 10 fistulas in the AFP group, 8 in the LIFT group, and 1 in the BioLIFT group. AFP was performed for 28 transsphincteric, 2 extrasphincteric, 1 intersphincteric, and 1 suprasphincteric fistulas, whereas all LIFT and BioLIFT procedures involved transsphincteric fistulas. Median follow-up intervals were 35 weeks (range 3-161 weeks) for AFP, 28 weeks (range 3-93 weeks) for LIFT, and 9 weeks (range 3-49 weeks) for BioLIFT. Clinical healing was achieved with 3 of 32 AFP (9%), 11 of 14 LIFT (79%), and 6 of 9 BioLIFT (67%). There was no new occurrence of fecal incontinence following any of the procedures. Over time, there was a shift away from the use of AFP, as it comprised 22 of 31 total cases (71%) during 2007-2010 compared to 10 of 24 total cases (42%) during 2011-2012. A draining seton had been placed prior to all but one AFP and all LIFT and BioLIFT procedures. Among the 23 LIFT and BioLIFT cases, cure was achieved in 10 of the 11 patients (91%) who had preceding seton drainage for less than 6 months, compared to 7 of the 12 patients (58%) who had preceding seton drainage for more than 6 months.

Conclusions: The plug should be abandoned for anal fistulas given its high failure rate and cost. For the LIFT or BioLIFT, shorter durations (<6 months) of preceding seton drainage may be associated with higher success rates, although larger series are required to verify an effect.

VIDEO-ASSISTED ANAL FISTULA TREATMENT AS A MINIMALLY INVASIVE TREATMENT FOR TRANSSPHINCTERIC FISTULA-IN-ANO.

(P63)

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Purpose: There are several treatment options available for trans-sphincteric fistula-in-ano but none of them is a gold standard. VAAFT (Video assisted treatment for Anal Fistula) is the latest addition in the treatment options for fistula-in-ano. We present our initial experience with VAAFT in trans-sphincter fistula-in-ano.

Methods: The pre and post-operative continence scoring was done with Vaizy Incontinence scoring (0- Perfect continence, 24- Total incontinence). The operation was done in the lithotomy position. The fistulascope was inserted through the external opening, the tracts were identified and the internal opening was localized. Hyperosmolar solution (Glycine plus mannitol) was used as the medium. The internal opening and the tract lining was cauterized with electrocautery, cleaned with endoscopic forceps and brush and washed thoroughly. The internal opening was sutured in two layers with an absorbable suture. No glue was used to reinforce the internal opening closure. In the patients with multiple external openings, non-closure of even one external opening was counted as failure of the procedure.

Results: 36 patients (33-male, 3 –female) were operated over a period of 16 months. The mean age was 39.3 ± 13.4 years and the follow-up ranged from 2-15 months (median- 7.5 months). The follow-up was done in all the patients. 9/36 (25%) patients had a recurrent fistula and had undergone 12 previous operations. The fistula was present for an average of 5.7 years (range- 4months to 24 years). The procedure went uneventful in all the patients and all the tracts could be visualized endoscopically and cauterized satisfactorily. All the patients were discharged with in 24 hours of the operation. 25/36 (69 %) had their fistula completely healed with cessation of discharge from all the external openings. 11/36 (31%) had recurrence of symptoms. The operation had no impact on continence status (no change in pre and post-operative Vaizy incontinence scoring).

Conclusions: VAAFT is a new minimally invasive method to treat trans-sphincteric fistula-in-ano. It has moderate success rate (69%) with minimal morbidity and least effect on anal incontinence. Long term results are awaited.

CONTEMPORARY OUTCOMES OF NEUTROPENIC LEUKEMIC PATIENTS ADMITTED WITH PERIANAL SEPSIS.

(P64)

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Purpose: Infectious complications are a significant cause of morbidity and mortality among neutropenic leukemia patients. The aim of this study was to investigate current treatment patterns and outcomes in neutropenic leukemia patients with perianal sepsis.

Methods: Analysis of the Nationwide Inpatient Sample (NIS) from the Healthcare and Utilization Project (HCUP) from 2006 to 2009 was performed. ICD9 codes were used to identify patients admitted with a principal diagnosis of perianal sepsis, neutropenia, and leukemia. Neutropenic leukemic patients with perianal sepsis were compared to non-neutropenic patients. Demographic variables, comorbidities, the rates for incision and drainage, or colostomy creation were examined. Multivariable analysis was performed to assess the impact of these variables on in-hospital mortality.

Results: 153,000 discharges were identified with a primary diagnosis of perianal sepsis. Of these, 2,670 (1.7%) had a concurrent diagnosis of neutropenia, and 1,177 (0.7%) had both leukemia and neutropenia. The median age of the population was 48.0 (1-84), 70.1 % of the patients were male, 57.9 % were white, and the median LOS was 14.0 days (0-113). Incision and drainage of perianal sepsis was performed in 7.5 % of patients. Few patients required a diverting colostomy (0.8 %). Overall, in-hospital mortality was significantly higher among neutropenic leukemic patients compared to the non-neutropenic population, 9.7% vs. 1.3% respectively ($p < 0.001$). In addition, on multivariate analysis, the odds of in-hospital mortality were significantly higher if patients had a diagnosis of heart failure or diabetes, or if a diverting colostomy was performed.

Conclusions: Perianal sepsis remains an uncommon but serious diagnosis in neutropenic leukemia patients, with a significantly higher in-hospital mortality rate compared to non-neutropenic patients. Surgical intervention was performed in less than 10% of these patients. Although an incision and drainage procedure was not associated with a higher mortality rate, patients requiring a colostomy had an increased risk of in-hospital mortality.

TREATMENT OF RECURRENT COMPLEX ANAL FISTULA WITH VIDEO-ASSISTED ANAL FISTULA TREATMENT: PRELIMINARY RESULTS.

(P65)

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Purpose: We report preliminary data of a prospective study designed to evaluate early and long-term outcomes of VAAFT (Video-assisted anal fistula treatment) in the treatment of recurrent complex anal fistula

Methods: From November 2011 to November 2012 a total of 90 consecutive patients referred in our coloproctology unit. All patients had a recurrent complex anal fistula and were treated by VAAFT (proposed by Meinero with Karl Storz Video Equipment). Postoperative evaluation was made at 15 days, 1, 3, 6 and 12 months

Results: All patients were treated with VAAFT. The median follow-up period was 6 months. Fistulas were transphincteric in 60 patients, extrasphincteric in 21 patients and intersphincteric in 9 patients. 8 patients had a loose seton placement before VAAFT. 15 patients were previously treated by stapled transanal rectal resection. No major complications, active sepsis or mortality were observed. Only two minor bleeding were observed and postoperative pain was acceptable. As regards the early-term follow-up, a success rate of 96% was achieved without continence impairment. Three patients had persistent symptoms and required further surgical treatment

Conclusions: The surgical treatment of recurrent complex anal fistula still remains challenging and a sphincter-saving procedure is desirable. Our preliminary data suggest that VAAFT is a simple, minimally invasive, safe, sphincter-saving and potentially effective procedure to treat complex anal fistula.

A REVIEW OF EXPERIENCE WITH DERMAL ISLAND FLAP ANOPLASTY FOR FISTULA-IN-ANO.

(P66)

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Purpose: Dermal island flap anoplasty has been used for the treatment of transsphincteric fistula in ano. The purpose of this study was to assess the success rate of this procedure and to determine if there are risk factors that might predict failure.

Methods: A retrospective review of patients undergoing dermal island flap anoplasty from 2005 to 2012 was performed. Variables collected were age, gender, fistula location, length of fistula tract, previous attempts at repair, presence of Crohn's disease, and smoking history. Primary outcome was resolution of symptoms and evi-

dence of healed fistula. Variables were assessed using Fisher Exact Probability Test. Treatment and outcome of persistent or recurrent fistulas were also reviewed.

Results: Thirty-one dermal flaps were performed in 28 individuals (ages 24-64, mean 43 years). Median follow up was 6 months. Four patients were lost to follow up. Dermal island flap was successful in healing 60% of fistulas. Sixty seven percent of patients were successfully treated. No significant differences were found when comparing anatomic and patient variables to resolution of fistula. Fistulas that were reported healed at 3-4 months remained healed at further follow up. Dermal island flap was equally successful in treating patients who had undergone previous operations as those who had not. Re-do dermal flap anoplasty was also successful in treating two patients with persistent fistulas. There was only one patient in our series with Crohn's disease who was successfully treated with dermal flap.

Conclusions: Dermal island flap anoplasty continues to be a successful treatment option for the repair of transspincteric fistula in ano, even when other treatments have failed. Success of the procedure is typically apparent within the first few months of follow up. No specific risk factors that might predict failure were identified.

P66

	Number healed/total	
Gender		P=0.5
Male	12/20	
Female	5/7	
Crohn's disease	1/1	
Smoking		P=0.57
Yes	5/7	
No	13/20	
Location		P=0.66
Posterior	8/12	
Non-posterior	10/15	
Length of tract		P=0.6
< 3 cm	1/1	
≥ 3 cm	13/20	
Not specified	4/6	
Previous repairs		P=0.58
none	11/19	
≥ 1	5/8	

PREDICTIVE FACTORS FOR HEALING OF PERIANAL ABSCESSES IN PATIENTS WITH HEMATOLOGIC DISORDERS.

(P67)

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Purpose: This study was intended to evaluate factors affecting outcome of perianal abscess in patients with hematologic disorders in whom immune status was compromised.

Methods: From January 2004 to December 2009, 30 patient with leukemia (N=25), lymphoma (N=2), or other hematologic disorders (N=3) were managed for perianal abscess. Drainage was delayed if fluctuation was not definite, absolute neutrophil count (ANC) was near 0 and patient had no fever at the nadir period. Otherwise immediate surgical drain was performed. GM-CSF was used when necessary and all patients were treated with antibiotics. Prospectively collected patients were analyzed retrospectively

Results: Twenty-six patients underwent surgical drainage (immediate in 11, delayed in 15) and drain insertion was needed in 7 patients with severe localized inflammation. Four patients with mild disease or spontaneous rupture were managed conservatively. Median age was 37 years (range 17~68), and 24 were male. The overall healing rate was 70% (21/30). Nine patients (30%) experienced persistent wound at 8 weeks or recurrence. There were 3 mortalities, none related to perianal abscess. On univariate analysis, healing rates were not different with respect to age, sex, primary disease, necessity for drain insertion, fever at operation, delayed operation by intention (delayed vs immediate, 74% vs 64%, p=0.563), neutropenia (ANC<500) at operation (absent vs present, 70% vs 40%, p=0.211), and GM-CSF use (used vs not used,74% 57%, p=0.397). Median ANC at operation (1628/ul vs 1563/ul, p=0.934) and the change of ANC between consultation and operation (-113/ul vs 0/ul, p=0.164) were not different. On multivariate analysis, healing rate was significantly better in cases without drain insertion compared to severe cases needing drain insertion (OR 14.7, 95% CI 1.16~185, p=0.038), and in patients who were given GM-CSF (OR 16.5, 95% CI 1.09~250, p=0.043).

Conclusions: The healing rates of perianal abscess in patients with hematologic diseases were related with severity of local inflammation as determined by necessity for drain insertion, and the use of GM-CSF. If patient's ANC is low, combined antibiotics and GM-CSF use followed by delayed operation can be considered.

TREATMENT OF RECTOVAGINAL FISTULA FOLLOWING LOW ANTERIOR RESECTION OF THE RECTUM FOR CANCER.

(P68)

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Purpose: A fistula between the neo-rectum and the vagina (recto-vaginal fistula; RVF) following low anterior resection of the rectum for cancer (LAR) is a wellknown complication in female rectal cancer patients. The aim

was to assess how RVF was treated in a population based setting.

Methods: All women who underwent LAR at one colorectal teaching unit during a 17 year period were analysed and patients who developed symptomatic RVF were identified. Patient demography, treatment strategy and outcome were analysed.

Results: Between 1995 and 2011 a total of 146 women underwent LAR whereof 14.8% (23/146) developed symptomatic anastomotic leakage including 5.5% (8/146) RVF (median age 65, preoperative radiotherapy 8/8, defunctioning stoma (DS) 4/8, tumor height 8 cm and level of anastomosis median 5 cm). Following diagnosis of the RVF, the initial treatment strategy was DS (n=6) and permanent end colostomy (n=2). No patient had their RVF healed by DS and conservative treatment after median 8 months. Herafter a decision with regard to possible reconstructive surgery was taken. This resulted in that 3/6 DS were deemed as permanent, and that another three patients underwent reconstructive surgery. Reconstruction of the RVF was initially performed by interposition of the puborectalis muscle, whereof one patient healed and two did not. One patient developed liver metastases and therefore kept the DS but later deseased despite surgery of the liver metastases. One patient underwent a second reconstruction with a vaginal advancement flap which also did not heal. The same patient underwent a third reconstruction with a musculus gracilis interposition, which healed permanently. The patients with healed RVF had their DS reversed after 8 and 10 months respectively, and had not recurred after a follow up of 5 and 6 years, respectively. Permanent healing was thus obtained in 1/1 patient in whom non radiated tissue was used, and in 1 out of 4 in whom radiated tissue was used for the reconstruction.

Conclusions: No patient with RVF healed with conservative treatment and defunctioning stoma. Two out of three healed following surgical reconstruction, and outcome was better when unradiated tissue was used for the reconstruction.

LIGATION OF INTERSPHINCTERIC FISTULA TRACT FOR THE TREATMENT OF FISTULA-IN-ANO: EARLY EXPERIENCE OF AN INSTITUTION.

(P69)

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Purpose: Fistula in ano is a chronic manifestation of the anorectal sepsis. The goal of the surgical management is to eradicate sepsis and fistula tract without sacrificing the sphincter function. Ligation of the Intersphincteric Fistula Tract (LIFT) is a novel sphincter saving operation for the treatment of fistula in ano. The aim of this study is to review the result of the LIFT technique for the treatment of suitable simple and complex fistula in ano at our institution.

Methods: All 19 patients, who had undergone LIFT from 8/2010 to 8/2012, were included in the study. LIFT was done as described by Rojanasakul et al. Data regarding demographics, etiology and type of fistula, healing rate, healing time, use of seton before the LIFT, recurrence, and morbidities associated with the procedure were obtained retrospectively.

Results: All fistulas were cryptoglandular and transsphincteric in origin with 2 involving rectovaginal septum. Median age was 42 years, 11(57.9%) were male while 8 (42.1%) were female. Nine (47.4%) patients had complex fistula whereas 10 (52.6%) had simple ones. Four (21%) patients had prior failed fistula surgeries, 16 (84.2%) had seton placement for median of 27 weeks (minimum 8, maximum 50) prior to LIFT surgery. Primary healing occurred in 15 (78.9%) patients; the status of healing could not be determined in 1 (5.3%) patient due to failure of follow-up. The median healing time was 6 weeks (range from 2 to 20) and the median follow up period was 12 weeks. Three (15.8%) patients developed recurrent transsphincteric fistula while 2 (10.5%) patients developed abscess at the incision site which were treated with incision and drainage. Three patients with complex fistula who had failed mucosal advance flaps or plug repair, 2 with rectovaginal fistula, 1 with J pouch, and 1 with Crohn's disease had excellent result from the LIFT. No patients developed post-operative incontinence.

Conclusions: Although a small percentage of patients do not improve with this surgery, LIFT is a safe and effective operation for most. It can be used for simple transphincteric and complex fistulas, including rectovaginal fistula and patients who had multiple prior failed surgeries.

TREATMENT OF FISTULA-IN-ANO USING FISTULA PLUG.

(P70)

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Purpose: Anal fistulas are often caused by previous anorectal abscess but can also develop secondary to trauma, Crohn's disease and infection. They are a major source of patient morbidity and remain a challenge to treat. Traditionally surgical fistulotomy has been the primary treatment; however it may yield some degree of incontinence. The anal fistula plug is a novel option for fistula-in-ano treatment. We present and evaluate one surgeon's experience with using fistula plugs in a diverse group of patients at one surgical centre.

Methods: Data were retrospectively collected and analyzed from patients undergoing insertion of a fistula plug between July 2006 and April 2012. Seton insertion was performed and left in place for 2-3 months prior to plug insertion. BioDesign fistula plugs were inserted according to standard protocol by one colorectal surgeon. Data collected included patient demographics, fistula location and depth, co-morbidities and postoperative outcome. Patients were followed up for a minimum of 6 months and up to 6 years.

Results: Twenty-seven patients underwent insertion of 36 plugs (16 men, mean 53y; 11 women, mean 42y). Only one patient had a prior fistulotomy. Fourteen patients with transpherincteric fistulas (56%) had successful healing following initial insertion of plug, with overall success rate of 17/36 plugs (47%). All Crohn's patients (n=3) and all patients with intersphincteric tracts (n=2) failed at first attempt with plug. Patients with internal posterior fistula openings (n=15) had a greater overall success rate than patients with internal anterior (n=5) or lateral openings (n=7) (67% vs. 60% and 28%). Four patients (5 fistulas) had a large internal opening (>5mm), which all failed initial plug insertion.

Conclusions: Treatment success with anal fistula plug may rely on fistula characteristics and patient co-morbidities. First attempt failure rate was higher in patients with Crohn's disease, with interrsphinteric tracts and large internal openings (>5mm). Furthermore, fistula location also affected outcomes, with posterior openings having a higher success rate than anterior or lateral. We suggest the fistula plug should remain a first-line treatment in small transpherincteric fistulas in patient's without Crohn's disease.

TREATMENT OF THROMBOSED EXTERNAL HEMORRHOIDS IN PREGNANCY: A RETROSPECTIVE REVIEW OF OUTCOMES.

(P71)

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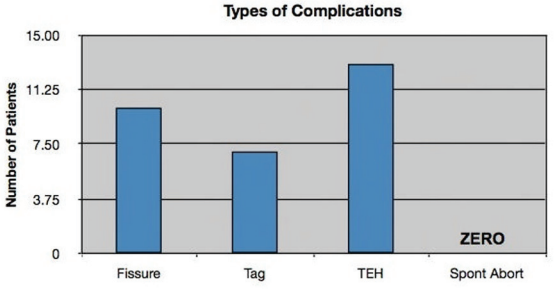
Purpose: Hemorrhoidal disease affects 4-10% of the population with a higher prevalence in pregnancy. In the third trimester, 7.8% of pregnant females will experience a thrombosed external hemorrhoid (TEH). Many sources state the best initial treatment is prevention. The literature has been modest when it comes to surgical outcomes of TEH in pregnancy. In order to assess the safety and efficacy of performing surgical excision of TEH in pregnancy, we conducted a retrospective cohort study. The objective was to determine if performing excision of TEH in pregnancy was safe and effective by examining complication and recurrence rates.

Methods: With the assistance of a software system, 1700 female patients with a diagnosis of TEH were identified from January 1990 through December 2011. Of these patients, 333 (19.6%) underwent excision of a TEH and 1367 (80.4%) received medical management only. Forty (12%) of the 333 patients were pregnant. This subset population of pregnant females was further examined. Data retrieved included patient demographics, symptoms at onset, co-morbidities, gestational age at presentation, procedures performed, and any complications or recurrences.

Results: Of female patients undergoing excision of TEH, 12% were pregnant. Average gestational age was 31.8 weeks. The most common post-op complication was development of another TEH (32.5%). The second most common complication was fissure (25%) followed by hemorrhoidal tags (17.5%). Twenty-one patients developed a complication of recurrence, fissure, or tag. Of those patients, seven (33.3%) were managed by surgery alone, eight (38.1%) by conservative therapy alone, and six (28.6%) by a combination. There were no spontaneous abortions or admissions for preterm labor.

Conclusions: Although there was once concern to suggest abandonment of surgical treatment of TEHs in pregnancy secondary to harm to the mother and/or fetus, our data suggests there is no increased risk of inducing preterm labor or miscarriage. None of this cohort experienced any obstetrical complications secondary to TEH excision. The two most common complications post-op, recurrence of TEH and anal fissure, are both amenable to further definitive treatment postpartum.



The most common post-op complication was recurrence of a TEH (32.5%). The second most common complication was fissure (25%) followed by development of a hemorrhoidal tag (17.5%). There were no spontaneous abortions or instances of preterm labor.

ARE THE LONG-TERM OUTCOMES OF PPH DURABLE?

(P72)

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Purpose: The procedure for prolapse and hemorrhoids (PPH) has been associated with less postoperative pain, earlier discharge, and less morbidity than hemorrhoidectomy. However, data on the long-term results of PPH are limited. Therefore, this study was conducted to describe the outcomes of patients treated with PPH in a single institution during an 11-year period.

Methods: Patients who underwent PPH between 8/2000 and 12/2011 were identified from an IRB-approved prospective database. Patients who underwent any concomitant anorectal procedure were excluded from the study. Data obtained through chart review included demographics, complications and recurrence at physical exam. A questionnaire was sent to all patients to assess residual symptoms and satisfaction with the procedure. Statistical analysis was performed using the Wilcoxon signed-ranks test; a p value of <0.05 was considered statistically significant.

Results: 238 of 275 eligible patients (64% male) of a mean age of 59 years were evaluated. The median follow-up was 89 (10-145) months. The majority of patients (74.8%) had grade III hemorrhoids. The overall complication rate was 26.0% (22.2% early, 3.8% late). The most common early complication was urinary retention (19 patients; 8%), although 12 (5.1%) patients were admitted for pain control. Eleven (4.6%) patients had bleeding at a mean of 3.27 (1-14) days, 4 of whom required surgery. Anal fissure occurred in 8 patients (3.4%), and 2 patients developed thrombosed external hemorrhoids needing surgery. One patient had sepsis and required admission for intravenous antibiotics. Anal stenosis occurred in 1 (0.4%) patient who needed anal dilatation. Eight (3.4%) patients had recurrence, all managed with open hemorrhoidectomy. Seventy-six (31.9%) patients responded to the questionnaire. Patients reported significant PPH-related reductions in symptoms of anal pain, bleeding, protrusion and itchiness. Sixty-five (85.5%) respondents were "very satisfied" or "satisfied" with the procedure.

Conclusions: PPH is a safe procedure with low recurrence and complication rates. Most patients report improved symptoms and are satisfied with their long-term outcomes.

COST EFFECTIVENESS OF COMBINED COLONOSCOPY AND THREE QUADRANT HEMORRHOIDAL LIGATION FOR RECTAL BLEEDING.

(P73)

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Purpose: Lower GI bleeding requires diagnostic colonoscopy, and the majority of cases are due to bleeding internal hemorrhoids. Conventional treatment involves colonoscopy followed by office ligation of each hemorrhoidal complex on three separate visits (staged technique). Combined colonoscopy and synchronous three quadrant hemorrhoidal ligation (combined technique) is a more convenient method and has comparable outcomes to conventional technique. We studied the cost comparisons of combined colonoscopy and synchronous three quadrant hemorrhoidal ligation vs. staged colonoscopy and three-session single hemorrhoidal ligation.

Methods: A 10 year efficacy and cost analysis was performed on patients undergoing colonoscopy and synchronous three quadrant hemorrhoidal ligation (combined technique) using the TriView™ anoscope and the Saeed ShortShot Multi-Band Hemorrhoidal Ligator™ (Cook Endoscopy, Winston-Salem, NC). Total costs were compared for colonoscopy followed by office ligation of each hemorrhoidal complex on three separate visits (staged technique). Applicable local Medicare reimbursement data for facility and provider fees was compiled and appropriate code modifiers and global periods were applied for all procedures performed. Total costs for combined and conventional methodologies were calculated.

Results: 1000 patients underwent combined technique of colonoscopy and ligation and 934 (93.4%)had resolution of symptoms and 66 patients (6.6%) required repeat ligation. Eighteen patients (1.8%) required elective completion hemorrhoidectomy. For the combined technique, average Medicare reimbursement was $1120 per patient ($824 facility fee and $296 provider fee). Equivalent costs for colonoscopy followed by three office ligations (conventional technique) were $1360 ($636 facility fee and $724 provider fee). Total costs for combined colonoscopy and ligation were therefore 18% less than staged technique.

Conclusions: Colonoscopy and synchronous three quadrant hemorrhoidal ligation is a convenient, safe, and effective method of treating symptomatic internal hemorrhoids. Total costs of the combined technique are 18% less than staged colonoscopy and single hemorrhoidal ligation.

RUBBER BAND LIGATION OF SYMPTOMATIC HEMORRHOIDS IS SAFE WHILE ON PLAVIX AND ASPIRIN.

(P74)

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Purpose: The use of Clopidogrel and Aspirin to prevent thrombosis is prevalent. For symptomatic internal hemorrhoids, rubber band ligation is the most common office procedure performed in a colon and rectal surgery practice. The aim of this study is to evaluate the safety of rubber band ligation in patients with Grade I, II and III symptomatic internal hemorrhoids while on Plavix or Aspirin and Plavix.

Methods: Retrospective cohort study of patients who underwent rubber band ligation for symptomatic Grade I, II and III hemorrhoids while on Plavix or Aspirin and Plavix between 2005-2011. Our control group consisted of age and gender matched patients who underwent rubber band ligation during this same time period. Our primary outcome measures were the risk of significant and insignificant bleeding in a 30 day follow-up period after rubber band ligation. Insignificant bleeding was defined as passage of blood or blood clots per rectum with spontaneous

stoppage and no need for further intervention.Significant bleeding was defined as patients requiring hospital admission, transfusions of blood, or intervention to control bleeding. The t-test was used for statistical analysis with $p < 0.05$ considered significant.

Results: There were 61 patients in our study with a median age of 75 and gender distribution of 29 males and 33 females. Thirty-one patients were in the control group and 31 patients in the anti-platelet group. Of the 31 patients on anti-platelet therapy, 21 patients were on Plavix alone (n=21) or Plavix and Aspirin (n=10). In the Plavix only group, 1 patient (4.8%) developed insignificant bleeding. In the Aspirin-Plavix group, 1 patient (10%) presented with significant bleeding which was controlled with electrocautery. In the control group,6 patients (19%) had an insignificant bleeding complication. There was no statistically significant difference in risk of bleeding between the groups (p value= 0.15).

Conclusions: Bleeding complication rates following rubber band ligation in patients on Plavix or Aspirin and Plavix is equal to the risk of bleeding in patients not on anti-platelet medications. With no significant difference in bleeding complication rates, rubber band ligation is safe in this subgroup of patients.

PROPHYLACTIC ANTIBIOTICS FOR HEMORRHOIDECTOMY: ARE THEY REALLY NEEDED?

(P75)

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Purpose: Hemorrhoidectomy is considered by many to be a contaminated operation that requires antibiotic prophylaxis to lower the incidence of surgical site infection (SSI). In reality, little evidence exists to either support or refute the use of antibiotic prophylaxis in this setting.

Methods: We conducted a multi-institutional retrospective database review from 2006-2012 to identify all patients undergoing elective hemorrhoidectomy with a minimum of 3 months follow-up. Patient demographics including known preoperative risk factors for SSI, rate of antibiotic prophylaxis use, and incidence of postoperative SSI were analyzed. SSI was defined using World Health Organization-defined criteria.

Results: 903 patients met inclusion criteria (49.1% female; mean age 50.3 + 13.8 years). Prevalence of preoperative risk factors for SSI included 8.3% with a smoking history, 2.8% with diabetes mellitus, 1.0% receiving steroids, and 0.2% with Crohn's disease. Surgery was performed predominately for 3-column prolapsed internal and mixed internal/external hemorrhoidal disease. Nearly half (48.9%) of surgeries performed were closed hemorrhoidectomies. Antibiotic prophylaxis was used in a lower number of cases (42.4% vs. 57.6%). Overall, there were only 12 documented postoperative SSIs identified, producing an overall incidence of 1.3%. Of those patients that developed postoperative SSI, 75% (9) did not receive antibiotic prophylaxis ($p = 0.38$). On multivariate regression analysis, no perioperative risk factor was associated with a greater likelihood of developing a postoperative SSI. Conversely, there were no adverse antibiotic-related complications such as Clostridium difficile colitis or antibiotic-associated diarrhea in those receiving antibiotic prophylaxis.

Conclusions: Postoperative surgical site infection is an exceedingly rare event following hemorrhoidectomy. Antibiotic prophylaxis does not reduce the incidence of postoperative surgical site infection and its routine use appears unnecessary.

QUALITY OF LIFE AND FUNCTIONAL OUTCOMES AFTER CIRCULAR STAPLED HEMORRHOIDOPEXY VERSUS FERGUSON HEMORRHOIDECTOMY: A STUDY OF 217 PATIENTS WITH LONG-TERM FOLLOW-UP.

(P76)

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Purpose: Efficacy, superior short-term outcomes and lower anal pain with circular stapled hemorrhoidopexy (SH) is supported by a growing body of evidence. However, no studies have to date compared quality of life (QOL) and functional results with longer than 5 year follow-up after SH and Ferguson hemorrhoidectomy (FH).

Methods: Patients undergoing SH and FH at a single institution between 2000-2010 were included in the study and invited to complete a questionnaire querying their satisfaction, QOL, current symptoms, functional outcomes and necessity of further treatment after surgery. QOL and anorectal function were assessed using validated questionnaires including Cleveland Global Quality of Life (CGQL), Fecal Incontinence Quality of Life (FIQL) and Fecal Incontinence Severity Index (FISI).

Results: 118 of 314 patients (38%), and 99 out of 218 patients (45%) who had FH and SH respectively, responded to the questionnaires. Mean follow-up was 7.7±3.4 vs.6.3±2.9 years; ($p=0.003$) after FH and SH, respectively. Long-term complications included prolapsed hemorrhoids (27 vs. 35 %; $p=0.24$), rectal bleeding (23 vs. 32 %; $p=0.13$), anal hygiene issues/itching (18 vs. 23 %; $p=0.4$), anal pain (13 vs. 14 %; $p=0.84$), difficult evacuation (10 vs. 12 %; $p=0.67$), stricture (7 vs. 4 %; $p=0.38$) and urination problems (1 vs. 2 %; $p=0.59$). During follow-up, one FH patient was diagnosed with a perianal abscess at one year and one FH patient developed rectal cancer ten years after the hemorrhoid surgery. Need for additional surgical or medical treatment was similar in both groups.

81% of FH patients vs. 83% SH stated they would undergo hemorrhoid surgery again if needed (p=0.86). FISI scores were similar between the groups (16.7±13.4 vs. 16.7±13.1; p=0.96). CGOL, FIQL scores and patient demographics were similar between the groups at the time of the survey (table).

Conclusions: This data shows SH and FH provide comparable long-term morbidity, functional outcomes and satisfactory quality of life. In addition to short term benefits, SH offers similar long-term control of symptoms with comparable necessity for additional surgical or medical treatment to FH.

GABAPENTIN SIGNIFICANTLY DECREASES POSTHEMORRHOIDECTOMY PAIN: A PROSPECTIVE STUDY.

(P77)

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Purpose: Surgery for symptomatic hemorrhoids remains a painful procedure with prolonged recovery. Gabapentin is Widely used for management of acute and chronic pain. The aim of this study is to evaluate the effect of gabapentin on post-hemorrhoidectomy pain and opioid use

Methods: This is a single center, prospective, open-label study. Consecutive patients requiring hemorrhoid surgery were randomized to receive standard treatment (control group - local anesthetic at the time of surgery and post-operative multimodality pain regimen including acetaminophen, NSAIDs and opioid) or treatment group (standard treatment plus daily dose of Gabapentin from day prior to 7 days after surgery). Phone surveys were performed assessing for pain level number of opioid pills taken on post-operative days 1, 7, 14 and 30

Results: A total of 17 treatment and 13 control patients were recruited into the study. One patient from the study group and 2 patients from the control group were excluded due to failure to follow up. Pain levels for the gabapentin group were significantly lower on POD 1, 7 and 14 when compared to the standard treatment group (3.68 vs. 6.82 p<0.01; 2.68 vs. 5 p=0.02 and 0.75 vs. 3.64 p<0.001 respectively). There was a trend towards lower number of opioid medications taken in gabapentin group for POD 1, 7 and

P76 Patient characteristics, satisfaction, quality of life and need for further treatment after Ferguson hemorrhoidectomy (FH) and circular stapled hemorrhoidopexy (SH)

	FH (n=118)	SH(n=99)	P value
Age (years)	53.7±12.5	56.1±10.97	0.1
Female/Male	59/59	36/63	0.054
Operations during study period			
2000-2005	71 (60 %)	50 (51 %)	0.17
2006-2010	47 (40 %)	49 (49 %)	
Symptom improvement after hemorrhoid surgery			
Greatly improved	75 (64 %)	55 (56 %)	0.06
Improved	36 (31 %)	32 (32 %)	
Unchanged	5 (4 %)	12 (12 %)	
Worse	2 (2 %)	0	
Recommending hemorrhoid surgery to others			
Yes	97 (84 %)	84 (87 %)	0.7
No	18 (16 %)	13 (13 %)	
Anorectal pain *	1.23±2.45	1.37±2.17	0.16
CGQL ‡	0.75±0.27	0.69±0.28	0.07
FIQL †			
Lifestyle	3.04±1.42	3.09±1.4	0.85
Coping/Behavior	2.85±1.33	2.98±1.32	0.22
Depression/Self Perception	2.96±0.95	3.15±0.86	0.07
Embarrassment	3.08±1.44	3.21±1.34	0.51
Need for additional treatment after hemorrhoid surgery			
Medical	4 (3 %)	3 (3 %)	1
Surgical	3 (3 %)	5 (5%)	0.47

* Assessed with visual analog score at time of the survey (0: worse; 10: best);

‡ (0: worse; 1: best); † (1: worse; 4: best).

CGQL: Cleveland global quality of life; FIQL: Fecal incontinence quality of life.

14 (4.69 vs. 6.36; 2.13 vs. 2.73 and 0.125 vs. 0.9) but it did not reach statistical significance. Average hemorrhoidal grade and number of hemorrhoidal complexes removed was similar between gabapentin and treatment group. Four patients in control group experienced post-operative complications (2 with urinary retention, one each bleeding and fecal impaction) vs. two patients in gabapentin group (urinary retention). All complications required visit to emergency room. No gabapentin related complications were seen in treatment group. The average cost of gabapentin course was $5.34 per patient

Conclusions: Daily use of gabapentin in the perioperative period significantly decreased levels of post-operative pain. This is an effective, inexpensive addition to improve pain after hemorrhoid surgery. Randomized placebo-controlled studies would better define the usefulness of this medication in the post-hemorrhoidectomy patient.

36 MM TISSUE SELECTING TECHNIUQE: A SIMPLE AND EFFECTIVE TECHNIQUE FOR PATIENTS WITH LARGE PROLAPSING HEMORRHOIDS AND OBSTRUCTED CONSTIPATION SYNDROME.

(P78)

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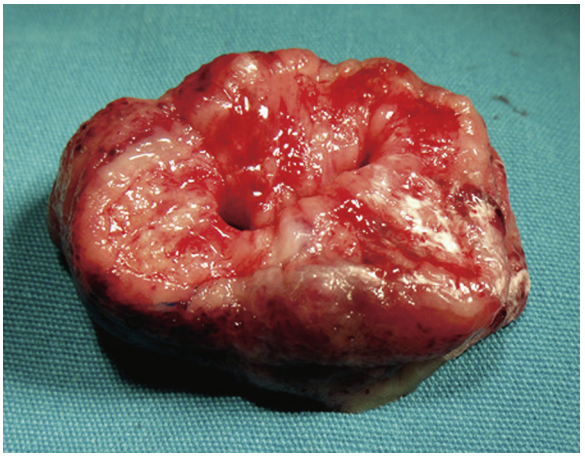
Purpose: Stapled transanal resections for large prolapsing hemorrhoids and obstructed defecation syndromes (ODS) have gain popularity with favourable results. However, the mean weaknessess of this procedure was related to recurrence rate and some major complications that can occur. Considering that a larger resection could help to avoid recurrence and that a better technology and an easier procedure could help to reduce some important complications, the need of a revision and an evolution of the devices and the procedure seem to be essential. 36 mm Tissue selecting technique (36mm TST), which came with a 36 mm diameter stapled case, was one of our attempts to achieve these goals. Therefore, this study is designed to assess the safety, efficacy, and postoperative outcomes of 36mm TST.

Methods: All the consecutive patients enrolled in the sixth affiliated hospital of Sun yat-sen university affected by Grade III-IV hemorrhoids and ODS due to rectocele and/or rectal intussusception that underwent stapled transanal resection with 36mm TST were included in the present study. Data pertaining to demographics, preoperative characteristics and postoperative outcomes was collected and analyzed.

Results: Twelve eligible patients underwent 36mm TST. Of 12 patients 5 was Grade IV hemorrhoids while 7 was ODS with a mean Cleveland Clinic Score for Constipation (CCSC) 13.7±1.1. Blood loss in patients was 8.0 ml (range, 5.0~15.0ml). The operative time was 8 min (range, 5~15 min). The volume of the resected specimen was 13ml (range, 12~15ml). Postoperative VAS was 2 (range, 1~4), 2 (range, 1~4), 2 (range, 1~3), 1 (range, 0~3), 1 (range, 0~2) and 2 (range, 2~4) at 12 h, day 1, 2, 3, and 7, and first defecation. No patients developed anal incontinence or stenosis. The CCSC for the 7 patients with ODS was 9.0±0.8 three months postoperatively (P=0.001). No recurrent prolapsing symptom was found in 5 with Grade IV hemorrhoids.

Conclusions: 36mm TST allows to obtain a great resection of rectal tissue and it also provides a surprising lifting effect. Therefore, 36 mm TST appears to be a simple safe and effective technique for patients with large prolapsing hemorrhoids and ODS.



The resected rectal specimen

STAPLED HEMORRHOIDOPEXY VERSUS TRANSANAL HEMORRHOIDAL DEARTERIALIZATION: A PROSPECTIVE STUDY WITH A LONG-TERM FOLLOW-UP.

(P79)

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Purpose: This prospective study was designed to compare the outcome of stapled haemorrhoidopexy (SH) versus transanal haemorrhoidal dearterialization (THD) for the treatment of haemorrhoidal disease.

Methods: From January 2007 to December 2008 100 patients, 50 for each arm (45F, 55M, mean age 42) affected by third or fourth degree haemorrhoids were enrolled in the study. Preoperatively, all underwent clinical examination and proctoscopy. The two techniques were evaluated with respect to the operative time, pain scores, complications, return to work, level of satisfaction and recurrency.

Results: The median follow up period was 50 (range 39-62) months. The mean operative time was significantly shorter in the SH group (P<0,001). The blood loss, pain scores and requirement of analgesics were similar in the

two groups. The patients in the SH group returned to work or routine activities significantly earlier as compared to the THD group (P<0,001). Recurrency was significantly less in the SH group (P<0,05). An overall satisfactory rate of 85% was achieved in THD group and 90% in the SH group.

Conclusions: Stapled haemorrhoidopexy and THD are both safe and effective day-care procedures for the treatment of grade III and grade IV haemorrhoids. Return to work is quicker after SH. Patient satisfaction was similar in both groups. Long term follow up demonstrated that stapled haemorrhoidopexy has a significantly lower rate of recurrency compared to the THD technique.

ANGIOGRAPHY: FUTILE EFFORT IN THE MANAGEMENT OF LOWER GASTROINTESTINAL BLEED.

(P80)

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Purpose: Management of lower gastrointestinal bleeding (LGIB) has evolved with the introduction of bleeding scan and angiography with potential benefits of localization and embolization. We sought to examine clinical and economic outcomes of angiography in the management of LGIB.

Methods: LGIB cases were identified from the Nationwide Inpatient Sample from 2001 to 2009. Angiography cases were compared with the control group, LGIB cases without angiography. Data analysis included demographics, hospital variables, procedures, length of stay (LOS), and total hospital charges (THC).

Results: A total of 33,387 LGIB angiography cases were identified. Angiography cases were more likely to be transfer cases (OR 1.964, P<0.001) to teaching hospitals (1.311, P=0.009) for patients living in metropolitan areas (OR 1.458, P<0.001). Angiography cases were more likely to require transfusion (OR 2.226, P<0.001) and eventual colectomy (OR 1.794, P<0.001). In the subgroup analysis of all patients who required colectomy, angiography cases were more likely to undergo total abdominal colectomy (OR 2.106, P<0.001) and less likely to undergo partial colectomy (OR 0.481, P<0.001). Angiography cases resulted in a longer median LOS (14 days vs 12 days, P<0.001) with a higher mean THC ($125,469 vs $108,531, P<0.001).

Conclusions: LGIB management may require transfer to teaching hospitals for angiography with an increased economic burden. Angiography however is associated with an increased transfusion requirement and eventual total colectomy rather than partial colectomy. Theoretical benefits of localization and potential therapeutic role of angiography remain to be explored in the management of LGIB.

COMPARATIVE STUDY BETWEEN TWO OPERATIVE TECHNIQUES OF PILONIDAL SINUS DISEASE.

(P81)

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Purpose: This clinical study compares the results obtained in the surgical treatment of the pilonidal sinus disease through random allocation of patients between those subjected to, a) using the excision and marsupialization technique and b) the technique of excision of the sinus tracts using a radiofrequency device

Methods: A total of 28 patients of chronic pilonidal sinus disease were randomized to undergo radiofrequency sinus excision technique (n=14) or excision and marsupialization (n=14). The demographic data, postoperative results, complications and recurrence were documented for comparison of the results. Patients from both the groups were recalled after 12 months to assess recurrence.

Results: Radiofrequency technique resulted in reducing the execution time (13 versus 34 minutes) as well as the hospital stay (9 versus 30 hrs). The postoperative pain (p=0. 04) and period off work (p= 0.01) was more with the marsupialization technique. Two patients from marsupialization developed wound infection. At subsequent follow-up, there was one case of recurrence in each group.

Conclusions: In dealing with a limited, chronic pilonidal disease, the radiofrequency sinus excision technique has definite advantages over sinus excision and marsupialization technique. It needed a shorter hospital stay with reduction in postoperative pain and early resumption to work.

HYPERBILIRUBINAEMIA PREDICTING SIMPLE AND PERFORATED APPENDICITIS.

(P82)

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Purpose: The diagnosis of appendicitis remains based on clinical judgement, and there are no reliable markers to predict perforation. Previous research has suggested that hyperbilirubinaemia to be a better predictive marker for perforated appendicitis than WBC (white blood count) and CRP (C-reactive protein). This study sought to establish whether there is a statistically significant association between hyperbilirubinaemia and perforated appendicitis. Secondary endpoints compared bilirubin to CRP and WBC, and also looked at the diagnostic value of bilirubin in simple appendicitis.

Methods: This single centre, prospective study included all patients admitted with right iliac fossa pain who had liver function tests performed. Statistical analysis was per-

formed using Fisher's exact test to compare bilirubin (>20μmol/L), WBC (> 11, 000 mm3) and CRP (>0–10 mg/l) levels for normal appendixes, simple appendicitis, and perforated appendicitis.

Results: 235 patients were included in this study, of whom 141 were managed operatively for RIF pain. Hyperbilirubinaemia in perforated appendicitis vs simple appendicitis had a specificity of 0.81 for perforated appendicitis, a sensitivity of 0.71 and an odds ratio of 10.2, correlating significantly with Fisher's 2 sided p-value p<0.0001. Bilirubin had a higher specificity (0.81) than both WBC (0.35) and CRP (0.21), but a lower sensitivity (0.71 vs 0.76 and 0.94 respectively). The specificity of hyperbilirubinaemia in appendicitis vs RIF pain of other aetiologies was 0.97, with a positive predictive value of 0.88, and an odds ratio of 11.0, correlating significantly with Fisher's 2 sided p-value < 0.0001. Sensitivity (0.27) and negative predictive value (0.69) were lower. The specificity was higher than WBC (0.71) and CRP (0.61).

Conclusions: Our results confirm that bilirubin is a useful test to predict perforated appendicitis, but also to differentiate appendicitis from right iliac fossa pain of other aetiologies. For both purposes, bilirubin has a higher specificity, but lower sensitivity, than WBC or CRP.

COLONIC FISTULAS: A SINGLE INSTITUTIONAL EXPERIENCE.

(P83)

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Purpose: Various conditions lead to the development of colonic fistulas. While the majority of non-malignant fistulas can initially be treated medically, surgical intervention is required in patients who don't heal. The purpose of this study was to determine the outcome of patients treated surgically for colonic fistulas.

Methods: A retrospective review was conducted of all patients who underwent operative intervention for colonic fistulas over a 6 year period. All operations were performed by 1 surgeon at a tertiary referral center.

Results: 44 patients were treated for colonic fistula. Median age was 58 years and 43% were males. 50% were ASA class III. The median BMI was 28 kg/m2. A chronic abscess was present in 43% of patients. 80% of patients were anemic and 36% were malnourished. 7% had prior operation for the fistula. The most common etiology of the fistula was diverticulitis (73%). The fistulas were colovesical (52%), colocutaneous (18%), colovaginal (18%), and colovaginal/colovesical (12%). The most common operations performed were anterior resection (51%) and sigmoidectomy (39%). Ureteral catheters were inserted in 57% of the cases. 39% of all operations were performed laparoscopically. 23% of all patients received a temporary ileostomy. Median operative time was 269 minutes [range 63-725]. Median length of stay was 6 days [range 2-65] and 18% of patients required intensive unit care. Postoperative complications occurred in 48% [wound complications 27%]. 90 day mortality was 4%. The re-admission rate was 32% and 4% of the patients required re-operation. All fistulas healed [Median follow-up 2 months].

Conclusions: Colonic fistulas can be successfully eradicated with surgical intervention. However post-operative complications were common in this study and re-admission to the hospital occured in one third of the cases.

P83 Post-operative outcomes of patients with colonic fistula

	N=44
Median length of stay [LOS], d[Mean, range]	6 [9, 2-65]
Intensive care hospitalization	8 (18%)
Overall complications, Wound infection, Wound dehiscence, Sepsis	21 (48%), 9 (20%), 3 (7%), 3 (7%)
Lower gastrointestinal bleeding, Extremity thrombophlebitis, Ileus	2 (4%), 2 (4%), 1 (2%)
Abdomino pelvic abscess, Thrombosed hemorrhoids	1 (2%), 1 (2%)
Deep venous thrombosis, Vocal cord paralysis	1 (2%),1 (2%)
Post-operative transfusion	7 (16%)
Readmission, Small bowel obstruction, Abdominal pain, Rectal bleeding	14 (32%), 3 (7%), 2 (5%), 2 (5%)
Ileus, Hydronephrosis, Trocar site hernia, Abdominal pelvic abscess	1 (2%), 1 (2%), 1 (2%), 1 (2%)
Fat necrosis, Leg edema, Urinary tract infection	1 (2%), 1 (2%), 1 (2%)
Reoperation during readmission, Hydronephrosis, Trocar site hernia	2 (4%), 1 (2%), 1 (2%)
Recurrence of fistula	0
Mortality	2 (4%)

COMPLETE EXCISION AND PRIMARY CLOSURE USING FLAP RECONSTRUCTION FOR RECURRENT AND CHRONIC PILONIDAL SINUS: 5-YEAR FOLLOW-UP.

(P84)

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Purpose: The surgical management of recurrent or chronic pilonidal sinus (PS) is still a matter of discussion and no clear recommendations exists. The present study analyzes the results of complete excision with primary closure using flap reconstruction (Lalor technique) for recurrent and chronic pilonidal sinus.

Methods: From December 2005 to December 2006 a total of 130 consecutive patients (98M; 32F, mean age 26.6years) referred to our surgical department. All patients had a recurrent or a chronic pilonidal sinus and underwent to a transversal midline wound with a complete excision of PS and a flap muscle-aponeurotic reconstruction (Lalor flap). Suction drains were placed in all patients until 5th postoperative day. The patients' postoperative complications, wound infection rate, recurrence rate, time until return to work and satisfaction score were recorded during follow-up or at the last interview. Clinical data were obtained at the end of the 5th postoperative day and at 1, 12 and 60 months following surgery.

Results: All patients were followed up. The overall complication rate was 4,6%. No recurrence. Two (1.5%) wound infections, two wound dehiscence (1.5%), one (0.7%) lateral abscess, and one (0.7%) hematoma were recorded. Surgical drainage was performed in 2 cases. Another 3 patients were treated with oral antibiotics and conservative measures. As regards the long-term follow-up, an overall satisfactory rate of 95% was achieved.

Conclusions: The ideal surgical treatment for pilonidal sinus disease must be simple and effective. In our experience, the transversal excision technique with primary closure with flap reconstruction showed a very low perioperative complication rate and no recurrences. It should be routinely considered for all patients affected by recurrent or chronic pilonidal sinus both for clinical results than socio-economic reasons.

CORRELATION BETWEEN CLINICAL PRESENTATION AND INTESTINAL PATHOLOGY IN INTESTINAL ENDOMETRIOSIS: A RETROSPECTIVE COHORT STUDY.

(P85)

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Purpose: Cases of intestinal endometriosis represent approximately 5.3% of all presentations of endometriosis. There is a paucity of information in the current literature on the presenting clinical features in these patients and how they correlate with the degree of pathological involvement. The objective of our study was to characterize the clinical profiles of an institutional cohort of patients with intestinal endometriosis and correlate this to the degree of pathological involvement.

Methods: The medical records of adult females coded with intestinal endometriosis were reviewed and assessed for common presentations and outcomes. Demographics were collected, in addition to clinical presentation and diagnostic modalities. In addition, the locations of endometrial involvement based on operative findings and tissue biopsies were reviewed by our pathologist.

Results: The average age at diagnosis of endometriosis at our centre was 36.3 years of age. Forty-four cases of biopsy proven intestinal endometriosis were identified. The most common presenting symptoms of intestinal endometriosis were non-specific abdominal pain (59.1%), abdominal mass (25%), and constipation (22.7%). Dyschezia and hematochezia represented a minority of cases eventually proven at biopsy to represent intestinal endometriosis. The most common sites of gastrointestinal involvement were the rectosigmoid bowel (65.9%), appendix (22.7%), and ileum (13.6%). The majority of intestinal endometriosis demonstrated invasion of endometrial tissue into the serosa (23.3%) and muscularis propria (25.6%) bowel wall layers.

Conclusions: Intestinal endometriosis is often difficult to identify based on presenting symptoms alone. Patients with biopsy proven endometriosis often presented with non-specific abdominal pain, abdominal mass, and constipation. Despite the fact that the most common presenting symptom was non-specific abdominal pain; there does not appear to be a correlation with gastrointestinal involvement. A correlation between presenting symptoms and the degree of pathological involvement may exist following more detailed analysis of the data and necessitates further study.

SURGICAL TREATMENT FOR COMPLICATIONS OF PELVIC IRRADIATION: SYMPTOMATIC PROCTITIS IS AT THE CENTER OF TROUBLESOME CLINICAL COURSE.

(P86)

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Purpose: With increasing use of radiation therapy (RT) and escalating number of long-term cancer survivors, radiation bowel damage requiring intervention by colorectal surgeons is expected to increase. We aimed to analyze the clinical characteristics of radiation enterocolitis that requires surgery.

Methods: Between May 1995 and June 2012, 57 patients (median age 59, male : female = 13 : 44) received surgery for radiation bowel damage after pelvic irradiation. Clinical data of this consecutive series were retrospectively analyzed.

Results: Cervix cancer was the most frequent indication for pelvic RT (n = 36, 63.2%), followed by rectal cancer (n = 8, 14%) and endometrial cancer (n = 7, 12.3%). Median interval from RT to operation was 2.4 years. Most common indications for surgery were obstruction (n = 26, 45.6%) and enteric fistula (n = 21, 36.8%). The most commonly performed operations were bowel resection (n = 21, 36.8%), followed by stoma formation only (n = 14, 24.6%), and bowel resection with simultaneous stoma formation (n = 13, 22.8%). The clinical courses were grave and complex. Thirteen patients (22.8%) expired within 1 year because of cancer progression. Radiation induced urologic complications occurred in 22 patients (38.6%) and in 25 patients (48.1%, excluding 5 patients who initially underwent abdominoperineal resection) stoma could not be reversed. Symptomatic proctitis including rectal bleeding and rectovaginal fistula were present in 25 patients (43.9%). Comparing these patients to those without symptomatic proctitis, the former were more frequently affected by radiation induced urologic complications (56.4% vs. 25.0%; p = 0.028) and were more likely to have permanent stoma (80.0% vs. 31.2%; p < 0.001).

Conclusions: Postoperative courses of patients undergoing surgery for complications of pelvic irradiation were poor with substantial portion of patients having to live with stoma. The presence of symptomatic proctitis was significantly associated with worse functional outcome.

LAPAROSCOPIC COLECTOMY IS AN UNDERUTILIZED PROCEDURE FOR THE ELECTIVE MANAGEMENT OF COLOVESICAL FISTULAS.

(P87)

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Purpose: Colovesical fistula is an uncommon entity often associated with complicated diverticular disease. The surgical principles are to resect the disease portion of the colon and over sew the bladder fistula. We sought to analyze the role, and contemporary usage of laparoscopic colon resection in the treatment of colovesical fistulas in a large population data base.

Methods: We performed a retrospective analysis of the Nationwide Inpatient Sample for the years 2008 and 2009. Patients electively admitted with the diagnosis of enterovesical fistula were selected for analysis. International Classification of Diseases (ICD-9) codes were used to identify patients with the diagnosis of colovesical fistulas (596.1). ICD 9 procedural codes were used to select patients that underwent open (45.73, 45.75, 45.76) or laparoscopic colectomy (17.33, 17.35, 17.36). Patients who underwent concomitant small bowel resection were excluded from the analysis. Patients were divided into laparoscopic or open groups. Demographics, length of stay (LOS), in-hospital mortality, total hospital charges, in-hospital complications, conversion rate, and stoma creation were analyzed.

Results: : 6,301 patients underwent elective colon resection for colovesical fistula, 17% of the procedures were performed laparoscopically. Conversion to open procedure was reported in 5.5% of the cases. Median age was 62 years old (18-95), 62% were male, and 76% white. Mean LOS was higher in the open group, 8.4 vs. 5.9 days (p< 0.001), as well as the mean total hospital charges, $ 59,582 vs. 53,869 (p=0.06). Diverticulitis was present in 82.3% of the cases. Mortality rate was 1.1% in the open group and 0% in the laparoscopic group (p< 0.001). The number of chronic conditions was the same between groups (p=0.1). In-hospital complications were higher in the open colectomy group when compared to the laparoscopic group, 19.5% vs. 13.2%, (p< 0.001).

Conclusions: Elective laparoscopic colon resection for colovesical fistulas is an underutilized resource, despite the fact that laparoscopic resection is associated with less complications, lower in-hospital mortality, shorter length of stay, and possibly lower total hospital charges.

THE RATE OF CLOSTRIDIUM DIFFICILE INFECTION IN PATIENTS WITH OR WITHOUT APPENDIX.

(P88)

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Purpose: The appendix is a repository for normal colonic flora and produces a biofilm with potential protective properties against enteric pathogens. The impact of appendectomy on the subsequent development of clostridium difficile infection remains uncertain. The aim of this study was to compare the rate of clostridium difficile infection in patients with an absent appendix [Group 1] to those with an intact appendix [Group 2].

Methods: A retrospective review was conducted of a prospectively collected database of a healthcare maintenance organization serving 3.6 million patients in Southern California. All patients who underwent a stool assay for suspected clostridium difficile infection between January 1, 2008 and March 31, 2012 were included, except for children (<18 years) and patients with a history of total colectomy. The presence or absence of the appendix was assessed using the relevant International Classification of Disease (ICD-9) codes and Current Procedural Terminology (CPT) codes for a history of an appendectomy or right hemicolectomy. Logistic regression was used to assess the relationship between the presence of the appendix and a positive clostridium difficile assay.

Results: Out of 56,080 patients who underwent a stool assay for suspected clostridium difficile infection during the study period, 52,198 patients met the inclusion criteria. Table 1 summarizes the group demographics and test results. 30,428 patients (58.3%) were females. Group 1 consisted of 6672 patients (12.8%). Median and mean age were higher in Group 1 compared to Group 2 (69 vs. 63 years, 65.6 vs. 61 years, respectively) (p<0.001). 8607 patients (16.5%) tested positive for clostridium difficile infections. There was no difference in test positivity between Group 1 and Group 2 (17 vs. 16.4%, P=0.2183) [OR= 0.957, 95% CI 0.89 - 1.03].

Conclusions: The findings of this large cohort study did not demonstrate a difference in the rate of clostridium difficile infection in patients with previously removed appendix to those with an intact appendix

CHANGING INCIDENCE OF CLOSTRIDIUM DIFFICILE COLITIS ASSOCIATED WITH ELECTIVE COLORECTAL RESECTIONS.

(P89)

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Purpose: Clostridium difficile colitis (CDC) has become a national epidemic. The purpose of this study is to identify the nationwide incidence of CDC in patients undergoing elective colorectal resection to improve risk stratification for elective abdominal colorectal procedures.

Methods: The Nationwide Inpatient Sample database was queried for this study. This database, the largest publicly available all-payer inpatient care database in the US, contains data from approximately 8 million hospital stays each year. We analyzed the incidence and the trend of CDC from 2000 to 2009 after elective abdominal colorectal procedures, including closure of ileostomy (IC) or

P88 Table 1: Demographics and Test Results

	Appendix Absent (N=6672)	Appendix Present (N=45526)	p-value
Age (years)			<0.0001
Mean (SD)	65.6 (16.98)	61.0 (18.88)	
Median	69	63	
Age Groups			<0.0001
18-44	789 (11.8%)	8781 (19.3%)	
45-64	2005 (30.1%)	15560 (34.2%)	
>/=65	3878(58.1%)	21185 (46.5%)	
Gender			<0.0001
Female	4305 (64.5%)	26123 (57.4%)	
Male	2367 (35.5%)	19403 (42.6%)	
C. Diff Assay			0.2183
Negative	5537 (83%)	38054 (83.6%)	
Positive	1135 (17%)	7472 (16.4%)	

colostomy (CC), segmental colectomy (right colectomy-Right; transverse colectomy-TV; Left colectomy-Left; sigmoidectomy-Sig), anterior resection (AR), abdominoperineal resection (APR) and total abdominal colectomy (TAC).

Results: The total number of elective abdominal colorectal procedures recorded in the study period are shown in Table 1. The incidence of CDC for the entire period varied, with the lowest rate seen after APR (0.28%) and the highest after TAC (1.78%). CDC incidence increased significantly when comparing cases from 2000-2004 to cases from 2005-2009, most after IC (122%), CC (108%), and APR (100%), and least after sigmoidectomy (46%). The incidence of CDC after TAC was 6 times higher than that after APR in all time periods evaluated.

Conclusions: The incidence of CDC after elective abdominal colorectal procedures varies widely, and appears to be increasing after all elective abdominal colorectal procedures. The location of colorectal resection appears to be a significant factor, with highest rates after TAC and IC. Disease, performance and/or nutritional status, and other patient related factors may be contributing factors to these findings. Further studies are needed to elucidate the etiology of these observations.

ENEMAS WITH N-ACETYLCYSTEINE CAN REDUCE THE LEVELS OF OXIDATIVE DAMAGE IN CELLS OF THE COLONIC MUCOSA DEVOID OF THE FECAL STREAM.

(P90)

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Purpose: Diversion colitis (DC) is a benign condition characterized by the appearance of chronic inflammation in the mucosa of the colon or rectum devoid of fecal stream in which the overproduction of oxygen reactive species leading to oxidative tissue stress has been implicated. The aim of the present study was to evaluate possible protective effects of n-acetylcysteine (NAC) in segments devoid of fecal stream.

Methods: Thirty-six Wistar rats were subjected to deviation of fecal stream by proximal colostomy and a distal mucosal fistula. They were distributed into three experimental groups of 12 animals according daily application of enemas containing 0.9% saline solution (control group) or two doses of NAC, 20 mg/Kg and 100 mg/Kg, respectively (treated groups). In each groups, half of the animals were sacrificed in two and half in four weeks of irrigation. The diagnosis of colitis and degree of tissue injuries was assessed by histopathological analysis. The lipid peroxidation and levels of oxidative stress to DNA were measure by determination of levels of malondialdehyde (MDA) and alkaline single-gel electrophoresis (comet assay), respectively. To compare the levels of oxidative damage between control and both experimental groups the Mann-Whitney test was used adopting for both tests significance level at 5% ($p<0.05$).

Results: Administration intrarectally of NAC ameliorated inflammatory alterations in colon without fecal stream. In colonic segments devoid of the fecal stream the tissue levels of MDA was significantly lower in the animals treated with 100mg/Kg compared with those treated with saline solution or 25 mg/Kg of NAC, regardless of the duration of intervention ($p <0.05$). The level of oxidative DNA damage in colon segments without fecal stream was significantly lower in the animals treated with both concentration of NAC, compared to group treated with saline, regardless of the duration of the irrigation ($p <0.01$).

Conclusions: Intrarectal application of NAC ameliorate the inflammatory score and reduce the tissue and DNA damage, probably by antioxidant effects and could be beneficial as a complementary agent in treatment of diversion colitis.

DOES THE DURATION FROM A POSITIVE CT ANGIOGRAPHIC SCAN TO INVASIVE MESENTERIC ANGIOGRAPHY FOR LOWER GASTROINTESTINAL BLEEDING PREDICT THE POSSIBILITY OF EMBOLIZATION?

(P91)

T. Shore, K. Tan, D. Strong, C. Young
Sydney, NSW, Australia

Purpose: Computed tomographic (CT) mesenteric angiography (MA) is increasingly adopted in patients

P89 Table1. Total procedures recorded, Incidence of C. difficile colitis and trends

	IC	CC	Right	TV	Left	Sig	AR	APR	TAC
# Procedures	23210	43834	104606	12147	29561	85328	41041	14923	10089
CDC %2000-09	1.31	0.75	0.72	1.02	0.72	0.56	0.56	0.28	1.78
CDC %2000-04	0.76	0.48	0.55	0.70	0.51	0.46	0.38	0.19	1.30
CDC %2005-09	1.69	1.00	0.89	1.32	0.96	0.67	0.72	0.38	2.36
% Increase	122	108	62	89	88	46	89	100	82
P value	0.0001	0.0001	0.0001	0.0006	0.0001	0.0001	0.0001	0.0294	0.0003

with lower gastrointestinal bleeding to identify the site of active haemorrhage. However, a positive CT scan does not always translate to a positive invasive MA when performed. The aim of this study was to identify factors that could predict a blush on invasive MA following a positive CTMA.

Methods: A retrospective review of all patients with lower gastrointestinal bleeding who had a positive CTMA followed by an invasive MA was performed.

Results: From July 2009 – October 2012, 33 positive CTMA scans from 30 patients were identified. There were 19 patients who were on antiplatelet therapy, while 7 were on anticoagulation therapy. Of the 33 bleeding points, 28 were in the colon (12 left- and 16 right - sided), while 5 were in the small intestine. Diverticular disease accounted for 20 of the bleeding points. The median hemoglobin of the study group just before the invasive MA was 86 (range, 61 – 137) g/l, while the median duration from the CTMA to the invasive MA was 165 (74 – 614) minutes. Of the 33 invasive MA that were correspondingly performed, only 14 demonstrated positive extravasation. Factors that were significant for a positive invasive MA following a positive CTMA included non-diverticular etiology (Odds Ratio (OR), 6.75, 95% Confidence Interval (CI), 1.43 – 31.90, p: 0.029) and hemoglobin < 100 g/l (OR, 14.44, 95% CI, 1.56 – 133.6, p: 0.009). When the invasive MA procedure was performed within < 150 minutes of the positive CTMA scan, it was 2.89 (95% CI: 0.69 – 12.12) times more likely to be associated with a positive invasive MA. This difference was not statistically significant.

Conclusions: Following a positive CTMA for lower gastrointestinal bleeding, patients with non-diverticular etiologies and lower haemoglobin levels are associated with a positive invasive MA. It is also prudent to consider performing the invasive MA within 150 minutes upon detection of the bleeding point on the CTMA.

MESENTERIC EMBOLIZATION IS EFFECTIVE IN PATIENTS WITH BLEEDING TUMORS AND POSTPROCEDURAL COMPLICATIONS.

(P92)

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Purpose: Mesenteric embolization is an integral part in the management of massive lower gastrointestinal (GI) bleeding. This study was aimed to assess our institution's experience in the safety and effectiveness of mesenteric embolization in the management of acute lower GI hemorrhage.

Methods: A retrospective review of all cases of mesenteric embolization for acute lower GI bleeding from October 2007 to August 2012 was performed.

Results: A total of 27 patients underwent mesenteric embolization for their acute lower GI hemorrhage. The median age of the study group was 73 (range, 31 – 86) year-old. More than half (n = 16, 59.3%) of the patients were on either antiplatelet and/or anticoagulant therapy. The underlying etiology included diverticular disease (n = 9), neoplasm (n = 5) and post-procedural (n = 6). The colon was the most common bleeding site seen in 21 patients (left: 10, right: 11). The materials used for the embolization included coils (n = 14), gelfoams (n = 9) and particles (n = 8). Seven patients had a combination of the above agents administered. The median hemoglobin prior to the embolization was 86 (61 – 126) g/l. There was a 100% technical success rate with immediate cessation of hemorrhage at the end of the session. The median amount of packed red cells and fresh frozen plasma infused were 8 (2 – 20) units and 4 (0 – 10) units, respectively. There were 4 (12.9%) clinical failures in our series. Two patients rebled and both underwent successful repeat embolization. Two other patients had infarcted bowel and required immediate operation of whom 1 died from the ensuing septic complications while the other had a prolonged ICU and hospital stay. Four of the five patients with neoplastic disease underwent elective surgery eventually. There were no factors that predicted clinical failure.

P91 Analysis of the factors predicting the outcome of invasive mesenteric angiography following a positive blush on CT mesenteric angiography

Characteristics	Negative blush on mesenteric angiography (n = 19)	Positive blush on mesenteric angiography (n = 14)	p value Odds Ratio (95% confidence interval)
Small bowel etiology	1 (5.3%)	4 (28.6%)	> 0.057.20 (0.71 – 73.53)
On anticoagulation therapy	4 (21.1%)	4 (28.6%)	> 0.051.50 (0.30 –7.43)
Duration from CT mesenteric angiograpy < 150 minutes	6 (31.6%)	8 (57.1%)	> 0.052.89 (0.69 – 12.12)
Non-diverticular etiology	4 (21.1%)	9 (64.3%)	0.029 6.75 (1.43 – 31.90)
Haemoglobin pre-invasive angiography < 100 g/l	9 (47.4%)	13 (92.9)	0.009 14.44 (1.56 – 133.6)

Conclusions: Mesenteric embolization for lower GI bleeding is associated with a high clinical success rate even in patients with anticoagulation therapy. It is effective in patients with neoplastic disease and in those who had complications following earlier invasive interventions. A repeat embolization can be performed safely but post-embolization ischemia is associated with poor outcomes.

WHAT IS THE RISK OF RECURRENT CLOSTRIDIUM DIFFICILE COLITIS IN PREVIOUSLY INFECTED PATIENTS HAVING ANOTHER SURGERY?

(P93)

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Purpose: Clostridium difficile (C.diff) colitis is a common opportunistic infection with significant morbidity. While mostly studied as the primary infection, it can recur following surgery and little has been published regarding this. The aim of this study is to define the incidence of primary and recurrent post-operative (post-op) C.diff colitis in a single-institution's entire surgical population.

Methods: Using electronic medical records from 2002-2012, charts were reviewed from all patients with laboratory proven (ELISA or PCR methods) C.diff-positive stool samples. Primary post-op C.diff colitis was defined as a positive C.diff assay (CDA) within 30 days of surgery and recurrent C.diff colitis was defined as a positive CDA within 30 days of any surgery or procedure in a patient with a previously documented positive CDA. A persistent C.diff colitis was defined as a positive CDA after a 14-day period following a post-op positive CDA. Patient demographics, surgical procedure, and laboratory data were recorded.

Results: Approximately 342,000 surgeries were performed between 2002 and 2012 with a 0.7% (2188 patients) incidence of primary post-op C.diff colitis; Figure 1 shows frequency of C.diff colitis. 98/2188 (4.5%) developed recurrent C.diff colitis after a second surgery, a 5-fold increase over the incidence of primary C.diff colitis, $p<0.0001$. Female gender was similar in both primary (n=959, 44%) and recurrent (n=45, 46%) patients, p=0.9. Median time to a post-op positive CDA was 9 days (range 1-30); median age at index surgery was 64 years (2 days-97 years), while the median age for recurrent C.diff colitis patients was 58 years (range, 2-86), $p<0.0017$. 89/2188 (4%) patients died within 30 days of diagnosed C.diff colitis. Additionally, 699/2188 (32%) patients had a persistent, positive CDA between 14 and 30 days following their primary C.diff colitis.

Conclusions: Our incidence of primary post-op C.diff colitis remains low. However, it appears that patients are at around a 5-fold increased risk for developing recurrent C.diff colitis when undergoing subsequent surgery if they have already had prior C.diff colitis. Further investigation into this group of patients is warranted.

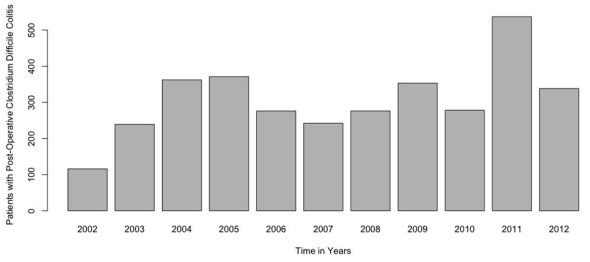

Figure 1 represents the total number of post-operative C.diff colitis patients by year wtih only half of 2012 included in the study years.

CLOSTRIDIUM DIFFICILE INFECTION IN COLORECTAL SURGERY PATIENTS: HOW ARE WE DOING?

(P94)

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Purpose: Post-operative Clostridium difficile (C.diff) infection is a recognized nosocomial infection that carries significant morbidity. C.diff infection (CDI) incidence has been reported at 1%, inclusive of all surgical specialties, but certain populations may be at greater risk of developing a post-operative CDI than others. This study evaluates primary post-operative CDI in colorectal surgery (CORS) patients compared to other specialties.

Methods: All patients with an ELISA or PCR-proven C.diff stool assay (CDA) were identified and included using an electronic medical records query from 2002-2012. We defined post-operative CDI as any positive CDA within 30 days following surgery. Basic patient demographics, surgical procedures, and laboratory data were recorded.

Results: Approximately 29,000 CORS surgeries were performed and 0.8% CORS patients developed post-operative CDI. 313,000 non-CORS surgeries were also performed and 0.6% developed CDI, p=0.008. Mean age, gender, percentage of deaths within 30 days, and time to death in those patients were similar between CORS and non-CORS patients; additional patient characteristics are shown in Table 1. CORS patients developed CDI significantly later in their recovery (11 days) compared to non-CORS patients (7 days), $p<0.0001$, and CORS patients had a shorter length of hospital stay (15 days ± 17) compared to non-CORS patients (19 days ± 17), p=0.006. Within CORS patients, CDI occurred most frequently in patients with cancer, diverticulitis, Crohn's, and Ulcerative Colitis. 4 (1.8%) CORS patients required subsequent colectomy secondary to a CDI.

Conclusions: The incidence of post-operative CDI is similar in CORS and non-CORS patients and it general-

ly occurs in the same age in CORS and non-CORS patients, but within CORS patients, the frequency of C.diff infection varies according to diagnosis. CORS patients develop C.diff infections later in their hospitalization, have shorter hospital stays compared to non-CORS patients, and progression to colectomy remains low in CORS patients. This highlights a potential spectrum of C.diff infection severity that may exists between groups. Further investigation into differences within surgical subspecialties compared to is warranted.

TIMING SURGICAL INTERVENTION FOR SMALL BOWEL OBSTRUCTION: DON'T LET THE SUN SET.

(P95)

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Purpose: Despite the old adage "never let the sun rise or set on a small bowel obstruction (SBO)," limited evidence exists about balancing conservative management with surgery. SBO requiring adhesiolysis is a frequent, costly problem and the decision regarding when to operate is individualized based on presentation. This study examines the differences in 30-day surgical outcomes between SBO patients treated with adhesiolysis early (<24hours) versus those treated later (≥24 hours).

Methods: Patients with a diagnosis of adhesive SBO (ICD-9 560.81) were selected from the ACS National Surgical Quality Improvement Program database from 2005-2010. Only cases operated on within 1 week of admission were included. Outcomes at 30-days, including mortality and major complications, were assessed for associated factors such as time to operation and other patient and surgical characteristics using Chi-square and Student's T-test. Factors with a p-value<0.1 were included in the multivariate logistic regression for each outcome. A two sided p-value <0.05 was considered significant.

Results: Of 8,912 patients undergoing adhesiolysis within 1 week of admission, 3,240 (36.4%) underwent early adhesiolysis. Mean time to surgery was 1.7±1.9 days. Differences between the early and late adhesiolysis groups are shown in Table 1. After adjusting for comorbidities and surgical factors, early adhesiolysis was associated with a 31% lower 30-day mortality rate (OR=0.69, CI:0.51,0.93, p=0.015) and 16% fewer major complications (OR=0.84 CI:0.74,0.96, p=0.009) compared to the late adhesiolysis group. Patients having early surgery had a decreased postoperative length of stay (7.4±7.4 days vs. 9.5±8.7 days, p=0.001).

Conclusions: This data may reflect surgeons' natural reluctance to intervene operatively on physiologically frailer patients. Notwithstanding this, following adjustment for these factors, early adhesiolysis was associated with a significant reduction in major morbidity, mortality and length of stay. While numerous factors go into the decision to operate, these findings support early surgeon involvement and an expeditious approach to bowel obstruction.

P94 Basic Patient Demographics in Post-op C.diff Colitis Patients

	CORS	Non-CORS	p-Value
Number of Surgeries	29,000	313,000	
Number of C.Diff Infections	220 (0.8%)	1968 (0.6%)	<0.0001
Female Gender (N)	106 (48%)	898 (46%)	0.5
Mean Age at C.diff Infection, Years	60.4 ± 17.5	61.3 ± 18.5	0.5
Median Time to C.diff Infection, Days	11 (1-30)	7 (1-30)	<0.0001
Death within 30 Days	4 (2%)	85 (4%)	0.1
Median Time to Death, Days	8 (2-27)	11 (1-29)	0.6
Median Length of Hospitals Stay, Days	11 (2-155)	15 (2-159)	0.006
Diagnoses in CORS C.diff Infection Patients		N (%)	Mean Age (Years), SD
Cancer		78 (35)	69.0 ± 13.7
Diverticular Disease		45 (20)	58.5 ± 14.0
Crohn's Disease		33 (15)	47.5 ± 17.6
Ulcerative Colitis		15 (7)	48.9 ± 17.1
Enterocutaneous Fistula		12 (5)	56.9 ± 13.1
Familial Adenomatous Polyposis		3 (1)	33.0 ± 8.7
Other		34 (16)	64.0 ± 17.6

CLOSTRIDIUM DIFFICILE ASSOCIATED DISEASE: HOW MUCH DO WE REALLY KNOW? A SINGLE INSTITUTION EXPERIENCE.

(P96)

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Purpose: Clostridium Difficile infection (CDI) is a source of major morbidity, which in severe cases can result in colectomy, and sometimes death. Our data indicates a 4-fold increase in the detection of C. Difficile toxin positive diarrhoea over the last three years. As ward transmission is preventable, the aim of the current study was to survey health care professionals on their knowledge of C. Difficile associated disease.

Methods: An institutional review board (IRB) approved written survey was distributed to health care professionals at a tertiary institution. The survey polled knowledge and management decisions relating to C. Difficile infection (CDI), with a particular focus on transmission, prevention and early management. Survey responses were collated and analysed. Comparisons were made between mode of profession (doctor vs nurses), and level of seniority (consultant versus resident).

Results: One hundred and four (90.3%) completed the survey (43 nurses, 61 doctors). Twenty-two (21%) had attended an educational seminar on C. Difficile. No health care worker was able to correctly answer all survey questions. Only 3 (2.9%)respondents correctly identified all major risk factors for CDI. Respondents who had previously attended a CDI information session were more likely to identify broad-spectrum antibiotic use as a risk factor for CDI (100% vs 82%, p<0.0001). Twenty-three (22.1%) respondents identified the most important management aspects in non-severe CDI, 27 (26%) the best contact precaution to prevent the transmission of vegetative C. Difficile, while 56 (53.8%) identified the best method to remove C. Difficile spores. Only 29 (27.9%) staff members knew that C. Dfficile spores could be detected in the air. Fifty three (51%) believed that patients with CDI were no longer infectious 48 hours following their last episode of diarrhoea.

Conclusions: Knowledge about Clostridium Difficile infection in a major tertiary institution is poor. Further education has the potential to reduce ward transmission and hence may reduce the morbidity associated with this preventable disease.

A SIMPLIFIED TECHNIQUE FOR PATHOLOGICAL CONFIRMATION OF ARTERIVENOUS MALFORMATIONS OF THE COLON.

(P97)

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Purpose: AVM's are a well-recognized source of lower gastrointestinal bleeding in adults, present in up to 6% of patients with gastrointestinal bleeding. Partial colectomy continues to be an important therapy in AVM's refractory to endoscopic therapy or with uncontrolled bleeding. The thin-walled, tortuous vessels of AVM's, however, are often missed by standard histologic preparation techniques. Barium-gelatin vascular injection is a poorly utilized technique that greatly aids in the identification of such lesions. We review here our technique for barium injection, as well as discuss a case series of six patients with clinical evidence of symptomatic AVM's in which either barium gelatin or standard preparation was performed following right colectomy.

Methods: Six patients with clinical evidence of chronic bleeding from cecal AVM's underwent right colectomy from February 1993 to March 2011 (Table). Three of the specimens were fixed with standard formalin. The other three were prepared with a barium injection method: after resection, the ileocolic artery and vein were cannulated and the specimen flushed with heparinized saline. A suspension of barium and gelatin was subsequently injected

P95 Table 1: Clinical and operative characteristics of the patient population.

	Total Population	Early Adhesiolysis	Late Adhesiolysis	P-value
Total group	8912	3240	5672	—-
Male gender	36.8%	36.7%	36.8%	0.99
Mean age (years)	62.4 +/- 17.1	59.6 +/- 16.8	64.0 +/- 17.1	<0.001
ASA (III, IV)	60.2%	51.0%	65.4%	<0.001
Wound class (III, IV)	14.3%	13.9%	14.6%	0.36
Preoperative sepsis/SIRS	25.1%	23.6%	25.9%	0.02
Operative time (min)	90.2 +/- 64.6	93.3 +/- 66	88.5 +/- 63.7	0.001
Emergency cases	50.8%	60.2%	45.4%	<0.001
Laparoscopic cases	15.3%	19.0%	13.2%	<0.001
Small Bowel Resection	27.6%	26.6%	28.2%	0.12
Postoperative LOS (days)	8.7 +/- 8.3	7.4 +/- 7.4	9.5 +/- 8.7	<0.001

Categorical variables represented as frequency, continuous variables as mean +/- standard deviation.

in both the artery and vein, and the entire specimen fixed in formalin overnight. No radiographs were taken.

Results: AVM's were visually demonstrated and histologically confirmed in all three of the colonic specimens undergoing barium-gelatin preparation, but were not seen in the specimens with standard preparation. These demonstrated focal areas of ectatic submucosal vessels in the first, a solitary ischemic ulcer in the second, and three separate areas of mucosal ulceration with transmural inflammation and edema in the third.

Conclusions: AVM's are a relatively common etiology of lower gastrointestinal bleeding in adults, but an often elusive pathologic diagnosis. Injection of the colonic vasculature with a suspension of barium-gelatin is a simple technique that aids in the identification of this abnormality. In turn, accurate diagnosis of AVM's assures the physician and patient that the correct treatment was performed, as well as helps to guide further therapy should symptoms recur.

SKIN GRAFTS FOR PERINEAL WOUNDS: SUCCESS IN THE DARK?

(P98)

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Purpose: Non-healing perineal wounds are a morbid and costly complication occurring after a variety of diseases and injuries. Wound management is a challenge due to the presence of infection, fecal stream and the dynamics of the perineal and anorectal region.

Methods: Retrospective chart review of patients who underwent skin graft repair of their perineal wound at a large tertiary care center between 2004 and 2012.

Results: 24 patients had skin graft performed for a perineal wound; mean age was 56.3 (35-84) and 66.7% were male. The most common diagnosis was Fournier's gangrene (16 patients, 66.7%), six (25.0%) were due to fire or hot liquid; one patient had hidradenitis and one had a non-healing decubitus wound. All skin grafts were performed by the burn service. Mean time to graft was 33.3 (2-92) days after primary injury or excision. All grafts were split-thickness; 95.8% were autologous and most commonly from the thigh (19 patients, 79.2%). The average size of the graft was 880 cm2 (170-3200). Wound care consisted of non-adherent dressing in 81.8% of patients and negative pressure wound therapy in 18.2%. Eight (33.3%) patients had fecal diversion with colostomy before grafting; seven patients had a rectal drainage system used. The remaining 10 patients were not diverted; however, eight of these patients were placed on constipating regimens (narcotics and anti-diarrheals to one stool every 3-4 days). Two patients required removal of the graft due to infection with repeat grafting. The average length of stay after graft was 15 days (4-63). With a mean follow-up of 11.8 months (0-93.8), 23 skin grafts (after 1st or 2nd surgery) had healed and one did not. Only one patient had their colostomy reversed. No patients complained of incontinence amongst those without diversion or after colostomy reversal.

Conclusions: We report excellent results in the treatment of perineal wounds with skin graft. Although hospitalizations were long, healing rates were 87.5% after the first skin graft and 95.2% after repeat grafting. This study implies that we should expand our armamentarium to include skin graft as well as a multidisciplinary approach to treatment of the always difficult perineal wound.

LAPAROSCOPY AS STANDARD ACCESS FOR SURGERY OF INTESTINAL ENDOMETRIOSIS.

(P99)

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Purpose: Among benign diseases, endometriosis is offering an ideal indication for a laparoscopic approach in cases of intestinal involvement. In this analysis, the outcome of a standardized laparoscopic approach has been evaluated.

Methods: As a total, 138 patients with endometriosis involving the intestinal tract were operated-on laparoscopically. Most frequent were cases with rectovaginal lesions; transvaginal excision and suture were carried out first, then the rectum with the endometrioma was mobilized laparoscopically. Depending on size and depth of invasion, the lesion was removed by laparoscopic wall excision or bowel resection.

P97

Patient	Surgery Date	Age	Sex	Barium Suspension	Pathology
A	02/93	62	F	Yes	AVM
B	01/99	75	M	No	Focal ectatic submucousal vessels
C	09/99	64	F	No	Solitary Ischemic Ulceration
D	01/01	76	M	No	Mucousal ulceration and transmural inflammation
E	11/04	57	F	Yes	AVM
F	03/11	69	F	Yes	AVM

Results: The median age was 33 years (18 - 55), 69 patients had had previous abdominal operations. The appendix was affected in four cases, small bowel also in four, sigmoid colon in 71 and the rectum in 87 patients. According to the spread of the disease, four appendectomies, four small bowel and ileocecal resections, sixteen rectal and sigmoidal excisions, sixty-seven resections of sigmoid and upper rectum and fifty-nine low anterior rectal resections were performed. Three cases required conversion due to the overall severity of pelvic disease. There were four postoperative anastomotic leaks and three cases of recto-vaginal fistulas after low rectal resections treated by laparoscopic ileostomy formation. In one patient appendectomy had to be performed for acute appendicitis on postop. day 8. Four cases of postoperative pain on defecation and five cases of urinary infection were treated conservatively.

Conclusions: In the majority of cases of intestinal endometriosis, the rectovaginal space and the sigmoid colon are affected. Low anterior rectal and sigmoid resections are the most frequent procedures, the conversion rate is low.

PRIMARY ANASTOMOSIS OR STOMA FORMATION DOES NOT INFLUENCE MORTALITY AFTER COLONIC RESECTION FOR SIGMOID VOLVULUS.

(P100)

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Purpose: Sigmoid volvulus is the cause of bowel obstruction in 7% of patients in the western world and 48-60% of patients who have endoscopic decompression suffer a recurrence. Previous individual case series have shown a mortality of 10% and 15-45% after elective and emergency surgery respectively. Aim: The aim of this study was to identify if primary anastomosis/stoma increase mortality and identify factors that predict mortality after surgery for sigmoid volvulus

Methods: Methods: This is a review of the American College of Surgeons National Surgical Quality improvement project database between 2005 and 2010. Patients who underwent operative treatment for sigmoid volvulus were identified using the International Classification of diseases (ICD-09) codes. Clinical characteristics as described in the NSQIP database were used in the multivariate analysis.

Results: Results: A total of 1438 patients treated for sigmoid volvulus were identified from the database. The female to male ratio was 1:1 and the median age of the patients was 69 years. The overall mortality was 8.3% (5.3% elective, 11.5% emergency). Major complications were seen in 24.5% of the patients. Factors predicting mortality after surgery are given in Table 1.

Conclusions: Conclusions: This is the largest single series of patients treated for colonic volvulus and mortality after surgery is lower than previously published results. Age over 65, higher ASA class and emergent surgery predict mortality. Resection followed by primary anastomosis or stoma formation does not influence mortality

P100 Table 1: Multivariate analysis of factors predicting mortality in patients undergoing colectomy for sigmoid volvulus

Factors predicting mortality	Number (%)	Odds Ratio	95%CI Lower	Upper	P value
Age >65 years	817(56.8)	3.378	1.982	5.759	.000
ASA 4 or 5	303 (21)	2.204	1.392	3.488	.001
Pre op functional status (dependent)	649 (45)	1.41	.933	2.136	.103
Intra-operative wound (contaminated/dirty)	297(20.7)	1.090	.673	1.766	.726
Cardiac co-morbidity	199 (13.8)	1.29	.794	2.122	.298
Respiratory co-morbidity	167 (11.6)	1.423	.864	2.345	.166
Neurological co-morbidity	253 (17.6)	1.487	.942	2.349	.089
Emergency surgery	702 (48.8)	1.845	1.188	2.866	.006
Pre operative sepsis	117 (8.1)	1.742	.961	3.158	.068
Stoma vs primary anastomosis	481(33)	1.229	.803	1.880	.342
Diabetes	181 (12.6)	.956	1.015	1.714	.601
Pre-op steroid use	49 (3.4)	.100	1.912	4.143	.883

LESSONS LEARNED FROM LONG-TERM FOLLOW-UP AFTER SURGERY FOR ISCHEMIC COLITIS: IS THERE LIFE AFTER SURGERY?

(P101)

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Purpose: Ischemic colitis (IC) is the most common manifestation of ischemic injury to the gastrointestinal tract and presents with a wide range of severity from a mild, self-limiting mucosal slough to fulminant transmural colonic necrosis requiring resection. The purpose of this study is to evaluate survival, short and long-term postoperative outcomes of patients who undergo surgery for IC.

Methods: Patients undergoing surgery for IC at a single institution from June 1995-January 2012 were analyzed. The preoperative diagnosis of IC was established by colonoscopy or radiologic studies. Patients who underwent an immediate laparotomy with a histopathologically confirmed IC were also included.

Results: There were 89 patients (41 males) with a median age of 63 years (24-92). IC was predominantly located at the right side of the colon (n=44), 25 patients had only left sided IC and 20 patients had entire colon involvement. 81 patients underwent resection: partial colectomy in 64, subtotal colectomy in 13 and small bowel resection with a colectomy in 4. A loop ileostomy was created in two patients since the colon was un-resectable. A massive, unsalvageable small bowel necrosis developed in four cases. One patient had no signs of bowel necrosis and one patient underwent an embolectomy. 70 patients required a stoma. Median length of hospital stay was 13 days (1-89) and median follow-up was 10 months (1 day-14 years) after index surgery. Short-term (≤ 30 days) overall morbidity and mortality were 34% and 25% respectively. Eleven patients underwent further bowel resection. Among the patients who were alive at the time of the most recent follow-up, the stoma reversal rate was 68% and intestinal continuity was maintained in 73% of the cases. The overall one-year and five-year survival rates were 48% and 18% respectively. Age (p=0.39), gender (p=0.44), location of the disease (p=0.74) and type of surgery (p=0.42) had no impact on survival. However, the development of a short-term postoperative complication reduced survival (figure).

Conclusions: Patients needing surgery for ischemic colitis are at high risk of complications and death. A surgical complication predicts early postoperative death.

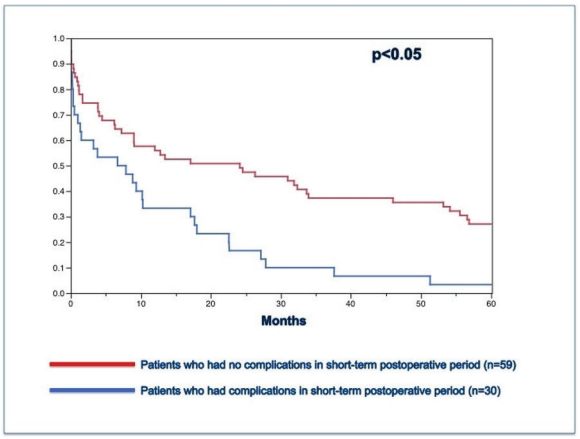

Figure 1: Assessment of overall survival based on development of short-term (≤30 days) postoperative complications. Kaplan-Meier and log-rank tests were used to assess overall survival.

REAL VASCULAR ANATOMY OF RIGHT COLON.

(P102)

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Purpose: This study was designed to evaluate common pattern of 3-dimensional vascular structure around SMA and SMV.

Methods: During laparoscopic colorectal surgery for right side colon cancers, all vessels around main vascular trunks were skeletonized with central to peripheral vascular approach and their patterns were depicted. We analyzed vascular patterns of 127 patients who had laparoscopic surgery for right and transverse colon tumor from Aug. 2005 to Nov. 2012 in Yang hospital.

Results: In 127 patients, the type of ileocolic vessels of 117 patients were evaluated. 50 cases(42.37%) were type A(ileocolic artery cross SMV anteriorly.) and 68 cases(57.6%) were type B(ileocolic artery cross SMV posteriorly.). 126 patients could be confirmed if they have right colic artery(RCA) or not. Only 51 patients(40.47%) had it. In 51 patients, RCA crossed SMV anteriorly in 48(94.11%) . In 124 patients,115(92.7%) had gastrocolic trunk(GCT) and the composition of it was fiqured out in 111 patients. Vascular composition of GCT showed 8 different patterns. Pattern I and II are most common (84.6%).(108 cases(85.7%) among 126 patients had only one middle colic artery(MCA) but 17 cases(13.5%) had two MCA. 111 cases(88.8%) among 125 patients had only one middle colic vein and 14 cases(11.2%) had two MCV. Most of MCV directly drained into SMV(118/124:95.1%). 120 patients in 127 patients were estimated about status of right colic vein(RCV). 87 cases(72.5%) had only one RCV and 28 patients(23.3%) had two RCV. But 3 patients(2.5%) had no RCV and 2 patinets had 3 RCV. RCV of 90 cases76.9%) In 177

patients drained into gastrocolic trunk and it of 15 patients(12.8%) directly drained into SMV. But it of 12 patients(10.2%) who had 2 or more RCV drain into GCT & SMV simultaneously. Finally, all patients had always ileocolic artery but only 1 patient didn't have ICV.

Conclusions: According the results of our study, this result is so different to the knowledge which has been given in textbook so far. In future the discussion about this issues of right colon should be carried out.

TREATMENT OF PILONIDAL CYSTS USING ROTATION RHOMBOID FLAPS.

(P103)

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Purpose: Pilonidal disease is a common disease, especially in the young male. Many different techniques have been described to address this issue, some with high recurrence rates. The goal of our study is evaluate the time to healing and overall healing rates of rhomboid rotational flaps as the treatment for primary or recurrent pilonidal cysts.

Methods: A retrospective chart review from 1/1/2009 to the 10/1/2012 was performed. 18 subjects (14 male and 4 female) had rhomboid rotational flaps used for coverage of primary or recurrent pilonidal cysts (10 primary and 8 recurrent). Average age of patients was 22.8 +/- 5.1 (range 18-37) years. Follow up was performed routinely in clinic.

Results: All procedures were done in an outpatient setting under general anesthesia. The average time to healing was 68 +/- 47 (range 6 – 173) days. Overall cure rate was 83% (15/18). Two patients were lost to follow up before complete healing but demonstrated excellent wound healing at last clinic visit. The one treatment failure/recurrence was noted 5 months after complete healing and was treated in the office with hair removal and treatment of granulation tissue with silver nitrate. One patient required early take back to the operating room for lateral wound dehiscence but the flap was salvaged and an otherwise uneventful recovery ensued. 72% of patients (13/18) developed a small opening, usually located inferiorly and less than 1 square cm in size that required office treatment with silver nitrate for hypergranulation tissue and packing with gauze for wound care. The prolonged time to complete healing in our study was largely due to this small opening that many times required 1-2 months to completely heal.

Conclusions: Rotational flap coverage using the rhomboid technique provides an acceptable alternative technique for pilonidal cyst treatment with excellent overall success rates and cosmetic results. The prolonged time to complete healing was largely due to a small wound located inferiorly successfully treated with silver nitrate and gauze packing. We find this technique to be better tolerated, result in higher patient satisfaction and require much simpler wound care when compared to the traditional wound left after pilonidal excision.

PNEUMATOSIS COLI: IS SURGERY ALWAYS INDICATED?

(P104)

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Purpose: The finding of gas within the bowel wall (pneumatosis intestinalis) is considered an alarm symptom due to the wide range of causes, some of them potentially life- threatening, such as intestinal ischemia, strangulation or toxic megacolon. However, pneumatosis coli is a benign condition that does not require a specific emergency measures. The presence of pneumoperitoneum in these cases could cause some doubts, but the appropriate management remains conservative.

Methods: We present here a case series of 10 patients with pneumatosis coli studied in our hospital in the last 4 years. All the cases were described first as a casual finings on the control chest or abdominal x-rays or CT-scans for the follow up of other pathologies. Patient description and comorbidities were analyzed.

Results: Among the details of the clinical histories of these patients, there were a patient with COPD, a patient with HIV, a patient with stenosis of the mesenteric artery treated with stent and another one with Crohn`s related enteral fistulas. In 2 patients a pneumoperitoneum was found. On the CT-scan there were no signs of intestinal ischemia, no free abdominal fluid, nor inflammation. The laboratory findings and the physical examination were normal and all the patients were successfully managed without surgically.

Conclusions: Pneumatosis coli is rare condition usually found on a simple abdominal radiography. Normal physical examination and laboratory findings together with the CT-scan typical images are decisive in order to avoid an unnecessary surgery.

PREDICTION OF COLORECTAL PERFORATION BY MEASURING CT ATTENUATION VALUES OF ASCITES.

(P105)

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Purpose: Colorectal perforation is a life-threatening disease with high mortality and morbidity. Prompt diagnosis and accurate evaluation of severity of peritonitis are needed. This study was undertaken to evaluate the relationship of computed tomography (CT) attenuation val-

ues of ascites at the perforated site in patients with GI (gastrointestinal tracts) perforations and postoperative complication.

Methods: We retrospectively analyzed the CT scans of 47 consecutive patients with measurable ascites after GI perforations. The CT attenuation values of the ascites were measured by OsiriX, an imaging software which can build 3D reconstructions, and the mean values were calculated at the sites where the fluids were most accumulated. Linear regression analysis was utilized to assess the factors that influence attenuation values. The impact on perforation site and postoperative complication was evaluated by using logistic regression analysis or Mann-Whitney's U test.

Results: Among all patients, there were 21 colorectal perforations, and 26 other site perforations (10 gastroduodenal perforations, 16 small intestinal perforations). Ascites CT attenuation values in patients with colorectal perforations were significantly higher than those in patients with other perforations. Median attenuation values were 23.5 (IQR 17.3-34.2) HU (Hansfield Unit) and 17.1 (IQR 13.7-22.7) HU, respectively (p=0.01). The amount of fluids or measured sites did not influence attenuation values. Logistic regression analysis demonstrated that the increased attenuation value was significantly associated with colorectal perforation [coefficient=1.06 (1.00-1.12), p=0.04]. Postoperative complication had no significant association with ascites CT attenuation value (p=0.28), but significant association with perforation site (p=0.02).

Conclusions: The present study suggests that CT attenuation values of ascites could be useful to predict a perforation site.

A SIMPLIFIED AND EASILY REPRODUCIBLE DEFECOGRAPHY COMMODE.

(P106)

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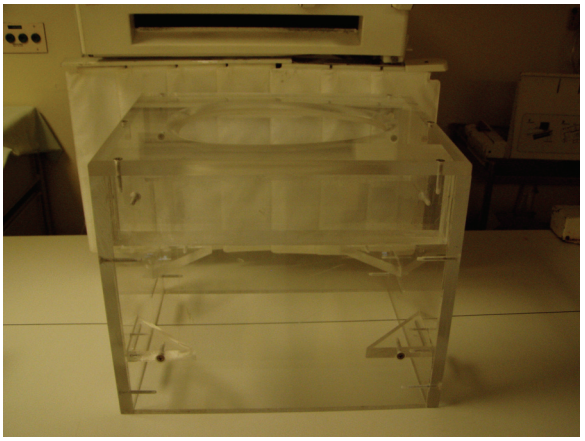
Purpose: Videodefecography evaluating the defecation mechanism was developed in the 1960s. This dynamic investigation allows visualization of abnormalities such as rectocele, enterocele, rectal intussusception, and rectal prolapse. Although videodefecography is accepted as an important tool to assess both function and anatomy, a standardized defecography commode is not widely available worldwide. Creation of a new pelvic floor laboratory in Hawaii necessitated the development of a custom defecography commode. We report the design, creation technique and results of our commode.

Methods: 11/16 inch polymethyl methacrylate, which is readily available throughout the world, was utilized as the main constructive material. Overall dimensions are: 15.5 inches tall, 19 inches long, and 15 inches wide. Joints were chemically welded with methylene chloride solvent and reinforced with internal corner brackets. All metal components were placed strategically to avoid artifact on studies. A one piece seat was constructed for patient comfort and the bottom of the commode is open, allowing for ease of cleaning and for creation of an optional stand. Slots for passage of securing straps to attach to a fluoroscopy table or commode stand were created inferiorly. Total weight is approximately 35 pounds.

Results: Since its creation in 2003, over 250 studies have been performed. It has consistently provided high quality still and videodefecography images. The plans were shared with The University of Arizona's Colon and Rectal Surgery section, as well as the Colon and Rectal Surgery section of Kaiser Permanente Los Angeles Medical Center. Both centers have successfully recreated the commode and have also used it successfully for videodefecography since that time.

Conclusions: Our videodefecography commode is constructed from widely available material, is inexpensive, and is easily reproducible. It is an important tool in any full-service pelvic floor laboratory and allows for proper visualization and interpretation of the dynamic processes involved during defecation.



Completed Commode

DEFECOGRAPHY IS USEFUL IN THE MANAGEMENT OF RECTOCELE.

(P107)

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Purpose: To evaluate the selection criteria and outcomes of rectocele repair and conservative therapy for rectocele associated with evacuation disorders.

Methods: The subjects were 96 patients with a rectocele, out of 252 who underwent defecography for evacuation disorders. They were analyzed regarding rectocele size, barium trapping and vaginal digitation. The improvement of symptoms and constipation-specific QOL were evaluated by modified Constipation Scoring System

(mCSS, 0:best – 26:worst) and Patient Assessment of Constipation Quality of Life questionnaire (PAC-QOL, 0:best – 4:worst), respectively in Surgery group and Conservative group.

Results: The median age was 69 yo.;all female. The 28%, 59% and 13% had a small (<2cm), medium (2≤ - <4cm), and large (4cm≤) rectocele, respectively. Barium trapping was observed in 4%, 39% and 75 % in the small, medium and large group, respectively. Vaginal digitation was useful in 0%, 4% and 25% in the small, medium and large group, respectively. Regarding the 3 factors of defecographic findings including rectocele size (2cm≤), barium trapping and vaginal digitation, 27%, 40%, 22% and 10% fulfilled 0, 1, 2 and 3 factors, respectively. In the explanations on decision making for surgery, the anticipated "Success" rate was explained to each patient as 60%, 70%, 80% and 90% depending on how many factors they fulfilled. Consequently, 0, 1 (3%), 0, 4 (40%) patients underwent a rectocele repair of transperineal anterior levatorplasty in 0, 1, 2, 3 factors group, respectively. In Surgery group of the 5 patients, the median mCSS improved remarkably from 9 preoperatively to 3 postoperatively (P=0.06), and the median PAQ-QOL remarkably improved from 1.5 preoperatively to 0.4 postoperatively (P=0.06), In Conservative group of 49 patients who were treated with laxative only (n=43) or biofeedback (n=6), the median mCSS significantly improved from 12 at first visit to 7 after therapy (P<0.0001), and the median PAQ-QOL significantly improved from 2.0 at first visit to 0.8 after therapy (P<0.0001).

Conclusions: Defecography is very useful in decision making of surgery for rectocele. Selection criteria to achieve excellent outcomes in rectocele repair include large rectocele (2cm≤), barium trapping and vaginal digitation.

3D DYNAMIC ULTRASOUND ASSESSMENT OF OBSTRUCTED DEFECATION SYNDROME: IS MULTIPARITY CORRELATED WITH POSTERIOR PELVIC FLOOR ABNORMALITIES?

(P108)

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Purpose: Evaluate the correlation between the prevalence of posterior pelvic floor abnormalities with the number of vaginal delivery in female with obstructed defecation syndrome(ODS) using 3D dynamic ultrasound(3D-US).

Methods: A Retrospective review from 2007-2012 on consecutive female patients with ODS and Wexner constipation score of >6 undergoing 3D-US to identify the posterior pelvic floor dysfunctions (grade II/III rectocele, intussusception, mucosal prolapse, anismus and grade III-II entrero/sigmodecele) and sphincter defect. Those patients with fecal incontinence(FI) symptoms associated were assessed using Cleveland Clinic Fecal Incontinence Score. They were distributed by number of vaginal delivery(VD):G1:nulliparous, G2:1-VD, G3: 2-VD and G4:>2VD.

Results: Of the 512 females with ODS, 182 in G1, mean age 48.5y, of which 11 had undergone anal surgery. 71 in G2, mean age 51y, (anal surgery=2); 79 in G3, mean age 54.3y, (anal surgery=4) and 180 in G4, mean age 63y, (anal surgery=6). 38/512(7%) complained of FI, of which 34 were found to have sphincter defect and 42/76(55%) females with sphincter defects had no FI symptoms. The mean age was significantly higher in G3. There was no significant correlation between the prevalence of rectocele, intussusception, mucosal prolapse, anismus, entrero/sigmodecele with the number of VD but the prevalence of sphincter defect increased significantly with the number of VD (Table). 11 female from G1 had sphincter defects of them 6 had internal anal sphincter-IAS defects and 5 had both external anal sphincter-EAS/IAS, of which 6 complained of FI(score-1-4). 10 from G2 had sphincter defects (EAS=7, IAS=2 and EAS/IAS=1 defects), FI=4 (score-1-4). 19 from G3 had sphincter defects (EAS=13, IAS=4 and EAS/IAS=2), FI=9 (score-1-4). 36 from G4 had sphincter defects (EAS=29, IAS=6 and EAS/IAS=1), FI=15(score-1-4).

Conclusions: The number of vaginal delivery is not correlated with the prevalence of posterior pelvic floor dysfunctions related to obstructed defecation syndrome but there is a strong correlation between the number of vaginal delivery and sphincter defects in patients with and without fecal incontinence symptoms

EARLY RESULTS OF PELVIC ORGANS PROLAPSE SUSPENSION OPERATION FOR DESCENSUS PERINEI AND OBSTRUCTED DEFECATION SYNDROME.

(P110)

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Purpose: A prolapse of pelvic organs and the whole pelvic floor may affect up to 50% of all parous women with a variety of ailments that affect all three compartments of the pelvic floor. The present study investigates the effect of the P.O.P.S. operation in patients with significant descenus perinei and co-existing outlet obstipation.

Methods: P.O.P.S. operation was performed as described by Antonio Longo by a laparoscopic lateral suspension using a mesh, but without a simultaneously S.T.A.R.R. procedure. Preoperative and postoperative obstructed defecation scores (Altomare), incontinence

scores (Wexner) and changes in existing urinary stress incontinence were determined.

Results: From October 2011 to August 2012 in 15 patients a P.O.P.S. operation was performed, age 62 ± 10, follow-up 217 ± 102 days. All patients had a descensus perinei, cystocele, rectocele and an internal rectal prolapse with positive ROM criteria for obstructed defecation syndrome (ODS). In all cases the operation was performed without intraoperative complications, mean hospital stay was 5 ± 1 days. No major adverse events were observed during the follow-up with one (7%) patient reporting about persistent pain, without evidence of abdominal infection. Descensus perinei and cystocele improved in all patients. The mean ODS score decreased from 16 ± 3 to 5 ± 4. In 3 (20%) patients with persistent ODS an additional S.T.A.R.R. operation was performed. An improvement of urinary stress incontinence was noticed in 7 of 10 patients (70%) with preoperative urinary incontinence. Wexner score changed from preoperatively 4 ± 7 to postoperatively 3 ± 6 only marginally.

Conclusions: P.O.P.S. seems to be a safe operation in this limited group of patients showing good results for ODS, descensus perinei and cystocele. In case of a remaining outlet-obstipation a following S.T.A.R.R. procedure can be performed as a second, sole operation. More studies with larger patient numbers are necessary to examine the effect of POPS alone compared to a combined S.T.A.R.R. procedure.

EVALUATION OF THE LEARNING CURVE IN LAPAROSCOPIC VENTRAL RECTOPEXY: A SINGLE SURGEON'S EXPERIENCE.

(P111)

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Purpose: Operating in the low pelvis ensures laparoscopic ventral rectopexy (LVR) is a technically challenging procedure that requires advanced laparoscopic motor and suturing skills. The concept of a learning curve in laparoscopic colorectal surgery is widely recognised. We evaluate the learning curve of a single surgeon performing LVR over a four year period.

Methods: A database of all patients undergoing LVR was prospectively maintained. Basic demographic data and outcome measures such as operation length, conversion rate, readmission and postoperative complication rates were recorded. Functional outcome was assessed with Obstructed Defecation Scores (ODS).

Results: A total of 131 patients underwent LVR between 06/2009 and 07/2012 (9 male, 122 female). The median age was 56 years and median operating time was 95mins. Median operating time over the first 25 cases was: 0-5 172mins, 5-10 168mins, 10-15 149mins, 15-20 138mins and 20-25 90mins. Over the next 25-50 cases median operating time plateaued at 101mins and then gradually fell between 50-100 cases to 86mins. Operating time was significantly reduced in the last two years of the series compared with the first. ($p<0.001$, t-test) Over the entire series there was a significant improvement in ODS scores following LVR ($p<0.001$, t test, means pre 14.4, post 6.6). A slight increase in ODS score improvement was noted between the first half of the series and the latter, though this was not significant ($p<0.636$ t-test, means early 7.4, late 8.0). There were two conversions which occurred in the first 50 cases; one for dense adhesions and another which required an unexpected synchronous open bilateral oophorectomy. Postoperative complications included two port site hernias and an early recurrent prolapse. These were spread evenly throughout the four years.

Conclusions: Laparoscopic ventral rectopexy can be performed safely with a low complication rate by an experienced surgeon on his/her learning curve. Functional outcome was not significantly related to operative experience. Our data suggests that a satisfactory efficiency can be achieved after 25 cases with further improvement coming more gradually.

P108 Incidence of posterior pelvic floor abnormalities in female patients with ODS according to the number of vaginal delivery

AbnormalitiesN(%)	Nulliparous182 (36%)	1-VD71 (14%)	2-VD79 (15%)	>2 VD180 (35%)	Total512 (100%)
Rectocele(grade II-III)	93 (51%)	45 (63%)	47 (59%)	91 (50%)	276 (54%)
Intussusception	51 (28%)	22 (31%)	24 (30%)	63 (35%)	160 (31%)
Mucosal prolapse	49 (27%)	18 (25%)	26 (33%)	56 (31%)	149 (29%)
Anismus	109 (60%)	43 (60%)	40 (50%)	103 (57%)	295 (58%)
Entero/Sigmoidocele (grade II-III)	9 (5%)	4 (5%)	5 (6%)	12 (6%)	30 (6%)
Sphincter defects	11 (6%)	10 (14%)	19 (24%)	36 (20%)	76 (15%)

* ($p<0.05$). VD- vaginal delivery. ODS-obstructed defecation syndrome

LAPAROSCOPIC VENTRAL RECTOPEXY: IS 23-HOUR DISCHARGE SAFE?

(P112)

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Purpose: Laparoscopic ventral rectopexy (LVR) is the definitive treatment for symptomatic rectocele and intussusception in patients with obstructive defecation syndrome. Reported median length of stay is 2 – 3 days in the published literature. Usually performed as an inpatient procedure we report our results following introduction of a 23 hour discharge pathway to our pelvic floor service.

Methods: All patients undergoing LVR were assessed for suitability of 23 hour protocol discharge based upon local day case unit criteria. A prospective database was maintained including demographic data; outcome measures were assessed.

Results: A total of 131 patients underwent LVR between 06/2009 and 07/2012 (9 male, 122 female). Median age was 56 years. 91 patients satisfied criteria for accelerated discharge and entered the pathway. 89% of patients selected for accelerated discharge were successfully discharged as either: day case (29/91, 32%) or within 23 hours of admission (81/91, 89%). Afternoon surgery was a common occurrence (53/91, 58%). This significantly increased the chance of an overnight stay compared with a morning procedure ($p<0.06$, Chi square). Operative time was significantly longer in patients who remained as inpatient compared with those successfully discharged within 23 hours ($p<0.001$, t-test). There was a significant reduction in Obstructed Defecation Scores (ODS) following surgery ($p<0.001$ t-test, means pre 14.4, post 6.6). However no significant difference in ODS score improvement was observed between patients discharged within 23 hours and those who stayed admitted as inpatients ($p<0.96$, t-test). Median length of stay in the inpatient group was 2 days (1-14 days). Morbidity was low with only two patients converted to open. No patients successfully discharged within 23 hours were subsequently readmitted. There were three readmissions in the inpatient group: one patient with poorly controlled pain, a strangulated port site hernia and another with 'dizziness' from a transdermal analgesic patch which required overnight stay.

Conclusions: Our data suggest LVR can be performed safely and without compromise to functional outcome on a 23 hour discharge pathway. Afternoon surgery significantly reduces the likelihood of day case surgery.

TRANSVAGINAL RECTOCELE REPAIR WITH BIOLOGICAL MESH, FUNCTIONAL OUTCOMES AND QUALITY OF LIFE ASSESSMENT IN A TARGETED GROUP OF FEMALES.

(P113)

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Purpose: Symptomatic rectocele leads to significant impairment in quality of life owing to defecatory disorder and sexual dysfunction. Repair of rectocele in appropriate candidates has shown satisfactory results. We aim to assess clinically the defecatory and sexual functions and quality of life in patients who underwent rectocele repair with biologic mesh.

Methods: Patients with clinical and radiologic (defecogram) proven obstructive defecation were analyzed with regards to symptoms improvement, complications and quality of life. Standardized questionnaires I.e. Longo's obstructive defecation score, Symptom severity score, Visual analogue scale and Patient Assessment of Constipation-Quality of Life Questionnaire ; satisfaction subscale, were given to the patients to compare their preoperative with post operative symptoms. Results were analyzed on SPSS version 16. Mean and standard deviation was used for continuous variables. Independent T test was used to compare symptom scores pre and post operatively. P value of < 0.05 was of statistical significance.

Results: 23 patients between May 2006 to April l2012 were included. Mean age was 55 years (28-79) and mean follow-up of 19 months (2-60).Pre operative Obstructive defecatory score significantly improved post operatively, mean of 23 Vs 7 ($p= 0.001$). Quality of life scores pre and post operatively also were statistically significant, mean 17 Vs 5 ($p= 0.001$). 4 patients (20%) complained of recurrence of the symptoms with less severity than at initial diagnosis .3 (13%) patients reported significant improvement in dypareunia while 3 (13%) reported dypareunia post repair. One patient developed post operative hematoma drained surgically. There was no infection in this series.

Conclusions: Transvaginal repair of rectocele with biological mesh significantly improves symptoms of obstructive defecation and quality of life. In 20 % cases the symptoms recurred, however the severity of symptom was lower than at its initial diagnosis.

LAPAROSCOPIC RECTOPEXY WITHOUT RESECTION: MESH OR NO MESH?

(P114)

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Purpose: Although the efficacy of laparoscopic nonresectional rectopexy for full thickness rectal prolapse has been well established, the advantages and disadvantages of routine mesh use during this procedure compared to suture rectopexy alone are unstudied. The goal of this study was to compare both recurrence rates and complications between patients undergoing laparoscopic nonresectional rectopexy with or without mesh.

Methods: All patients (2006-2012) undergoing nonresectional laparoscopic rectopexy with (WM) or without (WOM) mesh were included. Cases performed for recurrent prolapse were excluded. In all cases, complete posterior and lateral mobilization to the pelvic floor was performed to fully reduce the prolapse. WOM patients underwent suture rectopexy to the sacral promontory while patients in the WM group all had mesh placed posteriorly behind the mesorectum in the Well's fashion. The mesh was anchored to the sacral promontory and then sutured to the redundant lateral mesorectum. Our primary endpoint was recurrence. Secondary endpoints included operative, post-operative and mesh-related complications. Patient demographics, operative time, and length of stay were also collected.

Results: 97 consecutive patients undergoing nonresectional laparoscopic rectopexy were included. The mean age was 67 (WM, n = 43) and 71 (WOM, n= 54). Median follow-up was similar between groups (WM = 38 months; WOM 35 = months; P=0.73). The recurrence rate for WOM was significantly higher than WM patients (17% vs. 2%; P=0.009). Operative times, length of stay, and overall complications were similar between groups. There were no mesh-related complications.

Conclusions: Laparoscopic nonresectional rectopexy with posterior mesh is safe and may yield lower recurrence rates when compared to suture rectopexy alone. Prospective evaluation is warranted.

IMPACT OF SURGICAL TREATMENT ON SYMPTOMS DUE TO OBSTRUCTED DEFECATION SYNDROME.

(P115)

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Purpose: Management of obstructed defecation syndrome (ODS) is still debated. Indications to surgery are not fully agreed, mainly because surgical correction of the anatomical alterations is not always consistent with functional improvement of ODS symptoms. Aim of this study was to assess the impact of different surgical approaches on clinical features due to ODS.

Methods: One hundred eleven patients (106 female; mean age of 55±13 years) complaining ODS and submitted to surgical treatment were retrospectively evaluated. The following preoperative clinical ODS symptoms were considered: frequency of bowel movements, straining to begin or complete defecation, anal pain during/after defecation, incomplete evacuation, fragmented defecation, digital assistance in defecating, enemas/laxatives, rectal ability to discriminate, fecal incontinence, abdominal pain, time spent in toilette, unsuccessful attempts to evacuate. Cleveland Clinic Constipation Score (CCCS), and Altomare ODS score were derived. Indications to surgery were assigned on the base of clinical and physical evaluation, and diagnostic tests. After surgery, patients were regularly followed, and, at last follow up, all clinical ODS symptoms were collected again, and compared with preoperative findings.

Results: Fifty-three pts were submitted to transvaginal posterior colporrhaphy, 25 pts perineal proctopexy, 33 abdominal proctopexy. Mean follow up period was 35±27.2 months. Compared to the preop values, both mean CCCS and Altomare ODS score significantly improved (15.1±4.7 vs. 9.0±4.9, $p<0.05$, and 14.4±5.6 vs. 8.9±5.6, $p<0.05$, respectively). All clinical parameters, globally considered in the whole group of pts, improved significantly following surgery if compared to the preoperative status.

Conclusions: These data seem to confirm that success of surgical treatment is the result of an accurate selection between different options to be adopted only in selected ODS patients. When strict criteria are used, clinical improvement can concern the vast majority of surgically treated patients.

BURDEN AND HEALTH-RELATED QUALITY OF LIFE AMONG CAREGIVERS OF PATIENTS WITH PELVIC FLOOR DISORDERS.

(P116)

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Purpose: PFD are associated with significant decrements in patient QOL. Evaluation of efficacy for these disorders rests on QOL. Caregiver burden has not been previously evaluated. Our study aimed to test the following: Caregivers of patients with PFD will have a decreased QOL as measured by the SF-36 Health Survey and a higher Caregiver Burden. Also, caregivers with a lower Burden will have a higher QOL as compared to those with higher Caregiver Burden scores.

Methods: Twenty nonprofessional caregivers of patients with PFD were recruited between March- October 2012. Subjects were recruited through University of Florida clinics. Each subject completed the SF-36 and The Caregiver Burden Scale. Data elements included demographic data, socioeconomic data, and personal medical and psychological history.

Results: Twenty caretakers, 12 males and 8 females, ranging in age from 19-85 (mean 53.7) were enrolled. The duration of caregiving ranged from <1 month to 300 months (mean 70.5). Most caregivers lived in the residence with the patient (70%), 35% had prior caregiving experience and 15% had training. Total SF-36 score averaged 74.49 (range: 0-100), and total Caregiver Burden Scale score averaged 24.66 (range: 16-80). An inverse correlation was observed between the caregivers QOL and the Caregiver Burden (RR= -.02), but this was not statistically significant. Age of the caregiver was also inversely correlated with the caregiver burden (RR = -.28) but positively correlated with SF-36 scores (RR=.14).

Conclusions: Our preliminary study suggests that for caregivers of patients with PFD, diminished caregiver burden correlates with increased QOL. Further, caregivers of patients with PFD experience significant interference with their lives. However, QOL as measured by the SF-36 was not decreased in our participants. Although the burden of caregiving is mild to moderate, QOL may not be impaired. A partner-centered approach to educate and support partners of patients with PFD will be essential to improving the burden of PFD in patients and caregivers. Our study also highlights the need for a validated caregiver burden questionnaire for patients with pelvic floor disorders.

LONG-TERM OUTCOMES OF RECTOCELE REPAIRS COMPARING TRANSPERINEAL, TRANSANAL, STAPLED TRANSANAL RECTAL RESECTION AND TRANSVAGINAL APPROACHES.

(P117)

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Purpose: To compare the results of various techniques for symptomatic rectocele repair and determine the long-term functional outcomes.

Methods: All patients who underwent rectocele repair at a teaching hospital between Jan 2009 and Dec 2011 were reviewed retrospectively. Based on the type of repair, these patients were sub-divided into Transperineal (TPR), Transanal (TAR), Stapled Transanal Rectal Resection (STARR), and Transvaginal (TVR) groups. Patients were stratified based on their pre-operative symptoms. A Pelvic Floor Impact Questionnaire-short form 7 (PFIQ-7) was filled out based on patients' symptoms. PFIQ-7 scores range from 0 – 100, with 100 being the worst score. Statistical analysis was performed using Fisher's exact test for categorical data and Student's t-test for continuous data.

Results: A total of 35 patients underwent rectocele repair between Jan 2009 and Dec 2011. The TPR group was comprised of 9 patients with a mean PFIQ-7 score of 40, the TAR group of 13 patients with a mean score of 33, the STARR group of 9 patients with a mean score of 33, and the TVR group of 4 patients with a mean score of 13. The overall mean follow-up was 28 months. Although the absolute functional score was best for the TVR group, the sample size was too small to show any statistical significance.

Conclusions: Multiple techniques were used in our study to repair symptomatic rectoceles. Based on the above data, no single procedure was shown to be superior in achieving functional outcomes. Further prospective studies are needed to better delineate the functional outcomes.

LAPAROSCOPIC RESECTION RECTOPEXY WITH INFERIOR MESENTERIC VESSEL PRESERVATION – A NOVEL APPROACH TO FULL THICKNESS RECTAL PROLAPSE.

(P118)

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Purpose: Resection rectopexy is a commonly employed treatment for full thickness rectal prolapse with very low recurrence rates. However, treatment of recurrent rectal prolapse after resection rectopexy requires a technically challenging re-do rectopexy via abdominal approach as perineal approach is contraindicated. We present a review of cases utilizing a new technique for laparoscopic resection rectopexy where inferior mesenteric vessels were preserved potentially allowing for a perineal approach in case of recurrence.

Methods: This approach was offered to all patients presenting with new onset rectal prolpase. Laparoscopic rectal mobilization was carried out down to the pelvic floor. Lateral stalks were routinely divided. To minimize risk of future enterocele and to maintain posterior vaginal support, limited anterior rectal dissection was performed. Intra-corporeal division of rectum and sigmoid mesocolon was performed using EndoGIA stapler paying careful attention towards preservation of inferior mesenteric vessels. Redundant sigmoid was resected and an intra-corporeal colorectal anastomosis was performed using EEA stapler. Finally, rectum is anchored to either side of sacral promontory using non absorbable sutures placed laparoscopically.

Results: A total of 15 patients underwent this procedure. Average age was 63.8 (28-91) years, average follow-up was 269 days. Average operative time and blood loss

were 231 minutes and 128 cc respectively. Average hospitalization was 6 days and no major complications were noted. There were 3 conversions to open surgery. Four patients had previous history of anterior or middle pelvic compartment surgeries while 3 patients underwent concomitant Gyn surgeries. Surgery resulted in improvement in constipation and incontinence in 33% and 50% of patients respectively. During the follow-up period, one case of recurrent mucosal prolapse was noted.

Conclusions: Laparoscopic resection rectopexy with preservation of inferior mesenteric vessels is a viable technique for full thickness rectal prolapse. This technique retains the benefits of conventional resection rectopexy while allowing for a perineal approach in case of future recurrence.

RECTAL PROLAPSE: DOES SURGERY ALTER QUALITY OF LIFE IN OCTOGENARIANS?

(P119)

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Purpose: The objective of this study is to evaluate patient's perception of change in symptoms after surgery for rectal prolapse (RP) in patients over 80 years of age.

Methods: Retrospective review of all patients who had surgery for RP from 2009-2012 and were 80 years or older at the time of surgery. Demographics, preoperative characteristics, operative details, and postoperative follow-up were collected. Telephone interviews were conducted to assess patient satisfaction with surgery and post-op quality of life.

Results: 43 patients met the study criteria, 7 deaths (not surgery related) were reported and were excluded. 36 patients (all female) were included. Duration of symptoms ranged from 1-144 months. Associated symptoms were urological in 44.4%, fecal incontinence (FI) in 56% and constipation in 17%.14 patients (40%) had prior RP surgery. Mean number of vaginal deliveries was 3. Mean age at surgery was 85 yrs. 88% patients had an ASA score of III. 15 (42%) had an abdominal procedure (6 open, 6 lap, 2 lap-robotic, 1 robotic). 21 patients (58%) had a perineal procedure (15 Delorme and 6 Altemeier). 2 patients (17%) had levatorplasty and 7(20%) had surgery for pelvic organ prolapse concurrently. Overall duration of surgery was 3.36 hrs. Overall median length of stay was 3 days. There were no significant complications recorded within 30 days. FI was reported in 11 (37%) patients and urinary incontinence in 4(11%) postoperatively. 11/27(40%) patients had recurrence. 7/27 (26%) recurrences had received a Delorme repair, 4/27(15%) had a laparoscopic or open repair. Median follow-up was 9 months. 23/36 answered the survey. Patients who did not answer were in nursing homes and /or had memory issues. 39.1% of patients stated that surgery changed their symptoms. 73.9% were satisfied with the treatment. 30.4% noticed a significant improvement in quality of life. 65.2% would recommend surgery.

Conclusions: Surgery for rectal prolapse in octogenarians can be offered as it improves their day to day activity. However, recurrence rates are high but are lower in abdominal procedures.Abdominal procedures therefore may be offered to this group. Concurrent pelvic organ prolapse surgery does not add to the mortality or morbidity in this age group.

P119 Results

	Perineal Repair N=21 (15 Delorme, 6 Altemeier)	Abdominal Repair N=15 (7 open, 6 laparoscopic, 2 laparoscopic/robotic)
ASA III	19 (90.5%)	11 (84.6%)
Pelvic organ prolapse surgery	4 (19%)	3 (20%)
Median length of stay (days)(days)	3	5
Complications		
Bleeding	3 (14 %) patients	0
Pneumonia	0	2
Cardiac (arrhythmias)	2	1
C.diff	1	0
Deep venous thrombosis	1	0
Wound infection	0	1
Readmission <30 days	2 (5.6%)	0
Recurrence n=27	7/27(26%)	4/27(15%)
Do you feel happy about surgery? Answer :Yes n=23	11/16 (68.8%)	6/7(85%)
Would you recommend surgery?Answer : Yes n=23	8 /16(50.0%)	7/7(100%)

WHY DO YOUNG RECTUMS PROLAPSE AND HOW SHOULD WE FIX THEM?

(P120)

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Purpose: Rectal prolapse (RP) is not uncommon in children and those over 50 years of age but rarely is seen in young adults between 15-30 years old. The aim of this study is to identify risk factors and characteristics of rectal prolapse in this group of patients and determine surgical outcome.

Methods: Patients 15-30 years old who underwent surgical treatment for RP between September 1994 and September 2012 were identified from an IRB approved database. Data was obtained regarding demographics, risk factors, associated conditions, clinical characteristics, surgical management and follow-up.

Results: 44 (Females 32) patients were identified with mean age of 23 (range 16-29) years old. 18 (41%) had chronic psychiatric diseases requiring treatment and these patients experienced significantly more constipation versus non psychiatric patients (83% vs. 50%; P=0.024). 17 (39%) patients had previous pelvic surgery. The most common symptom at presentation was a prolapsed rectum in 40 (91%) and hematochezia in 24 (55%). 27 (61%) were noted intraoperatively to have a redundant sigmoid colon. 24 (55%) underwent a laparoscopic rectopexy, 14 (32%) open abdominal repair and 6 (14%) had transanal surgery. The most common procedure was resection rectopexy in 21 (48%; 7 open; 14 laparoscopic). At a median follow-up of 11 (range 1-165) months, 6 patients (14%) developed a recurrence, 3 (13%) after laparoscopic, 2(14%) after open abdominal and 1(17%) after transanal surgery.

Conclusions: Risk factors for RP in young patients include chronic psychiatric disease with associated constipation. Medically induced constipation in psychiatric patients and possible pelvic floor weakness in patients with previous pelvic surgery may be important contributing factors. Abdominal repair is the most common procedure with recurrence rates that are comparable to published literature for older individuals. Since these are younger patients, long term follow-up is neeeded to determine if over time the recurrence rates will increase.

A COMPARISON OF ROBOTIC AND OPEN PROCEDURES FOR RECTAL PROLAPSE; A SINGLE SURGEON'S EXPERIENCE.

(P121)

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Purpose: Robotic assisted surgery has superior visualization and instrument range of motion for rectal surgery as compared to traditional laparoscopic and open approaches. Increasingly, colon and rectal procedures are being performed using a robotic approach. The authors sought to assess the feasibility of robotic rectopexy and compare it to the open approach

Methods: The authors retrospectively analyzed patients presenting over the last 24 months to a single surgeon who underwent rectopexy for rectal prolapse. Data was collected on patient demographics, body mass index, operative procedure and time, use of mesh, length of hospital stay, and recurrence of prolapse.

Results: Twenty-nine patients underwent rectopexy; 18 (62%) robotic and 11 (38%) open abdominal. Two (11%) robotic cases were converted to open. There was no difference between robotic cases and open cases in the number of patients who had a sigmoid resection (5 vs. 2) or the use mesh (10 vs. 6). There was no difference in age (mean 57 vs. 65 years) or body mass index (mean 24.0+/- 3.85kg/m2 vs. 26.6+/- 6.6kg/m2) between the robotic and open cases, respectively. Combined procedures with Urogynecology were performed more commonly in robotic cases than open cases (3 vs.6, p=0.03, respectively). After removing combined procedures, the mean operative time was longer for robotic than open cases (mean 275 ± 57 min vs. 119 ± 83 min, p=0.02, respectively). Length of stay for the robotic group was shorter than that for the open group (mean 2.8 vs. 4.9, p= 0.005, respectively). Postoperative complications were similar between robotic vs. open cases (6% vs. 27%, p=0.1, respectively). The median length of follow-up was 9.3 months (range 1 - 22 months). Of the robotic cases, 2 (11%) had a recurrence while for the open cases, 1 (9%) had a recurrence.

Conclusions: Robotic rectopexy for rectal prolapse is a safe procedure with a low complication rate, decreased length of stay, and a comparable recurrence rate to that of the open approach. As experience increases, operative time may decrease and more combined procedures may be performed robotically.

PURSESTRING CLOSURE OF THE STOMA SITE LEADS TO FEWER WOUND INFECTIONS: RESULTS FROM A MULTICENTER RANDOMIZED, CONTROLLED TRIAL.

(P122)

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Purpose: Surgical Site Infection (SSI) after stoma reversal is common. We hypothesized that a near-complete purse-string (PS) closure compared to conventional primary (CP) closure leads to fewer SSIs of the stoma site.

Methods: We performed a randomized controlled trial comparing PS and CP closure of ileostomy and colostomy sites from December 2008 through August 2012 at two university medical centers. The primary endpoint was SSI isolated to the stoma site within 30 days of surgery. Secondary endpoints were overall SSI and delayed healing (defined as a wound requiring a dressing beyond 30 days postoperatively). In a subset of patients, we determined time to complete epithelialization of the wound (n=51) and patient satisfaction with wound appearance (n=55) on postoperative days 7 and 30 using a 5-point Likert scale. We compared continuous variables using Student t tests and categorical data using chi-square and Fisher exact tests. Cox proportional regression and multiple logistic regression models were used to calculate hazard ratios for SSI and delayed healing adjusting for potential confounders.

Results: We enrolled 125 patients during the study period. Twelve patients were excluded because of protocol violations or insufficient follow-up. Baseline demographics, patient comorbidities, and perioperative variables were comparable between groups. Stoma site SSI was significantly lower in the PS group than in the CP closure group (2% vs. 15%, p=0.0015), but time to complete epithelialization was significantly longer (34.6±20d vs. 24.1±17d, p=0.016). Incidence of delayed healing was not significantly different (21% vs. 15%, p= 0.392). There was no difference in patient satisfaction between groups. Conventional primary closure was found to be a significant and independent predictor of stoma site SSI (HR 46.3, 95% CI 1.9-1117.7). Stoma site SSI was a significant independent predictor of delayed healing (OR 14.6, 95% CI 1.3-160.7).

Conclusions: PS closure of the stoma site after ileostomy or colostomy takedown has a significantly lower risk of stoma-site SSI than CP closure though wounds take longer to heal using this approach.

AUTOLOGOUS FAT GRAFTING AS A NOVEL APPROACH TO PARASTOMAL SOFT TISSUE VOLUME DEFICIENCIES.

(P123)

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Purpose: To describe a novel approach in revising maladaptive soft tissue contour around an ileostomy.

Methods: A stoma patient with significant defects in abdominal soft tissue contour due to scarring and wound contraction underwent autologous fat grafting to achieve sealing of stoma appliance and improve cosmesis. The patient had a previous total proctocolectomy with end ileostomy for Crohn's disease, and subsequently stoma repositioning, for a large parastomal hernia and abscess, developed uneven subcutaneous indentations. He suffered significant difficulties with stoma flange adhesion to the skin requiring appliance change every three days, despite the use of adaptive paste and adhesive tape. Persistent small bowel effluent leakage led to chronic chemical injury to skin and circumferential granulation tissue growth at the mucocutaneous junction. In collaboration with a plastic surgeon, a sequential fat transfer process was carried out to repair parastomal soft tissue defects. Firstly, in an outpatient clinic, autologous adipose tissue from right iliac crest zone was harvested, centrifuged and implanted to the inferior zones of the parastomal soft tissue. A two month observation period was used to assess the survival of fat transplant. Once deemed successful, a subsequent combined procedure was performed, where a small bowel resection for interim flare of Crohn's ileitis was immediately followed by a second autologous fat transfer to smooth the contour around stoma. A complete

P122 Comparison of primary and secondary endpoint results

Variable, n(%)	Purse-string (PS) (n=58)	Conventional Primary (CP) (n=55)	p-value
Overall SSI	9(16)	15(27)	0.127
Stoma site SSI	1(2)	8(15)	0.015
Laparotomy site SSI	4(7)	5(9)	0.667
Deep space SSI	4(7)	5(9)	0.667
Delayed healing	12(21)	8(15)	0.543
Time to epithelialization, mean days (SD)	34.6(20)	24.1(17)	0.016
Patient satisfaction POD 7	4.0(0.6)	4.0(0.9)	0.880
Patient satisfaction POD30	4.3(0.4)	4.0(0.8)	0.152

seal of stoma appliance was accomplished at the end of fat implantation process.

Results: At 2 months follow-up, the patient was very satisfied with stoma sealing and was able to increase the interval between appliance changes to seven days with minimal skin excoriation.

Conclusions: Autologous adipose tissue transfer is a simple and effective approach to treat a subset of stoma patients with complex subcutaneous defects.

Figure 1. Ileostomy site with chemical excoriation and significant granulation tissue before fat transfer in April 2011 (left) compared to the same ileostomy site after sequential fat transfer in Oct 2012 (right).

FEASIBILITY OF POSTOPERATIVE COMPUTER-ASSISTED ILEOSTOMY EDUCATION USING TOUCHSCREEN TABLETS.

(P124)

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Purpose: Hospital readmission is emerging as a quality indicator with the goal of denying payment for select readmissions. Ileostomy patients are at risk for readmission from dehydration. Effective patient education has been considered an important component of readmission programs. The purpose of this study was to assess feasibility and patient acceptance of interactive tablet-based ileostomy education in colorectal surgery patients. We hypothesized that tablet education will result in improved ileostomy care knowledge and patient attitudes toward ileostomy self-management with the long-term impact of preventing ileostomy-related readmissions.

Methods: The interactive tablet-based ileostomy education was developed based on adult learning theories. The program interface for the educational program and touch screen tablet did not require previous computer experience. Baseline socio-demographic, mental status, orientation, health and computer literacy profiles were obtained. The patients were then asked to use the educational program over the following 24 hours. The impact of the educational program was assessed with ileostomy knowledge survey and ileostomy self-efficacy scales administered prior to and following using the tablet. An attitudinal survey and semi-structured qualitative interview were conducted after the tablet education to assess patient experience.

Results: Colorectal surgery patients with new ileostomies were enrolled. Tablet education resulted in improvement in patient knowledge scores(+12.12%), communication and attitudinal efficacy(+23.68%; increasing from slightly disagree to strongly agree), and stoma care and social self-efficacy(+33.93%; increasing from not confident to fairly confident). Qualitative analysis of patient feedback revealed high acceptance of tablet-based education, characterized as "easy to use" and "a good supplement to the teaching provided by the ostomy nurse."

Conclusions: Interactive tablet-based ileostomy education for colorectal surgery patients can potentially be a useful resource to inform patients about ileostomy care and to promote better patient-provider communication. Improved education may reduce ileostomy-related readmissions in this high risk patient group.

DOES PROPHYLACTIC INTRAPERITONEAL BIOLOGIC MESH PLACEMENT PREVENT PARACOLOSTOMY HERNIAS?

(P125)

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Purpose: Parastomal hernia (PSH) is a common complication of an end colostomy. Prophylactic placement of synthetic mesh in the retrorectus position reduces the incidence of PSH, but is difficult to perform if the operation has been performed laparoscopically and intraperitoneal mesh placement is easier. Concerns exist regarding the placement of synthetic meshes intraabdominally because of the risk of erosion and fistulation. The use of biologic meshes may overcome this problem. The aim of this study was to investigate whether prophylactic biologic mesh placement reduced the rate of PSH after laparoscopic abdominoperineal excision.

Methods: A retrospective review of patients who had abdominoperineal excision performed between April 2005 and Feb 2012. Data were collected on patient demographics, co-morbidities and both clinical and radiological follow up. PSH were classified according to the Moreno classification. All bowel had been routed in a transperitoneal fashion and the lateral space was not closed. From 2009 onwards acellular porcine dermis was used to reinforce the stoma site using a keyhole intraperitoneal onlay (IPOM) technique. The mesh was fixed in place with a non-absorbable tacking device.

Results: 15 patients had APE with prophylactic biologic mesh reinforcement of the stoma site and 37 without. CT follow up was available for 13/15 and 23/37 respectively. Age, sex, body mass index, radiological follow up duration and co-morbidities were similar between the two groups. For those with radiological follow up, 5/13 (38.5%) of those with mesh developed a parastomal hernia compared to 14/23 (60.9%) without (p=0.299, Fisher's exact test) at median follow ups of 7 & 8 months respectively. For those with only clinical follow up, 0/2 with pro-

phylactic mesh and 3/14 without mesh had developed PSH (p=1.00, Fisher's exact test). There were no cases of mesh infection, erosion or fistulation. One mesh had become detached from the abdominal wall on CT, but was not associated with a PSH.

Conclusions: Intraperitoneal onlay keyhole placement of biologic mesh is safe but does not significantly reduce the incidence of parastomal hernia in the short term.

COMPLICATION RATES OF OSTOMY SURGERY ARE HIGH AND VARY SIGNIFICANTLY BETWEEN HOSPITALS.

(P126)

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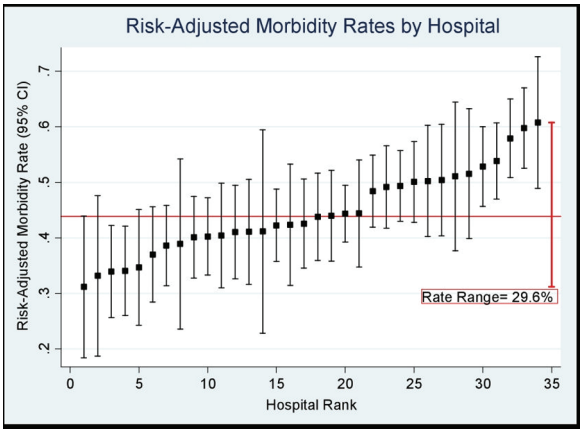
Purpose: Traditionally, ostomy surgery was associated with high rates of morbidity and mortality. We hypothesized that modern surgical techniques and perioperative care would result in a more favorable complication profile following ostomy surgery.

Methods: This was a cohort study of patients who underwent ostomy creation surgery between 2006-2011 within the 34-hospital Michigan Surgical Quality Collaborative (MSQC). The data are based on the validated ACS-NSQIP data platform. Hospitals' rates of 30-day morbidity and mortality were adjusted for patient risk (age, comorbidities, emergency v. elective and procedure type).

Results: 4,250 patients underwent ostomy creation surgery; 3,866 (91.0%) procedures were open and 384 (9.0%) were laparoscopic, with a median length of stay of 10 days. Statewide, unadjusted morbidity and mortality rates for ostomy creation were 43.9% and 10.7%, respectively. Differences in unadjusted morbidity and mortality were observed between emergent (55.4%, 18.8%) and elective (37.1, 5.9%) cases. Unadjusted morbidity rates for specific procedures ranged from 32.7% for ostomy-creation-only procedures to 47.8% for Hartmann's procedures. The most common complications were need for postoperative ventilation (13.7%), postoperative transfusion (8.9%), sepsis (7.9%), and pneumonia (7.1%). Analyses of factors such as cases volume, operative duration, and use of laparoscopic surgery did not explain the observed variation in morbidity rates between hospitals, indicating a more complex relationship between care and outcomes. Risk-adjusted morbidity rates varied significantly between hospitals, ranging from 31.2% (95%CI 18.4-43.9) to 60.8% (95%CI 48.9-72.6), with 5 high- and 3 three low-outliers.

Conclusions: Contrary to our hypothesis, morbidity and mortality rates for ostomy surgery remain extremely high, even after risk-adjustment. While this type of surgery has received little attention in healthcare policy, these data reveal that it is both common and uncommonly morbid. The between-hospital variation in performance provides an opportunity to identify quality improvement practices that could be disseminated among hospitals within the state of Michigan.



STOMA SITE AND PROGRESSION OF TREPHINE DIAMETER OVER TIME: A CLUE TO THE ONSET OF PARASTOMAL HERNIA?

(P127)

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Purpose: Parastomal hernia (PSH) development remains the main long term complication of stoma formation. The ideal stoma position relative to the rectus abdominis muscle (RAM) remains controversial. Furthermore; the diameter of the abdominal wall aperture (AWA) is related to the likelihood of developing PSH The aim of this study was to evaluate the relationship between AWA diameter, stoma site position and time.

Methods: A retrospective review of all end colostomies performed following elective abdominoperineal excisions (APE) between February 2006 and October 2011. All stoma sites were marked pre-operatively by the stoma therapist. Data including age, sex, curative intent, and stoma position relative to the RAM and serial AWA diameter on surveillence Computed Tomography (CT) imaging were collected retrospectively.

Results: During the study period 64 elective APEs were performed, of which 50 charts were available for review for this study. Thirty-nine (78%) had the colostomy created through the RAM, whilst 11 (22%) had it lateral to the RAM. Median follow-up CT imaging was at 21.5 (0.4 – 59.7) months in the RAM group compared to 29.7 (0.6 – 69.1) months in the lateral to RAM (LRAM) group (p=0.23). In the LRAM group the AWA diameter increased by 1.41mm per year (95%CI: 0.63 – 2.19, p=0.001), whereas in the RAM group it increased by 1.03mm per year (95%CI: 0.35 – 1.71, p=0.004). The AWA diameter in the RAM group was lower than that of

the LRAM group by 13mm (95%CI: -18.1 – -7.95; p<0.001) regardless of time since surgery.

Conclusions: AWA diameters for stomas created through the RAM progress in size at a significantly lower rate than those created lateral to RAM. A smaller initial AWA diameter is associated with a slower rate of progression with time.

IS THE PERMANENT STOMA RATE GREATER IN OBESE PATIENTS?

(P128)

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Purpose: Obesity is a risk factor for colorectal cancer (CRC) and significantly affects postoperative morbidity. Consequently obese patients are thought to have a higher permanent stoma rate, particularly following rectal cancer surgery. We aimed to assess the permanent stoma rate in obese patients in comparison to their non-obese counterparts. Primary ends points were permanent stoma rate and post-operative morbidity, with quality of life (QoL) being used as a secondary end point.

Methods: A database of all colorectal cancer resections is routinely maintained by the department's team of specialist nurses. Data from 2006-10 was extracted and retrospectively analysed. Qol data was prospectively collected by postal questionnaire, and scored as published by Baxter et al in Dis Colon Rectum 2006;49:205–212.

Results: 72 obese (Body Mass Index >30) and 266 non-obese patients underwent resection within the study period. The median age of both groups was similar (65.5 years vs. 70 years) with 51.8% and 50.8% undergoing pelvic procedures respectively. The permanent stoma rate for rectal cancers in obese patients was 23.5% compared to 24.5% in the non-obese group. Medical postoperative complications occurred in 12.5 % versus 7.5% patients (p=0.177) with surgical complications seen in 16.6% of obese compared to 6.8% of non-obese patients (p=0.0085). Qol data in 14 obese compared to 29 non-obese patients revealed no significant difference in the 20 parameters measured. Median overall satisfaction score between both groups was identical (p=0.967).

Conclusions: Obese patients have no significant difference in permanent stoma rate compared to non-obese patients at our centre. Furthermore permanent stomas did not appear to adversely impact Qol. The incidence of medical post-operative complications was comparable between groups, however obese patients had a significantly higher risk of suffering from a post-operative surgical complication.

FECAL DIVERSION AFTER COLORECTAL RESECTIONS IN OVARIAN CANCER DEBULKING.

(P129)

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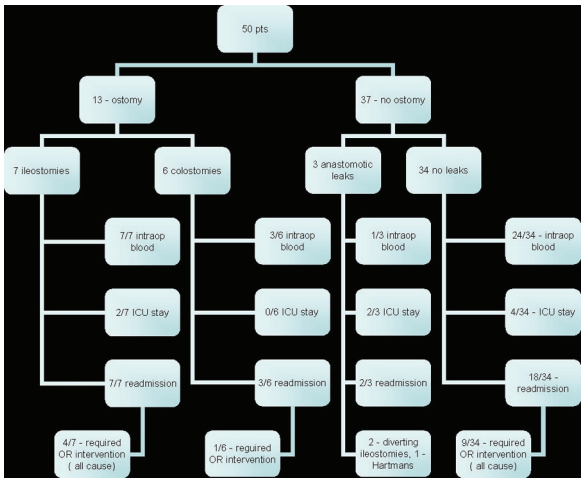
Purpose: Optimal cytoreduction improves survival in patients with ovarian cancer. This often entails bowel resection. We examined our experience with bowel resection during debulking for ovarian cancer to identify factors influencing intraoperative decisions and their effects on overall patient outcomes.

Methods: A retrospective chart review was performed of patients with epithelial ovarian cancer treated at Hartford Hospital between 2000 and 2010. Using tumor registry, patients had surgery for ovarian, fallopian tube, and primary peritoneal cancer were identified. Those who had bowel resection at Hartford hospital were included. These patients were analyzed for anastomotic leak rate and use of diverting ostomy.

Results: Of 296 patients identified, 50 patients underwent bowel resection at the time of debulking surgery, 37 had primary reanastomosis, 7 had ileostomies and 6 had colostomies. There was no difference with respect to age, stage of disease, ICU stay, and number of units transfused between the patients with and without an ostomy. In the anastomotic group, 3 patients had anastomotic leak (8.1%). Among which, 2 underwent subsequent diverting ileostomies and one had a Hartman's procedure. Among the patients with fecal diversion, 1 out of 6 colostomies (16.7%) was reversed and 5 of 7 ileostomies (71.4%) were reversed but subsequently 3 of these patients required a new diverting ileostomy. So overall, 10/13 patients (77%) ended with permanent ostomy.

Conclusions: patients with 2 or more anastomoses were more likely to get a protective ostomy. All the patients who had a fecal diversion were felt to be at high risk for anastomotic leak. 37 Patients were felt to be at acceptable risk for primary anastomosis, despite this the leak rate was high (8.1%).Even though a high percent of patients ended with permanent ostomies, we conclude that having low threshold to create an ostomy may be safer for this patient population. This decision needs to be individualized based on the patient characteristics, extent of disease and resources available. All patients undergoing debulking surgery for advanced ovarian cancer should be counseled to the potential of permanent ostomy.



THE INCIDENCE OF OSTOMY SITE INCISIONAL HERNIAS AFTER STOMA CLOSURE.

(P130)

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Purpose: This study sought to evaluate the incidence of ostomy site incisional hernias after stoma reversal at a single institution and to determine any significant risk factors that might lead to such hernias.

Methods: This is a single institution retrospective analysis from 2001-2011 of ostomy reversal. Questionnaires were mailed for patients with less than 12 months follow-up. The study considered the following demographics: age, gender, indication for stoma, urgent versus elective operation, time to closure, total follow-up time, the incidence of and reoperation for stoma incisional hernia, diabetes, postoperative wound infection, smoking status within 6 months of surgery, and any immunosuppressive medications.

Results: A total of 401 patients were included. A total of 179 questionnaires were mailed. Median age was 51 years. Females comprised 42% (170/401) and males 58% (231/401). Elective cases made up 68% (276/401), urgent cases 32% (125/401). Loop ileostomies comprised 70% (281/401), end ileostomies 6% (24/401), loop colostomies 12% (51/401), end colostomies 12% (45/401). Diagnoses were: cancer 26.8%, diverticular disease 13.6%, inflammatory bowel disease 38.2%, and other (including trauma and mesenteric ischemia) 21.4%. Median time to stoma closure was 5 months. Median follow-up time was 14 months. The clinical hernia rate was 16%. Significant risk factors for hernia development (p-value <0.05) were diabetes (RR 1.96), smoking within 6 months of surgery (RR 2.01), end colostomies (RR 3.55), and undergoing an urgent operation (RR 1.85). The median time to clinical hernia detection was 11 months. Sixty-four percent of patients required surgical repair of their stoma incisional hernia.

Conclusions: This large, retrospective, single institution analysis evaluated rates of stoma site hernia formation after stoma closure. Sixteen percent of patients undergoing stoma closure developed an incisional hernia. Sixty five percent of these patients required definitive hernia repair. Diabetes, smoking within 6 months of surgery, end colostomies, and undergoing an urgent operation were significant risk factors for the development of stoma site incisional hernias.

FACILITATION OF OSTOMY CREATION UTILIZING AN ALEXIS RETRACTOR DEVICE IN DAMAGE CONTROL RESUSCITATED BOWEL IN TRAUMA PATIENTS.

(P131)

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Purpose: Trauma patients often require ostomy creation at time of temporary or definitive fascial closure, while having significant bowel wall, mesenteric, and body wall edema; making ostomy creation difficult. We describe a case that demonstrates a novel technique of easily and more safely advancing edematous bowel through the fascial/skin opening during the creation of an ostomy using an Alexis Wound Protector/Retractor.

Methods: While creating an ostomy in a damage control trauma patient, much difficulty was had advancing the small bowel through the fascia and skin due to the large amount of bowel, mesenteric, and body wall edema. Multiple attempts at conventional ostomy creation through the fascia and skin were made with little success. Decision was made to place a small size (2.5-6cm incision) Alexis Wound Protector/Retractor through the ostomy site. Placement of the device created ample retraction of the skin, subcutaneous fat, and fascia for ostomy creation. The bowel was then grasped with Babcock clamps and advanced effortlessly through the Alexis and out to the skin. The internal ring was removed, allowing the Alexis to be removed from around the bowel and out of the abdomen, leaving the ostomy in place.

Results: The Alexis Wound Protector/Retractor allowed for easy advancement of the small bowel through the fascia and skin, even in the face of bowel, mesentery, and body wall edema. Little force was required to advance the bowel compared to previous attempts without the Alexis, which allowed for a less traumatic approach. The Alexis also created a smooth, friction free canal that facilitated passage of the bowel, taking less time.

Conclusions: The Alexis Wound Protector/Retractor demonstrated that it can be used in cases where the bowel is too edematous for conventional ostomy creation. This device allows for safer and less traumatic advancement to the skin surface when creating an ostomy. It allows for a smooth passage that the bowel can be advanced through,

while minimizing the amount of traction force required to be applied to bowel that is both edematous and friable; which ultimately leads to a less traumatic, safer, and more efficient approach.

Ostomy advanced through Alexis Wound Protector/Retractor.

DIAGNOSIS AND MANAGEMENT OF EFFERENT LIMB SYNDROME IN PATIENTS WITH ILEAL POUCHES.

(P132)

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Purpose: The disease course, diagnosis and management of efferent limb syndrome (ELS) have not been studied, beyond case reports. The aim of this study is to evaluate the diagnosis and management of ELS and compare S pouch (ELS-S) patients to those with a J pouch (ELS-J).

Methods: Consecutive ELS patients with ileal pouches followed up at our subspecialty Pouchitis Clinic from 2002-2011 were included. Demographic, clinical, endoscopic, and radiographic features together with its management and outcomes were studied.

Results: A total of 26 patients met the inclusion criteria, with 17 (65.4%) being male. All patients had underlying ulcerative colitis (UC). The cohort consisted of 11 patients (42.3%) in the ESL-S group and 15 (57.7%) in the ELS-J group. The mean age at the diagnosis of UC and at colectomy was 26.2±12.8 years and 31.7±13.1 years, respectively. The majority of patients (n=24, 92.3%) were diagnosed by pouchoscopy. Eight (30.8%) patients had a long efferent limb with/without angulation identified by contrast pouchogram and 1 (3.8%) by defecography. The median length of efferent limb for all patients was 6.0 (5.0-8.8) cm, 7.0 (5.0-9.0) cm and 6.0 (5.0-10.5) cm for S and J pouch patients, respectively (P=0.025). Dyschezia (n=15, 57.7%) was the most common symptom, followed by bloating (n=9, 34.6%), abdominal pain (n=9, 34.6%), incomplete evacuation (n=7, 26.9%) and perianal discomfort (n=3, 11.5%). A greater proportion of S pouch patients had dyschezia than J pouch patients (90.9% vs. 33.3%, P=0.005). More S pouch patients had a sense of incomplete evacuation (45.5% vs. 13.3%, P=0.1). Ten S pouch patients (90.9%) needed surgical management versus 5 patients (33.3%) with a J pouch (P=0.005). After a mean follow up of 3.4±1.4 years, 1 (12.5%) of the 8 patients, who underwent redo pouch construction with efferent limb excision, developed ischemic pouchitis and subsequently required pouch excision.

Conclusions: ELS-S patients tend to have a more severe disease entity than ELS-J patients. Surgical intervention is often needed, especially for S pouch patients. Redo pouch construction with efferent limb excision appears to be an effective procedure with a favorable long-term outcome.

P132 Table. Diagnosis and Management of Efferent Limb Syndrome.

Characteristic	All cases	ELS-S	ELS-J	P Value
Male patients	17	7 (63.6%)	10 (66.7%)	1.0
Referred patients from other institutions	22	9 (81.8%)	13 (86.7%)	1.0
Length of efferent limb, cm	6.0 (5.0-8.8)	7.0 (5.0-9.0)	6.0 (5.0-10.5)	0.025
Clinical presentations				
Dyschezia	15	10 (90.9%)	5 (33.3%)	0.005
Bloating	9	5 (45.5%)	4 (26.7%)	0.42
Abdominal pain	9	2 (18.2%)	7 (46.7%)	0.22
Incomplete evacuation	7	5 (45.5%)	2 (13.3%)	0.1
Perianal discomfort	3	0 (0%)	3 (20.0%)	0.24
Diagnostic method				
Pouchoscopy	24	10 (90.9%)	14 (93.3%)	1.0
Contrasted pouchogram	8	3 (27.3%)	5 (33.3%)	1.0
Defecography	1	1 (9.1%)	0 (0%)	0.42
Requirement of surgical management (intention- to-treat)	15	10 (90.9%)	5 (33.3%)	0.005

IS CONCOMITANT CLOSTRIDIUM DIFFICILE INFECTION AND INFLAMMATORY BOWEL DISEASE ASSOCIATED WITH POOR SHORT-TERM OUTCOMES FOLLOWING COLECTOMY?

(P133)

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Purpose: The incidence of Clostridium difficile infection (CDI) among patients with inflammatory bowel disease (IBD) is increasing and has been accompanied by an increase in morbidity, mortality and colectomy rates. We aimed to examine short-term outcomes following colectomy in patients with medically refractory IBD colitis and concomitant CDI.

Methods: We included all patients undergoing colectomy from 9/2007 to 8/2012 for a diagnosis of medically refractory IBD and a positive PCR-stool test for CDI within the 30 days prior to colectomy.

Results: Sixty-three patients were included with median age at the time of colectomy of 38.1 years (range 17 to 74); 51% were female. The IBD diagnosis was ulcerative colitis in 49 (78%), Crohn colitis in 10 (16%), and indeterminate in 4 (6%). Eighty-nine percent of patients were receiving steroids at the time of colectomy; the median prednisone dose was 60 mg (range 10 to 200); 49% had a dose of biologics within 8 weeks, 24% were receiving immunomodulators, and 5% were on other immunosuppressants. Forty-three (68%) were inpatients at the time of colectomy. Surgical procedures included total abdominal colectomy with end ileostomy in 40 (63%), total proctocolectomy with end ileostomy in 12 (19%), and proctocolectomy with ileal pouch-anal anastomosis and ileostomy in 11 (17%). The 30-day morbidity was 33.3%; mortality was nil. The most common complications were ileus (n=12, 19%), small bowel obstruction (n=5, 8%), and portal vein thrombosis (n=4, 6%) (Table 1). We found no association between gender, age, IBD type, high dose steroids (>20 mg), biologic administration, inpatient status, surgical procedure or age and morbidity. Re-admission was required in 11 patients (17%) and re-operations were necessary in 5. In the group of patients with UC or indeterminate colitis, 39 have undergone IPAA (76%) successfully. A three-stage IPAA was performed in 28/39 (72%).

Conclusions: Concomitant CDI in patients with IBD who require colectomy does not seem to increase morbidity and mortality rates when compared to historical data in patients without CDI. A history of CDI does not appear to hinder a planned IPAA.

P133 30-Day Complications following colectomy

Complication	Clavien Grade	Number of patients
Paralytic Ileus	I, II	12
Small bowel obstruction	IIIb	5
Portal vein thrombosis	II, IIIa	4
DVT/PE	II	2
Wound infection	I	2
Infected peritoneal fluid	IIIa, IIIb	2
Wound dehiscence	IIIb	1
Other	I, II	2

BENEFITS OF PREOPERATIVE INFLIXIMAB TREATMENT IN SURGICAL SITE INFECTION FOR PATIENTS WITH PENETRATING CROHN'S DISEASE.

(P134)

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Purpose: Pre-operative infliximab treatment may or may not reduce the post-operative infectious complications in patients with Crohn's disease. However, previous work has suggested that infliximab may shorten the hospital stay after surgery. This study aimed to define the predictors of surgical site infection after surgery for Crohn's diseases and to evaluate the effects and benefits of preoperative infliximab administration.

Methods: We performed a prospective surveillance and review of surgical site infections(SSI).This study was conducted in the Surgical Department of Hyogo College of Medicine. Consecutive patients with Crohn's disease who underwent abdominal surgery between January 2008 and December 2011 were included. Possible risk factors were analyzed by logistic regression analyses to determine the predictive significance of the factors that were distinct from the phenotype.

Results: We analyzed 405 patients with Crohn's disease. Of these, 20% received infliximab, and 60% had the penetrating Crohn's disease. The median duration from the last infliximab infusion to surgery was 43 (range 4–80) days. The overall incidence of surgical site infection was 27%, while the incidence of incisional surgical site infection was 18% and that of organ/space surgical site infection was 8%. In the stepwise logistic regression model, a duration of surgery ≧167 min (OR 3.1) and operative frequency ≧ 2 (OR 2.6) were selected as independent risk factors for overall SSI. Ostomy creation (OR 4.3) and proctectomy (OR 3.2) were selected as independent risk factors for incisional SSI. Serum Alb level < 2.9 g/dl (OR 4.5) and proctectomy (OR 3.3) were selected as independent risk factors for organ/space SSI. By contrast, clean-contaminated wound (OR 0.5) was selected as a risk reducing factor for overall SSI, and IFX administration (OR0.1) was selected as a risk reducing factor for incisional SSI.

Conclusions: Pre-operative infliximab administration is not a risk factor for surgical site infection, and it may prevent incisional surgical site infection.

CROHN'S DISEASE AND PREGNANCY: THE IMPACT OF PERIANAL DISEASE ON DELIVERY METHODS AND COMPLICATIONS.

(P135)

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Purpose: Determining the optimal delivery method in pregnant Crohn's Disease (CD) patients is difficult, with concerns about subsequent sphincter function and no large-scale evidence on which to base decisions. We compared delivery-related patterns and outcomes in pregnant patients with and without CD.

Methods: The Nationwide Inpatient Sample (NIS; 1998-2009) and ICD-9-CM codes were used to identify childbirth deliveries. Patients were stratified based on presence or absence of CD and active perianal disease (i.e., ano-rectal fistula or abscess, rectovaginal fistula, anal stenosis, or anal fissure). Primary outcomes included rates of premature delivery, episiotomy, cesarean section, and 4th degree perineal lacerations.

Results: Of the 5,127,472 pregnant women who delivered, 5,190 had a diagnosis of CD (0.10%). CD patients were older (30 vs. 28 years, P<0.001), more likely to be smokers (3.2% vs. 1.8%, P<0.001), and have perianal disease (2.3% vs. 0.02%, P<0.001). CD patients had higher rates of premature delivery (12.1% vs. 7.4%, P<0.001), and lower rates of cesarean section (46% vs. 56%, P<0.001). CD patients who delivered vaginally had lower rates of episiotomy (20% vs. 60%, P<0.001) and 4th degree perineal lacerations (1.4% vs. 3.2%, P<0.001). 121 CD patients had active perianal disease at the time of delivery, of whom 89% received a cesarean section. On multivariate logistic regression analysis, only large for gestational age babies were independently predictive of 4th degree laceration (OR 3.4, 95% CI 3.3-3.5, P<0.001). CD (OR 0.3, 95% CI 0.22-0.41, P<0.001) and episiotomy (OR 0.32, 95% CI 0.31-0.32) were independently associated with lower rates of 4th degree lacerations.

Conclusions: CD patients have lower rates of episiotomy, 4th degree lacerations, and cesarean section. In the absence of active perianal disease, the method of delivery in pregnant women with CD should be predicated on the obstetric indication. However, with active perianal disease, rates of cesarean section significantly increase and the safety of vaginal delivery remains undetermined.

INTESTINAL STRICTUREPLASTY FOR CROHN'S DISEASE: WHERE AND WHEN DOES THE RECURRENCE OCCUR?

(P136)

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Purpose: Despite the rich previous evidence establishing the safety and low recurrence rates after intestinal strictureplasty for Crohn's disease (CD), few recent studies have evaluated whether the previously reported outcomes remain true at the current time. The aim of this study is to evaluate safety and efficacy of strictureplasty after prolonged follow-up for CD patients with jejunoileal disease and to identify location and predictors of surgical recurrence after strictureplasty.

Methods: From a prospectively maintained Crohn's database, patients undergoing strictureplasty for Crohn's disease from 1990-2010 were identified. Data regarding demographics, duration of disease prior to strictureplasty, maintenance treatment prior to and after surgery, surgical procedures as well as short and long term outcomes were evaluated.

Results: Four hundred and fifty three patients underwent 1521 strictureplasties (3.4 per patient, 1320 Heineke-Mikulicz; 145 Finney) with no mortality and overall morbidity of 19% (bleeding 5%, abdominal abscess 4%, ileus 4%, leak 2%). Additional resections were performed in 326 patients (small bowel resection: n=278 (61%); Ileo-colic resection: n= 48 (11%)). After median follow up 8.2 years (IQR 3.5-14) for the cohort, surgical recurrence occurred in 183 patients (40%) after a mean period of 6±2 years. Recurrence occurred at the strictureplasty site in 36% patients. Younger age(p=0.001), shorter time of symptoms prior to index surgery(p=0.01), smoking(p=0.05) and greater number of strictureplasty procedures(p=0.01) were associated with recurrence. Malignancy was detected at the strictureplasty site on biopsy during strictureplasty in 2 patients (0.4%).

Conclusions: Strictureplasty continues to be a safe and efficacious bowel preserving procedure for patients with jejunoileal Crohn's disease. Although the risk of complications and cancer is low, a sizeable proportion of patients develop recurrence on prolonged follow-up, upto a third at the strictureplasty site. After strictureplasty, consideration of medical therapy to prevent recurrence should be especially considered in the presence of younger age, smoking history, shorter duration of symptoms and multiple strictures.

CROHN'S DISEASE RECURRENCE: DO RATES DIFFER IN PATIENTS WITH END VERSUS LOOP ILEOSTOMIES?

(P137)

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Purpose: After ileocolic resection, anastomotic recurrence is observed in up to 70% of cases. Stoma construction is often undertaken, especially in emergency cases. This study was conducted to determine whether rates of Crohn's disease recurrence differ between patients who undergo end ileostomy versus anastomosis with a diverting loop ileostomy.

Methods: After IRB approval, we reviewed medical records of patients with small bowel Crohn's disease who underwent resection with stoma and subsequent closure from 1/2000-7/2012. Patients were grouped by stoma type: end ileostomy or anastomosis with a diverting loop ileostomy. Recurrence was defined as endoscopic and/or clinical. Fisher's exact tests were performed to compare recurrence rates in the 2 groups; $p<0.05$ was considered significant.

Results: 97 patients met inclusion criteria: diverting loop ileostomies (56) and end ileostomies (41). 11 patients (11%) were tobacco smokers (5 loop, 6 end). 22 patients (23%) were ex-smokers (13 loop, 9 end), 41 patients (42%) were non-smokers (23 loop, 18 end), and 23 (24%) patients were never assessed (15 loop, 8 end). There was no difference in overall recurrence between smokers and non-smokers (p value 0.193).77 patients (79%) recieved postoperative medications. There was no difference in recurrence rates among patients who did or did not use postoperative 5-ASA, corticosteroids, or immunomodulators. The main indications for bowel resection with stoma creation were obstruction (78%, 76 patients), abscess formation (16%, 16 patients) and perforation (5%, 5 patients). There was no difference in recurrence rates between patients with loop ileostomies (n=25, 45%) and end ileostomies (n=16, 39%; p=0.58). 10 patients (10%) had anastomotic recurrence (6 loop, 4 end). There was no difference in recurrence rate in the small bowel (23% vs 24%) or at the anastomosis (11% vs 10%, p value .91).

Conclusions: There is no difference in either anastomotic or in overall recurrence rates between end and loop ileostomy after stoma reversal.

TEMPORARY FECAL DIVERSION FOR PERIANAL CROHN'S DISEASE MAY ACTUALLY BE PERMANENT IN THE MAJORITY OF PATIENTS.

(P138)

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Purpose: Fecal diversion is considered an option to allow severe perianal disease to improve, potentially avoiding a permanent stoma. The aim of this study was to evaluate the outcomes of a temporary stoma for severe anorectal Crohn's disease.

Methods: Medical records of patients with Crohn's disease who underwent a temporary stoma for severe perianal Crohn's disease and/or rectovaginal fistulas from 1/2000 to 4/2012 were reviewed from an IRB-approved database. Demographics, comorbidities, disease duration, medication use, and operative outcomes were collected for analysis. Predictive factors for stoma reversal were evaluated. Response to treatment was defined as stoma closure after cessation of perianal or vaginal discharge and/or closure of the external opening. Chi-square and Student's t-tests were performed; a p value $<.05$ was considered significant.

Results: Fifty patients (34 females) of a median age of 44.1 (18-87) years were included; 12 had more than one indication for stoma including complex perianal (21) and rectovaginal (18) fistulas, perianal sepsis (14), stenosis (8) and ulcer (1). Twenty-seven (54%) patients had undergone previous fistula repair. Thirty-six (72%) patients used biologics and/or immunomodulators. The mean follow-up was 41 (4-126) months. Twenty-one (42%) patients underwent stoma reversal, 16 (76%) after fistula repair procedures including gracilis transposition, rectal advancement flap, fibrin glue, plug, fistulotomy or LIFT. Five of the 21 patients had disease recurrence after reversal, 1 of whom required a permanent stoma. Twenty-seven patients had no response to temporary diversion, 9 of whom underwent proctectomy with a permanent stoma. Eighteen of the 27 patients remained with a stoma despite ≥ 1 interventions. There was no association among demographics, BMI, smoking, medications, disease duration and stoma reversal.

Conclusions: "Temporary" fecal diversion for perianal Crohn's disease may actually be permanent in the majority of patients.

RESPONSIBLE CT SCANNING IN CROHN'S DISEASE.

(P139)

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Purpose: Computed tomography (CT) is increasingly relied upon above clinical examination as the modality of

choice in determining management of patients with Crohn's disease. The cost and radiation burden of frequent imaging is significant, and healthcare practitioners should be responsible in their use of these studies and resources. To this end, we aimed to identify factors that predict low yield CT scans that are less likely to lead to a change in management of the patient.

Methods: A retrospective chart review was conducted of 72 patients with Crohn's disease at Tufts Medical Center between May 2009 and October 2012. Data gathered included number of emergency department (ED) visits, admissions, operations, diagnostic studies (CT, MRI, small bowel follow through, endoscopy), chronic narcotic use, attendance of surgery, gastroenterology, or pain clinics, and missed visits.

Results: Pain clinic attendees' mean ED visit frequency was 3.3-fold higher than non-pain-clinic patients, with 2-fold higher likelihood of being admitted. However the likelihood of going to the operating room (OR) per CT, ED visit, or admission was 4.3-fold, 2.7-fold, and 1.5-fold lower, respectively, than in a non-pain clinic patient. Narcotic users were found to undergo twice as many CT scans per operative intervention. This is consistent with previous data. However in contrast to previous studies, history of multiple missed clinical appointments was not predictive of imaging in excess of operative intervention. Notably, there was no significant difference in the use of other imaging studies between narcotic and non-narcotic groups.

Conclusions: Our data show that patients who are on chronic narcotics or attend pain clinic receive 20-40% of the total CTs done for Crohn's patients despite only representing 5-20% of our Crohn's population. Additionally they are more likely to undergo CT scans that do not result in operative intervention. Therefore, we have identified chronic use of narcotics and pain clinic as significant predictors of low-yield CT. Greater clinical scrutiny of these patients' indications for imaging could reduce the scan burden in this population, thus reducing both health care financial cost and ionizing radiation risk to these patients.

TWANGING LIKE A BOW STRING: MESENTERIC TENSION AFTER ILEAL POUCH-ANAL ANASTOMOSIS.

(P140)

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Purpose: The aims of this study were to develop a method of assessing mesenteric tension during ileal pouch-anal anastomosis (IPAA), and to evaluate its impact on the long-term pouch outcomes and quality-of-life (QOL).

Methods: Patients underwent IPAA from 2008-2009 and mesenteric tension was scored by the surgeon (scale of 1 to 10) after the anastomosis and ileostomy. Distance from apex of ileum to symphysis pubis, and from pouch to ileostomy were measured. Demographics, postoperative clinical and functional outcomes and QOL were abstracted. Mesenteric tension scores were divided into low (1-2), medium (3-6) and high (7–10).

Results: Of 134 patients, 34 (25.4%) had low tension, 53 (39.6%) medium, and 47 (35.1%) high. Seventy-one patients (53.0%) were men; mean age 38.9±12.3 years. More men had high tension (P=0.006); more patients with stapled anastomosis had low tension (P=0.034). Patients with high mesenteric tension had a shorter distance from upper border of symphysis pubis to the apex of small bowel (P=0.002), but a longer distance from pouch to ileostomy (P<0.001), validating the mesenteric tension score. Mean follow-up was 3.5±0.7 years. More patients in the high tension group tended to have anastomotic stenosis (19.1% vs. 2.9% and 7.7%, p=0.06) postoperative complications (70% vs. 56% and 58%; p=0.32) as well as pouch failure (6.4% vs. 2.9% and 1.9%, p=0.53). However, no significant differences were identified among the three groups in terms of bowel function, and quality of life.

Conclusions: Males are prone to have increased mesenteric tension after IPAA, especially when the anastomosis is hand sewn. This may predispose to anastomotic stenosis and an overall increased risk of complications.

SEVERITY OF DISTAL DISEASE AS A RISK FACTOR FOR ILEOANAL ANASTOMOTIC LEAK POSTPELVIC POUCH PROCEDURE FOR ULCERATIVE COLITIS.

(P141)

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Purpose: Pelvic pouch procedure (PPP) carries significant postoperative complication risks including a 4-14% risk of ileo-anal anastomotic (IAA) leak. The aim of this study is to evaluate the severity of disease at the IAA distal margin as an independent risk factor for IAA leak following PPP for patients with ulcerative colitis (UC).

Methods: A retrospective case-control study was undertaken. Patients were identified from the prospectively collected database at our institution from years 1981 to 2011. Patients with perioperative IAA leak were matched to controls based on multiple factors, including but not limited to, gender, age, ileostomy and surgeon. Previously known patient and operation related risk factors for leaks (such as age, gender, body mass index (BMI), alcohol, smoking, steroid use, malnutrition, diabetes, renal failure, ASA level, blood loss, operative duration, ileostomy and

anastomotic tension) were collected. The distal margin of each subject's specimen was reviewed by a blinded pathologist and the degree of inflammation was scored using a modified histological activity index (HAI) – a 0 to 5 graded scale with HAI of 5 representing ulcerations >25% the depth of bowel wall. Descriptive statistics (means +/- SEM) as well as a conditional logistic regression was performed.

Results: Forty-nine patients with perioperative IAA leaks (mean 11 postoperative days +/-.92) were identified and matched for variables. The case cohort had 33 males (67%) with a mean age at time of surgery of 36.3 years (+/- 1.42), mean BMI of 24.7 (+/- .64) and mean ASA level 1.88 (+/- 0.09). Of all known risk factors investigated, only the presence of a diverting ileostomy offered protection against IAA leaks with an OR of 0.06 (p=0.01). Severe distal activity was not associated with an increased IAA leak rate (OR 0.03, p=0.023).

Conclusions: The severity of UC at the distal margin of an IAA after PPP was not identified as a risk factor for IAA leak in this study. Patients with severe UC in the distal rectum can be candidates for a PPP provided that a defunctioning ileostomy is performed to reduce the risk of IAA leak.

POUCH-PELVIC SEPSIS INCREASES MORBIDITY OF ILEOANAL POUCH EXCISION.

(P142)

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Purpose: Perineal wound complications (PWC) after ileoanal pouch excision (PE) are a significant cause of morbidity. Few studies have addressed this problem. We describe the incidence, outcomes and predictors of PWC after PE.

Methods: Patients who underwent PE from 1992-2012 were identified from an IRB-approved database. Patient, operative and postoperative variables were obtained by chart review. The primary endpoint, PWC, included perineal wound infection, persistent perineal sinus (PPS) (nonhealing by 6 months) and perineal hernia. Univariate and multivariate analyses were performed.

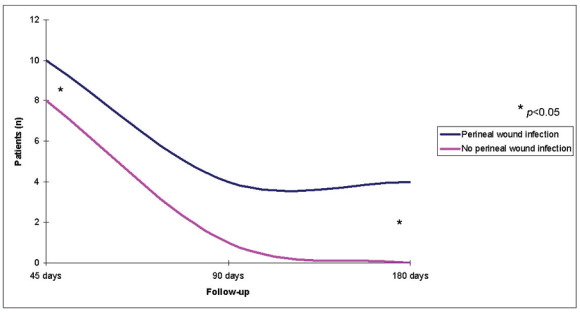
Results: 47 patients (mean 46 years, 43% male) with familial adenomatous polyposis (10.6%), mucosal ulcerative colitis (61.7%) and Crohn's disease (27.7%) underwent PE: 36.2% for pouch-pelvic sepsis (pouch-vaginal, pouch-perineal or pouch-sacral fistula; anastomotic defect; or presacral abscess); 44.7% for pouch dysfunction; 10.6% for refractory pouchitis; and 8.5% for neoplasia. Most patients had an intersphincteric dissection (87.2%) and primary closure of the perineum (97.0%). 14 (29.8%) patients developed PWC: 100% had perineal wound infections, 28.6% had PPS, and 7.1% had a perineal hernia. Perineal wound infection was significantly associated with delayed (>6 weeks) healing (71.4% vs 24.2%, p=0.002) and PPS (28.6% vs 0%, p= 0.001). Patients with and without PWC were similar in age, comorbidities, diagnoses, preoperative diversion, immunosuppression, nutrition, and operative factors. PWC was significantly associated with smoking (21.4% vs 3.0%, p =0.04), pouch-pelvic sepsis as the indication for PE (57.1% vs 27.2%, p=0.05) and pre- or intraoperative pouch perforation (35.7% vs 9.1%, p =0.03). On multivariate analysis, pouch-pelvic sepsis was a significant independent predictor (OR 6.4, 95% CI 1.35-30.17) of PWC.

Conclusions: Patients with pouch-pelvic sepsis are at 6-fold increased risk of perineal wound complications after pouch excision. Preoperative cessation of smoking, avoid-

P140 Patient Demographics.

Patient Characteristics	All Patients	Low Tension	Medium Tension	High Tension	P value
Age at colectomy	38.9±12.3	39.1±12.8	41.1±11.9	37.6±12.5	0.4
Male patients	71	22(64.7%)	19 (35.8%)	30(63.8%)	0.006
Stapled anastomosis	105	32(94.1%)	38 (71.7%)	35 (74.5%)	0.034
Distance from upper border of symphysis pubis to the apex of small bowel	2.4±4.1	4.7±4.1	2.9±4.0	1.0±3.7	0.002
Distance from pouch to ileostomy	40.4±20.4	32.4±11.6	35.3±16.8	51.7±24.1	<0.001
Follow-up time	3.5±0.7	3.4±0.7	3.6±0.5	3.5±0.9	0.32
Post-op anastomotic separation	12	2 (5.9%)	5 (9.6%)	5 (10.6%)	0.8
Post-op anastomotic stricture	14	1 (2.9%)	4 (7.7%)	9 (19.1%)	0.06
Post-op fistula	7	1 (2.9%)	3 (5.8%)	3 (6.4%)	0.89
Any post-op complication	82	19(55.9%)	30 (57.7%)	33 (70.2%)	0.32
Post-op pouch failure	5	1 (2.9%)	1 (1.9%)	3 (6.4%)	0.53
Cleveland Global QOL	0.7±0.2	0.7±0.2	0.7±0.2	0.7±0.2	>0.99
SF12	49.7±9.9	47.9±10.9	47.5±10.4	52.6±8.2	0.1
Fecal incontinence quality of life	11.6±4.2	11.4±4.1	11.4±4.8	11.9±3.7	0.96

ance of pouch perforation, and prophylactic muscle flap reconstruction are potential strategies to reduce the risk of PWC after pouch excision.



Perineal wound infection significantly delays healing after PE

DOES RECTAL EVERSION DURING PROCTECTOMY AFFECT FECAL CONTINENCE IN PATIENTS WITH ULCERATIVE COLITIS?

(P143)

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Purpose: In patients with ulcerative colitis (UC), proctectomy is sometime performed with concomitant rectal eversion (RE), which could stretch or injure the anal sphincter. We compared functional outcomes among UC patients following proctectomy with RE versus no eversion (NE).

Methods: All patients undergoing IPAA surgery for active UC at a tertiary hospital over 10.5 years were mailed bowel function surveys containing previously validated tools, including the Memorial Sloan-Kettering Cancer Center (MSKCC) Bowel Function Scale, Fecal Incontinence Quality of Life (FIQL) instrument, and Fecal Incontinence Severity Index (FISI). Survey and clinical data were analyzed using univariate statistics.

Results: Surveys were returned by 89/201 (44%) patients (mean age 35±2 years, 57% male, 92% white, 62% RE). Mean time from proctectomy was 5±0.3 years. There were no differences between RE vs. NE patients in terms of age, race, gender, smoking status, comorbidities, steroid or other immunomodulator use, surgical urgency, severity of disease on pathology, surgical staging, or surgeon experience. RE patients underwent laparoscopic procedures less often (0% vs. 41%, p<0.0001) and had higher surgery apgar scores (6.7±0.2 vs. 6.1±0.2, p=0.03). There were no differences in rates of perioperative complications between groups (1.0±0.2 vs. 1.5±0.3, p=0.14), and RE patients reported similar MSKCC scores compared to NE patients (Table). Interestingly, patients who underwent RE reported better fecal continence scores compared to NE patients (FISI 17±3 vs. 31±4, p=0.009), although this did not translate into an improved fecal incontinence-specific improvement in quality of life (FIQL). However, RE patients had 36% longer lengths of retained rectum as assessed on gastrografin enemas performed prior to ileostomy reversal (p=0.02).

Conclusions: Rectal eversion is associated with improved continence compared to standard proctectomy without eversion, but does not appear to impact fecal incontinence-related quality of life or overall bowel function. Longer retained rectal lengths may explain the difference in continence between groups, which may be a concern long-term and should be studied further.

P143

MSKCC			
Frequency	RE (N=55)	NE (N=34)	p-value
Dietary	19.8±0.47	20.3±0.60	0.48
Soilage	12.2±0.50	11.8±0.65	0.63
Subscales Total	16.4±0.46	15.5±0.59	0.24
Total (All)	48.4±1.0	47.7±1.2	0.64
FIQL			
Lifestyle	59.4±1.1	59.1±1.4	0.87
Coping/Behaviour	2.97±0.18	3.08±0.21	0.68
Depression/Self	2.79±0.16	2.66±0.18	0.59
Perception	2.84±0.13	2.68±0.16	0.44
Embarrassment	2.83±0.17	2.92±0.18	0.73
FISI Total	17.2±3.3	31.4±4.0	0.009

RE: rectal eversion; NE: no eversion; MSKCC: Memorial Sloan-Kettering Cancer Center Bowel Function Scale; FIQL: Fecal Incontinence Quality of Life instrument; FISI: Fecal Incontinence Severity Index

COMPARING AN INNOVATIVE VARIANT 2-STAGE PROCEDURE TO CLASSIC SINGLE AND 2-STAGE PROCEDURES TO CREATE AN ILEAL POUCH-ANAL ANASTOMOSIS IN PATIENTS WITH ULCERATIVE COLITIS.

(P144)

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Purpose: Proctocolectomy with IPAA for patients with UC is prone to anastomotic complications. To minimize morbidity, diversion is widely utilized at the time of IPAA, and high risk patients are often subjected to a 3-stage approach. We believe that the anastomotic risk associated with IPAA is not a consequence of the operation but the conditions under which it is performed. We perform a variant 2-stage procedure for high risk patients in which initial abdominal colectomy is followed by completion proctectomy/IPAA without ileostomy. Pouch creation following this management should be of similar risk to those undergoing a single-stage procedure.

Methods: Data from the electronic medical records of all UC patients who underwent IPAA from 2003-2009 were extracted. Patients were grouped according to procedure: single and 2-stage compared to variant 2-stage. Preoperative population characteristics were compared by bivariate analyses, and operative endpoints by stepwise logistic regression controlling for significant preoperative factors.

Results: 109 (33%) underwent variant 2-stage and 219 (67%) single and 2-stage surgeries. Statistically different risk factors for complications include dysplasia/cancer, urgent or emergent surgery, and high dose or long term steroid use. Gender; age; length of follow-up; tobacco use; diabetes mellitus; 5-aminosalasylic acid, immunologic, or biologic use at first procedure did not differ. Pouch leak overall was decreased (0.39; 0.19-0.82)* in the variant-2 stage compared to the single and 2-stage procedure. Intraabdomal abscess (1.07; 0.46-2.53), and stoma complications (0.71; 0.38-1.34) were not significantly different. (OR; 95% Confidence Interval) * p-value<0.05

Conclusions: A variant 2-stage IPAA permits UC patients to be managed safely without the need for 3 stages. These data suggest that anastomotic complications after IPAA for UC are more the consequence of the conditions under which IPAA is performed, not the procedure itself.

OBESITY INCREASES RISK FOR COMPLICATIONS FOLLOWING RESTORATIVE PROCTOCOLECTOMY.

(P145)

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Purpose: Restorative proctocolectomy with ileal pouch-anal anastomosis (IPAA) is the preferred surgical treatment for most patients with ulcerative colitis (UC). IPAA is a technically complex surgical procedure and overall complication rates range from 30% to 60%. Mirroring the epidemic of obesity in the general population, the proportion of obese patients referred for IPAA is increasing. Accordingly,the aim of this study was to investigate the hypothesis that obesity increases complication rate following IPAA.

Methods: This study was conducted as a retrospective review of a prospectively collected database of patients that underwent IPAA between January 1990 and April 2011. Patients were categorized according to body mass index (BMI): BMI<30 (non-obese) and BMI≥30 (obese). Patient characteristics, operative information and complications were recorded through medical record review. The primary outcome measure was cumulative complication rate. Statistical analysis was performed using Student t test and Fisher's exact test with significance set at $p<0.05$.

Results: A random sample of 178 patients undergoing IPAA were selected from the database: 103 (58%) with BMI<30 (median 24, range 16-29) and 75 (42%) with BMI≥30 (median 34, range 30-52). The most frequent primary diagnosis was UC in 142 (79%) patients and mean followup after IPAA was 56 months. Use of preoperative immunomodulator therapy and laparoscopic surgery were significantly more frequent among patients in the BMI<30 group when compared to the BMI≥30 group (see Table). Patients with BMI≥30 had a significantly increased rate of overall complications following IPAA. This was primarily due to pouch-related complications in the obese group, with a significantly increased rate of pouch anastomotic strictures in particular (17% vs. 3%, $p< 0.01$).

Conclusions: While IPAA is technically feasible and safe in patients with BMI≥30, obesity is associated with an increased risk of complications. In particular, the rate of pouch anastomotic strictures is higher in obese patients undergoing IPAA. Obese patients should be informed about these risks during preoperative counseling.

OUTCOMES OF PROCTECTOMY AFTER COLONIC J-POUCH ANAL ANASTOMOSIS ARE WORSE IN OBESE PATIENTS.

(P146)

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Purpose: This study compared operative and functional outcomes of colonic J-pouch anal anastomosis (CPAA) among obese, overweight and normal-weight patients.

Methods: An IRB-approved database was reviewed to identify patients who were scheduled for proctectomy with CPAA from 3/2000-4/2012. Demographics, comorbidities, previous surgery, diagnosis, neoadjuvant chemoradiation (CRT), postoperative complications, bowel function (assessed by the Cleveland Clinic Fecal Incontinence scale FIS) and questions about urgency, number of daily bowel movements and cramping were collected. Chi-square and t-tests were used to compare outcomes in patients grouped by BMI (kg/m^2): normal weight (18.5-24.9), overweight (25-29.9), and obese (≥ 30).

Results: 197 patients were scheduled for CPAA; in 34 CPAA construction failed due to fatty mesentery (47.1%), narrow pelvis (26.5%) or short colon (26.5%); obese and overweight patients had a higher rate of pouch failure than did normal-weight patients (31.5% vs 12.2% vs 1.6%; p<0.001). 76 (45%) of 163 patients (mean age:61 (26-92) years; 68% males) available for follow up at a mean of 3.6 (range 1 to 12) years responded to the questionnaire: normal weight (34), overweight (27), obese (15). 60 (97%) patients had malignancy. The groups were similar in demographics, ASA score, previous abdominal surgery, diagnosis, TNM stage, CRT, pouch length and anastomosis type (handsewn vs stapled). Significantly more obese or overweight than normal weight patients had open surgery (67% vs 59% vs 38%; p=.007). More obese patients had comorbidities (79% vs 41% vs 27%; p=.01) and perioperative complications (40% vs 15% vs 9%; p=.03) as compared to overweight or normal weight patients. Obese patients reported more urgency as compared to overweight or normal-weight patients (60% vs 19% vs 44%; p=.04). The mean FIS was 5.9, with no difference among groups (p=.68). Handsewn anastomosis (7 patients due to lower level of anastomosis, and 6 patients due to intersphincteric resection) (p=.03) and CRT (p=.02) were correlated with urgency.

Conclusions: Obese patients who undergo proctectomy have a higher failure rate of CPAA formation and more perioperative complications.

PORTOMESENTERIC VENOUS THROMBOSIS AND INFLAMMATORY BOWEL DISEASE: DOES SURGICAL APPROACH MATTER?

(P147)

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Boston, MA

Purpose: Inflammatory bowel disease (IBD) and laparoscopy have been associated with portomesenteric

P145 Operative information and complication rates

	BMI <30	BMI ≥30	p	RR	95% CI
Total	103	75			
Preoperative variables					
Age (mean, SEM)	40 ± 1.4	42 ± 1.5	0.15	-	-
Gender: Male	52 (50%)	32 (43%)			
Gender: Female	51 (50%)	43 (57%)	0.36	-	-
BMI (mean, SEM)	24 ± 0.3	35 ± 0.4	<0.01	-	-
Albumin (mean, SEM)	3.77 ± 0.1	3.91 ± 0.1	0.23	-	-
Hgb (mean, SEM)	12.8 ± 0.2	12.8 ± 0.2	0.94	-	-
WBC (mean, SEM)	9 ± 0.4	8.4 ± 0.4	0.29	-	-
Preoperative Steroids	55 (53%)	34 (45%)	1.00	-	-
Preoperative Immunomodulator(s)	78 (76%)	16 (21%)	<0.01	-	-
Laparoscopic	49 (48%)	13 (17%)			
Open	54 (52%)	62 (83%)	<0.01	-	-
Operative time, minutes (mean, SEM)	226 ± 6.8	227 ± 9.7	0.94	-	-
EBL, mL (mean, SEM)	291 ± 22	375 ± 42	0.08	-	-
Complications: Overall	55 (53%)	52 (69%)	0.04	1.32	(1.03 to 1.68)
Pouch related: Overall	7 (7%)	16 (21%)	<0.01	2.04	(1.08 to 3.82)
Leak, dehiscence & sepsis	6 (6%)	2 (3%)	0.47	0.76	(0.50 to 1.16)
Anastomotic pouch stricture	3 (3%)	13 (17%)	<0.01	3.29	(1.18 to 9.20)

(RR: Relative risk, CI: Confidence interval, SEM: Standard error of the mean)

venous thrombosis (PVT). The relationship between IBD patients undergoing laparoscopic surgery and PVT has not been well defined. The purpose of this study was to determine the incidence of PVT among patients undergoing bowel surgery in a two-institution retrospective review, identify predictive factors, and assess outcomes.

Methods: A retrospective study of all patients undergoing open or laparoscopic bowel surgery from January 2008 to July 2012 was performed. Incidence of PVT was determined by radiologic imaging on CT scan or abdominal US. Patient demographics (age, race, sex, body mass index (BMI)), type of surgery, administration of perioperative thromboprophylaxis, treatment, and outcomes were recorded.

Results: A total of 1,104 patients underwent bowel surgery (n=749 open, and n=265 laparoscopic).Incidence of PVT was 3.8% (n=10) for laparoscopic bowel surgery, and 2.1% (n=16) for open bowel surgery (p=<0.05). Factors associated with the development of PVT included laparoscopic bowel surgery, BMI>30. Age, race, sex, and type of surgery were not significant predictors. No significant differences in short term patient outcomes including morbidity and mortality were identified.

Conclusions: Laparoscopic bowel surgery in IBD patients is associated with an increased incidence of PVT with no difference in patient outcomes. We suspect the etiology of the increased rate of PVT in laparoscopic surgery is decreased mesenteric blood flow secondary to increased abdominal pressure during the procedure. Further work needs to be done to investigate whether IBD patients undergoing laparoscopy would benefit from longer term prophylactic anticoagulation or from intermittent release of pneumoperitoneum.

LONG-TERM FUNCTIONAL OUTCOMES FOLLOWING LAPAROSCOPIC ILEAL-POUCH-ANAL ANASTOMOSIS IN PATIENTS WITH CHRONIC ULCERATIVE COLITIS: FIVE-YEAR FOLLOW-UP OF A CASE-MATCHED STUDY.

(P148)

K. Mathis, E. Dozois, S. Baek, S. Boostrom, R. Cima, J. Pemberton, D. Larson
Rochester, MN

Purpose: Laparoscopic ileal-pouch anal anastomosis (L-IPAA) has been increasingly adopted over the last decade due to short-term patient-related benefits. Several studies have shown L-IPAA to be equivalent to open IPAA in terms of safety and feasibility. Few L-IPAA studies have examined long-term functional outcomes. We aimed to evaluate the long-term functional outcomes of L-IPAA and compare them to open IPAA.

Methods: A previous case-matched study at our institution compared short-term outcomes between L-IPAA and open IPAA from 1998 to 2004. For the current study, we selected patients from this cohort with chronic ulcerative colitis (CUC) who had a follow-up of greater than one year and data from an annual postoperative survey of pouch function.

P148 Univariate Analysis Comparing Functional Outcomes between Open and L-IPAA

	Laparoscopy	Open	p
Stool frequency per daytime			0.040
1-6	40/59 (68%)	44/87 (51%)	
>6	19/59 (32%)	43/87 (49%)	
Stool frequency per nighttime			0.021
1-2	51/59 (86%)	59/85 (69%)	
>2	8/59 (14%)	26/85 (31%)	
Consistency of stools			0.272
Semi-liquid/solid	51/59 (86%)	69/87 (79%)	
Liquid	8/59 (14%)	18/87 (21%)	
Can differentiate gas from stool			0.089
Yes	47/59 (80%)	58/87 (67%)	
No	12/59 (20%)	29/87 (33%)	
Incontinence			0.043
Yes	37/59 (63%)	68/87 (78%)	
No	22/59 (37%)	19/87 (22%)	
Medication for stool control	28/59 (48%)	42/88 (48%)	0.974
Perianal skin irritation	35/59 (59%)	39/87 (45%)	0.087
Voiding difficulty	3/57 (5%)	5/73 (7%)	0.710
Sexual problem	15/51 (29%)	30/86 (35%)	0.510
Occupational change	4/56 (7%)	9/82 (11%)	0.452

Results: 150 patients (59 L-IPAA, 91 open IPAA) were included with 8 years of median follow-up. There were no differences in demographics and short-term surgical outcomes between groups. Stool frequency during daytime and nighttime was significantly lower in the L-IPAA group (>6 stools per day, L-IPAA 32%, open 49%, p=0.040; >2 stools per nighttime, L-IPAA 14%, open 30%; p=0.021). Consistency of stool was semi-liquid or solid and similar between groups (p=0.272). Ability to differentiate gas from stool was not different (p=0.089), but the rate of complete continence was significantly better in L-IPAA than in open group (L-IPAA 37%, open 22%; p=0.043). There was no difference in terms of use of medication to control stools, perianal skin irritation, voiding difficulty, sexual problems, and occupational change between groups.

Conclusions: Overall, L-IPAA has comparable functional results to the open approach, with slightly lower stool frequency and improved continence.

FACTORS INFLUENCING EARLY VERSUS LATE FAILURES IN ILEOANAL POUCH PROCEDURE.

(P149)

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Newington, CT; Hartford, CT

Purpose: To understand trends in Ileoanal pouch failure and to identify factors influencing early vs. late pouch failures

Methods: This is a retrospective chart review of adult patients who underwent pouch procedure in last 20 years at Hartford hospital. Patients under 18 years were eliminated Additional 84 patients in the registry were excluded, as no data was available for them and 297 patients were included. Primary endpoint was pouch failure. Various preoperative, intraoperative and postoperative variables were analyzed against pouch failure.

Results: Mean follow up was 8.6 years (0.07-21.78 years). Overall, pouch failure rate at 5, 10 and 15 years was 2.1%, 3.6% and 6.6% respectively. There was no association with age, gender and approach (laparoscopic vs. open). Patients with double stapled anastomosis had lower pouch failure (4.9% vs. 17.2, P=0.01). FAP (compared to UC, 16.7 vs. 6.3, P=0.093), Completion proctocolectomy (10.2% vs. 6.5%, P=0.02), reexploration (50.4 vs.3.2) and pouchitis (21.6 vs. 5.3 P=<0.001) were associated with higher pouch failure. On three-way analysis – no failure vs. early failure (<5yrs) vs. late failure (>5 yrs), early failure was seen in patients with anastomotic leak or pelvic sepsis (86.2% vs.0% vs.13.8 %, p=0.018), redo pouch (80% vs. 20% vs. 6.6%, p=0.038) and reexploration (multiple vs. single vs. none; 30. 8% vs. 18% vs.3.2, p=<0.001). Late failure was seen in patients with FAP (83.3% vs.0% vs.16.7%), crohn's (50% vs.0%vs.50%) and pouchitis (78.4% vs.8.1% vs. 13.5%, p=<0.001). On multivariate analysis with logistic regression, strongest predictor of pouch failure was reexploration (single vs. multiple 6.1 vs. 10.8 times, p=0.002). In absence of reexploration, patients with pouchitis had 12.7 times (p=0.004) risk of pouch failure.

Conclusions: Ileoanal pouch procedure continues to have very good long term outcomes. Rate of pouch failure seems to increase with the duration of the pouch. Anastomotic leak, redo pouch and reexploration were associated with early failure. FAP, crohn's and pouchitis were associated with late failure. Understanding the risk of pouch failure associated with reexploration and pouchitis may help to counsel patients better while planning an ileoanal pouch procedure

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	Upper
Step 1[a]	IndicateMaxRX(1)	-.994	.651	2.332	1	.127	.370	.103	1.326
	FAPvsUC(1)	.216	.914	.056	1	.813	1.241	.207	7.444
	Pouchitis(1)	1.051	.604	3.032	1	.082	2.860	.876	9.336
	RedoPouch(1)	-.137	.924	.022	1	.882	.872	.143	5.333
	LeakorSepsis(1)	-.432	.790	.299	1	.584	.649	.138	3.053
	HandSewnorStapled(1)	.961	.652	2.170	1	.141	2.613	.728	9.380
	PercutaneousDrainYN(1)	.577	.790	.533	1	.465	1.780	.379	8.364
	Laparotomy			13.909	2	.001			
	Laparotomy(1)	2.113	.627	11.369	1	.001	8.273	2.422	28.256
	Laparotomy(2)	2.689	.899	8.954	1	.003	14.721	2.529	85.696
	Constant	-2.161	.514	17.694	1	.000	.115		

a. Variable(s) entered on step 1: IndicateMaxRX, FAPvsUC, Pouchitis, RedoPouch, LeakorSepsis, HandSewnorStapled, PercutaneousDrainYN, Laparotomy.

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95.0% C.I.for EXP(B) Lower	Upper
Step 1[a]	IndicateMaxRX(1)	-1.249	1.217	1.054	1	.305	.287	.026	3.113
	FAPvsUC(1)	1.563	1.317	1.410	1	.235	4.775	.362	63.063
	Pouchitis(1)	2.785	1.077	6.683	1	.010	16.192	1.961	133.709
	RedoPouch(1)	-17.171	40192.970	.000	1	1.000	.000	.000	.
	LeakorSepsis(1)	-16.283	10708.244	.000	1	.999	.000	.000	.
	HandSewnorStapled(1)	.200	1.217	.027	1	.870	1.221	.112	13.269
	PercutaneousDrainYN(1)	-17.417	8869.227	.000	1	.998	.000	.000	.
	Constant	-4.032	.768	27.584	1	.000	.018		

a. Variable(s) entered on step 1: IndicateMaxRX, FAPvsUC, Pouchitis, RedoPouch, LeakorSepsis, HandSewnorStapled, PercutaneousDrainYN.

LONG-TERM SURGICAL OUTCOMES FOLLOWING LAPAROSCOPIC ILEAL POUCH-ANAL ANASTOMOSIS IN PATIENTS WITH CHRONIC ULCERATIVE COLITIS: 5-YEAR FOLLOW-UP OF A CASE-MATCHED STUDY.

(P150)

S. Boostrom, E. Dozois, S. Baek, K. Mathis, R. Cima, J. Pemberton, D. Larson
Rochester, MN

Purpose: Laparoscopic ileal pouch-anal anastomosis (L-IPAA) has become a new standard in the surgical management of chronic ulcerative colitis (CUC) due to significant advantages in short-term outcome compared to open surgery. However, limited data exists on long-term outcomes of L-IPAA. We aimed to evaluate the long-term outcomes of L-IPAA and compare them to open IPAA.

Methods: A previous case-matched study at our institution compared short-term outcomes between L-IPAA to those who underwent open IPAA. For the current study, we selected all patients with CUC from this previous cohort who underwent L-IPAA and open IPAA from 1998-2004 and had a follow-up of greater than one year.

The main outcome measures reviewed were long-term complications, including pouch failure.

Results: 170 patients (69 L-IPAA, 101 open IPAA) were analyzed. The mean follow-up was 78±47 months (range, 12-166 months). There were no differences in gender, age, and body mass index (BMI) between groups. The incidence of delayed complications in the laparoscopic vs open patients including; pouchitis (35% vs. 36%), small bowel obstruction (17% vs. 16%), pouch-anal stricture (9% vs. 13%), pelvic abscess (4% vs. 5%), fistula (4% vs. 7%), pouch dysfunction (3% vs. 8%), and incisional hernia (7% vs. 6%) were not different. (Table 1) Pouch excision or diversion was done in 5 patients in the open group compared to none in the L-IPAA group, but this was not statistically significant. Abscess and fistula were significant risk factors for permanent pouch failure. One patient in the open IPAA group developed adenocarcinoma at the pouch-anal anastomosis.

Conclusions: Laparoscopic IPAA in patients with CUC has similar long-term surgical outcomes compared to a matched cohort of patients undergoing open IPAA.

SAFETY, FEASIBILITY, AND SHORT-TERM OUTCOMES IN 588 PATIENTS UNDERGOING LAPAROSCOPIC ILEAL POUCH-ANAL ANASTOMOSIS: A SINGLE INSTITUTION EXPERIENCE.

(P151)

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Purpose: A laparoscopic approach to proctocolectomy and ileal-pouch anal anastomosis (IPAA) in patients with chronic ulcerative colitis (CUC) and familial adenomatous polyposis (FAP) has grown in popularity secondary to reports of small series of patients showing short-term patient benefits. Limited data exists in large numbers of patients undergoing laparoscopic IPAA (L-IPAA). We aimed to analyze surgical outcomes in a thirteen-year experience performing L-IPAA.

Methods: From a prospectively maintained surgical database, 30-day surgical outcome data was reviewed for all L-IPAAs performed for CUC and FAP from 1999 to 2012. Demographics, operative approach, and operative and postoperative complications were analyzed.

Results: 588 L-IPAA were performed over 14 years, predominantly for CUC (94%). The mean age was 36 years, 54% were male, with a mean BMI of 24.1 kg/m2. The mean operating time was 260 min. Three stage operations included 18% of the cohort (n=85 L-IPAA, n=19 HALS). 55% of cases were hand-assisted laparoscopic surgery (HALS); the overall rate of conversion to open was 9%. Median length of stay was 5 days. There was no mortality and 37% of patients experienced complications; Clavien grade I (18%), grade II (73%), grade III (10%). Table 1. Analysis of the grouped data over time demon-

P151 Complications

Morbidity	217 (37%)
Clavien Classification	
I:II	38 (18%) : 158 (73%)
III:IV	21 (10%) : 0
Non-operative ileus	98 (17%)
Operative small bowel obstruction	18 (3%)
Dehydration	45 (8%)
Urinary retention	45 (8%)
Urinary tract infection	22 (4%)
Anastomotic leakage	12 (2%)
Intraabdominal abscess	21 (4%)
Wound infection	18 (3%)
Stoma related	3 (0.5%)
Cardiac complication	1 (0.2%)
Pulmonary complication	5 (0.9%)
Others	48 (8%)

P150 Delayed Complications

	Laparoscopy	p	Open(n=101)	p	LA (n=50)	HAL (n=19)
Overall complication	39 (57%)	32 (64%)	7 (37%)	0.043	55(55%)	.792
Pouchitis	24 (35%)	18 (36%)	6 (32%)	0.735	36 (36%)	0.909
Small bowel obstruction	12 (17%)	10 (20%)	2 (11%)	0.361	16 (16%)	0.791
pouch anal stricture	6 (9%)	6 (12%)	0	0.117	13 (13%)	0.399
pelvic abscess	3 (4%)	3 (6%)	0	0.282	5 (5%)	0.856
pouch anal/vaginal/vesical fistula	3 (4%)	3 (6%)	0	0.282	7 (7%)	0.485
pouch dysfunction	2 (3%)	1 (2%)	1 (5%)	0.478	8(8%)	0.174
incisional hernia	5 (7%)	5 (10%)	0	0.157	6 (6%)	0.736
midline	2 (3%)	2 (4%)	0	0.384	5 (5%)	0.511
Stoma site	4 (6%)	4 (8%)	0	0.210	1 (1%)	0.069
Others	3 (4%)	2 (4%)	1 (5%)	0.821	9 (9%)	0.257

LA, Totally laparoscopic assisted; HAL, hand-assisted technique

strated a statistically significant reduction in operative time (p<0.001) and an increase in the ratio of HALS over straight laparoscopy (p=0.001).

Conclusions: In a large cohort of patients undergoing L-IPAA for CUC and FAP, we found a low conversion rate and few Clavien grade III complications.

ILEAL POUCH FISTULAS AFTER RESTORATIVE PROCTOCOLECTOMY: MANAGEMENT AND OUTCOMES.

(P152)

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Purpose: Fistula between an ileal pouch and the vagina, anus or perineum is an uncommon complication of ileal pouch-anal anastomosis and is a cause of considerable morbidity. The aim of this study was to review the outcomes of patients who presented with ileal pouch fistulas after restorative proctocolectomy (RPC).

Methods: Retrospective review of patients treated for ileal pouch fistulas after RPC from 1989 through 2011.

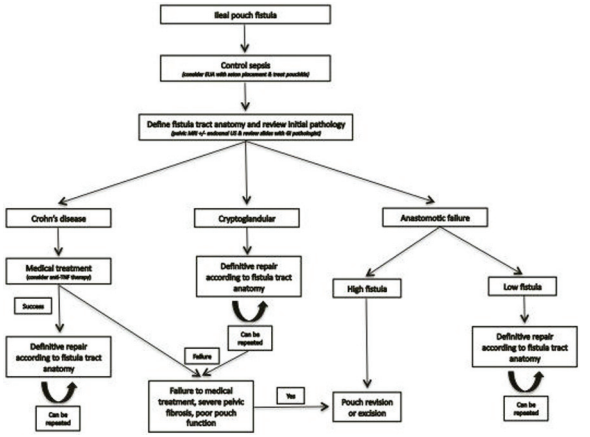
Results: 21 patients (13 men, mean age 40 years) presented with symptomatic ileal pouch fistulas. Preoperative diagnosis was ulcerative colitis (n=19) and familial adenomatous polyposis (n=2). The majority of patients underwent RPC in 2 stages (57%), with J-pouch configuration (86%), and stapled ileal pouch-anal anastomosis (90%). Postoperative pelvic sepsis occurred in 7 (33%) patients. Median time to pouch fistula following RPC was 5.4 years (range, 1 month-20 years). Fistulas were classified as pouch-anal (n=11, 52%), pouch-vaginal (n=5, 24%), complex (n=3, 14%), and pouch-perineal (n=2, 10%). Etiology included Crohn's disease (n=13, 62%), cryptoglandular (n=5, 24%), and anastomotic failure (n=3, 14%). Eighteen patients underwent enodanal US and/or pelvic MRI before fistula repair. Each patient underwent an average of 2.4 local procedures and operative treatment consisted of seton drainage (n=18), fibrin glue injection (n=11), fistulotomy (n=5), ileal advancement flap (n=2), collagen plug insertion (n=4), transperineal repair (n=3), pouch excision with end ileostomy (n=2), insertion of cutting seton (n=2), Martius flap (n=1), and transperineal repair with gracilis muscle interposition (n=1). Four patients underwent temporary diverting loop ileostomy and five permanent end ileostomy. Five patients with Crohn's disease received anti-TNF therapy. Overall healing rate was 67% at a median follow-up of 26.5 (range, 2-108) months (Table). Two of 5 patients who received anti-TNF therapy had complete healing.

P152 Fistula healing according to operative technique.

Operative technique (n)	Healing rate (%)
Cutting seton (2)	100
Gracilis muscle interposition (1)	100
Lay-open fistulotomy (5)	80
Collagen plug insertion (4)	50
Seton + anti-TNF therapy (4)	50
Ileal advancement flap (2)	50
Transperineal repair (3)	33
Fibrin glue (11)	9
Seton (14)	0
Martius flap (1)	0

TNF: tumor necrosis factor.

Conclusions: Operative treatment of pouch fistulas after RPC resulted in complete healing in approximately 70% of patients following a step-wise diagnostic and therapeutic approach (Figure).



EARLY AND LATE MORBIDITY IN PATIENTS UNDERGOING ILEOANAL POUCH EXCISION.

(P153)

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Purpose: Ileal pouch anal anastomosis (IPAA) is a highly successful operation in patients with ulcerative colitis and familial adenomatous polyposis. Despite its success, some pouches will fail and when pouch complications cannot be mitigated by fecal diversion, revision or reconstruction, pouch excision is required. Limited data exists on the morbidity associated with pouch excision surgery. Our aim is to review and define the short and long-term morbidity following IPAA excision and identify factors predicting increased morbidity.

Methods: A retrospective review of a prospectively maintained surgical database at our institution was used to identify patients who underwent IPAA excision between 1994 and 2012. Demographics, indications for surgery and short and long-term complications were retrieved and analyzed.

Results: 113 patients (56 females, median age 46 yrs) were identified with mean BMI of 25.1. Indications for IPAA were ulcerative colitis in 103 patients, FAP in 8 patients, indeterminate colitis and HNPCC in one patient each. Mean time from pouch creation to pouch excision was 7.8 years (range, 1 – 27 yrs). 32 patients (28%) had a temporary diverting loop ileostomy prior to excision of the pouch. Indications for pouch excision were pelvic sepsis (n=70, 62%)), pouch dysfunction (n=20, 17.5%), refractory pouchitis (n=19, 16.8%), and malignancy (n=4, 3.5%). Of the patients with pelvic sepsis, 38 patients (54 %) had Crohn's disease. Postoperative mortality was nil. Short-term (< 30 days) and long-term (> 30 days) morbidity was seen in 38 (33.6%) and 36 patients (31.8%), respectively. Morbidity is outlined in table 1.

Conclusions: The most common reason for IPAA excision at our institution is pelvic sepsis related to Crohn's disease. Pouch excision is associated with significant short and long term morbidity in up to one third of patients mostly related to surgical site infections.

INDICATIONS FOR AND COMPLICATIONS ASSOCIATED WITH ILEAL PELVIC POUCH EXCISION.

(P154)

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Purpose: Current knowledge regarding outcomes of ileal pelvic pouch excision surgery amongst patients who underwent ileal pouch anal anastomosis (IPAA) is limited. The aim of this study was to identify indications for and postoperative complications of pouch excision surgery at one institution.

Methods: A retrospective review of patients who underwent IPAA and ileal pelvic pouch excision from 1983 to 2012 was performed using a prospectively maintained database. Factors analyzed included indications for pouch excision and complications following pouch excision during the immediate postoperative period. Complications were defined as small bowel obstruction, enterotomy, abscess, injury to ureters or bladder, myocardial infarction, pulmonary embolism, deep vein thrombosis, pneumonia, bleeding requiring transfusion, wound infection or dehiscence, and death as a direct result of the surgery.

Results: From 1983 to 2012 eighty-three patients underwent pouch excision (mean age = 36.7). Seventy-five had construction of a terminal ileostomy (91%) and seven received a Kock pouch (9%). Mean number of pouch-related surgeries prior to excision was 1.8 (N=82). These included, but were not limited to, fistula repair, abscess drainage and stricture dilation. Mean number of pouch revisions was 0.66 (N=83). Detailed information was available for 62 patients (73.8%). Indication for pouch excision was technical failure in 33 (53.2%), poor function in 25 (24.2%), Crohn's disease in 5 (8.1%), intractable pouchitis in 5 (8.1%) and pelvic or abdominal cancer in 4 (6.5%). There were 13 post-operative complications among 12 patients, leading to an overall patient complication rate of 19.4%. The most common complica-

P153 Table 1 – Morbidity of Pouch Excision

		(Total = 113)	n	%
Short term morbidity (<30 day)	SSI (abdominal and pelvic sepsis)		12	10.6
	midline abdominal wound infection	Wound packing	7	
		Antibiotics only	1	
	pelvic abscess	CT guided drain placement	4	
	Post op ileus		11	9.7
	Post op bleeding needing transfusion		9	7.9
	urinary retention/ UTI		9	7.9
	Readmissions		7	6.1
	ICU admissions		5	4.4
Long term morbidity (>30 day)	Readmissions		20	17.6
	perineal wound		16	14.1
		open and packing	5	
		operative debridement, catheters, setons	6	
		Flap closure	1	
	Pelvic abscess	CT guided drain placement	4	
	operative interventions		11	9.7
	parastomal/ventral hernia		8	7
	ileus/SBO		7	6.1

tions were abscess formation (N=6), ureter or bladder injury (N=2) and wound infection (N=2). One death was directly related to pouch excision surgery.

Conclusions: Ileal pelvic pouch excision surgery has a low rate of complications in the immediate postoperative period, and can be safely and effectively done in situations where pouch excision may be indicated.

COLECTOMY RATE AFTER LONG-TERM THERAPY WITH INFLIXIMAB IN STEROID-DEPENDENT ULCERATIVE COLITIS.

(P155)

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Purpose: Up to 40% of ulcerative colitis (UC) patients need steroid during their course and 20% of them become steroid-dependent. In this setting of patients, Infliximab (IFX) has been shown efficacious in this setting of patients for inducing clinical and endoscopic remission at 1 year. Aims of the study were to evaluate the colectomy rate during the long-term IFX treatment in active steroid-dependent UC and to identify predictors of colectomy

Methods: Consecutive patients with active steroid-dependent UC were enrolled and intentionally treated with IFX. The primary endpoint was colectomy free-survival. Secondary endpoints was to evaluate the predictive variables of colectomy.

Results: 126 active steroid-dependent UC patients entered in the study. Median follow-up was 32 months (IQR 22.5-62.2), with a median number of IFX infusion of 14 (IQR 7-24). Twenty-nine (23%) patients underwent to restaurative proctocolectomy with ileal pouch after a median time of 16 months (IQR 9-30). Cox regression analysis identified extensive UC phenotype (p=0.02) and Mayo endoscopic score≥2 (0.03) as independent predictors of colectomy. No post-operative mortality occurred. Overall short-term post-operative complications was recorded respectively in 7 patients (24%): infectious complications in 4, post-operative hypomotility in 1, bleeding requiring surgery in 1 and anastomotic leak in 1.

Conclusions: At a median follow-up of 32 months from the start of IFX therapy, 23% of steroid-dependent UC patients needed colectomy. Disease extension and the severity of endoscopic lesions seems to represent factors strongly related to the rate of colectomy.

CLOSTRIDIUM DIFFICILE ENTERITIS AFTER TOTAL PROCTOCOLECTOMY FOR ULCERATIVE COLITIS.

(P156)

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Purpose: Clostridium difficile enteritis (CDE) is poorly understood. We describe outcomes in patients who underwent total proctocolectomy for ulcerative colitis (UC) and were subsequently treated for CDE.

Methods: We identified all patients at a single tertiary care institution with a positive Clostridium difficile test from 2007 to 2010 (n=2785). We then identified patients within this cohort with a history of total proctocolectomy for UC who were subsequently found to have CDE (n=16).

Results: Of the 16 patients identified, 9 were female with a median age at time of CDE of 46 years (range 16 to 82 years). Fifteen patients had an ileal pouch anal anastomosis (IPAA) and 1 had a permanent ileostomy. Time from IPAA to the first documented episode of CDE ranged from 4 months to 27 years (median 3.2 years). At the time of CDE, 3 patients were being treated with steroids and 5 patients were on other immunosuppressive medications. Thirteen patients (81.3%) had been treated with antibiotics within the 30 days prior to CDE diagnosis. Three patients had a prior transplantation (2 liver, 1 liver/kidney). Six patients required hospitalization for CDE; 5 had severe infections characterized by serum creatinine >1.5 times baseline (n=4) and one had WBC count >15K.Six patients underwent endoscopy; all had severe inflammation, and pseudomembranes were documented in 1. Eleven patients were treated with metronidazole and 5 with vancomycin. Two patients had recurrent CDE during the 2.8 year median follow-up period and 1 had CDE refractory to medical management. No surgical intervention was required. Thirteen patients (81.2%) had multiple episodes of pouchitis before and after CDE infection. Ten patients (62.5%) had chronic pouchitis characterized by the need for daily antibiotic suppression.

Conclusions: C. difficile infection has been reported with increasing frequency in patients with UC prior to colectomy. In patients developing CDE following IPAA, we found that the majority presented following antibiotic use (most frequently for pouchitis). Clinically, CDE may be difficult to distinguish from pouchitis and though rare, CDE should be considered in patients with refractory pouchitis.

NEOADJUVANT THERAPY ELEVATES THE RISK OF THROMBOEMBOLISM IN COLORECTAL CANCER PATIENTS.

(P157)

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Purpose: Patients with cancer have up to a 6-fold increased risk of thromboembolism (TE) compared to general population, and this may be elevated by therapeutic intervention. We describe the epidemiology of TE in patients with colorectal cancer (CRC), and the timing of TE to identify highest risk periods.

Methods: A single centre retrospective analysis of all patients diagnosed with CRC from 2005-11 was performed. All radiology reports were screened for keywords 'DVT', 'PE', 'Thromb*' or 'Emb*' to identify index events within the patient cohort. Patient data was analysed to identify relevant patient and treatment characteristics at the time of TE.

Results: Of 254,254 radiology reports screened, 6,943 contained keywords. A cohort of 1,088 patients with CRC had 9,654 admissions during the analysis period. 146 CRC patients matched both keyword and ICD-10 code. 85 were excluded where a report stating 'No evidence of thrombosis' or similar was found, giving an overall TE prevalence of 5.6% (95%CI 4.2-7.0%). 52 (85%) TE events occurred in patients with metastases: 21 (1.9%, 95%CI 1.1-2.7%) pulmonary emboli, of which 13 (62%) were incidental, and 22 (2.0%, 95%CI 1.2-2.8%) lower limb DVT. Six (9.8%) patients had a portal vein or SMV thrombosis related to tumour compression. Thirteen (21%) had an upper limb TE associated with central venous catheters. Forty four (72%) were diagnosed during administration of chemotherapy and in 34 (55%) the treatment was palliative. Eight (13%) were receiving or recently received radiotherapy, while 6 (10%) TE events were postoperative. Five (8%) were hospitalized for a medical complication. Five of the 272 rectal cancer patients receiving neoadjuvant chemoradiotherapy had a TE (1.8%, 95%CI 0.24% to 3.4%) compared to 6 of 732 patients who had surgery (0.8%, 95%CI 0.17-1.5%).

Conclusions: The TE prevalence in patients with CRC was 5.6%, with majority of events occurring in patients with metastatic disease and in those receiving palliative chemotherapy. Of note, the risk of TE during neoadjuvant chemoradiotherapy was 1.8%, higher than the rate seen post-operatively (0.8%).

MDT MEETINGS RARELY CHANGE THE MANAGEMENT OF NONMETASTATIC COLON CANCER.

(P158)

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Purpose: It is recommended that patients with cancer should be managed in the context of a Multidisciplinary Team (MDT). Alternatively, proponents of the standard model of care propose that the well-informed treating doctor is able to make the appropriate plan for each patient, making the need for a MDT meeting redundant. We aimed to evaluate the decisions made within a colorectal cancer MDT.

Methods: Consecutive cases presented to the colorectal MDT were prospectively assessed. Prior to the meeting, a management decision was recorded, based on routine care pathways. These were compared to decisions made at the MDT meeting and discrepancies recorded. The number of cases that generated beneficial discussion was recorded.

Results: There were 261 discussions regarding the care of 197 patients. In cases where the pathway was relevant (203), patient management was consistent with the pathway in 94% of cases discussed. Discussion of routine cases of colon cancer rarely changed management (3.4%). Conversely, management changed after MDT discussion in 50% of complex cases (the preoperative management of rectal cancer, recurrence, metastatic disease and malignant polyps). The postoperative discussion of pathology findings rarely generated beneficial discussion nor were the reports subject to significant change as a result of MDT discussion.

Conclusions: Discussion of routine cases of colon cancer in our MDT rarely changed management. MDT discussion does change the decisions regarding complex cases. We propose streamlining the MDT process and only discussing complex cases where discussion may change management.

PATHOLOGICAL RESULTS OF NEOADJUVANT INTENSITY MODULATED RADIOTHERAPY WITH CONCURRENT CAPECITABINE AND TOTAL MESORECTAL EXCISION FOR LOCALLY ADVANCED RECTAL CANCER.

(P159)

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Purpose: The design of this study was to analyze the pathological response and lymph nodes retrieval following neoadjuvant intensity modulated radiotherapy (IMRT) with concurrent capecitabine and total mesorectal excision for locally advanced rectal cancer.

Methods: Patients were diagnosed locally advanced mid-low rectal cancer and received and received IMRT with gross targeting volume (GTV)/ clinical targeting volume (CTV) of 50.6 / 41.8 Gy in 22 fractions plus concurrent capecitabine (825 mg/m2 twice daily) in 30 days. The biological effective dose (BED) of GTV is 48.1Gy. The primary end point is pathological complete response (ypCR). Retrieval of mesorectal lymph nodes (LNs) was also analyzed.

Results: A total of 197 patients enrolled in this trial from September 2009 to July 2012. The median age was 55 years (range 21-87), and 32.8% were female. The median tumor height was 5cm (range 2-10). Pathological complete response occurred in 19.3% (38/197) of patients. The median number of retrieved LNs was 9 (0-43). There were 62.9% (124/197) of cases had lesser than 12 LNs retrieved. Statistically difference of retrieved LNs number was observed between ypCR and non-ypCR groups (8.5 vs. 10, p=0.018).

Conclusions: Neoadjuvant IMRT plus concurrent capecitabine for rectal cancer was associated with increased BED of GTV, high ypCR rate and lesser LNs retrieval.

THE EFFECT OF CHEMORADIOTHERAPY ON RECURRENCE RATES AND SURVIVAL IN MUCINOUS RECTAL CANCER.

(P160)

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Purpose: Mucinous carcinoma of the rectum is a distinct pathological entity. It is defined by its ability to produce mucin within the tumour complex. It is associated with a poor prognosis and is relatively chemo-resistant. Much of the difficulty in studying these tumours has been due to their classification. More recently, the WHO have defined mucinous carcinoma as tumours which consist of at least 50% mucin content of the tumour complex. We present long-term clinical outcomes for mucinous tumours of the rectum from our local network.

Methods: Mucinous tumours which presented to our institution between 2001 and 2011 were identified from pathology reports. Data was collected on patient demographics, biopsy and pathology results, treatment regime and radiology. This included overall survival, patterns of recurrence and rates of recurrence.

Results: A total of 183 patients were identified to have mucinous tumours as demonstrated on pathology. 33 patients (18%) had mucinous type identified on biopsies. 102 patients underwent pre-operative chemoradiotherapy (CRT) of which 53 patients also had adjuvant chemotherapy. 44 patients had adjuvant chemotherapy without any pre-operative treatment. 7 patients had palliative oncological treatment. 30 patients had surgery alone. 5 year overall survival was 58.5% for the entire group of patients. 5 year survival for patients who had undergone pre-operative CRT was 62.3% and 53.8% in those patients who had surgery alone (p-value 0.06). Rate of recurrence was 65.4% for surgery-only group and 59.4% for the pre-operative CRT group (p-value 0.2). Local recurrence rates for the surgery-only group was 65.4% and 49% in the CRT group (p =0.02).

Conclusions: Pre-operative CRT does not significantly improve 5 year survival or recurrence rate in mucinous cancer of the rectum. However it does affect the local recurrence rate. Pre-operative CRT should be given to patients to improve local recurrence prior to surgical resection. Furthermore, biopsy specimens only identify mucin in less than 20% of cases. MRI may be a better diagnostic tool to diagnose mucinous tumours pre-operatively.

THE EFFECT OF CHEMORADIOTHERAPY ON T-STAGE, NODAL DISEASE AND CRM INVOLVEMENT IN EMVI-POSITIVE RECTAL CANCER.

(P161)

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Purpose: Extramural venous invasion (EMVI) is an independent marker of poor prognosis in rectal cancer. Chemoradiotherapy (CRT) has been shown to be beneficial in more advanced tumours in terms of downstaging and clinical outcome. The increased use of MRI in local staging of rectal cancer and tumour response to CRT allows accurate identification of EMVI prior to and during treatment. The effect of CRT on EMVI remains unknown in terms of clinical outcomes. We investigate the effect of CRT on EMVI positive rectal cancer in terms of downstaging of disease and clinical outcomes.

Methods: Demographic data, treatment data as well as radiological and pathology details were recorded on consecutive patients with primary rectal cancer presenting to our institution between December 2007 and December 2011. Patients with metastases on presentation were not included. Pre-CRT and post-CRT MRI scans were assessed to document change in T-stage, nodal disease and relationship to the circumferential resection margin (CRM). T-stage was recorded as good if T3b or less, whereas a T-stage of T3c or above was classified as poor. Clinical outcome data in terms of disease free survival, overall survival, and recurrence rates was also recorded.

Results: A total of 146 patients were included (70 EMVI positive and 76 EMVI negative). The groups were matched for age, sex and height of tumour from anal verge.EMVI positive (n=70): recurrence in 25/70 (36%) patients. EMVI negative (n=76): recurrence in 18/76 (24%) patients.

Conclusions: EMVI positive tumours are associated with a more advanced T-stage, are more likely to have nodal involvement but less likely to involve to CRM. CRT improves T-stage, nodal disease and CRM involvement in both EMVI positive and negative patients.

TRENDS IN INITIAL TREATMENT OF CLINICAL T3 AND T4 RECTAL CANCER.

(P162)

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Purpose: Current NCCN (National Comprehensive Cancer Network) guidelines state that patients with clinical T3 and T4 rectal cancer should receive neoadjuvant radiation therapy prior to surgery. It is unclear however how these recommendations have been adopted by clinical practice. The goal of this retrospective analysis is to observe any differences in treatment trends of patients with clinical T3 and T4 rectal cancer over time and between different ages and sex.

Methods: The SEER registry (Surveillance, Epidemiology, and End Results (SEER) Program (www.seer.cancer.gov) Research Data (1973-2009), National Cancer Institute, DCCPS, Surveillance Research Program, Surveillance Systems Branch, released April 2012, based on the November 2011 submission) was queried to identify patients with T3 and T4 rectal cancer between the years 2003-2009. These pts were separated by treatment into gold standard vs. other treatment. Gold Standard treatment was defined as any pt who received neoadjuvant radiation before surgery and other treatment was defined as treatment that did not include neoadjuvant radiation. Trends in initial treatment differences were then analyzed focusing on time, age and sex.

Results: We identified 25,613 patients with T3 and T4 rectal cancer from 2003-2009. Patients in 2003-2005 were less likely to receive gold standard therapy as compared to 2006-2009 (OR, 0.75; 95% CI, 0.72-0.78). Age also played a significant role in whether patients received gold standard therapy with younger patients (19-75) more likely than older patients (75+) (OR, 2.06; 95% CI, 1.95-2.17) to receive gold standard therapy. Males were also more likely to receive gold standard therapy as compared to females (OR, 1.18; 95% CI, 1.13-1.22).

Conclusions: In this study, differences in initial treatment of T3 and T4 rectal cancer with neoadjuvant radiation therapy were observed over time, and between different ages and sex. Although the increased rate of gold standard treatment over time and at a younger age is not surprising, the difference among sex is surprising. More investigation will need to be done to determine why these differences exist.

MULTIMODALITY TREATMENT IN ELDERLY PATIENTS WITH RECTAL CANCER: ARE WE OVERTREATING OR UNDERTREATING?

(P163)

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Purpose: Chemoradiation followed by surgery is recommended for stage II- III rectal cancer and selectively used for stage IV. Elderly patients are less frequently offered multimodality therapy. The aims of our study were to assess the reasons for chemoradiotherapy omission and the oncologic outcomes of elderly patients with rectal cancer.

Methods: Patients≥ 70 years old with stage II-IV rectal cancer treated between 1990-2007 were identified from an institutional, IRB-approved cancer database and chart review. All patients underwent radical resection using total mesorectal excision principles. Patients receiving multimodality treatment were compared to patients undergoing surgery alone for clinicopathological variables, surgery type, postoperative morbidity and cancer outcomes.

Results: 209 patients were identified (40% females) with a mean age of 77±5 years and a mean follow-up of 4.2 years. 104 patients (49.8%) had surgery alone and 105 patients (50.2%) chemoradiotherapy followed by surgery, with 53 cases also receiving postoperative chemotherapy. A significantly greater proportion of patients with stage III cancer received multimodality treatment while a greater proportion of stage II patients underwent surgery alone (table). Omission of chemoradiation was reportedly due to patient

P161 The effect of CRT on tumour stage

EMVI positive	Pre-CRT	Post-CRT
T-stage	65/70 (93%) - Poor	44/70 (63%) - Poor
Nodal disease	50/70 (71%) - positive	34/70 (49%) - positive
CRM involvement	41/70 (59%)	28/70 (40%)
EMVI negative	Pre-CRT	Post-CRT
T-stage	42/76 (55%) - Poor	17/76 (22%) - Poor
Nodal disease	40/76 (53%) - positive	16/76 (21%) - positive
CRM involvement	58/76 (76%)	13/76 (17%)

preference (n=12), previous pelvic radiotherapy (n=2), surgeon preference (n=58), and medical comorbidity (n= 32). Tumor grade, mean distance from the anal verge (7.5 vs 8.4 cm, p=0.17) and rates of restorative procedures (57% vs. 64%, p=0.57) were similar. On multivariable analysis, poor tumor differentiation (p=0.025), lymph node or distant metastases (p=0.005 and p<0.001, respectively) were similarly associated with decreased overall survival in either groups. Postoperative morbidity and oncologic outcomes, including overall survival, were also comparable (table).

Conclusions: Equivalence in oncologic outcomes with more advanced staging indirectly indicates the benefits of multimodality treatment in elderly patients. When selecting the appropriate management, elderly patients should not be deprived of chemotherapy and radiotherapy solely because of age.

TUMOR RESPONSE TO NEOADJUVANT CHEMORADIOTHERAPY AS A PREDICTOR OF SUSTAINED LOCOREGIONAL CONTROL FOR T2N0/T3N0 RECTAL ADENOCARCINOMA.

(P164)

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Purpose: Full thickness local excision (FTLE) following neoadjuvant chemoradiotherapy (nCRT) for T2N0/T3N0 rectal adenocarcinoma has been proposed as an alternative to radical surgery (RS). The major criticism for this approach is for an increased risk of local recurrence (LR). We hypothesize that complete tumor response to nCRT, rather than stage at presentation, is predictive of locoregional control following FTLE.

Methods: Patients who underwent FTLE following nCRT for T2N0/T3N0 rectal adenocarcinoma were retrospectively analyzed. RS was indicated for all patients but not elected either due patient refusal of a permanent colostomy or were medically unfit for surgery. Endorectal ultrasound and computed tomography were used for staging in all cases.

Results: Forty-two patients underwent FTLE 6-8 weeks following nCRT and followed for a median of 50.4 mo. Twenty (47.6%) patients presented with T2N0 tumors and 22 (52.4%) presented with T3N0 tumors. Complete pathologic response (ypCR) to nCRT was observed in 19 (45.2%) patients and partial or no response in 23 (54.8%). Incidence of ypCR was similar in patients presenting with T2N0 and T3N0 tumors (63.2% vs 36.8%, p = 0.120). Six patients were excluded due to presence of extrapelvic disease or incomplete nCRT at the time of FTLE. OS and LR were similar in patients initially presenting with T2N0 or T3N0 tumors. OS was also similar when comparing tumor response (ypCR vs. incomplete response) to nCRT. No LR and one systemic recurrence were detected in the ypCR group with a median followup of 82.7 mo. In the incomplete responders, 5 (25%) LR and 2 (10%) systemic recurrences were detected with a median followup of 46.6 mo. LR was significantly lower in ypCR-patients compared to incomplete responders (Figure 1).

Conclusions: We conclude that tumor response, rather than stage at presentation, is more predicative of LR in patients undergoing FTLE following nCRT for rectal adenocarcinoma. This data suggests that ypCR predicts sustained, locoregional control whereas incomplete response to nCRT predicts local failure. Further investigation in the form of a prospective phase II trial is currently ongoing.

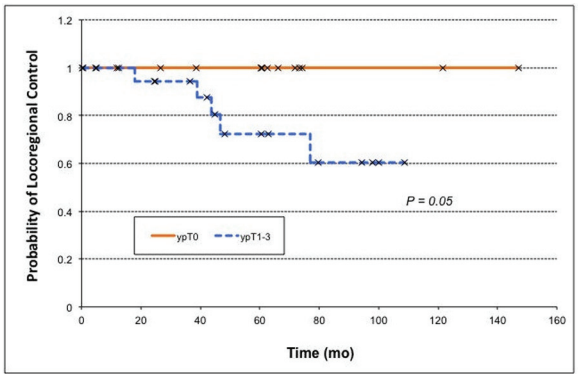

Figure 1. Locoregional control relative to tumor response following neoadjuvant chemoradiotherapy for rectal adenocarcinoma.

P163 Table. Stage distribution, cancer outcomes and post op morbidity in patients treated with multimodality treatment vs. surgery alone.

	Multimodality treatmentN=105	Surgery alone N=104	P value
Tumor stage II,III,IV	30(30.5%), 57(54.3%), 16(15.2%)	55(52.90%), 34(32.7%), 15(14.4%)	0.003
Postoperative morbidity	37(35%)	25(25%)	0.12
5 year oncologic outcomes			
OS	44.3%	47.4%	0.86
DFS	40.1%	45.5%	0.79
DR	13(12.4%)	14(13.5%)	0.82
LR	5(4.8%)	4(3.8%)	1
DSS	63.5%	68.1%	0.49

OS:Overall survival,DFS:Disease-free survival,DR:Distant recurrente,LR: local recurrente,DSS:Disease-specific survival

DEPTH AND LATERAL SPREAD OF MICROSCOPIC RESIDUAL RECTAL CANCER AFTER NEOADJUVANT CHEMORADIATION: IMPLICATIONS FOR TREATMENT DECISIONS.

(P165)

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Purpose: It has been proposed that rectal cancers with a good response to chemoradiation may be adequately treated by local excision. In this situation, successful oncologic treatment assumes accurate localization of tumor cells. Little is known, however, about the distribution of residual microscopic disease and the correlation to gross appearance of reisdual mucosal abnormalities (RMAs). The goal of this study was to determine the distribution of microscopic residual cancer, both laterally and deep, in relation to RMA to help define the oncologic feasability of local excision in these patients.

Methods: Archived pathological slides from 36 rectal cancers staged as ypT1-3 that had undergone neoadjuvant chemoradiation were reviewed. Tissue sections where both RMA and adjacent normal mucosa were present were identified. Histologic depth of tumor invasion (ypT) stage was noted in 2 locations: i) underneath the RMA, and ii) lateral to the RMA underlying normal mucosa. In sections where lateral tumour spread was found under adjacent normal mucosa, its distance (mm) was assessed from the lateral border of the RMA.

Results: Representative sections containing both RMA and adjacent normal mucosa were available for 27 patients representing ypT1 (n=7), ypT2 (n=12) and ypT3 (n=8). The most advanced ypT stage was situated directly underneath the RMA in 26 of 27 (96%) patients. Lateral tumour spread under normal appearing mucosa adjacent to RMAs was found in 19 (70%) patients with an average distance of 5 mm beyond the RMA border. The maximal lateral extension by stage was 4 mm (ypT1), 9 mm (ypT2) and 9 mm (ypT3).

Conclusions: In nearly all cases, the greatest depth of residual rectal cancer occurs under the residual mucosal abnormality; however lateral spread beyond gross mucosal disease is common. Restaging biopsy under the RMA after chemoradiation can help determine ypT stage that may guide surgical decision-making and provide patient prognosis, but the RMA cannot be used to accurately assess the extent of local excision required to remove all micorscopic residual cancer.

THE VALIDITY OF ROUTINE ADJUVANT THERAPY IN THOSE RECEIVING PREOPERATIVE CHEMORADIOTHERAPY FOR THE TREATMENT OF RECTAL CANCER.

(P166)

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Purpose: In the treatment of rectal cancer neo-adjuvant chemo-radiotherapy (CRT) is offered in locally advanced disease to reduce the risk of local recurrence. Adjuvant chemotherapy (AC) is usually administered to these patients, but supporting evidence for this is limited and any improvements in survival are felt to be marginal at best. We assessed long-term survival of patients with rectal cancer who were treated in line with these currently accepted protocols.

Methods: Consecutive cases of rectal cancer diagnosed and treated at a single centre between 1999-2007 were identified. CRT comprised 45-50 Gy in 25 daily fractions over 5 weeks followed by surgery 4-8 weeks later. AC comprised a six month regimen of bolus 5-FU and folinic acid. Data pertaining to patient demographics, staging, operative treatment and neoadjuvant/adjuvant therapy were collected. Outcome measures including overall 5 and 10 year survival and recurrence were measured. Survival analysis was performed using the Kaplan-Meier method.

Results: 195 patients operated for rectal cancer were identified. Mean age was 67.6 years (range 23-91). Mean follow-up was 5.3 years (range 0.01-13.7). M:F 132:63. 82 patients (42%) received CRT. 5 and 10 yr survival for the whole cohort was 57% and 32% respectively. Patients who received CRT experienced delayed local (P=0.07) and systemic recurrence (P<0.001). There was no significant difference in 10 yr survival of patients with stage 3 disease who received CRT compared with those who did not (P=0.39). AC did not confer any long term survival advantage to the CRT group (P=0.51). The outcome of patients who received CRT with no positive lymph nodes on final histology was comparable to those who were truly node negative, with no difference in 10-year survival (P=0.65).

Conclusions: Evidence to support the routine use of AC in all patients following CRT and surgical resection is lacking. Our results add to the existing pool of data suggesting that a more targeted strategy may be necessary to avoid subjecting patients to the potential morbidity of cytotoxic agents with little to gain in terms of long term survival.

EARLY QUALITY OF LIFE OUTCOMES FOR HIGH DOSE RATE ENDOLUMINAL BRACHYTHERAPY FOR THE TREATMENT OF RECTAL CANCER.

(P167)

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Purpose: Neoadjuvant chemoradiation (CRT) for the treatment of rectal cancer is associated with high risk (~30%) of grade 3 – 4 toxicity and no survival benefit over surgery alone. Endoluminal high dose rate brachytherapy (HDRBT) for 4 days has been shown to be an effective form of neoadjuvant therapy for rectal cancer and is associated with improved pathologic complete response rates. We wish to compare toxicity and quality of life (QOL) between CRT and HDRBT.

Methods: 9 prospective patients enrolled in our institutional trial for rectal cancer were compared with 50 historical controls who received standard conformal chemoradiation (CRT). Standard pretreatment and weekly assessments of toxicity were recorded. QOL was measured pretreatment and 3 - 6 weeks following the start of treatment using EORTC QLQ-C30 and QLQ-CR29 instruments.

Results: There was no difference in age (56 vs. 59) and race (78% vs. 80% caucasian) between HDRBT and CRT patients. More female patients received HDRBT than CRT (78% vs. 28%, p=0.001). Grade 3 toxicity related to HDRBT treatment was seen at week 3 in 3 patients (33%) and in 8 patients (16%) during week 5 -6 of CRT (p=0.219). At a mean of 6 weeks following the start of treatment, patients undergoing HDRBT reported significantly higher constipation scores (37.5 ± 13.3) than patients undergoing CRT (13.3 ± 3.2, p=0.01). When comparing changes from pre to post treatment in QOL symptoms scales, significantly worsening buttocks pain (p=0.0100), constipation (p=0.01), abdominal pain (p=0.009), and bloated feelings (p=0.01) were reported among HDRBT than CRT patients. Additionally, changes in global quality of life demonstrated worsening of their emotional (p=0.02) and regular functioning (p=0.01) among HDRBT patients. CRT patients reported significantly better body image (p=0.0008) and decreased anxiety (p=0.007) when compared to patients undergoing HDRBT.

Conclusions: Early data from patients undergoing 4 days of HDRBT as compared to standard 6 week therapy demonstrated decreased QOL resulting from pain at the treatment site and constipation. The effect of HDRBT on long term QOL and anorectal function following surgery remains to be seen.

CLINICAL AND RADIOGRAPHIC PREDICTORS OF RESPONSE TO HIGH DOSE RATE ENDOLUMINAL BRACHYTHERAPY FOR THE TREATMENT OF RECTAL CANCER.

(P168)

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Purpose: Recently, several reports have demonstrated radiographic predictors of response to therapy in patients undergoing standard conformal external beam neoadjuvant chemoradiation for rectal cancer. Endoluminal high dose rate non-conformal brachytherapy (HDRBT) as neoadjuvant therapy for rectal cancer has been shown to be associated with good complete pathological response rates (30%). We wish to compare radiographic and clinical predictors of response to HDRBT treatment.

Methods: We assessed response among 9 prospectively enrolled patients in our institutional HDRBT trial. Clinical evaluation with endoscopy, multiplanar MRI, and PET/CT imaging performed pre-treatment and post-treatment MRI, PET/CT, and intraoperative assessment of response were compared with the final pathological assessment. Radiographic assessment for each modality was determined using response evaluation criteria in solid tumors (RECIST) and PET response criteria in solid tumors (PERCIST) by a single radiologist and clinical assessment was made by the operating surgeon.

Results: Among the 9 patients, the mean age was 56 (34 – 88) years, 89% were female, and 78% were white. The final tumor pathological response in 3 patients (33%) was a complete tumor response (PCR) and in 6 patients (67%), a partial tumor response (PPR). One patient with partial response had carcinoma insitu (TRG 1). The time from post-treatment to imaging for MRI vs.PET/CT was not different (38 vs. 39 days, respectively). Clinical assessment was made a mean of 15 days (5 – 26) following radiographic assessment. The sensitivity for the detection of PCR among clinical evaluation, MRI, and PET/CT was 100%, 100%, and 0%, respectively. The specificity for PCR among the above modalities was 100%, 86%, and 67%. The highest positive predictive value for complete tumor pathologic response was seen for clinical evaluation (100%) followed by multiplanar MRI (67%).

Conclusions: Early results suggest that assessment of response from HDRBT is best made on clinical examination or multiplanar MRI. Further evaluation with newer radiographic modalities may demonstrate improved predictability.

COMPLETE RESPONSE VERSUS PARTIAL RESPONSE POSTNEOADJUVANT CHEMORADIATION IN LOCALLY ADVANCED RECTAL CANCER: DOES THE DEGREE OF RESPONSE INFLUENCE THE OUTCOME.

(P169)

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Purpose: Locally advanced rectal cancer is frequently treated with neoadjuvant chemoradiation (NCR) to reduce local recurrence rates and possibly improve long-term survival. The tumour response to NCR is variable and may influence the prognosis post curative surgery. While pathologic complete response (pCR) to NCR improves prognosis after surgery, very few studies have evaluated the outcome following pathologic partial response (pPR). This study compared long-term results of pCR and pPR to NCR in patients operated for low and mid-rectal adenocarcinoma.

Methods: A single-centre, colorectal cancer database was retrospectively queried for patients with primary rectal cancer undergoing NCR followed by total mesorectal excision (TME) with curative intent between 2000-2006. Patients were stratified into pCR, pPR and no response groups. Criteria for pPR were a down staging of T value +/- a down staging in the N value or a stable T value with a down staging of N value as compared to the pre-treatment MRI. Local and distant recurrence, and 5 year overall survival were calculated, and analysed using Fisher's exact test and log rank test.

Results: One hundred and eleven patients underwent TME for low and mid-rectal cancer after NCR. consisting of 45 to 50 Gy of radiation combined with 5FU. Of these, 20 patients (18%) achieved pCR, 27 patients (24.3%) achieved pPR, and 64 had no response. At 5 years post surgery (median follow-up 6.2 years), the pCR group compared to the pPR group had a cumulated local recurrence rate of 5% vs 6,3% (p>0.9), and a distant recurrence rate of 7,4% vs 21% (p=0,3). Five year overall survival rates were 85% (pCR) vs 77.8% (pPR) (p= 0.6). Patients with no response to NCR had a distant cancer recurrence rate of 40,7%(compared to pCR, p=0.037, compared to pPR, p=0.20, and compared to pPR+pCR= 0.034)) and a 5 year overall survival rate of 72,4%.

Conclusions: Pathologic partial response and complete response to NCR and pCR offer similar outcomes in locally advanced cancer.

RESULTS OF A "WATCH AND WAIT" STRATEGY IN COMPLETE REMISSION OF RECTAL CARCINOMA AFTER CHEMORADIOTHERAPY.

(P170)

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Purpose: In rectal carcinoma, until today, no definite criteria have been determined for abandoning the traditional pathway of radical resection in case of complete remission after neoadjuvant chemoradiotherapy.

Methods: In about 10 % of our patients with rectal carcinoma, after neoadjuvant therapy and radical resection, ypT0ypN0 categories were stated. Overall, in 23 selected patients, the originally indicated resections were not performed but a watch and wait strategy installed.

Results: In 16 patients with a median age of 54 years (39-80), any surgery was cancelled at clinical complete tumor remission. After a median follow-up of 48 months (7-99), 14 patients remained locally tumor-free; two further patients were operated on radically after a prolonged observation time of 4 months, each, for pT1pN1 and pT3pN0 tumors, respectively, with no long-term oncologic disadvantages. In 3 patients, local recurrences were detected, all of them 2 years after primary low anterior resection (pT2pN0 and pT2pN1 categories). With complete local remission, one patient has remained tumor-free without reoperation over 102 months; in the second case with known liver metastases, additional pulmonary and bone metastases occurred, however, after 38 months, no local recurrence. The third patient was operated on curatively for a recurrent rpT2rpN0 carcinoma only after 25 months, however, developed re-recurrence and peritoneal carcinosis. After transanal full-thickness local excision of a pT1pNXM0 tumor, local recurrence with liver metastases was found in one 39-year old patient after 3 years. After chemoradiotherapy and complete local remission, additional pulmonary metastases were found, however, no local recurrence (follow-up 48 months). Despite R1 resection, three further patients remained tumor-free without re-operation, in one case after neoadjuvant chemoradiotherapy, in the other two cases after primary full-thickness excision and adjuvant therapy.

Conclusions: In selected cases of rectal carcinoma and recurrent tumors, clinical complete tumor remission can be achieved by chemoradiotherapy which may be permanent justifying a watch and wait policy with close follow-up checks.

SURVIVAL ANALYSIS IN PATIENTS WITH ADENOCARCINOMA OF THE ANAL CANAL: DOES CHEMORADIATION PROVIDE ADDITIONAL BENEFIT IN RELATION WITH SURGERY?

(P171)

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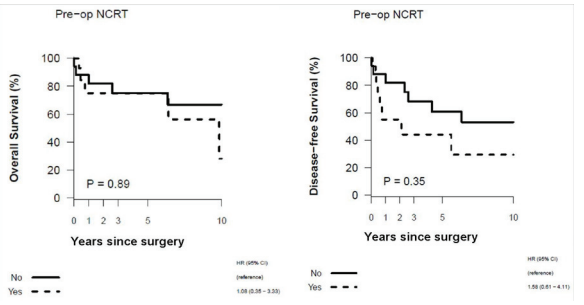
Purpose: Adenocarcinoma of the anal canal (AAA) is a rare malignancy that arises from the columnar epithelium lining in the anal canal. Limited data exist regarding treatment strategies and their effects on survival.

Methods: Patients undergoing surgery for AAA with curative intent at a single institution between September 1987 and December 2011 were included in the study. Patients' demographics, treatment strategies, recurrence, and survival were evaluated and compared. Kaplan-Meier method was used for survival analysis.

Results: Records of 38 patients with AAA were reviewed from an institutional review board approved, prospectively maintained database. Four patients were excluded from the analysis (2 underwent brachytherapy and 2 had a diverting colostomy). None of the patients undergoing surgery had stage IV disease at the time of diagnosis.16 out of 34 patients underwent abdominoperineal resection (APR) followed by preoperative chemoradiotherapy (PCRT). Out of 18 patients who did not receive PCRT, 5 patients were treated with APR only, 8 patients with APR followed by adjuvant chemoradiation and 5 patients with local excision followed by adjuvant chemoradiation. Mean tumor size (cm) of the patients who underwent PCRT was significantly larger than the others who had no PCRT (2.6±1.6vs4.1±2.2;p=0.03). The patients undergoing PCRT had more advanced disease (Stage II/III) according to the pathologic staging when compared to those who had no PCRT (88vs.50%,p=0.02). Median age of the patients was 62 years (30-86). Median follow-up was 31 months (inter-quartile range,6.2-119), local recurrence was 11.8% (n=4), distant recurrence was 29.4% (n=10) and cancer-related mortality was 26.5% (n=9). Overall survival (OS) and disease free survival (DFS) at three years in all patients was 74.4% and 57.4% respectively. DFS and OS were similar after surgery patients regardless of PCRT (figure).

Conclusions: PCRT followed by abdominoperineal resection for the treatment of advanced AAA leads to survival outcomes that are similar to those of patients with less advanced disease. PCRT may play a role in the improvement of disease free and overall survival in patients with AAA.



SYSTEMATIC REVIEW OF SENTINEL LYMPH NODE BIOPSY IN ANAL SQUAMOUS-CELL CARCINOMA.

(P172)

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Purpose: Anal squamous cell carcinoma with lymph node metastases is associated with poor outcome. There remains a need for a better method to diagnose inguinal lymph node metastases which is minimally invasive, accurate and avoids unnecessary irradiation to the groin and its significant co-morbidity. The aim of this study was to evaluate the role of sentinel lymph node (SLN) biopsy in anal squamous cell carcinoma.

Methods: The systematic review was conducted in accordance with PRISMA guidelines. The Medline, Central and Embase databases were searched using the terms 'sentinel lymph node' and 'anus neoplasms'.

Results: The systematic review identified 17 studies (270 patients). Two independent reviewers allocated a Down and Black Score to each study with a kappa statistic for inter-rater variability of 0.706, demonstrating good agreement. The SLN detection rate varied from 47%-100% with nodal metastases identified in 0-44%. The complication rate varied from 0-59%. The rate of development of subsequent inguinal lymph node metastases in those cases previously SLN biopsy-negative (a surrogate marker for false negative rate) ranged from 0-19%.

Conclusions: SLN biopsy is a feasible method of assessing lymph node status in patients with anal squamous cell carcinoma. Longer follow up is required to evaluate the proportion of patients who are SLN biopsy-negative and subsequently develop inguinal nodal metastases. Serious consideration should be given to a randomized trial of SLN biopsy-directed selective use versus routine use of wide volume pelvic-inguinal chemo-radiotherapy.

PREVALENCE OF ANAL INTRAEPITHELIAL NEOPLASIA IN A COHORT OF MEN WHO HAVE SEX WITH MEN, INFECTED WITH HIV - A SPANISH SCREENING PROGRAM.

(P173)

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Purpose: Until today, no screening strategies have been able to demonstrate a reduction in mortality and morbidity rates of anal cancer because the rates of progression to cancer seem to be substantially lower than they are for cervical intraepitelial neoplasias, in addition it usually does not appear before the fourth decade of life in HIV-positive patients. Nevertheless, many authors express the need of anal cancer screening programs. We aimed to study the prevalence of anal intraepithelial neoplasia (AIN).

Methods: 298 MSM HIV-positive, followed up in the early diagnosis unit of a tertiary hospital in Spain were included, from June 2009 to May 2012. Citology and human papiloma virus (HPV) detection were performed to all the patients. A high-resolution anoscopy (HRA) and biopsy were performed to all patients who had abnormalities on cytology.

Results: The mean age of the population was 41 ± 10.5 years (mean ± SD), 50% of the patients were under 40 years old. 122 patients (40.9%) undergoing initial screening with cytology showed abnormalities (atypical squamous cell undetermined significance (ASCUS) 13.9%, low grade squamous intraepithelial lesion (LSIL) 60.7% and high grade intraepithelial lesion (HSIL) 25.4%). HRA was performed in 119 patients. Of these 83 (69.6%) presented AIN and 66 (55.4%) presented high grade AIN (HAIN) (AIN 2 or 3). The prevalence of both AIN and HAIN was 28% (22.9-33.1 CI 95%) and 22% (17.3-26.7 CI 95%) respectively. The positive predictive value of the cytology for the diagnosis of both, AIN and HAIN, were respectively 69.8% (95% CI 61.6 to 68) and 55% (95% CI 46.1 to 63.9). The presence of HPV 16 is strongly associated with the diagnosis of HAIN odds ratio 6.4 (2.8-14.3).

Conclusions: In our study with a young population, cytology screening program has proven effective. The prevalence of HAIN is high (22%) compared to other studies. It would be necessary to establish a citology screening for all subjects at risk, but further management of this condition should be conducted at specialized multidisciplinary units. In our opinion anoscopy should be performed only in patients with cytological abnormalities.

CLINICOPATHOLOGIC PRESENTATION AND NATURAL HISTORY OF ANORECTAL MELANOMA: A CASE SERIES OF 13 PATIENTS.

(P174)

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Purpose: Anorectal melanoma is a rare malignancy with variable natural history and non-specific presentation. We describe the prognostic and clinicopathologic parameters of a series of patients with anorectal melanoma.

Methods: After IRB approval, a retrospective review of all patients with anorectal melanoma treated at our institution between 1980 and 2011 was performed. Patients were identified through the institutional pathology database. Clinicopathologic parameters including patient demograhics, presenting symptoms, pathology findings, treatment, and outcomes were recorded. Descriptive statistics are presented as mean±standard error or count (%) as appropriate.

Results: 13 patients with a confirmed tissue diagnosis of anorectal melanoma were identified. The majority of patients were white (11/13, 85%) and male (8/13, 62%). Mean age at diagnosis was 61±3.6 years. More than half of the patients (8/13, 62%) were initially diagnosed incorrectly, including 3 patients who were found to have anorectal melanoma after routine hemorrhoidectomy. The most common presenting symptom was bright red blood per rectum (8/13, 62%) that occurred over a mean of 6.2±1.3 months prior to medical evaluation. Lesions were located most frequently in the anal canal (7/13, 54%), and multiple lesions upon presentation were common (8/13, 62%). Surgical management included local excision (8 patients) and abdominoperineal resection (4 patients). Average follow-up was 37.7 months (range 1-136 months). Disease recurrence occurred in 6 (46%) patients within 12±4 months (Table), mostly to metastatic sites (5/6 83%) including regional lymph nodes (2/6, 33%), liver (2/6, 33%), and lungs (1/6, 17%). Overall disease-specific mortality was 38% at a mean of 11+5 months, including death in 2/8 (25%)

P173 Correlation between cytology and biopsy results

	Normal	AIN grade 1	AIN grade 2	AIN grade 3	Condyloma	Total
ASCUS	8	0	7	1	1	17
LSIL	12	15	27	9	9	72
HSIL	3	2	8	14	3	30
Total	23	17	42	24	13	119

patients with local excision and 3/4 (75%) patients with abdominoperineal resection.

Conclusions: Anorectal melanoma is a rare malignancy that is often associated with late diagnosis due to a delay in patient presentation, non-specific presenting symptoms, and frequent incorrect diagnoses. In our small series, size and lesion depth appeared to be associated with recurrence. Overall disease mortality is high regardless of surgical management.

THE HIGH RESOLUTION ANOSCOPY CURVE: DOES PRACTICE MATTER?

(P175)

S. Fang, J. Efron, S. Gearhart, E. Schneider, E. Wick
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Purpose: The development of high resolution anoscopy (HRA) has advanced our ability to survey and screen for anal dysplasia, however its learning curve is unknown. The purpose of this study was to document our outcomes after initiating a HRA practice and define its learning curve.

Methods: Following IRB approval, a retrospective review was performed on all patients undergoing HRA at our institution, from November 2011 to November 2012, perfomed by a single colorectal surgeon (ECW) after completing the ASCCP approved coloposopy and HRA course and an observership at an AIDS Malignancy Consortium site. Anal pap smears were obtained concurrently with each HRA performed.

Results: Fifty-one patients underwent 74 HRAs. Mean age was 44.6 years (range 25-74). Thirty-one patients (59%) were male. Eleven HRAs were incomplete due to bleeding, patient discomfort, or technical issues. Seventy percent (44/63) of HRAs were performed on HIV-infected persons and 19% (8/44) had CD4 counts < 200. Indications for referral included incidental finding after anorectal procedure (16/63, 25%) and abnormal anal pap (47/63, 75%). Eighty-four HRA biopsies were obtained with an average of 1.3 (range 0-5) biopsies per procedure. Forty-two (50%) biopsies were positive for anal intraepithelial neoplasia (AIN), or a combination of AIN, distributed as follows: AIN I = 23, AIN II = 14, AIN III= 17. The table correlates the anal pap smears of 53 patients who had adequate anal pap smears (Table 1). Complications from HRA included pain in 2 (3%) patients and bleeding in 1 (1.5%) patient. Of the 16 patients who had a repeat HRA, 4 had persistence of dysplasia. Fifty-six percent of the first 25 patients to undergo HRA had a positive correlation between pap smear and HRA. In the second group of 25 patients, the correlation improved to 64% (p = 0.84).

Conclusions: HRA is a safe procedure for the screening of anal dysplasia. Higher grade dysplasia on anal pap smear better correlates with an increased likelihood of identifying the area of dysplasia on HRA. The learning curve for accuracy of HRA is still not well defined, but seems to improve with time and requires > 70 procedures. High procedure volume may lead to more accurate identification of dysplastic lesions.

IMMUNE STATUS DOES NOT PREDICT PRESENCE OF HIGH-RISK HPV IN ANAL CONDYLOMA.

(P176)

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Purpose: More than 90% of anal condyloma is attributed to non-high risk strains of human papilloma virus (HPV) such as 6, 10 and 11. Thus, patients treated for anal condyloma do not necessarily undergo HPV serotyping unless they are immunocompromised (IC). We hypothesized that IC patients with anal condyloma have a higher risk of high-risk HPV (hrHPV) and dysplasia than non-immunocompromised (NIC) patients.

P174 Clinicopathologic parameters of recurrent vs. non-recurrent anorectal melanoma lesions

	No Recurrence (N=7)	Recurrence (N=6)
Location		
Anus	5 (86%)	5 (83%)
Rectum	1 (14%)	1 (17%)
Multiple Lesions	2 (29%)	2 (33%)
Surgical Management		
Local Excision	5 (86%)	3 (50%)
Abdominoperineal Resection	1 (14%)	3 (50%)
Lesion Size (cm)	2.5±0.2	4.6±0.8
Lesion Depth (mm)	0.95±0.55	8.0±2.1
Positive Margins	1 (14%)	1 (17%)
Positive Lymph Nodes	0 (0%)	2 (33%)
Melanotic	5/6 (83%)	2/4 (50%)

Methods: We performed a retrospective chart review of patients who underwent surgical treatment by a single surgeon for anal condyloma from January 2000 through January 2012. Serotyping was performed in all patients during the study period regardless of immune status. The IC group included patients with a known diagnosis of HIV, solid organ transplant, or on chronic immunosuppressant medications such as methotrexate or prednisone. We compared incidence of hrHPV and dysplasia in condyloma specimens from IC and NIC groups. Student t tests, Chi square tests and Fisher exact tests were performed. Odds ratios for presence of hrHPV and dysplastic lesions were calculated using logistic regression adjusting for smoking, gender, age, and immune status.

Results: We identified 120 condyloma cases during the study period (Table). Twenty-one (17.5%) patients were IC. High-risk HPV was identified in 14 specimens and included serotypes 16, 18, 31, 33, 51, 52, and 67. Invasive carcinoma was identified in one IC patient but tested negative for high-risk HPV. Twenty-two (18.3%) cases had dysplasia. The prevalence of dysplasia or hrHPV was not significantly different between IC and NIC groups. HrHPV was a significant independent predictor of dysplasia (OR 5.2, 95% CI 1.24-21.62). IC status, however, was not a significant predictor of hrHPV (OR 1.11, 95% CI 0.16-5.12) nor dysplasia (OR 0.27, 95% CI 0.037-1.17).

Conclusions: IC patients did not have a significantly higher incidence or risk of hrHPV or dysplasia in our study. HPV serotyping should be considered in all patients treated for anal condyloma as NIC patients may be at significant risk for hrHPV and anal dysplasia

ANAL MELANOMA LESSONS FROM THE PETER MACCALLUM CASE SERIES.

(P177)

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Purpose: Anal melanoma is a rare tumour, comprising 1-2% of melanomas and carries a poor prognosis. The lesions are often discovered late but also infiltrate and metastasise early and aggressively. The prognosis is determined by stage at diagnosis with median survival for patients with distant, regional and localised spread of 10, 13 and 34 months respectively. We review a case series with particular regard to achieving local control and using tyrosine kinase inhibitors to treat specific tumour mutations.

Methods: A retrospective review was performed of all patients with anal melanoma treated at The Peter MacCallum Cancer Centre, Melbourne, Australia; between Jan 2000 and Jan 2012. The diagnosis was confirmed by histology from medical records. Data collected included: age, sex, presentation, initial histology, staging, surgical and oncological therapies and follow up data.

Results: 16 patients were identified, 10 female (63%) with a median age of 66 (27-83). 6 of these already had disease dissemination at presentation, 3 to groin and 3 to nodes within the pelvis, 2 patients also had systemic metastases. 11 patients were tested for c-Kit mutations and 5 were positive (45%), 8 for B-Raf all of which were negative. 13 patients had follow up data to death or greater than 5 years, survival for 1, 2 and 5 years was 69%, 46%

P175 Table 1. Correlation between Anal Pap Smear and High Resolution Anoscopy

	High Resolution Anoscopy		p = 0.009
Anal Pap Smear	Positive	Negative	Total
Negative	1 (8.33%)	11 (91.67%)	12
Low-grade	9 (56.25%)	7 (43.75%)	16
High-grade	9 (75%)	3 (25%)	12
ASCUS	6 (46.15%)	7 (53.83%)	13
Total	25 (47.17%)	28 (52.83%)	53

P176 Comparison of immune status groups

Variable, n(%)	IC (n=21)	NIC (n=99)	p-value
Age, mean y(SD)	39.1(10)	32.8(13)	0.034
Male	20(95)	93(934)	1
Current smoker	6(29)	36(36)	0.50
Dysplasia	2(10)	20(20)	0.36
Mild-moderate dysplasia	2(10)	13(13)	1
High-grade dysplasia	0	7(7)	0.35
Invasive carcinoma	1(5)	0	0.18
High-risk HPV	2(9.5)	12(12.1)	1

and 23% respectively. 9 patients underwent local excision, 2 with adjuvant radiotherapy, of these 4 required abdominoperineal resection; 5 underwent primary abdominoperineal resection only. Local control was achieved in 5 cases, 2 recurrences were after 10 years. 4 of the patients with c-Kit mutations were treated with the tyrosine kinase inhibitor imatinib, all showed rapid regression of metastasis on CT or PET scan. 4 of the 6 patients who were negative for c-Kit were treated with Dacarbazine all showed progression on imaging.

Conclusions: This series demonstrates the poor survival of patients with this cancer. Local resection has been recommended in view of the poor life expectancy. We found local resection led to high rates of salvage abdominoperineal resection and poor local control. Patients with the c-Kit mutation responded well to imatinib treatment which may improve survival for this subset of patients.

RECURRENCE OF ANAL LESIONS FROM HUMAN PAPILLOMA VIRUS IN THE DISTRICT OF COLUMBIA.

(P178)

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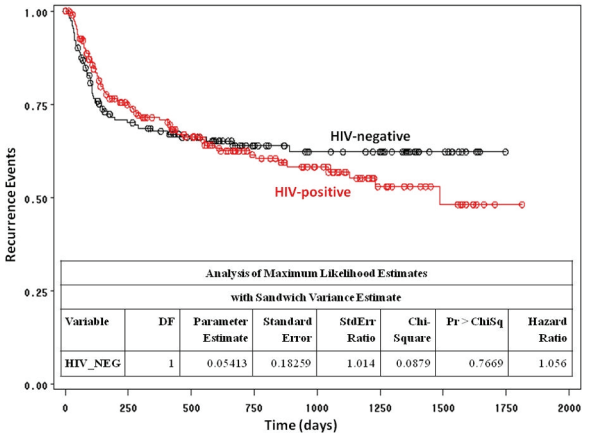
Purpose: A 2010 report by the D.C.'s Department of Health found that 3.2% of adults and adolescents (16,721 people) are living with HIV – the highest rate for any U.S. city and well above the World Health Organization's definition of an epidemic (1%). HPV rates are hard to track, since screening occurs only sporadically in females by pap smear. D.C. has the highest cervical-cancer rate in the U.S. (13.5% vs. national average of 8.8%). HPV infection rate in the anal canal is likely also higher than the national averages. The mainstay of treatment of anal lesions from HPV is surgical excision and fulguration (success rate of 71-93%, recurrence rate of 4-29%). We aimed to investigate the risks of recurrence among patients seeking surgical intervention for HPV-related anal lesions at the highest-volume hospital in D.C.

Methods: We retrospectively reviewed the database from the MedStar Washington Hospital Center Section of Colon & Rectal Surgery to find patients who underwent anal surgery for HPV lesions from January 2007-December 2011. From these data, we manually reviewed electronic medical records to record patient demographics (including race, HIV status, and use of antivirals) as well as surgical pathology. Differences were assessed using Fisher's exact tests. Significance was assessed at $p<0.05$.

Results: From 2007-2011, 390 patients underwent 527 surgeries for anal HPV disease. The population was mostly male (n=361, 92.6%), 41% African American (n=160), and 44.9% HIV positive (n=175). Of these patients, 78 (20%) had a recurrence requiring additional surgery within the study period. Number of recurrences per patient ranged from 1 to 9 (mean 1.8). Time to recurrence was on average 6.9 months (SD=8.6, range 11 days to 4 years). 15.6% of patients were diagnosed with anal carcinoma in situ on first surgery (n=61). The risk of recurrence was not related to gender (p=0.23), race (p=0.25), HIV status (p=0.79), or cancer diagnosis (p=0.73). HIV coinfection was associated with an increased risk of pre-malignant disease (p=0.003).

Conclusions: HPV is epidemic in our city. As surgeons, we ought to be invested in reducing recurrences by investigating medical interventions that can be undertaken after surgery.



Analysis of Maximum Likelihood Estimates
with Sandwich Variance Estimate

Variable	DF	Parameter Estimate	Standard Error	StdErr Ratio	Chi-Square	Pr > ChiSq	Hazard Ratio
HIV_NEG	1	0.05413	0.18259	1.014	0.0879	0.7669	1.056

Recurrence events did not vary significantly by HIV status

NIGRO IS NOT ENOUGH FOR LARGE ANAL SQUAMOUS-CELL TUMORS:TREATMENT FAILURES FOR ANAL SQUAMOUS-CELL CARCINOMA.

(P179)

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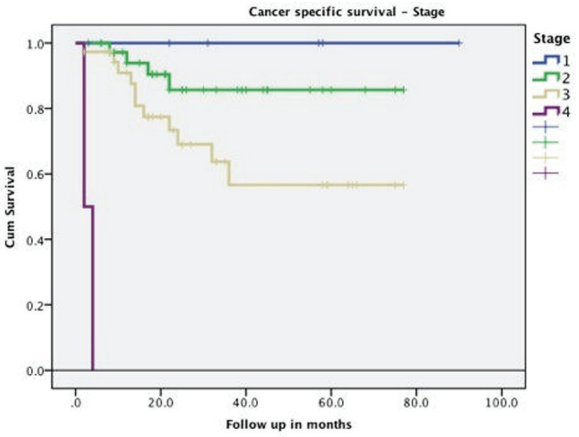
Purpose: To analyze the factors affecting survival benefit and outcome for the treatment of anal squamous carcinoma.

Methods: A retrospective review of 103 patients was performed on patients with anal squamous carcinoma treated with a modified Nigro protocol (5FU 1000mg/m2, Mitomycin C 10mg/m2 and 5000cGy of radiation over 6 weeks) from 2000-2011. 19 patients with follow up less than 1 year or incomplete data were excluded for analysis. Survival function was analyzed using the method of Kaplan Meier and significance ($P<0.05$) tested using the log rank test and Cox regression analysis.

Results: The population had 27 whites, 66 blacks and 8 Hispanics with a median age of 49 years. There were 67 males, 34 females and 2 transgender. 33% were HIV+. Therapy was completed in 95% of patients. Tumors

regressed icompletely in 62%. 14 patients were treated with APR for persistence (11/14) and recurrent (3/14) disease at 10 and 30 weeks after completion of Nigro. Protocol. 13/14 have recurred and 7/14 are dead of disease. Distant/groin (11/14) and local failure (3/14) has been observed after a median interval of 13 months. 9 patients were treated with palliative diversion for severe incontinence (1/9) and advanced local disease (8/9) Overall survival and recurrence for stages 1, 2, 3 and 4 was (100%, 89%, 70%, 60%) and (0%, 39%, 61%, 100%) respectively at mean follow up of 28 months. (p=0.0003, 0.017). Overall and disease free survival was independent of age, race sex, interruption of therapy and HIV status. With multivariate analysis, stage at presentation and tumor size were independent predictors of survival (p=0.03, 0.018).

Conclusions: Size of anal canal squamous carcinoma at initial presentation is the best predictor of response to therapy, recurrrence and survival. Two thirds patients with advanced disease failed Nigro protocol. Salvage therapy administered 10-31 weeks after Nigro had a very low success rate. We propose that surgery should be applied early to the Nigro protocol in most patients with bulky, invasive and advanced disease.



THE PREVALENCE OF ANAL HUMAN PAPILLOMA VIRUS AND ANAL DYSPLASIA IN WOMEN WITH CERVICAL DYSPLASIA.

(P180)

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Purpose: Since 1975 the incidence of anal cancer in women has nearly doubled and there has been a five-fold increase in the mortality rate for women diagnosed with anal cancer. Despite the rising number of women affected by anal cancer, there are no standardized screening guidelines like those established for cervical cancer. This study examines the relationship between cervical dysplasia and the presence of anal Human Papilloma Virus (HPV) and anal dysplasia. The goal of this study is to evaluate the prevalence of anal HPV infection and dysplasia in women with known HPV related cervical dysplasia.

Methods: After obtaining IRB approval, data was prospectively collected from a cohort of 200 patients referred to the Gynecology Dysplasia Clinic for known cervical dysplasia. Informed consent was obtained from all participants. An anal swab was performed and these samples were evaluated for the presence of dysplastic anal cells and HPV. Patients with anal dysplasia were referred to the Colorectal Clinic for high resolution anoscopy (HRA) and anal biopsies as indicated.

Results: Of the 200 women with cervical dysplasia, 19 women had both anal dysplasia and high risk HPV. Of those 19 women, 6 were noted to be Low Grade Squamous Intraepithelial Lesion (LGSIL) and 13 were Atypical Squamous Cells of Unknown Significance (ASCUS). Of the 6 women with LGSIL, HRA was performed on 4, as 2 women refused further evaluation. Of the 4 patients who underwent HRA, all of them had Anal Intraepithelial Neoplasia (AIN I-III). Additionally we performed HRA on one woman with ASCUS, and she as well had AIN (I). To this point in our study, 100% of women undergoing HRA for high risk anal dysplasia had AIN lesions.

Conclusions: Our preliminary data suggests that there is a connection between high risk HPV positive cervical dysplasia and the presence of HPV positive anal dysplasia. Further investigation is necessary to solidify this connection.

THE IMPACT OF AGE ON COLORECTAL CANCER OUTCOMES IN AN EQUAL ACCESS HEALTHCARE SYSTEM.

(P181)

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Fort Lewis, WA; Bethesda, MD; Worcester, MA

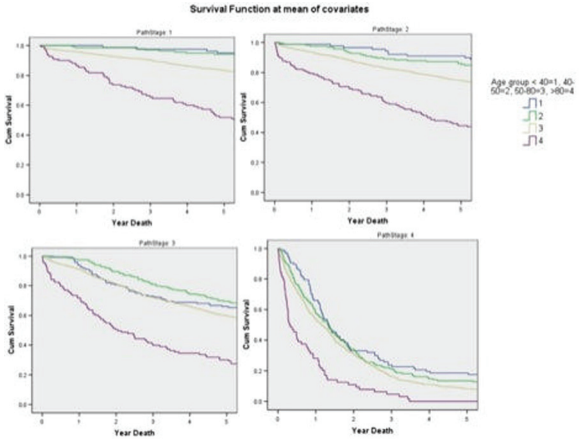
Purpose: Inferior outcomes in young patients with colorectal cancer (CRC) may be secondary to several factors including tumor biology, delay in diagnosis, poor access to care, and/or treatment differences. We sought to determine the outcome of CRC in younger patients in an equal access healthcare system

Methods: We used the Department of Defense Automated Central Tumor registry (ACTUR) to identify CRC patients between January 1993 and December 2004. Patient demographic and survival cohorts were defined. Age was stratified based on <40, 40-50, 50-80, and >80 years. Primary outcomes were AJCC Stage at presentation, adjuvant therapy use, 5-year recurrence and mortality. Data was analyzed using univariate and multivariate methodology.

Results: 7,953 patients with CRC were identified, and most (78%) were in the age 50-80 group. Left-sided tumors were most common (39%), followed by right

(29%), rectal (21%), and transverse (6%). Overall, 25% presented with AJCC Stage III disease. Compared to patients age 50-80 and >80, patients <40 and 40-49 presented more frequently with advanced disease [Stage III (35% and 35% vs. 28% and 26%) and Stage IV (24% and 21% vs.18% and 15%); all P<0.001]. Chemotherapy use in Stage III patients was 62%, with patients >80 and 50-80 years having decreased use (P<0.001). Overall recurrence was 15%, with the highest rates in patients <40 years (19%; P<0.001). Cox regression analysis demonstrated that while overall survival was worse in patients >80, the remaining cohorts had similar survival (Figure). For Stage III disease, patients 40-50 years had the highest survival among all cohorts (P<0.001).

Conclusions: In an equal access system, age <40 years was associated with advanced Stage and higher recurrence of CRC, but similar survival compared to older patients. While increased adjuvant therapy use in younger patients may partially account for Stage-specific increases in survival, the relative decreased chemotherapy use overall requires further evaluation.



YOUNG COLORECTAL CANCER - IS IT REALLY INCREASING? AN AUSTRALIAN PERSPECTIVE FROM THE LAST DECADE.

(P182)

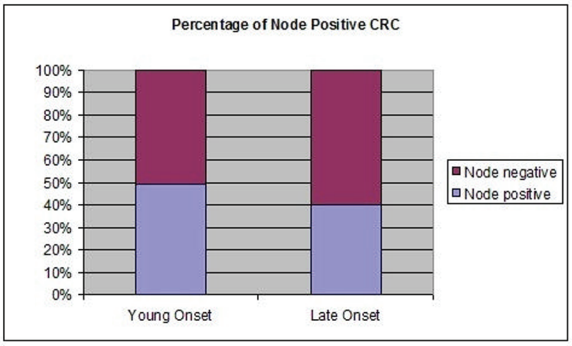
C. Sia, R. Wale, S. Warrier
Melbourne, VIC, Australia

Purpose: The incidence of young colorectal cancer (YCRC) in the United States is increasing. Early age onset CRC poses challenges to diagnosis, with late presentations and at more advanced stages of disease. The aim of the current study was to assess if similar trends have been noted in a large, reliable Australian cancer registry.

Methods: The Victorian Cancer registry (state-based) database between 2000 and 2010 were searched for CRC diagnosed at 18 years or older. Site, grade, nodal status and survival were sought from the registry. Rates of metachronous CRC were calculated using participants up to 2005. Annual percentage changes (APC) were calculated using joinpoint regression program, and comparisons between young and old cohorts were made.

Results: 2635 (7%) CRC aged less than 50 were identified from the registry. Forty seven percent were diagnosed between 45-49 years of age. Over the study period, the incidence of YCRC was increasing with an APC of 1.7%p.a (95%CI:05-2.9) versus 1.3%(95% CI:0.9-1.6), p=NS. Rectal carcinoma was more common among YCRC patients (42% vs 34%, p<0.0001). Sixty three percent (versus 53% later onset, p<0.0001) of young CRC was reachable by sigmoidoscopy . YCRC patients were more likely to have node positive disease (49.3% vs 40%, p<0.0001), especially in the young colonic cancer group (52.7% vs 41.2%, p<0.0001). No differences in rates of metachronous CRC were detected, and overall survival was comparable between the two groups.

Conclusions: Young CRC in Australia is increasing which reflects an overall increase in CRC over the study period. Young patients are more likely to have rectal cancers, and be node positive. This does not translate to worse overall survival.



Node Positive Disease: Young CRC compared with Later CRC (49.3% vs 40%, p<0.0001)

COLON CANCER IN ADOLESCENTS AND YOUNG ADULTS.

(P183)

S. Patel, M. Goldfarb, A. Senagore
Los Angeles, CA

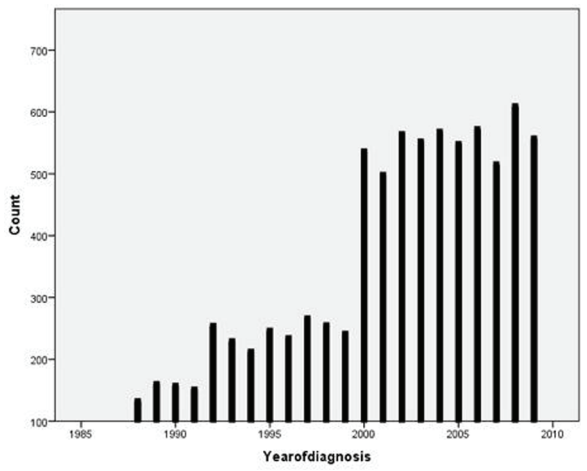
Purpose: Although it is commonly believed that colon cancer in adolescent and young adults (AYA; ages 15-39 years) is aggressive and associated with increased mortality, there is virtually no data to support this hypothesis. The objective of this study was to analyze the demographics and outcomes of colon cancer in this age group.

Methods: 8056 AYAs with colon cancer were identified from the SEER registry between 1988-2009. Trends in cancer incidence, demographics, and tumor characteristics were analyzed for the entire cohort and after stratification by age (<25 years and ≥25 years). Overall survival (OS) and disease-specific survivals (DSS) were compared.

Data analyses using chi-square tests, analysis of variance, Kaplan-Meier analysis, and multivariate logistic regression were performed.

Results: Over the past 2 decades, there has been an increasing incidence of colon cancer in AYAs (Figure). A similar incidence was observed between the sexes (males-51%; females-49%) and lesion distribution was as follows: right colon (44%); sigmoid (33%); left colon (13%); appendix (10%). The majority of patients underwent a segmental resection, however 44% of cases were node positive and 28% of patients presented with Stage IV disease. For the entire cohort, the mean OS and DSS were 160 months and 170 months, respectively. On multivariate analysis, female gender, tumor location, and disease stage were independent predictors of OS ($p<0.05$). Appendiceal tumors demonstrated the best prognosis and left colon tumors the worst (OS: 190 vs. 152 months, DSS: 201 vs. 161 months; $p<0.05$). Of note, tumor distribution was different between the older (≥25 years) and younger AYAs (<25 years) with appendiceal and left colon tumors more frequent in younger AYAs (20% and 16% vs. 9% and 13%; $p<0.05$). Stage at diagnosis was correlated with survival irrespective of tumor location ($p<0.05$).

Conclusions: The incidence of colon cancer in AYAs is increasing, suggesting the need for an emphasis on family pedigrees and focused endoscopic surveillance based on symptoms. Survival remains stage-dependent, highlighting the importance of early diagnosis. Further research is needed to determine whether these findings are a reflection of decreased awareness, unique tumor biology, or other factors.



Incidence of AYA colon cancer by year.

OUTCOMES FROM COLORECTAL RESECTIONS IN OCTOGENARIANS.

(P184)

P. Sutton, A. Sheikh, E. Tweedle, C. McFaul, M. Johnson, D. Vimalachandran
Chester, United Kingdom

Purpose: Octogenarians are an increasingly expanding cohort of patients undergoing colorectal resections, with their outcomes remaining understudied and underreported. We aimed to analyse outcomes of octogenarian patients undergoing curative colorectal resections when compared to a similar cohort two decades younger.

Methods: A database of all colorectal cancer resections is routinely maintained by the department's team of specialist nurses. Data from 2004-06 was extracted and retrospectively analysed. Performance status (CR-possum) was calculated for each patient and compared between the two groups, as were the primary end points of 30-day morbidity/mortality and 5-year survival.

Results: Eighty-one patients (> 80 years) and 61 patients (aged 60-70 years) undergoing elective and emergency resections were identified during the study period. In the octogenarian group 75.3% of resections were performed in the elective setting, compared to 78% in the younger cohort ($p=0.9$), with pelvic procedures accounting for 34.6% and 44.3% respectively ($p= 0.34$). Octogenarians had a significantly higher median CR-possum score than the younger cohort (18.0 vs. 14.0, $p=0.001$). Permanent stoma rates were similar (22% for octogenarians vs. 27% for younger; $p=0.8$) as was the pathological stage ($p=0.24$). There was one post-operative mortality in each group. Median overall survival in the octogenarians was 73 months compared to 74 months in the younger cohort; 5-year survival was 53% and 66% respectively ($p=0.2$ Mantel-Cox). CR-possum score did not affect the overall survival ($p=0.711$, Mantel-cox), however a higher score correlated with postoperative complications in both groups.

Conclusions: Octogenarian patients have a poorer performance status, however can safely undergo colorectal resections with acceptable mortality and morbidity. Poor performance status confers a higher risk of postoperative complications, however overall survival between both groups was similar. Patient selection for colorectal resection should focus on performance status and fitness rather than age.

DNA MISMATCH REPAIR DEFECTS DO NOT ACCOUNT FOR THE MAJORITY OF NEWLY DIAGNOSED YOUNG-ONSET COLORECTAL CANCERS.

(P185)

Y. You, B. Bednarski, G. Chang, S. Khose, S. Nguyen, B. Feig, J. Skibber, M. Rodriguez-Bigas
Houston, TX

Purpose: The incidence of young-onset colorectal cancer (diagnosed before age 50) is rising, but the underlying causes for this trend remain unknown. Young-onset CRC should trigger a search for hereditary syndromes, most commonly Lynch Syndrome. We aimed to establish what proportion of young-onset CRCs could be accounted for by defects in DNA mismatch repair (MMR) and microsatellite instability (MSI).

Methods: All newly diagnosed (not screened due to familial diagnosis) young-onset CRCs undergoing surgical resection between September 2009-August 2012 were prospectively and systematically examined for MMR defects/MSI. 222 patients (94% of 237 eligible) were tested by immunohistochemistry (IHC) of MMR proteins (n=221) and/or by PCR-based MSI testing (n=179). Clinicopathologic features of young-onset CRC were identified after stratification by defective MMR/MSI, defined as loss of MMR protein expression on IHC or as >30% allelic shift by PCR-MSI testing.

Results: Among young-onset CRCs, 32(15%) showed defective MMR/MSI, accounting for 62% of CRCs in patients aged 20-29, 11% of those aged 30-39 and 12% of those aged 40-50. Defective MMR/MSI was detected in 35% of all young-onset cases arising from the proximal colon, 4% of those from the distal colon, and 12% of those in the rectosigmoid/rectum. The majority of the young-onset CRCs was microsatellite-stable (MSS) without clinical polyposis, and differed significantly from MMR defective cases in age, tumor location, and disease stage at presentation (Table). Germline MMR mutation, tested for in 26 (81% of 32) patients, demonstrated deleterious mutations in 16 (61%), variants of uncertain significance in 3 (12%) and uninformative negative results in 7 (27%).

Conclusions: Defective MMR/MSI accounted for 15% of all newly diagnosed young-onset CRCs, a proportion not dissimilar to that observed in all CRCs regardless of age. This supports the current practice of testing for Lynch Syndrome, especially in the very young, the proximal colon and rectosigmoid/rectum. However, the majority of the young-onset CRCs does not arise from defective MMR, and further molecular characterization the young-onset non-polyposis MSS subgroup is necessary.

P185 Two distinct subgroups of young-onset CRC

	Young-onset CRC, defective MMR/MSI (n=32, 15%)	Young-onset CRC, microsatellite-stable (n=190, 85.5%)	p-value
Age at surgery, years (median, interquartile range)	41.3 (29.8-45.8)	45.7 (40.4-48.6)	0.001
Age at surgery		<0.001	
20-29 years	8 (25%)	5 (3%)	
30-39 years	5 (16%)	41 (21%)	
40-50 years	19 (59%)	144 (76%)	
Sex (male, %)	16 (50%)	96 (51%)	0.956
Tumor site		<0.001	
Proximal colon	15 (47%)	28 (15%)	
Distal colon	2 (6%)	51 (27%)	
Rectosigmoid/Rectum	15 (47%)	111 (58%)	
Stage at presentation*		0.035	
I	9 (28%)	19 (10%)	
II	7 (22%)	27 (14%)	
III	10 (31%)	95 (50%)	
IV	6 (19%)	48 (26%)	

For patients who underwent preoperative chemoradiation or systemic chemotherapy (n=137), their pre-treatment clinical stage as assessed by CT/MR/EUS was utilized. Otherwise, pathologic stage was utilized.

EFFECTIVENESS OF ADJUVANT CHEMOTHERAPY ON SURVIVAL OF ELDERLY PATIENTS WITH HIGH RISK STAGE II COLON CANCER.

(P186)

M. Kim, C. Kim, S. Bae, H. Hur, B. Min, S. Baik, K. Lee, N. Kim
Seoul, Republic of Korea

Purpose: Elderly patients with stage II or III colon cancer(CC) received adjuvant chemotherapy less frequently than younger patients. Whether adjuvant chemotherapy for high risk stage II CC benefits elderly patients is unknown. The aim of this study were to investigate the survival results of adjuvant chemotherapy in elderly patients with high risk stage II CC.

Methods: We retrospectively analyzed 126 elderly patients (≥ 70) with curatively resected high risk stage II CC between 1990 and 2007. The overall survival(OS) and disease free survival(DFS) was analyzed for the two groups [adjuvant chemotherapy group (n=65) vs. surgery only group (n=61)]. In adjuvant chemotherapy group, 63 patients received 5-fluorouracil-based (5-FU) adjuvant chemotherapy and only 2 patients received FOLFOX regimen.

Results: The median follow-up time were respectively 79.2 (range, 2-227) and 64.9 months (range, 2-222) in adjuvant chemotherapy and surgery only groups. There was no difference in the distribution of age, sex, comorbidity, CEA at diagnosis, tumor location, presence of lymphovascular invasion, Tumor grade, number of retrieved lymph node, and rate of tumor perforation. In young patients (< 70, n=357), the adjuvant chemotherapy group (n=284) showed longer 5-year OS and DFS rate compared with the surgery only group (n=72) [86.5 vs. 69.4 months ($p<0.001$), 80.6 vs. 67.7 months ($p<0.001$)]. In elderly patients (≥ 70, n=126), the adjuvant chemotherapy group (n=65) showed longer 5-year OS and DFS rate compared with the surgery only group (n=61) [84.1 vs. 70.4 months ($p<0.001$), 79.6 vs. 68.4 months ($p = 0.003$)].

Conclusions: In elderly patients (≥ 70) with high risk stage II CC, patients with adjuvant chemotherapy had a significantly longer OS and DFS compared to patients with surgery only.

DOES RARITY OF CHOLANGIOCARCINOMA IMPLY INCREASED RATES OF LYNCH SYNDROME?

(P187)

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Winston-Salem, NC

Purpose: Lynch syndrome (LS) is an autosomal dominant genetic disorder that confers increased risk for multiple primary cancers. There are no studies which measure the frequency of LS in patient cohorts with rare cancers such as cholangiocarcinoma (CCA). The goal of this study is to measure LS risk in CCA patients using clinical and histopathologic risk factors.

Methods: In this retrospective review, patients with surgically resected CCA were identified. Clinical risk for LS was determined by age of diagnosis < 50 years, metachronous LS cancers, or family history consistent with Bethesda criteria. Tumor specimens were evaluated for microsatellite instability (MSI) associated histologic features including tumor infiltrating lymphocytes, Crohn's like reaction, mucinous or signet ring differentiation, and medullary growth pattern. Immunohistochemistry (IHC) of tumor blocks was performed for MLH1, MSH2, MSH6 and PMS2. Patients were classified as high risk for LS if family history met Bethesda criteria, the tumor had 3 or more MSI features or there was loss of protein staining on IHC. Referral for genetic counseling and genetic testing was recorded. Survival from date of diagnosis was measured.

Results: Twenty eight patients met inclusion criteria. Patients were diagnosed at an average age of 66 (+/-9) years and 17 (61%) were male. One patient was diagnosed <50 years of age and one had metachronous colon cancers. Ten patients (36%) had a first degree relative with a LS tumor while 2 (7%) met Bethesda criteria. Nineteen patients (68%) had at least one MSI tumor characteristic while two (7%) had 3 or more MSI features. Two (7%) patients had loss of both MSH2 and PMS2 tumor expression. Overall 5 (18%) patients were high risk for LS. No patient underwent genetic counseling or testing. Fourteen (50%) patients were alive at the time of study completion with a median survival of 30 (+/-18) months.

Conclusions: Patients with surgically treated CCA have a high rate of clinical and pathologic risk factors for LS. These patients should be referred for genetic counseling and testing. Further studies that include genetic testing are needed to determine the true rate of LS in patients with CCA.

THE PRAGMATIC APPROACH TO MAGNETIC RESONANCE IMAGING DIRECTED RECTAL SURGERY.

(P188)

M. Elmasry, J. Warner, P. Sutton, G. Abbott, C. McFaul, M. Johnson, D. Vimalachandran
Chester, United Kingdom

Purpose: MRI is now routinely used to provide preoperative staging of rectal cancers and is thought to provide an accurate assessment of the Tumour stage, Nodal stage and position of the tumour in relation to the circumferential resection margin (CRM). With one modality having such a strong influence on the decisions made at the multi-disciplinary team meeting it is imperative to ensure that it is sufficiently accurate in predicting the patients who require neo-adjuvant therapy, with the ultimate aim of maintaining a low local recurrence rate. This

study compares the radiological and histological staging of rectal cancers within our department and thus the fundamental workings of our MDT.

Methods: The pre-operative MR scans performed between April 2009 and July 2011 in patients with histologically proven carcinoma of the rectum were reviewed retrospectively. Comparison was made between the T and N stage, and the CRM involvement as reported on the MR scan with the histological staging reported according to the Royal College of Pathologists minimum dataset.

Results: Post-operative histology was available for 52 patients, who between them had 81 MR scans. There was a 42% correlation between the MR and histological T stage, with 25% of patients being under staged on MR and 33% being over staged. For Nodal staging there was a 64% correlation. Using a pragmatic approach to interpreting the data, patients were divided into 2 groups: advanced rectal cancers (bulky T3 tumours with nodal disease and T4 tumours); and non-advanced rectal cancers (T1/2 and early node negative T3 tumours). 21 patients were staged as having non-advanced rectal cancer. For 89% of these patients the T stage was correctly correlated. The nodal staging correlated in 86% of cases, with 100% correct prediction of CRM involvement.

Conclusions: Preoperative MR scans appear initially to provide a poor predictive indicator of tumour stage. Interpreting their results in a pragmatic fashion shows an excellent correlation between both the T and N stage as well as CRM involvement. Therefore the MDT can confidently stage patients and accurately predict those who would benefit most from neo-adjuvant therapy.

PREDICTION OF LATERAL PELVIC LYMPH NODE METASTASIS AND RECURRENCE BY MDCT IN PATIENTS WITH ADVANCED LOW RECTAL CANCER TREATED WITH PREOPERATIVE CHEMORADIOTHERAPY.

(P189)

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Tokyo, Japan

Purpose: The significance of lateral pelvic lymph node (LPLN) metastasis in advanced low rectal cancer treated with preoperative chemoradiotherapy (CRT) remains unclear. The purpose of this study is to evaluate whether preoperative MDCT can predict LPLN metastasis in patients with advanced low rectal cancer treated with preoperative CRT.

Methods: A total of 127 consecutive patients with clinical stage II-III low rectal cancer who underwent preoperative CRT and curative resection from 2004 to 2010 were reviewed. LPLN dissection was performed only in patients with suspected LPLN metastasis by MDCT (LND group, N=38), and only total mesorectal excision (TME) were performed in patients with no suspected LPLN metastasis (TME group, N=89). Maximum short- and long-axis diameters of internal iliac and obturator lymph nodes before CRT were evaluated.

Results: The mean distance of the tumor from the anal verge was 39 mm in the TME group and 40 mm in the LND group (p=0.8623). The mean maximum short- and long-axis diameter of LPLN was 1.6 mm and 2.1 mm in the TME group and 9.2 mm and 11.3 mm in the LND group, respectively. Pathological LPLN metastasis was detected in 25 patients (66%) in the LND group. Area under the ROC curve of short- and long-axis diameters in the LND group were 0.83 and 0.77, respectively. Three-year local recurrence (LR) rates were 6.2% in the TME group and 2.7% in the LND group (p= 0.1775). There was no LPLN recurrence in the LND group. The LPLN recurrence occurred in 3 patients (3.3%) in the TME group. The 3-year recurrence free survival (RFS) and LR rates were not significantly different between patients with or without LPLN metastasis (RFS: 71% vs. 78%, p=0.8471; LR: 4.2% vs. 5.4%, p=0.1082).

Conclusions: The rate of LPLN metastasis is high even after preoperative CRT. However, LPLN metastasis itself is not poor prognostic indicator after preoperative CRT and LPLN dissection. MDCT is useful for the prediction of LPLN metastasis and the identification of patients who might benefit from LPLN dissection in advanced low rectal cancer treated with preoperative CRT.

INTEROBSERVER AGREEMENT FOR MRI CRITERIA USED TO SELECT RECTAL CANCER PATIENTS FOR PREOPERATIVE CHEMORADIATION.

(P190)

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Toronto, ON, Canada; Sutton, United Kingdom

Purpose: The objective of this study was to assess interobserver agreement for MRI criteria used to select rectal cancer patients for pre-operative chemoradiation (preCRT) on a population based level.

Methods: Radiologists across the province of Ontario, Canada were invited to participate in a Continuing Medical Education (CME) event in which they were asked to report 5 MRIs according to a standardized template. Descriptive statistics were used to report means and proportions for subject characteristics and MRI criteria and interobserver agreement was assessed using Cohen's kappa and intraclass correlation coefficients.

Results: 111 radiologists were invited and 73 (65.7%) participated in the event. The majority of the radiologists were male (64.4%), had been in practice 5-15 years (54.3%) and reported 1 to 3 rectal MRIs per month (55.7%). The aggregate results for each of the 5 MRIs are shown in Table 1. No significant differences were found when the criteria endorsed by the MERCURY Group in

the UK and the criteria used in North America to select rectal cancer patients for preCRT were compared. Interobserver agreement was highest for distance to the MRF (0.58, 95% CI 0.27 to 0.90) followed by EMD (0.47, 95% CI 0.21 to 0.87), LN+ (0.41, 95% CI 0.32 to 0.49) and T-category (0.36, 95% CI 0.23 to 0.46). Interobserver agreement for the MERCURY criteria was 0.50 (95% CI 0.35 to 0.64) and for the North American criteria was 0.55 (95% CI 0.38 to 0.71).

Conclusions: Interobserver agreement for MRI criteria used to select rectal cancer patients for preCRT on a population based level is fair. Intraobserver agreement for the MERUCRY criteria and the North American criteria to select rectal cancer patients for preCRT is similar.

OUTCOMES AFTER TRANSANAL ENDOSCOPIC MICROSURGERY WITH INTRAPERITONEAL ANASTOMOSIS.

(P191)

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Bethlehem, PA; Minneapolis, MN

Purpose: Transanal endoscopic microsurgery (TEM) has gained increasing popularity as a treatment alternative for rectal tumors. With increasing experience, more proximal rectal tumors can be managed using TEM with an intraperitoneal anastomosis (IPA). The purpose of this study was to review our experience of using the TEM technique with IPA in patients with proximal rectal tumors.

Methods: A prospective, single surgeon database documented all patients undergoing TEM from October 1996 though January 1, 2012. We retrospectively reviewed information on all 445 patients who underwent TEM in this time period and included all patients with an IPA.

Results: Twenty-eight patients underwent definitive intraperitoneal entry and IPA. Median follow-up was 12 (range, 0.5-111) months. There were no operative mortalities. Procedure related complications included urinary retention (11%), fever (11%) and fecal seepage (4%). One patient (3%) required abdominal exploration and drainage for an anastomotic leak but did not require diversion. Follow-up was achieved in 27/28 patients and all these patients were alive and free of recurrence at the last follow-up. The remaining patient was alive but declined postoperative surveillance.

Conclusions: TEM with intraperitoneal anastomosis without diversion can be safely performed by surgeons experienced in TEM technique. Recurrence rates in properly selected patients appear to be low.

P190

MRI	1	2	3	4	5
PreCRT	No	Yes	Yes	Yes	Yes
Final Pathology	T2N0	Complete Pathologic Response	T3N2	T3N0	Unresectable
Definite T3 or More, %	5.5	12.2	89	85.9	92.9
LN+, %	1.4	26.1	45.6	71	95.8
Distance to Mesorectal Fascia (MRF), mm	10.73	3.94	2.25	1.25	0.65
Extramural Depth of Invasion (EMD), mm	0.61	3.03	8.85	8.05	10.11
MERCURY CRITERIA: EMD > 5 mm OR Distance to the MRF ≤ 1, %	0	40	89	81.4	91.6
NORTH AMERICAN CRITERIA: T3 OR LN +, %	1.6	52.1	91.8	93	98.6

P191

	Benign Tumors (n=18)	Malignant Tumors (n=10)
Age, yr (range)	59 (40-75)	71 (49-90)
M:F	11:7	7:3
Tumor distance from anal verge, cm (range)	11.6 (7-16)	11.2 (8-14)
Specimen size, mm^2	1569 ± 1355	1174 ± 565
Operation time, min	102 ± 36	109 ± 64
EBL, ml	4 ± 7	17 ± 23
Hospital stay, days	4.4 ± 1.6	4.8 ± 2.4
Pathology	Adenoma=18	T1=6, T2=3, T3=1
Follow-up,days	630 ± 688	1176 ± 1133

Mean ± SD

IS LOCAL RESECTION ADEQUATE FOR MANAGEMENT OF RECTAL CARCINOIDS? EXPERIENCE IN A SINGLE INSTITUTION.

(P192)

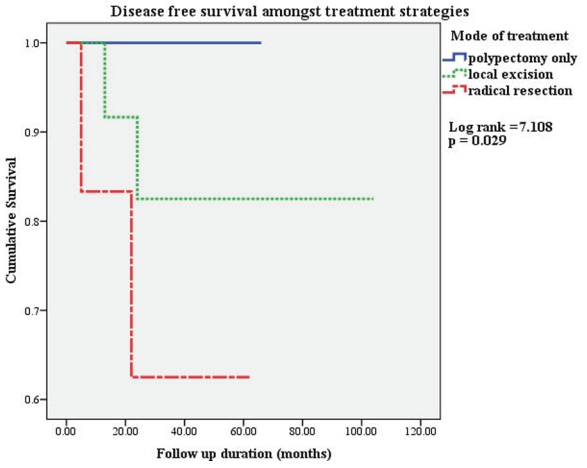
R. Wei, O. Lo, W. Law, W. Shek
Hong Kong SAR, Hong Kong

Purpose: Rectal carcinoids or neuroendocrine tumor (NET) is an uncommon entity comprising only 1–2% of all rectal tumors. Rectal NET is frequently diagnosed during colonoscopy but management after polypectomy is still controversial. The aim of this study is to review the management and outcomes of rectal NET in a single institution.

Methods: All rectal NET pathologically diagnosed between January 2003 and September 2012 were reviewed retrospectively, including clinicopathological characteristics, their management and surgical outcomes.

Results: There were 57 patients with a median age of 60 years and 34 were males (59.6%). All patients underwent colonoscopy and the most had rectal bleeding (50.9%). Four patients were diagnosed incidentally in the surgical specimens of rectal tissues. Eighteen patients were diagnosed to have rectal NET after snaring polypectomy with the median size of 4.5 mm and no further intervention was required. Twenty-eight patients had local resection either by means of transanal resection (19.3%) or transanal endoscopic operation (29.8%) with the median tumour size of 5 mm. Radical resection was performed in seven patients with the median tumour size of 17.5mm due to large size, concomitant rectal adenocarcinoma or margin involvement. Of these 7 patients, one had T3N1 disease and the others did not have lymph node metastasis. In the median follow-up of 25 months (2-104), there was no recurrence in the "incidental" or post-polypectomy group. However, 2 patients with transanal resection and 2 patients with radical resection developed hepatic metastases after 13-24 months post-treatment. The 5-year disease free survival was 100% in patients having snaring polypectomy only, 83% in those with local resection and 63% in patients who underwent radical surgery ($p = 0.029$) (Figure 1).

Conclusions: As the prognosis of rectal NET and its treatment mainly determined by tumour size, snaring polypectomy is adequate for small tumours with good prognosis. Local excision for lesions less than 10 mm is also usually adequate although there is a risk of disease recurrence. Large tumours tend to have worse histological staging and prognosis thus radical resection should be considered.



ENDOSCOPIC ENDORECTAL SURGERY WITH THE ENDOREC SYSTEM AND CONVENTIONAL LAPAROSCOPIC INSTRUMENTS.

(P193)

J. Villanueva-Herrero, Y. Alarcon-Bernes, G. Carreon, B. Jimenez-Bobadilla
Mexico City, Mexico

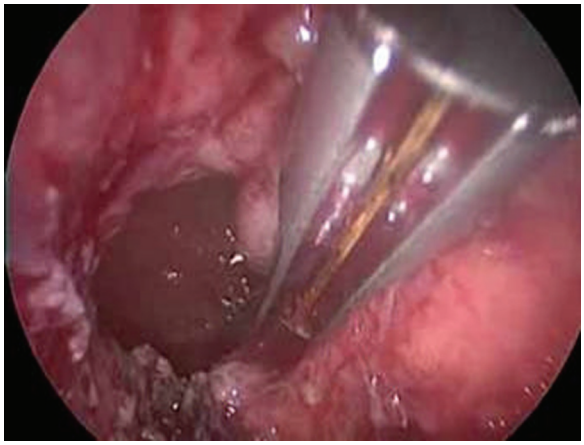
Purpose: Transanal endoscopic surgery (TES) with conventional laparoscopic instruments and new rectal platforms have recently been applied to treatment of rectal neoplasias and benign diseases. The purpose of this study was to describe the surgical technique of a single tertiary institution experience using the Endorec® (Aspide Medical La Talaudiere France) device with conventional laparoscopic instruments.

Methods: A retrospective chart review was conducted of all patients who received this approach for treating a rectal pathology. The Endorec port was inserted in the rectum and sutured to the anal margin skin. Pneumorectum was established at a pressure of 14 mmHg CO2 with continuous insufflation. A 5mm 30° laparoscopic camera was used and also conventional laparoscopic graspers, needle holders and scissors. We also used the EnSeal (Ethicon) vessel sealing and cutting instrument. Mechanical bowel preparation and antibiotic prophylaxis was given.

Results: Four patients were treated with TES. Mean patient age was 37 years. All the lesions were between 4 and 6 cm from the anal margin. The rectal diseases where: 2 polyps and 2 chronic presacral sinus one of them with an ileoanal stenosis. One polyp was resected in the submucosal plane, the other polyp was resected by an abdominal procedure because we can not keep an adequate distension of the rectum. One patient was first treated with a partial cutting of an ileoanal stenosis and second for unroofing the sinus. The patient with only the presacral sinus was treated unroofing it. Proven complete healing of the sinus was achieved in both patients, with a follow up of 3

months. The patient with the ileoanal stenosis and the presacral sinus had an ileostomy that was closed after 3 months. For all patients the median operating time was 120 min and the median postoperative stay was 1 day. We did not have postoperative complications.

Conclusions: Based on the results of this cases series, the approach of treating benign and selected neoplasms using TES with the Endorec is technically feasible, is a safe procedure and with a low cost . Future studies should collect more information on treatment outcomes in order to confirm the feasibility of this TES approach.



IS THE LOCAL EXCISION AFTER NEOADJUVANT CHEMORADIOTHERPAY IN YPT0 RECTAL CANCER SAFE?

(P194)

H. Kim, H. Cho, B. Kye, I. Lee, Y. Lee, S. Oh, J. Kim
Suwon, Republic of Korea

Purpose: Although neoadjuvant chemoradiotherapy (CRT) followed by TME has become the standard of care in patient with locally advanced rectal cancer (LARC), there is increasing interest of avoiding radical surgery in LARC after neoadjuvant CRT in a selected patient. Avoiding radical rectal surgery may increase the quality of life and preserve the anal sphincter function, but the oncologic safety is not well evaluated yet. The aim of this study was therefore to elucidate the risk of lymph node metastasis in ypT0 rectal cancer after neoadjuvant CRT.

Methods: From January, 2009 to December, 2011, Surgery after neoadjunvant long-course CRT was performed in 129 patients with T3-T4 or N+ rectal adenocarcinoma at St. Vincent's hospital, The Catholic University of Korea. We reviewed the medical records of these patients, retrospectively.

Results: A total of 111 patients were eligible for analysis, of them 61.3% were men. And mean age was 62.8±11.2. The tumors were located 6.1±2.4cm above the anal verge. The radical rectal resection was performed 7.9±1.0 weeks after the completion of CRT. Sphincter saving surgery with diverting stoma was performed in 94.6%. And 97.3% of all surgery was performed by laparoscopic technique. Diverting stoma was closed in 93.3% of the patients. Postoperative complication was noted in 33 patients with 7.2% of anastomotic leak. In pathologic examination, ypT stage was decrease in 56.8% compare to initial cT stage. And as for ypN stage, it is decreased in 47.7%. Pathologic complete responses (ypCR) were diagnosed in 12 cases (11%). There were 15 (13.5%) cases of ypT0, but three patients had mesorectal lymph node metastasis (20%, 3/15). Among these three patients, two patients were diagnosed as node negative in initial and after CRT evaluation with transrectal ultrasound. The rate of lymph node metastasis was 22.2% (4/18) among ypT0, ypTis and ypT1 patients.

Conclusions: Even though there are some theological benefits of local excision after neoadjunvant CRT in ypT0 rectal cancer, we should be very careful and aware of possible recurrence due to residual metastatic lymph nodes, when local excision after neoadjuvant CRT even in ypT0 rectal cancer was performed.

COMPLETION SURGERY FOLLOWING TRANSANAL ENDOSCOPIC MICROSURGERY; ASSESSMENT OF QUALITY, SHORT- AND LONG-TERM OUTCOMES.

(P195)

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Basingstoke, United Kingdom; Oxford, United Kingdom; Amsterdam, Netherlands

Purpose: In patients where unfavourable pathology is identified on transanal endoscopic microsurgery (TEM), completion surgery (CS) should be offered if appropriate. The aim of this retrospective cohort study was to assess short-term outcome and long-term oncological results of CS, and identify factors possibly compromising quality of resection specimens.

Methods: Data were retrieved and analysed on patients who underwent CS from a comprehensive national TEM database (1992-2008) and the institutional prospective database from the Oxford University Hospitals (2008-2011).

Results: A total of 36 patients were eligible for analysis. Postoperative complications occurred in 19 patients, and were minor (grade I-II) in 13 patients and major (grade III-V) in 6 patients. The quality of resection specimens was grade 3, 2 or 1 in 23 (64%=good), 6 (16.6%=moderate) and 7 (19.4%=bad) patients respectively. Full-thickness excision by TEM (p=0.03), interval to CS longer than 7 weeks (p=0.05), anteriorly located lesions (p=0.07) and distal lesions (p=0.04) increased the risk for "inferior" specimens. Overall survival after completion surgery at 1 year was 91% and 83% at 5 years. Patient with a "good" TME specimen had significantly

improved disease free survival compared to patients with an "inferior" specimen (100% versus 51%, p=0.001)

Conclusions: CS after TEM is feasible without significant morbidity, and overall oncological outcomes are comparable to primary radical surgery. However, the reduced disease free survival in patients with inferior specimens is worrisome and therefore patients with expected difficult surgery (e.g. after full-thickness excision, distally and anteriorly located lesions) should deserve special consideration.

RECURRENCE OF RECTAL ADENOMAS AFTER TRANSANAL ENDOSCOPIC MICROSURGERY.

(P196)

I. Schornagel, M. Raval, P. Phang, C. Brown
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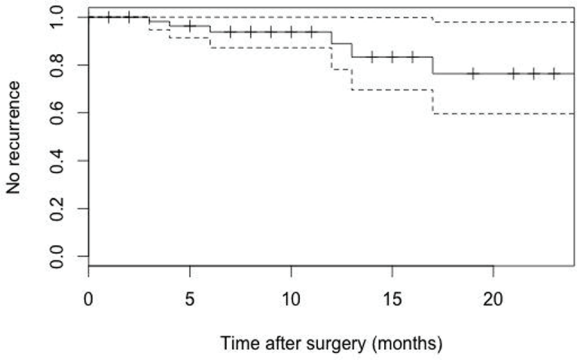
Purpose: Transanal endoscopic microsurgery (TEM) has emerged as a minimal invasive technique for excision of rectal adenomas. The purpose of this study was to determine recurrence of adenomas after TEM and to identify patients at risk for recurrence.

Methods: Since March 2007, all patients treated with TEM at St. Paul's Hospital (SPH) have been prospectively monitored and data were maintained in the SPH TEM database. All patients with a single TEM procedure with the postoperative pathologic diagnosis of adenoma were included in this study. Patients with a planned multi-stage procedure were excluded from the analysis. Patient characteristics and histological and pathological parameters were analysed in a Cox proportional hazards model to identify predictors of recurrence.

Results: Between March, 2007 and August, 2012, 99 patients (46 female) met our inclusion criteria. Mean age was 66 (range 24-94), mean tumour height was 8.1 cm from the anal verge (range 1-15) and mean tumour size was 3.9 cm. In 23% (23/99) of patients, the adenoma was recurrent after colonoscopic removal. At a mean follow-up of 7 months (range 0-56), 8 patients were diagnosed with a recurrence: 7 adenomas and 1 adenocarcinoma. Mean time to recurrence was 16.1 months (range 3-48). Recurrent adenomas were treated by colonoscopic removal (3) and repeat TEM (4). The patient who recurred as adenocarcinoma was treated with laparoscopic low anterior resection (pT1N0). Univariate analysis and multivariate analysis did not show a significant association between age, gender, tumor diameter, distance from the anal verge, degree of dysplasia, histology, depth of dissection, or margin involvement and recurrence of adenoma.

Conclusions: In patients treated with TEM for adenoma, recurrence at our institution is 8%. We did not identify a feature predictive of adenoma recurrence. We recommend close endoscopic follow up of these patients for early identification and treatment of recurrence.



Kaplan-Meier curve

OUTCOMES FOLLOWING LOCAL EXCISION OF RECTAL ADENOCARCINOMA: PREDICTORS FOR RECURRENCE AND SURVIVAL.

(P197)

K. Kimonis, J. Goldberg, R. Bleday
Boston, MA

Purpose: Local excision is a common practice in a select group of low risk patients with the benefit of lower morbidity and mortality compared to radical excision. However, local excision for high risk T1 lesions and T2 lesions remains controversial. The aim of this study is to investigate outcomes of patients undergoing local excision for rectal cancer and analyse risk factors.

Methods: A retrospective chart review of patients with rectal adenocarcinoma who underwent local excision for low risk T1 lesions, or local excision plus adjuvant therapy for high risk T1 and T2 lesions between November 1999 and July 2012 was performed. Univariate analysis using the chi-square test was used for the evaluation of outcome measures. Statistical Analysis System software package was used for analysis. Cancer free survival was calculated using the Kaplan-Meier analysis. Main outcome measures include local and distant recurrence, mortality, and cancer related mortality. Risk factors analysed included histology.

Results: A total of 104 patients were included (T1 N=77, T2 N=27). Mean follow up was 3.4 (1-12.2) years. Five year survival rates were 87% for patients with T1 lesions and 75% for T2 lesions. Cancer related mortality for patients with T1 and T2 cancers was 4 and 14 percent respectively. Overall recurrence rate for patients with T1 lesions was 9 percent: local 3/77, distant 3/77. local/distant 1/77. Among patient's with T1 lesions, lymphovascular invasion approached significance as a predictor of local recurrence (p= 0.08). Recurrence for patients with T2 lesions was 11 percent: local 3/27, distant 3/27, local/distant 1/27. All failures were in patients who did not recieve appropriate adjuvant chemoradiation therapy (1 delayed, 2 prior radiation)

Conclusions: Local excision for T1 lesions affords low rates of recurrence and is associated with excellent rates of survival. Among T1 lesions, lymphovascular invasion is asso-

ciated with a higher rate of local recurrence. Patients with T2 lesions treated with local excision had decreased survival and a higher rate of cancer related mortality. However recurrence in T2 patients was exclusively seen in patients who did not receive proper adjuvant chemo-radiation therapy.

TRANSANAL ENDOSCOPIC MICROSURGERY AFTER NEOADJUVANT RADIOCHEMOTHERAPY FOR LOCALLY ADVANCED EXTRAPERITONEAL RECTAL CANCER: SHORT-TERM MORBIDITY AND FUNCTIONAL OUTCOME AT 1 YEAR.

(P198)

C. Coco, G. Rizzo, C. Mattana, A. Verbo, M. Gambacorta, F. Vecchio, B. Barbaro, V. Valentini
Rome, Italy

Purpose: Transanal endoscopic microsurgery (TEM) after radiochemotherapy (RCT) has been reported in selected cases of locally advanced rectal cancer as an alternative to traditional radical resection with total mesorectal excision with a curative intent or as diagnostic tool to confirm a pathological complete response of the primary tumour. No study has evaluated long-term functional outcome after TEM in preoperatively irradiated patients.

Methods: Aim of the study was to evaluate short-term morbidity (according to Clavien's classifications) and continence and evacuative function at 1 year (according Wexner's and Gervaz's score) after RCT and TEM and to establish the impact of RCT on post-operative outcomes. Patients with locally advanced rectal cancer treated by RCT and TEM (group 1) or with early T1 or adenomas treated only by TEM (group 2) entered this prospective comparative study.

Results: Twenty-two patients entered the study as group 1 and 25 as group 2. No post-operative mortality occurred. The morbidity rate was 36.4% in group 1 vs. 16% in group 2 (p=0.114). The rate of suture dehiscence was 22.7% in group 1 vs. 4% in group 2 (p=0.068). No grade III complications, reoperation or hospital readmission within 30 days was recorded in either group. One year after surgery, continence and evacuative scores in group 1 were similar to scores in group 2 (1.05±1.25 vs 0.84±1.43, p=0.081, and 24.72±2.79 vs 25.60±2.24),p=0.288, respectively).

Conclusions: TEM after RCT in selected rectal cancer patients has an acceptable morbidity and optimal functional results at 1 year after surgery. Preoperative irradiation does not seem to influence evacuative and sphincter function.

TRANSANAL ENDOSCOPIC MICROSURGERY AFTER ENDOSCOPIC RESECTION OF EARLY RECTAL CANCER. A REQUISITE STEP IN TREATMENT?

(P199)

A. Fajardo, C. Klos, M. Silviera, A. Sarin, P. Wise, S. Dharmaranjan, B. Safar, E. Birnbaum, M. Mutch, S. Hunt
Saint Louis, MO

Purpose: Colonoscopically resected adenomas that subsequently have adenocarcinoma on pathology present a treatment dilemma. Transanal Endoscopic Microsurgery (TEM) has been demonstrated as a safe alternative to radical resection in patients with rectal neoplasms. This study evaluates post-TEM pathology in a select group of patients who underwent grossly complete colonoscopic polypectomy with adenocarcinoma in the endoscopic specimen. Our objective is to validate that TEM is a valuable step in the staging and treatment of this select group of patients.

Methods: This is a retrospective case series of patients who underwent TEM for adenocarcinoma in a polypectomy specimen between 2006-2012. All patients with gross colonoscopic resection of rectal polyps with biopsy proven adenocarcinoma who subsequently underwent TEM excision of the scar were included.

Results: 33 patients underwent full-thickness TEM resection of the scar after colonoscopic polypectomy of adenocarcinomas. 29 (88%) patients had no evidence of residual disease (NED) on TEM pathology. Of those with NED, 23 (79%) received no further treatment, while 6 underwent

P198 Short-term (within 30 days) post-operative (p.o.) complications and functional outcome at 1 year: comparative analysis between group 1 and group 2.

Variables	Group 1	Group 2	p-value
No. of patients	22	25	-
Median age (range)	63 y (41-78)	64 y (44-82)	0.773
Median hospital stay (days)	4 (3-12)	4 (2-14)	0.230
Overall p.o. morbidity	8 (36.3%)	4 (16%)	0.114
Suture line dehiscence	5 (22.7%)	1 (4%)	0.068
Grade III p.o. morbidity	0%	0%	-
Readmission rate within 30 days	0%	0%	-
Evacuation score (Mean ± SD)	24.73 ± 2.79	25.60 ± 2.24	0.288
Continence score (Mean ± SD)	1.23 ± 1.23	0.84 ± 1.43	0.081

endocavitary and/or external beam radiation therapy (EBRT). 4 patients (12%) had residual adenocarcinoma in the TEM specimen, including 3 T1 lesions (2 superficial and 1 deep submucosal involvement) and one T2 lesion. All were moderately differentiated and had no evidence of lymphovascular or perineural invasion. All residual cancers had pathologically negative margins on TEM. Due to patient preference or prohibitive comorbidity, no patients with residual disease underwent radical resection. Two patients (deep submucosal invasion and T2) received postoperative EBRT while the other T1 patients received no further therapy. No local or distant recurrences have occurred in any patient (median follow up 13.7 mos, range 2-59 mos).

Conclusions: Full thickness TEM resection of the scar is a requisite step in the staging and treatment of patients who have had gross colonoscopic removal of early rectal cancers.While the majority of patients were NED on TEM, the omission of full-thickness excision would miss a small, but important fraction of patients with residual cancer.

TRANSANAL ENDOSCOPIC MICROSURGERY PRIOR TO PROCTECTOMY FOR RECTAL CANCER DECREASES DISTAL MARGIN AND POSSIBILITY OF LOW ANASTOMOSIS.

(P200)

P. Nguyen, J. Manchio, D. Maun, T. Reidy, B. Sanders, B. Tsai
Indianapolis, IN

Purpose: We routinely perform transanal endoscopic microsurgery (TEM) for benign rectal tumors or when pathology/staging of rectal adenocarcinoma is equivocal. If TEM pathology confirms or upstages malignancy, these patients are offered proctectomy with total mesorectal excision. We feel that TEM may affect the quality of subsequent proctectomy or oncologic outcomes. The goal of this study was to compare operative factors and outcomes in rectal cancer patients who underwent proctectomy with and without prior TEM.

Methods: We queried our tumor registry to identify rectal cancer patients treated between Jan 2008 and Sept 2012. This was cross matched with a query of CPT code 0184T to identify patients who underwent TEM. We selected out patients that had proctectomy without neoadjuvant chemoradiation. Retrospective chart review was performed to collect applicable data points, which were analysed with student's t-test, $p<0.05$ significant.

Results: Nine patients who underwent TEM had proctectomy after a mean time interval of 62 days. The reason for proctectomy was false-negative initial biopsy (5) or upstaging of known adenocarcinoma (4). Eleven patients with adenocarcinoma went directly to proctectomy without TEM. Tumors were more distal in the TEM group and the suture line from TEM was 1.75 cm lower than the distal border of the original tumor. Pathologic distal margin with proctectomy was significantly less if TEM was performed. A larger proportion of TEM patients ultimately had permanent colostomy. There was no difference in stage-matched survival between the groups.

Conclusions: In this study, TEM was used in more distal tumors. This may represent a bias of surgeons attempting to avoid permanent colostomy by offering local excision instead of proctectomy in low tumors. When proctectomy is deemed necessary following TEM, there is a loss of distal margin that may make reestablishing intestinal continuity more challenging. There appears to be no difference in oncologic outcomes whether or not TEM is performed. We recommend that TEM be used cautiously if rectal cancer is suspected or known because the distal margin and feasibility of low anastomosis may be negatively impacted.

EARLY EXPERIENCE USING TRANSANAL ENDOSCOPIC MICROSURGERY FOR RECTAL ADENOCARCINOMA.

(P201)

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New Brunswick, NJ

Purpose: Transanal endoscopic microsurgery (TEM) allows for the excision of more proximal rectal lesions not amenable to transanal excision. Surgeons familiar with TEM have used the technique for resection of T1 and T2 rectal cancers. Here we review our experience with TEM for rectal adenocarcinoma.

Methods: We retrospectively searched the UMDNJ-RWJUH database from July 2007 to October 19, 2011 using ICD-9 diagnosis codes. The operative and pathology reports

P200

	TEM followed by proctectomy	Proctectomy alone	p value
n	9	11	
Distal tumor border from anal verge (cm)	6.7 ± 0.9	9.6 ± 1.2	0.04
Operative time (min)	270.6 ± 21.3	201.6 ± 18.7	0.02
Blood loss (ml)	252.8 ± 66.7	309.1 ± 81.1	0.61
Pathologic margin (cm)	1.9 ± 0.3	3.5 ± 0.8	0.04
Lymph node harvest	16.5 ± 1.5	17.8 ± 2.0	0.63
Permanent colostomy	4 (44%)	2 (18%)	

were reviewed to identify patients who underwent TEM for rectal adenocarcinoma. Various outcome measures were recorded.

Results: A total of 21 patients who underwent TEM during the study period had adenocarcinoma. The mean age was 72.1 years, and the mean distance from the anal verge was 6.2 cm. Although 76.2% patients had a tumor invasion of T1 or less, more advanced tumors were also resected by TEM in patients at high operative risk or who refused an abdominoperineal resection. Of two patients with T3 rectal cancer on final pathology, one underwent an abdominoperineal resection and the other decided on palliative care secondary to recurrent prostate cancer. 9 of 21 patients (43%) experienced postoperative complications such as urinary retention, atrial fibrillation, wound dehiscence, vomiting, minor leakage of stool, bleeding, myocardial infarction, stenosis, or urethral injury. There have been no recurrences in follow-up (range 2-41 months).

Conclusions: TEM provides high risk patients an alternative to more radical operations. Lesions up to T3 may be resected on select patients. Our experience with a higher overall complication rate likely reflects the high risk patients and advanced lesions on which we performed TEM.

TAMIS TOTAL MESORECTAL EXCISION FOR DISTAL RECTAL CANCER: EARLY EXPERIENCE WITH SHORT-TERM OUTCOMES.

(P202)

G. Nassif, H. Polavarapu, T. deBeche-Adams, S. Atallah, M. Albert, S. Larach
Orlando, FL

Purpose: The characteristics for the ideal rectal cancer surgery include locoregional control, sphincter preservation, low morbidity and mortality, and a minimally invasive approach. These goals become challenging to obtain in the re-operative pelvis, narrow pelvis in obese male patients, and distal pathology. Our group pioneered transanal minimally invasive surgery (TAMIS), which was initially described as an advanced platform for high-quality local excision of rectal neoplasia, but we evolved this technique and platform to accomplish total mesorectal excision (TME) for distal rectal cancer. The TAMIS platform is used to perform TME with hand sewn coloanal anastomosis or abdominal perineal resection in a "bottom up" fashion as opposed to the standard technique of "top down". With increasing awareness in minimizing hospital stay and decreasing hospital morbidity while obtaining equivalent oncological outcomes, interest in less invasive techniques such as TAMIS are seen as an atractive alternative to conventional laparoscopy. Our purpose is to analyze the safety and feasibility of TAMIS-TME as an option for distal rectal cancers in the difficult pelvis.

Methods: We retrospectively reviewed data from a prospectively maintained database of a single colorectal surgery practice of four surgeons to identify all patients who had TAMIS- TME. Cases were performed with standard laparoscopic instruments, cameras and single port transanal platforms. Patient data collected included demographics, intra-operative details, perioperative morbidity and mortality, post-operative data, and pathologic grading of the mesorectum.

Results: Table 1

Conclusions: Minimally invasive surgical procedures have led us to explore less traumatic and more effective techniques. This review demonstrates the feasibility of TAMIS-TME in an early experience with short term follow up. Long-term outcomes and functional data will need to be examined.

P202 Table 1

N=8		
Sex	Men-6	Women-2
Age	57.2 yrs	Range (36-65 yrs)
BMI	26.2 Kg/m2	Range (18-35 kg/m2)
Neoadjuvent radiation	Yes-6	No-2
OR time	227 min	Range (81-441 min)
EBL	259 cc	Range (75-500cc)
Stoma	8	6-loop ileostomy, 2-end colostomy
Morbidity	1-post op MI	
Mortality	0	
Pathologic TME	6-complete	1-not assessed, 1-fragmented
Lymph nodes harvested	19	Range (14-42)
Pathologic T stage	T4-2; T3-4; T2-1; T0-1	
Combined case	1-pelvic exent with urology	
Length of stay	3 days	Range (3-6 days)
Time to clears	1.6 days	Range (1-6 days)
Follow up	2.4 months	Range (0-6 months)

TAMIS-TME is a new approach to oncologic resection of the rectum, and its use will require further validation.

LONG-TERM RESULTS OF LOCAL EXCISION AFTER PREOPERATIVE ADJUVANT THERAPY AND ASSESSMENT OF ONCOLOGIC OUTCOMES IN A CASE-MATCHED COMPARISON WITH RADICAL SURGERY IN RECTAL CANCER.

(P203)

J. Yun, H. Kim, Y. Park, Y. Cho, S. Yun, W. Lee
Seoul, Republic of Korea

Purpose: The standard operative technique for rectal cancer is radical resection, but this is associated with a risk of morbidity, impaired urination, sexual problem, and compromised quality of life by a stoma. Preoperative adjuvant therapy has been developed and found to enable local excision in some selected patients.

Methods: From January 2000 to March 2012, thirty-seven patients who had undergone local excision (LE) after preoperative radiotherapy (RT) or chemoradiotherapy (CRT) for lower rectal cancer were matched according to sex, age, pathologic T stage with 37 control patients who had undergone curative radical surgery (RS), and the outcomes were compared.

Results: In each group, 19 were male and 18 were female. The mean age was 59 years. 3 patients in LE group have received RT only. Mean follow-up period were 45 and 47 months for each group. 18 patients (48.6%) were no residual tumor and 12 patients (32.4%) were carcinoma in situ/T1 in each group. Tumor distance from anal verge was significantly higher in RS group (3.2 vs 4.2 cm, p=0.032). More postoperative chemotherapy was performed in RS group (48.6% vs 73.0%, p=0.032). Recurrences were detected in 6 patients in LE group and 1 in RS group. 2 patients in LE group died of disease. But, disease-free survival rate had no significant difference between two groups in multivariate analysis (p=0.077).

Conclusions: These results support local excision after preoperative RT or CRT can be effective alternative to radical method in carefully selected patients with distal rectal cancer.

A FAT CLEARING TECHNIQUE INCREASES LYMPH NODE YIELD OVER LYMPH NODE ENHANCEMENT ALONE BUT RARELY YIELDS ADDITIONAL POSITIVE LYMPH NODES IN COLECTOMY SPECIMENS FOR CANCER.

(P204)

M. Bani Hani, D. Levien, K. Shekitka, A. Haddad, M. Hashmi, B. Betek, J. Hickey
Baltimore, MD

Purpose: After previously showing that enhancing solution significantly increases lymph node yield in colectomy specimens for cancer over routine methods, this work seeks to determine if a fat clearing technique yields a significantly increased number of LN over enhancing solution, and, if so, how frequently does it change stage.

Methods: Institutional Review Board approval & informed consent were obtained prospectively from 17 patients undergoing colectomy for cancer. Patients with rectal cancer and lesions without invasion were excluded. Pericolic fat was dissected from the specimen and placed in enhancing solution (Dissect Aid, Decal Chemical Co.) for 12 to 24 hours. LNs were dissected from the fat and the remaining fat was processed by a fat clearing method (acetone, ethanol and xylene). The residual fat was examined histologically for additional LNs. The number of nodes obtained by the two methods was compared. The student T test was used to compare means using 32 DOF.

Results: The mean number of LNs harvested was 47 with a SD of 19, a median of 47 and a range of 15-91 with lymph node enhancement only whereas when fat clearing was added, the mean total lymph nodes removed was 59 with a SD of 24, a median of 56 and a range of 21 to 128. The difference between the two means was significant with $p< 0.005$. Five of 17 patients (29%) had positive lymph nodes after enhancing solution and only one additional positive LN was found when fat clearing was added; that patient was already node positive and the tumor stage was not affected.

Conclusions: We previously showed that in 119 colon resections, the average number of LNs retrieved after routine formalin fixation alone was 24.10, well above the 12 nodes often cited as a quality indicator. With use of the enhancing solution, the average number of LN increased to 31.19 (p-value 0.00003) (1) . Fat clearing in this present work significantly increased the LN yield (by 12.7 nodes) in colon cancer resections over LN enhancing technique alone. Fat clearing infrequently increases the yield of positive nodes and did not change the stage in any patient.

CORRECTING LYMPH NODE RATIOS FOR RESECTION LENGTH IN COLON CANCER SURGERY DOES NOT IMPROVE PROGNOSTIC VALUE.

(P205)

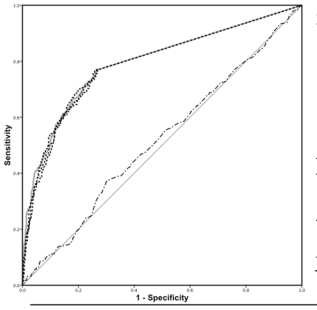
R. Amri, C. Klos, L. Bordeianou, P. Sylla, D. Berger
Boston, MA; Saint Louis, MO

Purpose: The absolute number of tumor-positive lymph nodes (+LN) divided by the total number of resected lymph nodes (rLN), or Lymph Node Ratio (LNR), is used in various cancers to predict recurrence and survival. In colon cancer, LNR may be significantly affected by resection length (RL), which potentially alters rLN, +LN or both. The aim of this study is to show the effect of correcting LNR for resection length on its ability to predict oncologic outcomes in colon cancer.

Methods: All colon cancer patients operated on at our center between 2004 and 2011 were included. We measured the association of LNR, with and without correction for resection length, with recurrence and survival outcomes using the following models: 1: +LN/rLN (LNR "gold standard"); 2: LNR/RL (also equal to (+LN/RL)/rLN)); 3: +LN/RL, and 4; +LN/(rLN/RL). Sensitivity and specificity of these models for recurrence and survival was calculated using a Receiver Operating Characteristic (ROC) curve. We also calculated correlation values between the outcomes and these models as well as resection length alone.

Results: 1071 patients were included in the analysis. Mean total harvest was 21 (SD ±12), with 428 (40%) patients having positive nodes. Median resection length was 21 cm (range 5-149, SD ±20). ROC curves (figure 1) show that none of the alternative models had an improved association with outcomes compared to LNR alone. In fact, all curves were strikingly similar. Resection length alone had no association with any of the outcomes except for a very weak correlation with survival duration.

Conclusions: Our analysis shows that resection length does not have a significant impact on the prognostic value of LNR after colectomy for colon cancer. Based on these results, correcting LNR values for resection length seems redundant and may even act as noise distorting LNR values in some cases.



Area under the curve of ROC curves

	Model 1 LNR	Model 2 $\frac{LNR}{RL}$	Model 3 $\frac{+LN}{RL}$	Model 4 $\frac{+LN}{rLN/RL}$	RL
Death*	.719	.715	.712	.715	.497
All metastasis	.794	.790	.789	.789	.516
Recurrence	.665	.670	.668	.657	.508

*Displayed on the ROC curve on the left

Correlation of models with outcomes

	Model 1 LNR		Model 2 $\frac{LNR}{RL}$		Model 3 $\frac{+LN}{RL}$		Model 4 $\frac{+LN}{rLN/RL}$		Resection Length (RL)	
	r	P	r	P	r	P	r	P	r	P
Death	.369	< .001	.320	< .001	.259	< .001	.304	< .001	.011	.725
Recurrence	.146	< .001	.153	< .001	.139	< .001	.065	.035	.001	.971
Disease-free survival	.276	< .001	.238	< .001	.216	< .001	.237	< .001	.052	.090
Survival duration	.205	< .001	.186	< .001	.157	< .001	.192	< .001	.065	.034

P204 Prospective Study of 17 Colectomies for Adenocarcinoma of Colon

1	2	3	4	5	6	7	8	9
47m	Sigmoid	8.5	T3N0	52	0	22	0	74
88m	Cecum	3.0	T3N1b	52	3	16	0	68
63m	Ascending	7.1	T4aN2b	49	7	6	1	55
81f	Cecum	6.2	T4bN1A	91	2	37	0	128
80f	Decending	3.4	T2N0	47	0	17	0	64
75f	Cecum	7.0	T3N0	49	0	7	0	56
55m	Ascending	2.0	T3N0	41	0	11	0	52
73f	Ascending	2.5	T1N0	30	0	9	0	39
68f	Sigmoid	4.6	T4aN1b	45	2	14	0	59
73f	Ascending	3.3	T3N0	32	0	7	0	39
48f	Sigmoid	8.7	T4aN2b	75	7	7	0	82
52f	Cecum	4.0	T3N0	62	0	8	0	70
76f	Cecum	8.5	T3N0	36	0	11	0	47
62m	Cecum	3.9	T3N0	15	0	14	0	29
72m	Ascending	4.9	T3N0	42	0	9	0	51
87m	Splenic Flexure	6.2	T1N0	16	0	5	0	21
31m	Cecum	8.2	T3N0	58	0	16	0	74

Comparison of lymph node harvesting with lymph node enhancement alone vs.harvesting with lymph node enhancement followed by fat clearing.

Column Key:

1. Age and Sex
2. Tumor Site
3. Tumor Size in cm
4. Pathological TNM Stage
5. Number of Lymph Nodes using enhancing solution
6. Lymph Nodes positive for cancer using enhancing solution
7. Additional Lymph Nodes Identified using fat clearing after enhancement
8. Additional positive lymph nodes using fat clearing after enhancement
9. Total LN w/ enhancement plus fat clearing

DOES A HIGH REACTIVE TO MALIGNANT LYMPH NODE RATIO CONFER A SURVIVAL ADVANTAGE IN RECTAL CANCER?

(P206)

J. Bhoday, M. Chand, G. Brown
London, United Kingdom

Purpose: Lymph nodes may be reactive or represent malignant disease in the context of tumour staging. An increased number of reactive lymph nodes may be an indication of host response and improved long-term outcome. Our aim was to evaluate the prognostic impact of lymph node ratio, (LNR: ratio of reactive or malignant nodes to the total number of lymph nodes examined), pre- and post chemoradiotherapy (CRT) on disease free survival and overall survival, among patients with primary rectal cancer, undergoing preoperative CRT followed by surgery. We hypothesized that a high LNR of reactive to malignant nodes may confer a survival advantage, and this may manifest as numerous mesorectal lymph nodes visible on staging MRI with benign features.

Methods: All patients who met the inclusion criteria had their pre-CRT and post-CRT MRI scans reassessed and the number of local nodes and whether they appeared reactive or malignant (by using nodal border, contour and signal characteristics) was recorded. Final pathology reports were used to record the histopathological data including LNR. Patient notes were used to determine recurrence rates, DFS and OS.

Results: A high LNR of reactive to malignant nodes did not confer a survival advantage. LNR was found to be independent of DFS and OS. (Pre-CRT reactiveLNR and DFS p=0.368; Pre-CRT malignantLNR and DFS p=0.402; Pre-CRT total LN and DFS p=0.9; Post-CRT reactiveLNR and DFS p=0.679; Post-CRT malignantLNR and DFS p=0.478; Post-CRT total LN and DFS p=0.897.)

Conclusions: LNR has previously been investigated in other cancers such as breast, oesophageal and uterine and these authors advocate the use of LNR as a predictor of survival. However, we were able to clearly demonstrate that despite being able to accurately identify malignant and reactive nodes using MRI, there was no survival advantage seen in rectal cancer. As such, we propose that LNR in rectal cancer should not be used as a substitute/addition to current staging methods and any emphasis placed on LNR in tumour staging should be interpreted with caution.

PROGNOSTIC IMPACT OF THE LYMPH NODE METASTATIC RATIO IN 5-YEAR SURVIVAL OF PATIENTS WITH RECTAL CANCER NOT SUBMITTED TO PREOPERATIVE CHEMORADIATION.

(P207)

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Santo André, Brazil; São Paulo, Brazil

Purpose: Lymph node metastases represent a major prognostic factor in colorectal cancer. Inadequate lymph node resection is related to shorter survival. The lymph nodes ratio (LNR) has been used as a prognostic factor in patients with colon cancer. Few studies have evaluated the impact of LNR on the 5-year survival of patients with rectal cancer.The aim of this study was to evaluate the impact of LNR on the survival of patients with rectal cancer not submitted to preoperative chemoradiotherapy.

Methods: Ninety patients with rectal cancer excluding colon tumors, synchronous tumors, hereditary colorectal cancer and those undergoing preoperative chemoradiation were included. Patients were divided into three groups according to LNR: LNR-0, no lymph nodes; LNR-1, 1% to 20% of lymph nodes; and LNR-2, more than 21% of the lymph nodes. The identification of the cutoff of the selected sample was obtained from the curve of receiver operating characteristics (ROC). Survival was assessed by Kaplan-Meier test, the difference among groups by Cox-Mantel test and the correlation among variables by Pearson's test, adopting a significance level of 5% ($p \leq 0.05$).

Results: The 5-year survival was related to the Dukes classification, TNM, number of metastatic lymph nodes and LNR. A difference in 5-year survival between the different classes to LNR was founded. Patients classified as LNR-0 had a survival rate of 85%, while the classes LNR-1 and LNR-2, 73% and 19%, respectively (p=0.0001).

Conclusions: The results showed that the PLM has an impact on 5-year survival of patients with rectal cancer not submitted to neoadjuvant therapy.

NUMBER OF RETRIEVED LYMPH NODES HAS NO CORRELATION WITH PROGNOSIS IN YPN0 PATIENTS FOR RECTAL CANCER FOLLOWING 30GY/10F PREOPERATIVE RADIOTHERAPY-IS THE STORY "THE MORE, THE BETTER" TRUE?

(P208)

N. Chen, L. Wang, J. Gu
Beijing, China

Purpose: To investigate the correlation between the number of retrieved mesorectal lymph nodes (LNs) and prognosis in rectal cancer following preoperative radiotherapy

Methods: The clinical and pathological data of mid-low rectal cancer patients who received 30Gy/10f (BED: 36Gy) preoperative radiotherapy and underwent total mesorectal excision from Aug. 2003 to Aug. 2009 were collected retrospectively. Cases without lymph node metastasis and clear circumferential margin were enrolled in this study. The relationship between the number of retrieved lymph node and 3-year disease-free survival (3yr DFS) was analyzed.

Results: One hundred and fifty nine patients were pathologically identified as ypN0 stage. There was 10.1% (16/159), 52.2% (83/159) and 37.8% (60/159) cases were staged as ypCR, ypT1-2 and ypT3-4. The median number of retrieved LNs was 16 (range 0 - 57). There were 63.5% (101/159) patients who retrieved 12 or more LNs. The overall 3yr DFS was 90.6%. On univariate analysis, the difference of 3yr DFS between patients with <12 and ≥ 12 LNs was not significant by log-rank test (93.1% vs. 89.1%, p=0.452). On multivariate analysis, number of retrieved LNs was not a prognostic factor for (p=0.403), while ypT stage was significant (p=0.057).

Conclusions: Two-thirds of ypN0 stage patients could retrieve more than 12 LNs following 30Gy/10f preoperative radiotherapy, however, the number of LNs did not correlated with prognosis. The threshold value of LNs retrieval (12 or more) in rectal cancer following preoperative radiotherapy needs more investigation.

PROGNOSTIC IMPLICATION OF NUMBER OF RETRIEVED LYMPH NODES IN PATIENTS WITH RECTAL CANCER AFTER PREOPERATIVE CHEMORADIOTHERAPY.

(P209)

I. Park, J. Kim, C. Kim, Y. Yoon, S. Lim, C. Yu, J. Lee, S. Seo, S. Oh
Seoul, Republic of Korea

Purpose: Impact of number of harvested lymph nodes on oncologic outcomes is still controversial in rectal cancer patients treated with preoperative chemoradiotherapy. The aim of this study is to evaluate the influence of the number of lymph nodes retrieved on oncologic outcome in patients with rectal cancer treated by preoperative chemoradiotherapy.

Methods: From 2000 to 2009, all patients with locally advanced (cT3-4 or cN+) rectal cancer treated with preoperative chemoradiotherapy and radical resection at our institution were identified and their records were retrospectively reviewed. The median radiation dose was 50.4 Gy with concurrent chemotherapy. Surgery and pathologic assessment were standardized. Multivariate analysis evaluated the influence of the number of both retrieved lymph nodes on overall recurrence, distant metastasis, and local recurrence.

Results: Median number of retrieved lymph nodes was 13 (IQR, 9-17) among 872 patients met criteria. Recurrence occurred among 181 (20.8%) patients. Number of examined lymph nodes was significantly correlated with overall recurrence and distant metastasis. Local recurrence, however, was not related with number of harvested lymph nodes. Relationship between number of examined lymph nodes and recurrence was analyzed by stage. Number of harvested lymph node was related with overall recurrence and distant metastasis among patients with yp Stage II. For patients with other than yp Stage II rectal cancer, number of harvested lymph nodes was not related with distant metastasis. Local recurrence was not influenced by number of harvested lymph nodes among all patients. 5-year DFS was associated with number of retrieved lymph nodes (P=.009), and this association was prominent among patients with ypStage II.

Conclusions: Overall recurrence and DFS was associated with the number of lymph nodes retrieved in patients with rectal cancer treated by preoperative chemoradiotherapy due to influence of retrieved number of lymph nodes on recurrence among patients with yp Stage II. Therefore, among patients with ypT3-4N0, oncologic impact of number of retrieved lymph nodes needs to be considered during operation.

INFLUENCE OF TINY LYMPH NODE HARVEST ON LYMPH NODE STAGING AFTER TOTAL MESORECTAL EXCISION OF RECTAL CANCER.

(P210)

H. Wang, Q. Zuo, Q. Yu, C. Fu
Shanghai, China

Purpose: To determine whether tiny lymph node (<2mm) harvest after total mesorectal excision has any influence on lymph node staging in patients with non-neoadjuvant rectal cancer in an attempt to provide evidence to retrieve lymph nodes selectively in surgical specimens.

Methods: Lymph nodes in specimens from patients with rectal cancer were retrieved under the guidance of ultrasound. The longest diameter of each lymph node was measured. All the lymph nodes were submitted to pathological examination and were divided into four groups according to the longest diameter (<2mm, 2-5mm, 5-8mm and ≥8mm). Relationships between the longest diameter and the total harvest number, metastasis status and metastasis rate were analyzed.

Results: A total of 448 lymph nodes were retrieved, including 73 (16.5%) in <2mm group, 264 (59.7%) in 2-5mm group, 78 (17.7%) in 5-8mm group, and 27 (6.1%) in ≥8mm group. The longest diameter of positive and negative lymph nodes was 6.3±3.06mm and 3.6±2.05mm respectively (p=0.000). Thirty-eight positive lymph nodes were harvested, including 1 (1.4%) in <2mm group, 11

(4.2%) in 2-5mm group, 16 (20.5%) in 5-8mm group, and 10 (37.0%) in ≥8mm group, with an overall metastasis rate of 8.6%. There was significant difference in the metastasis rate between the four groups (p=0.000). A positive tiny lymph node in <2mm group was detected in an N2 stage patient, which did not significantly affect the lymph node staging of the patient.

Conclusions: It seems prudent to recommend tiny lymph node (<2mm) detection in rectal cancer patients without receiving nenoadjavant chemoradiotherapy because their metastasis rate is very low and they do not seem to influence lymph node staging significantly.

SIZE AND ANATOMICAL DISTRIBUTION OF LYMPH NODES IN SPECIMENS RESECTED FOR RECTAL CANCER.

(P211)

A. Patel, D. Bowley, G. Langman
Birmingham, United Kingdom

Purpose: The anatomical variation in distribution and size of lymph nodes around the rectum has received little attention, with most data derived from human cadaveric studies. In addition, small lymph nodes (<5 mm) are often considered to have lower malignant potential. This study aimed to determine the distribution and size of lymph nodes in rectal cancer resection specimens.

Methods: Review of a prospective database compiled by a single histopathologist of all patients undergoing excision of rectal cancer from 2007 to 2012. The specimen was divided into sigmoid mesentery (SM), tissue around superior rectal artery (SRA) and mesorectum (MR). Lymph nodes were retrieved by meticulous manual dissection. The distance between the lymph node and peritoneal reflection was recorded. Size of lymph node was determined by image analysis software. In a subset of patients, the clockface distribution of lymph nodes in the axial plane was recorded.

Results: 9080 lymph nodes were retrieved from 209 patients (66 females, median age 68 years (IQR 59-75 years). 152 anterior resection and 57 abdominoperineal resection specimens were analysed. Median lymph node yield was 41 lymph nodes (IQR 32-52). 290/9080 (3.19%) were positive. Lymph nodes were distributed in the SM, SRA and MR in 32%, 28% and 40% respectively. 80 % of MR lymph nodes were above the peritoneal reflection. MR lymph node distribution in relation to the tumour was 53% above, 35% adjacent to and only 11% below the tumour. Distribution of positive nodes was SM: 1/2930 (0.03%), SRA: 48/2545 (1.8%), MR: 245/3604(6.7%). The vast majority (79%) of MR nodes were found posteriorly, between 3 & 9 o'clock. 86/290 (29%) of positive nodes were ≤3mm in diameter.

Conclusions: This is the largest, prospective study to examine lymph node distribution in rectal cancer patients. The majority of mesorectal lymph nodes are found lying posteriorly, at or above the peritoneal reflection, adjacent to or above the tumour. Yield of positive nodes in the sigmoid mesentery is small. A significant proportion of involved lymph nodes are less than 3 mm in maximum diameter. The study has implications for pathologists and surgeons alike.

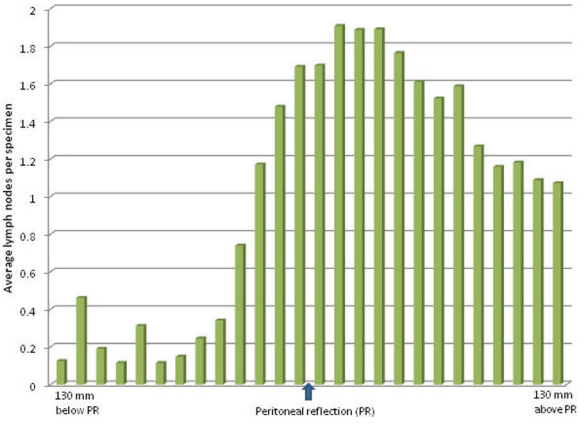

Fig.1 – Distribution of lymph nodes in mesorectum according to distance (10 mm divisions) from peritoneal reflection

THE EFFECT OF ADJUVANT THERAPY ON THE SIZE AND DISTRIBUTION OF LYMPH NODES IN RECTAL CANCER.

(P212)

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Birmingham, United Kingdom

Purpose: Lymph node yield is important to accurately stage patients with rectal cancer and thereby plan adjuvant therapy. The effect of neoadjuvant chemoradiotherapy is to reduce tumour bulk and thereby facilitate curative resection. This study aimed to determine the impact of neoadjuvant therapy on lymph node yield in rectal cancer.

Methods: Retrospective review of a prospectively compiled database by a single histopathologist. All patients undergoing resection of rectal cancer from 01/07 to 07/12 were included. Lymph nodes were retrieved by meticulous manual dissection. Size of lymph nodes was determined using image analysis software. The specimen was divided into three sections: SM (sigmoid mesentery), SRA (tissue around superior rectal artery) and MR (mesorectum).

Results: 209 patients (66 females, median age 68 years (IQR 59-75 years) were identified. 152 anterior resection and 57 abdominoperineal resection specimens were analysed. 9080 lymph nodes (LN) were retrieved. 63/209 [30%] had long course chemoradiotherapy [CRT], 80/209 [38%] underwent short course radiotherapy [SCRT] and 66/209 [32%] went straight to surgery [STS]. There was no significant difference in mean lymph node yield in the three groups. CRT patients had significantly smaller

lymph nodes and fewer of these lymph nodes were positive [see table]. Lymph node distribution adjacent to the tumour in the CRT, SCRT and STS groups was 9%, 13 %, 16 % respectively (p<0.005). In all three groups, 2/3 MR lymph nodes were located adjacent to or above the tumour.

Conclusions: Adjuvant therapy does not affect the number of lymph nodes retrieved in rectal cancer resection specimens. However, CRT reduces the size of lymph nodes, decreases the number of lymph nodes found to be positive and alters their distribution so that fewer lymph nodes are found adjacent to the tumour. Contrary to previous reports, it is possible to achieve a diagnostic lymph node yield in CRT patients but careful examination of the specimen is required as these lymph nodes are smaller and unlikely to lie next to the tumour.

PROGNOSTIC IMPORTANCE OF NUMBER OF DISSECTED LYMPH NODES AFTER INDUCTION CHEMORADIATION FOR RECTAL CANCER.

(P213)

J. Hanna, A. Castleberry, J. Thacker, C. Mantyh, J. Migaly
Durham, NC

Purpose: The prognostic significance of identifying lymph node (LN) metastases following surgical resection for rectal cancer is well recognized and reflected in accurate staging. For patients receiving neoadjuvant chemoradiation (CRT), the intended purpose is tumor down-staging, though this may contradict the traditional goal of achieving a maximal LN harvest due to a decrease in the number of nodes identified. However, it is unclear whether or not this represents an inferior resection and affects survival outcome. We sought to determine the minimum number of LNs required to accurately stage a rectal cancer patient who has undergone neoadjuvant CRT using a large series of pathologic N0 patients after induction chemoradiation.

Methods: Data from N0 rectal cancer patients receiving preoperative CRT and post-therapy proctectomy diagnosed between 1/04 and 12/09 were analyzed using the Surveillance, Epidemiology, and End Results (SEER) database.

Results: 3,734 patients were included for analysis (median age 61 years, 35% female). Median number of dissected LNs was 11 (IQR 6-15). Among the analyzed variables (age, gender, race, pathologic T status, and number of dissected LNs), number of dissected LNs was found to independently predict survival (HR 0.88, [0.82-0.95], p=0.001). In order to identify a minimum number of dissected LNs to prevent understaging, recursive partitioning was performed on post-induction (y), pathologic (p) N0 patients using T status and number of dissected LNs as predictors. N0 patients with greater than 8 LNs dissected had a 3-year mortality of 17.2% (group 1; figure). For patients with fewer than 8 LNs dissected, the next prognostic factor was T status. For ypT1-2N0 patients, number of LNs dissected did not impact survival (group 2). For ypT3-4N0 patients, a significant survival decrement was noted for patients with fewer than 3 LNs dissected (group 4) when compared to those with greater than 3 LNs dissected (Group 3).

Conclusions: Number of involved LNs is a powerful prognostic factor after induction chemoradiation. In ypT1-2N0 patients, number of dissected LNs is not prognostic. In yT3-4N0 patients, at least 3 LNs must be dissected and analyzed to prevent understaging.

P212

	Long course chemoradiotherapy (CRT)		Short course radiotherapy (SCRT)		Straight to surgery (STS)		Statistical significance
Number of patients	63		80		66		
Total number of lymph nodes	2478		3533		3069		
Mean number of lymph nodes	38.7		44.7		45.2		p=0.055
Mean LN diameter (mm)	2.45		2.51		2.63		p<0.001
Number of involved lymph nodes	73/2478 (3%)		123/3533 (3.5%)		99/3069 (3.2 %)		p<0.001
	Positive	Negative	Positive	Negative	Positive	Negative	
Above tumour	40	490	54	637	42	617	
Below tumour	3	80	1	143	5	172	
Adjacent to tumour	16	221	29	458	36	481	
SRA	14	761	18	1031	16	766	
SM	0	853	0	1141	1	934	

THE EFFECT OF ABDOMINAL OBESITY ON PATIENTS WITH RECTAL CANCER.

(P214)

S. Schwartz, A. Aboulian, A. Kaji, B. Petrie
Torrance, CA

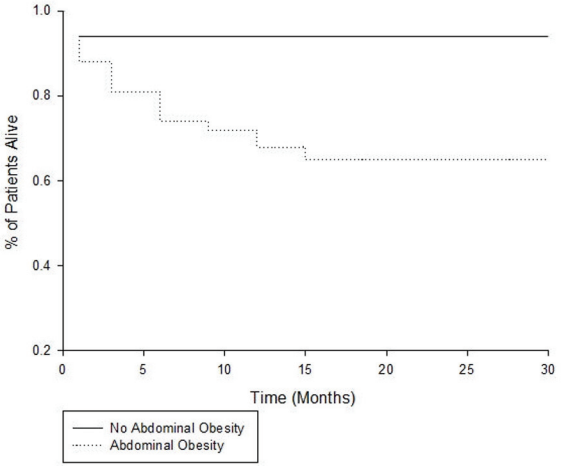
Purpose: Abdominal obesity is a risk factor for colon cancer. A similar relationship exists between abdominal obesity and rectal cancer. Anthropometric measurements such as body mass index (BMI) are not as accurate as waist circumference and waist-to-hip ratio (WHR) in diagnosing abdominal obesity. The aim of this study was to determine the effect of abdominal obesity, as measured by WHR, on patients with rectal cancer.

Methods: Abdominal computed tomography scans were reviewed for 152 patients with rectal cancer diagnosed in 2008 through 2011. Waist and hip diameters were measured from these scans allowing calculation of circumferences and WHR. Abdominal obesity, as defined by the World Health Organization, was documented when WHR exceeded 0.9 in men and 0.85 in women. Demographic data, carcinoembryonic antigen (CEA) values, and pathologic data (tumor subtype, histologic grade, and TNM stage) were gathered for each patient. Overall survival data was also obtained for these patients.

Results: When compared to rectal cancer patients without abdominal obesity, those with abdominal obesity demonstrated no difference in mean age, race, CEA value, tumor subtype, and histologic grade at initial diagnosis. However, men with abdominal obesity and rectal cancer had advanced nodal status ($p = 0.007$) and increased cancer stage ($p = 0.0011$). Women in this category also had advanced nodal status ($p=0.04$) but only revealed a trend toward increased cancer stage. All rectal cancer patients with abdominal obesity had significantly decreased overall survival when compared to those without abdominal obesity ($p = 0.002$) (Figure 1).

Conclusions: Abdominal obesity has no influence on initial age, race, CEA value, tumor subtype, or histologic grade in patients with rectal cancer. However, patients with abdominal obesity have higher initial rectal cancer stage in men and decreased overall survival in both genders.

Figure 1: Survival Curve



ARE PHYSICIANS WILLING TO ACCEPT ALTERNATIVE, LESS EFFECTIVE TREATMENT OPTIONS FOR LOW RECTAL CANCER TO AVOID APR?

(P215)

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Purpose: Treatment decision making for low rectal cancer is challenging due to the inherent trade off between effectiveness and functional outcomes. More recently, there have been an increasing number of studies suggesting transanal excision (TAE) for tumours greater than T1 and observation (OB) of complete clinical response (CCR) following chemoradiation therapy (CRT). The purpose of this study was to determine if physicians are willing to accept a decrease in survival and/or increase in local recurrence (LR) for these alternative options in order to avoid abdominal perineal resection (APR).

Methods: A mailed survey was sent to surgeons and radiation oncologists across Canada. Physicians' opinions about low rectal cancer treatment were assessed for two specific scenarios: (1) TAE followed by CRT for a T2N0 tumour and (2) observation of CCR after CRT for T3N0 tumour, relative to APR. Respondents were initially asked to choose the treatment option they would recommend when survival and LR were equivalent for both options and then asked to indicate the minimum survival and maximum LR they would accept and still recommend TAE and OB instead of APR.

Results: The overall response rate to the survey was 52.1% (292/560). For Scenario 1, 73.9% of the respondents indicated they would recommend TAE when survival was 80% for both TAE and APR and 40.7% would continue to recommend TAE even when survival decreased to 70%. With respect to LR, 84% would recom-

mend TAE when LR was 6% for both TAE and APR and 57.5% would continue to recommend TAE even when LR increased to 10%. For Scenario 2, 64% of the respondents indicated they would recommend OB when survival was 80% for both OB and APR and 35.2% would continue to recommend OB even when survival decreased to 75%. With respect to LR, 83.1% would recommend OB when LR was 1% for both OB and APR and 67.1% would continue to recommend OB even when LR increased to 6%.

Conclusions: A large proportion of physicians are willing to accept a decrease in survival and increase in LR with TAE and OB to avoid APR. These findings have significant implications as current clinical guidelines recommend APR as the standard.

CHARACTERISTICS, COMPLICATIONS AND OUTCOMES FOR THE NONSURGICAL CANDIDATE WITH COLORECTAL CANCER.

(P217)

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Chester, United Kingdom

Purpose: Resection rates in England for colorectal cancer are 66%. We report on the presentation, clinical course and survival of patients managed without curative surgery in our institution.

Methods: Patient details were prospectively collected in our institution from 2007 to 2011 following MDT discussion. Clinical and outcome data were obtained from hospital computer records and the North West Cancer Intelligence Service (NWCIS).

Results: A total of 116 patients met the criteria, mean age 78yrs (range 27-95yrs), M: F 3:2. Emergency presentation accounted for 32/116 (28%) of referrals. Metastases at presentation were diagnosed in 48/116 (41%) patients, 5 were unstaged. Palliative chemotherapy was administered to 43/116 (37%) overall, but more frequently to those with metastases than without (52% versus 27%; P=0.0010, Fishers Exact Test). Reasons for non- operative management were comorbidities in 48/116 (41%), metastases in 48/116 (41%), technically unresectable primary in 9/116 (8%), patient choice 8/116 (7%) and local disease control 3/116 (3%). Thirty-four patients (29%) were treated for symptoms of bowel obstruction; initial management was a stent in 21/34 (62%) cases and defunctioning loop colostomy in 13/34 (38%) cases. Median (interquartile range) survival was 5.1 (3.3-9.4) months for those with metastases and 17.2 (9.6-26.9) months for those with local disease only. Chemotherapy improved survival only in the group with metastases (P=0.0112, Logrank test). Successful treatment of bowel obstruction did not influence survival (P=0.1072, Logrank Test). Multivariate analysis using Cox Proportional Hazards model revealed metastases (P=0.0033), emergency presentation (P=0.0133) and number of inpatient admissions to be independently prognostic (P=0.0010).

Conclusions: The median survival from unresectable metastatic colorectal cancer was dismal at 5.1 months. Chemotherapy did however improve prognosis for these patients. Intervention for bowel obstruction was frequent across the whole cohort (30%) but did not correlate with survival. Patients without distant metastases survived for a median of 17.2 months. Quality of life studies are urgently required in this patient group.

MANAGEMENT OF PRIMARY RECTAL LYMPHOMA: A MOVING TARGET.

(P219)

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Purpose: Primary rectal lymphoma (PRL) represents the third most common type of rectal malignancy. Due to it rarity and frequent changes in histological subtyping and staging, treatment has not been standardized. Given this, interpretation of outcomes in the current literature is difficult. Our aim was to review our experience with the management of PRL using the most current histological and staging criteria.

Methods: Using an institutional database, all patients seen and managed with PRL between 1988 and 2010 were identified and reviewed. Year of diagnosis, gender, age at diagnosis, type of lymphoma, grade, stage, history of inflammatory bowel disease, immunocompromised status, treatment received, and outcomes following treatment were reviewed.

Results: 17 patients were identified (10 male) with an average age of 53.58 (range 30-79). The most common diagnoses were mucosa associated lymphoid tissue (7/41%) and diffuse large B cell lymphoma (6/35%). Stage at diagnosis was I-EA in 14 patients, II-EA in 2, and unknown in 1. Five patients had inflammatory bowel disease and 6 others were considered immunocompromised. Two patients were treated with chemotherapy-only, one had persistence, the other developed recurrence. Surgery alone resulted in two recurrences out of 5 patients. Four patients underwent endoscopic resection with 2 developing a recurrence. One patient treated with H. pylori eradication had a complete response. Multimodal therapy including surgery / chemotherapy (n=2) and endoscopic resection / chemotherapy (n=2) was administered in 4 patients, all with a complete response. Treatment was not recorded in 1 patient. The mean follow-up was 64 months (range 18-138). At last follow-up, 15 patients were alive with no evidence of disease. Two patients have died from their disease at 8 and 21 months after diagnosis.

Conclusions: In our cohort, the most common type of rectal lymphoma was mucosa associated lymphoid tissue and diffuse large B cell. Most patients had IBD or were

immunocompromised. Due to the diverse treatment approaches and small numbers of patients treated at single institutions, a multi-institutional collaboration will be necessary to determine the best treatment approach in patients with primary rectal lymphoma.

NEW CLASSIFICATION OF LOCALLY ADVANCED MID AND LOW RECTAL CANCER FOR SURGICAL APPROACH TO OPTIMAL OUTCOME.

(P220)

L. Daero, A. Sami, H. Hur, B. Min, S. Baik, N. Kim
Seoul, Republic of Korea

Purpose: Treatment of patients with locally advanced mid and low rectal cancer is challenging and associated with poor functional or oncologic outcome. Our aim is to classify those patients to reach the optimal functional as well as oncological outcome.

Methods: A retrospective chart review of all patients diagnosed with locally advanced mid and low rectal cancer between January 2005 and December 2009. Tumors at less than 10 cm from anal verge and clinically T3, T4 or node positive by MRI were included in this study. All patients received a neoadjuvant CRT (5-FU, leucovorin, 50.4Gy). Depending on post CRT MRI finding, we classify the tumor based on its relation to levator ani muscle into 3 levels. Level I: tumor above the levatorani muscle, Level II: tumor at the level of levator ani and deep external sphincter and Level III: tumor below the level of levatorani muscle (at superficial external sphincter and below).

Results: A total of 160 patients diagnosed with locally advanced mid low rectal cancer were noeoadjuvent CRT have been given to them, 67 patients were in level I, 62 were in level II, 31 were in level III.The surgery for each level was performed as follows: for level I patients: LAR in 49 (72.0%). And CAA with or without ISR in 15 (22.1%). For level II : LAR in 64(39.8%), CAA with or without ISR in 59 (36.6%), Hartman operation in 3 (1.9%), APR in 31 (19.3%). For level III patients: CAA with or without ISR has been done in 19 (59.4%) and APR in 17 (37.5%). The mean follow up period was 29.9 months. The positive rate of CRM was not significantly different between all levels and it was: 3 (4.4%) for level I, 5 (7.9%) for level II and 4 (12.5%) for level III ($p = 0.358$). The 5-year OS for level I was 80.7%, level II 87.8% and for level III 88.6% ($p = 0.279$). The 5-year DFS for level I was 76.6%, level II 72.3%, and level III 61.5% ($p = 0.279$).

Conclusions: Sphincter saving surgery for level II patients was feasible and safe. Locally advanced rectal cancer at level II was challenging and many procedures proposed aiming to preserve sphincter function and oncological outcome with careful patient selection. New classification can guide us to different surgical options for level II patients.

MCKITTRICK-WHEELOCK SYNDROME: A RARE CASE OF GIANT VILLOUS ADENOMA LEADING TO SEVERE FLUID-ELECTROLYTE IMBALANCE AND ULTIMATELY TREATED BY LOW ANTERIOR RESECTION.

(P221)

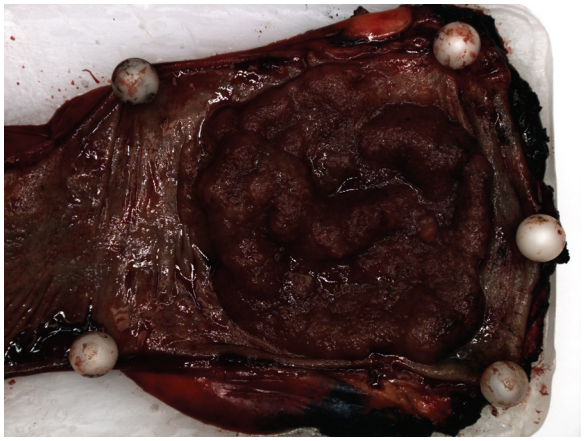
S. Pacifico, V. Sams, J. Solla
Knoxville, TN

Purpose: McKittrick-Wheelock syndrome is defined as a fluid and electrolyte imbalance caused by profuse secretory diarrhea associated with a giant villous adenoma of the rectum. This causes a depleting syndrome of prerenal acute renal failure associated electrolyte imbalance due to hypersecretion from the colorectal tumor.

Methods: 62 year old male presented to a gastroenterologist due to a change in bowel habits for two months. The patient was having 10-12 loose and watery evacuations per day. The patient's colonoscopy with biopsy revealed a large tubulovillous adenoma with no evidence of invasive adenocarcinoma. He was found on proctoscopy that the tumor's distal margin was 6 cm and proximal margin was 16 cm from anal verge. Prior to his planned surgery, he was admitted to the hospital with nausea, vomiting, and diarrhea and diagnosed with acute renal failure, hyponatremia, hypokalemia, and hypochloremia. After hydration, electrolyte replacement, and supportive care, the patient was discharged home and surgery was scheduled four days later. He underwent an open low anterior resection with colorectal anastomosis, omental pelvic exclusion flap, and loop ileostomy. Following surgery, the patient progressed well and corrected his electrolyte and acid/base profile.

Results: Final pathology revealed a giant rectal villous adenoma, measuring 10.5 x 10 x 2.3 cm. No high grade dysplasia was seen or evidence of malignancy was found in the twelve lymph nodes contained within the specimen.

Conclusions: The triad chronic diarrhea, electrolyte disturbance and acute renal failure due to a villous adenoma, known as the McKittrick-Wheelock. It is a rare and potentially life-threatening condition. This syndrome requires multiple medical disciplines for both diagnosis and treatment. Usually, colonoscopic resection is not feasible in cases of secreting villous adenomas owing to their size or location. Laparoscopic surgery by an experienced surgeon is a safe, effective, and complete option, further enhanced by the benefits of minimally invasion surgery.



PREVALENCE OF RESIDUAL NEOPLASTIC TISSUE AFTER ENDOSCOPIC RESECTION OF COLONIC NEOPLASTIC POLYPS: CORRELATION WITH THE SURGICAL SPECIMEN.

(P222)

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Purpose: Endoscopic resection of neoplastic colonic polyps may be curative depending on the depth of invasion and the presence of polypectomy margins free of disease. Information about the prevalence of residual neoplastic tissue (RNT) after polypectomy is scarce. The aim of this study is to determine the prevalence of RNT in surgical specimens from patients undergoing colectomy after endoscopic resection of malignant colon polyps, and evaluate the relationship between RNT status and the type of polypectomy, the resection margins and the depth of invasion.

Methods: Patients with colonic neoplastic polyps treated by laparoscopic colectomy in a university hospital in Buenos Aires between January 2003 and March 2011 were prospectively analyzed. Those with polyps containing in situ or invasive carcinoma in whom an endoscopic polypectomy with curative intention was performed before surgery were included. The polyp resection margins informed by the pathologist were classified into three groups: complete, incomplete and indeterminate. Primary outcome was determinate the proportion of patients with RNT in the surgical sample.

Results: 155 patients undergoing colectomy for colonic polyps. 46 with in situ or adecarcinoma and a previous attempt of curative endoscopic polypectomy were included. 52% were men, average age was 63 (40-91). Polyp morphology: 0-Is (sessile) 64%, 0-Ip (pedunculated) 17% and 0-IIa (slightly elevated) 13%. Average polyp size was 18 (3-35) mm. 72% of the polyps contained in situ carcinoma and 26% invasive adenocarcinoma. RNT was found in the surgical specimens of 56% the patients. Prevalence following polypectomy with forceps (71%), EMR (55%), snare polypectomy (26%). RNT was found in 51%, 43% and 0% of incomplete, indeterminate and complete resections respectively.

Conclusions: A high prevalence of RNT was observed following forceps polypectomy, and when incomplete or indeterminate polypectomy resection margins were informed.

REPEAT ATTEMPT AT COLONOSCOPIC POLYPECTOMY BY THE SURGEON SPARES SURGICAL RESECTION IN SELECT PATIENTS.

(P223)

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Purpose: Colonoscopy is the gold standard screen for premalignant and malignant growths of the colon and rectum. While incomplete colonoscopic polypectomy has mandated colectomy in the past, this study assessed the value of a surgeon-performed repeat attempt at complete polypectomy (CP) under general anesthesia in the operating room.

Methods: Patients referred to the colorectal service with reportedly unresectable colon or rectal polyps were reviewed for inclusion based upon polyp size, pathology, and photographic documentation from a previous colonoscopy. Patients offered a repeat polypectomy under general anesthesia were consented to undergo a definitive surgical resection if repeat polypectomy was unsuccessful. When a CP could not be performed, a laparoscopically-assisted colorectal resection was performed.

Results: From February 2010 to June 2012, 41 patients (male 21/female 20; mean age 64/age range 39-80) agreed to a repeat attempt at a CP. A CP was achieved in 18 patients (43.9%), four of whom underwent a laproscopically-assisted polypectomy related to the configuration of the colon. In the remaining 23 patients (56.1%), an appropriate laparoscopic colon or rectal resection was performed when a CP was not possible. Five of these patients had a laparoscopic resection different from the one planned preoperatively based on the repeat colonoscopy (inaccurate previous localization (4), detection of another malignant appearing polyp (1)). No morbidity resulted from repeat attempt at CP, and operative time was prolonged for only 15-20 minutes in the patients who required a resection.

Conclusions: The 40%+ of patients who underwent CP at repeat colonoscopy were spared formal resection with its attendant complications, recovery time, and costs. Patients in whom the operative resection was modified based upon repeat colonoscopy were spared an inappropriate or incomplete procedure. A repeat attempt at CP by a surgeon with the patient in the operating room under general anesthesia is recommended in select patients.

SPLIT DOSE BOWEL PREPARATION CONFERS SIGNIFICANT ADVANTAGE FOR POLYP DETECTION.

(P224)

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Purpose: Screening colonoscopy is reported as less effective in preventing right sided colon cancer deaths, presumably due to the flat nature of right sided polyps and the limitations of visualization due to inadequate bowel preparation. Our institution adopted the split dose preparation of liquid polyethylene glycol (PEG) to improve the quality of bowel preparation to address this issue. We hypothesized that the split dose PEG preparation increased right sided polyp detection rates when compared with the historical full dose regimen.

Methods: A prospective institutional colonoscopy database was used to conduct this study. The records of all average-risk patients who underwent screening colonoscopy during the study years were reviewed following IRB approval. Demographic, procedural, and outcomes data were retrieved for patients who consented to research (HIPPA compliance). Study years were 2006 and 2007 for the full dose and 2010 and 2011 for split dose, with transitional years excluded. Data were analyzed using Wilcoxon rank sum and Chi-square tests with $p < 0.05$ considered statistically significant.

Results: Screening colonoscopy was performed for 3155 patients using full dose and 3220 patients using split dose administration of PEG. Median age of patients was 58 and 56 years with female gender of 45% and 48% in full dose and split dose groups respectively. Median scope withdrawal time (8 min) with split dose was significantly longer ($p < 0.0001$) than full dose (6 min). Table 1 compares the quality of bowel preparation and number of polyps detected between two groups. In the split dose group, significantly more neoplastic polyps (high risk polyps with tubular, tubulovillous, villous, serrated or cancer histology) per patient and significantly more patients with at least one neoplastic polyp were found compared to the full dose group (both $p<0.0001$).

Conclusions: Right and left sided polyp detection rates were significantly increased in patients undergoing split dose compared to full dose bowel preparation prior to screening colonoscopy. Therefore, split dose administration of PEG is strongly recommended for screening colonoscopy.

MAPPING SERRATED POLYPS: ARE THEY PART OF THE SYNDROME?

(P225)

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Purpose: MYH-associated polyposis (MAP) is a recessively inherited syndrome of colorectal cancer predisposition due to germline mutations in the base excision repair gene MYH. The "classical" phenotype associated with biallelic MYH mutations is oligo- adenomatous polyposis and a significantly increased risk of colorectal cancer. Some authors describe serrated polyps occurring in association with GC/TA transversions in KRAS in MYH associated polyposis. Because serrated polyps require a different pattern recognition during colonoscopy, we studied the incidence of serrated polyps in the large intestine of our affected patients.

Methods: All patients with biallelic mutations in MYH who were enrolled in our polyposis registry were eligible. Records were reviewed to determine the histology of all large intestinal polyps. Lymphoid, inflammatory and normal mucosal polyps were excluded. High risk serrated polyps were defined as hyperplastic polyps >10mm, any sessile serrated adenoma/polyp and any traditional serrated adenoma.

Results: 60 patients were available for study. 32 had only adenomas and 28 (47%) had one or more serrated polyps. 23 (38%) patients had hyperplastic polyps, and 5 (8%) had sessile serrated adenomas/polyps. 4 of the hyperplastic polyps were large for a total of 10 "high risk" serrated polyps (17%). 23 of the hyperplastic polyps were right sided (20%) compared to 5 of the 11 (55%) SSA/Ps (Fisher's exact test $p = 0.066$). Two patients fit WHO criteria for Serrated Polyposis, one of whom had 11 hyper-

P224 Table 1. Quality of Colonoscopy and Polyps

	Full Dose (n= 3155)	Split Dose (n= 3220)	P-value
Mean number of right side polyps per patient	0.083	0.146	<.0001*
Mean number of left side polyps per patient	0.162	0.261	<.0001*
Patients with polyps detected, n (%)	678 (21.5%)	890 (27.6%)	<.0001†
Excellent/Good prep quality, n (%)	2543 (80.6%)	2663 (82.7%)	0.0329†
Completion of colonoscopy, n (%)	3033 (96.1%)	3084 (95.8%)	0.5098†

*Wilcoxon rank sum test

†Chi-square test

plastic polps, 5 proximal to the sigmoid colon 1 > 1cm and the other had 30 hyperplastic polyps.

Conclusions: Serrated colorectal polyps are found frequently in patients with biallelic MYH mutations and may cause confusion with clinical diagnosis. They may contribute to the colorectal cancer risk and endoscopists should be alert to the possibility of their presence.

THE YIELD OF OFFICE COLONOSCOPY: WHAT SHOULD A COLONOSCOPIST EXPECT TO FIND?

(P226)

X. Wu, S. Kravochuck, J. Church
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Purpose: The aims of surveillance and screening colonoscopy are to prevent colorectal cancer by removing premalignant polyps and to detect existing cancers before they become symptomatic. Quality of colonoscopy is now judged by polyp yield, but without standards for the detection of advanced adenomas, multiple adenomas and serrated polyps, expectations of yield are impossible to set. We performed this study to see what sort of yield can be expected.

Methods: The experience of one colonoscopist with screening and surveillance colonoscopy was reviewed from a prospectively entered database and separated into three 12 month periods: October to October 2009 to 2010, 2010 to 2011, and 2011 to 2012. Indications for colonoscopy, findings and pathology were reviewed and were tabulated by year. Only surveillance colonoscopy after an index polyp or cancer, average risk screening and familial risk screening were included. For ease of reporting, surveillance after prior polypectomy or cancer resection are combined, and average risk screening is combined with familial risk screening.

Results: Two thirds of surveillance colonoscopies and one half of screening colonoscopies yielded polyps. These findings were stable over the three years. The rates of high risk lesions and more than 2 adenomas were high and stable over time. The rate of detection of sessile serrated adenoma/polyps seems to be increasing. Surveillance colonoscopies yielded more adenomas than screening but the same number of serrated polyps.

Conclusions: Colonoscopists performing surveillance and screening colonoscopy should expect to find polyps in one half to two thirds of cases. High risk lesions: advanced adenomas, multiple adenomas and sessile serrated polyps, may be found in one patient in six.

ADENOMA DETECTION RATE IS A POOR INDEX OF QUALITY IN SCREENING COLONOSCOPY.

(P227)

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Purpose: Detection rates of adenomas and serrated polyps do not address the ability to detect multiple lesions, an important risk factor for metachronous advanced neoplasia. However, few studies report detection rates of multiple lesions. Our aim was to measure the detection rate of multiple adenomas and serrated polyps during screening colonoscopy and relate it to detection of any lesion, as well as colonoscopy withdrawal time.

Methods: This is a retrospective database study of prospectively collected data. Adenoma and serrated polyp detection rates in patients presenting for average risk screening colonoscopy were stratified according to the number and histology of the polyps removed.

P226 Table. Surveillance and Screening Colonoscopy.

Findings		2009-2010	2010-2011	2011-2012	All cases
All patients	Surveillance	322	312	285	919
	Screening	235	200	208	643
Any polyps	Surveillance	206 (64%)	208 (67%)	176 (62%)	590 (64%)
	Screening	110 (47%)	79 (40%)	104 (50%)	293 (46%)
Adenomas	Surveillance	162 (50%)	159 (51%)	139 (49%)	460 (50%)
	Screening	74 (31%)	51 (25%)	63 (30%)	188 (29%)
Multiple Adenomas	Surveillance	54 (17%)	41 (13%)	48 (17%)	143 (16%)
	Screening	9 (3.8%)	8 (4.0%)	8 (3.8%)	25 (3.9%)
Advanced adenomas	Surveillance	63 (20%)	48 (15%)	48 (17%)	155 (17%)
	Screening	16 (6.8%)	6 (3.0%)	23(11.1%)	55 (8.6%)
Serrated polyps	Surveillance	95 (30%)	95 (30%)	75 (26%)	265 (29%)
	Screening	55 (23%)	41 (21%)	62 (30%)	158 (29%)
Sessile serrated adenoma/polyps	Surveillance	32 (10%)	39 (12.5%)	23 (8%)	94 (10%)
	Screening	23 (10%)	15 (8%)	33 (16%)	71 (11%)
Cancer	Surveillance	6 (1.9%)	0	3 (1.0%)	9 (1.0%)
	Screening	1 (0.4%)	0	0	1 (0.2%)

Colonoscopy withdrawal time was measured in normal colonoscopies.

Results: 6 colonoscopists performed 2428 screening colonoscopies in average risk patients. Overall completion rate was 96.5%. Mean adenoma detection rate was 21.7%; 14.6% had one adenoma, 4.4% had two and 3.0% had three or more. Rates of detection of serrated polyps were lower with a mean of 14.0%; 11.0% had one, 2.7% had two and 1.0% had three or more. There was no correlation between adenoma detection rate and multiple adenoma detection rate (R^2 0.345, p=0.22), but a strong correlation between serrated polyp detection rate and multiple serrated polyp detection rate (R^2 0.84, p=0.01), and withdrawal time and detection of multiple polyps of either histology (adenomas, R^2 0.81, p=0.014, serrated polyps R^2 0.96, p=0.005).

Conclusions: Categorizing polyp detection rate by number of polyps is an important refinement of this quality indicator. It is likely to improve quality assessment in a way that reflects clinical significance. Time of withdrawal remains an important determinant of polyp detection.

HOW BAD ARE FAP INTRAPERITONEAL ADHESIONS? IS THE LEGEND TRUE?

(P228)

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Purpose: Legend has it that intraperitoneal adhesions occurring in patients with familial adenomatous polyposis are more severe than those in other patients. This may come from the common association with desmoid disease, which is essentially a tumor of adhesions. We studied adhesions in FAP patients to see if the legend is true.

Methods: Patients with familial adenomatous polyposis undergoing reoperative abdominal surgery were accessed from a prospectively entered FAP database. Where patients had multiple operations, the first reoperative surgery was chosen so that each patient appears only once. The presence of desmoid disease was noted as reaction (sheet), nodules or mass. Adhesions were graded as none, mild (description, or<10 minutes for mobilization), average (10 to 30 minutes) and severe (>30 minutes or significant bowel damage). Patients having their first abdominal surgery for FAP were used as a control group.

Results: 221 patients had no prior surgery. 5% had desmoids and 1% had adhesions. 137 patients underwent reoperative surgery. 39% had desmoid disease, the highest rate being in patients after ileal pouch anal anastomosis (57%). 45% had severe adhesions, worst after Koch pouch (89%) and total proctocolectomy with ileostomy (82%). The presence of desmoid disease was associated with severe adhesions, although the association was absent for desmoid reaction (see table).

Conclusions: The legend is true. Familial polyposis is associated with severe adhesions. The adhesions are more marked in those who develop desmoid disease.

A PLEA FOR SCREENING IN POLYPOSIS PATIENTS: RESULTS OF A PROSPECTIVE THYROID ULTRASOUND PROGRAM.

(P229)

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New York, NY

Purpose: Patients with adenomatous polyposis may be at increased risk for developing thyroid cancer (TC). However, screening guidelines for TC in these patients are not well established.

Methods: Patients with a clinical or molecular diagnosis of familial adenomatous polyposis (FAP), attenuated FAP, and gene-negative adenomatous polyposis enrolled in our Hereditary Colorectal Cancer Family Registry were offered a screening thyroid ultrasound from November 2010 through August 2012. Patients with a history of TC (5) were excluded. Ultrasound findings were reviewed by the study endocrinologist and intervention and/or follow-up determined. Data was prospectively recorded.

Results: Of the 103 adenomatous polyposis patients, 90 from 74 kindreds were eligible for the prospective screening program. 50 (56%) patients underwent screening thyroid ultrasound. The median age at the time of ultrasound was 34 years (range 19-70). 34 (68%) patients had abnormal findings on ultrasound, including 27 (79%) with thyroid nodules and 7 (16%) with heterogeneous thyroids. 12

P228 Incidence of adhesions according to presence of desmoid disease in patients undergoing reoperative surgery for FAP

	No Adhesions	Mild	Average	Severe	Total	P*
No Desmoids	5	12	36	30(36%)	83	
Sheets	1	4	4	8(47%)	17	0.4650
Nodules	1	0	2	5(63%)	8	0.3171
Masses	1	4	5	19(66%)	29	0.0364
Total Desmoids	3	8	11	32(59%)	54	0.0303
Total	8(6%)	20(15%)	47(34%)	62(45%)	137	

of 19 (63%) females and 22 of 31 (71%) males had abnormal findings on thyroid ultrasound. In 7 patients, ultrasound-detected thyroid nodules met established criteria for fine needle aspiration (FNA). Of the 6 patients who underwent FNA, 2 were diagnosed with papillary thyroid carcinoma and underwent total thyroidectomy. If the 5 patients in our Registry with a history of TC are included, the overall incidence of TC among all 103 adenomatous polyposis patients in our Registry is 7%. All 7 Registry patients with TC are female.

Conclusions: A large proportion of adenomatous polyposis patients will have abnormal results on thyroid ultrasound that when biopsied are malignant. Although male and female polyposis patients have similar incidences of abnormal thyroid findings, female patients have an apparently greater risk of developing TC. Polyposis patients, especially females, should be offered participation in a thyroid ultrasound screening program.

UTILIZATION OF COLONOSCOPY AND PATHOLOGY REPORTS FOR IDENTIFYING PATIENTS MEETING THE WHO CRITERIA FOR SERRATED POLYPOSIS SYNDROME.

(P230)

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Purpose: Serrated polyposis syndrome (SPS) is a rare hereditary colorectal cancer (CRC) syndrome. The World Health Organization (WHO) criteria were established to standardize the diagnosis and management as well as determine the genetic basis for patients afflicted with SPS. Although useful, the WHO criteria may be too broad and therefore not ideal for initial screening of at-risk populations for SPS. We examined the use of a minimal cut-off point of colorectal lesions in order to increase the yield of SPS cases.

Methods: Colonoscopy and pathology reports from 500 patients who had ≥2 pathologically diagnosed hyperplastic polyps (HP) and/or serrated adenomas (SA) from 1999 to 2009 were reviewed to identify those who met the WHO criteria for SPS. Demographic and clinical data were extracted.

Results: Only 3 of 40 (8%) patients had a family history of SPS. The median age of SPS diagnosis was 56.5 years (range 26.1-82.2). The median number of HP/SA per patient was 40 (range 6-150). The median size of the largest HP/SA was 1.2 cm (range 0.3-1.5). The median number of colonoscopies per patient was 4 (range 1-23). Four (10%) patients underwent prophylactic subtotal colectomy for uncontrolled polyposis; none had CRC on pathologic review. Sixteen (39%) patients had CRC there were located in the right colon (6), sigmoid colon (1), and rectum (9). Forty of 500 (8%) patients met the WHO criteria for SPS. Of these, only 5 were in our institutional Hereditary Colorectal Cancer Family Registry.

Conclusions: The cut-off point of ≥2 HP and/or SA as an initial requirement can help identify SPS cases, which may otherwise go undetected. This approach can increase the identification of SPS cases.

THE EFFECT OF A GERMLINE APC MUTATION ON AGE OF DIAGNOSIS OF CANCER.

(P231)

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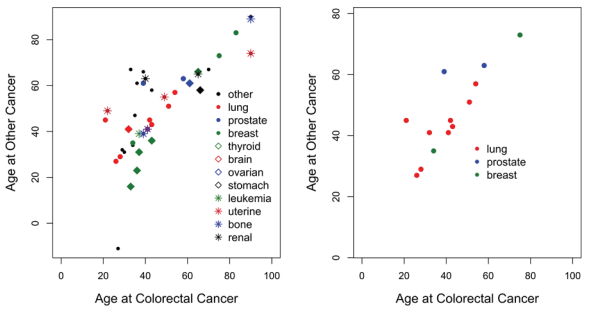
Purpose: In patients with familial adenomatous polyposis (FAP), the combination of a rapidly dividing colorectal epithelium, a germline mutation in a key tumor suppressor gene and a high exposure to carcinogens is a potent cause of progressive neoplasia leading to early cancer. Other cancers arise through other mechanisms but we hypothesize that these are also affected by the germline APC mutation. To test our hypothesis, we compared age of onset of non-syndromic cancers in FAP patients to age of onset of colorectal cancers.

Methods: All FAP patients with a colorectal cancer and a cancer in another organ were identified through Cologene database. Metastases were excluded. We tabulated the age of diagnosis of the cancers and performed a regression analysis comparing colorectal cancer with other cancers.

Results: 36 patients (15 men and 21 women) had both colorectal and another primary cancer. 14/36 patients (7 men and 7 women) had colorectal and clearly non-syndromic cancer: lung, breast or prostate. These patients were analyzed separately. Mean age at colorectal cancer for the breast, lung, and prostate group was 45.1 years +/- 17.1 while age at colorectal cancer for the whole group was 45.6 years +/- 18.6. Pearson's correlation coefficient for colorectal versus all other cancers is 0.76 ($p < 0.0001$), and for colorectal versus non-syndromic cancers is 0.89 ($p = 0.00005$) (Figure 1).

Conclusions: There is a strong relationship between age of onset of colorectal cancer and other cancers in patients with FAP. This finding has implications for cancer screening in general.



Relationship between age of onset of colorectal cancer and other cancer (A); age of onset of colorectal cancer and non-syndromic cancer (B).

RECONSIDERING THE "NON" IN HEREDITARY NONPOLYPOSIS COLORECTAL CANCER: MULTIPLE ADENOMAS DO NOT PRECLUDE LYNCH SYNDROME.

(P232)

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Purpose: Patients with 10 or more lifetime adenomas are recommended for genetic counseling and testing for suspected MYH-associated polyposis or attenuated familial adenomatous polyposis. Lynch Syndrome, however, falls under the umbrella of hereditary nonpolyposis colorectal cancer. In accordance with the name, it is assumed that patients with Lynch syndrome do not develop multiple synchronous or lifetime adenomas. This is a key point in the diagnosis of patients with oligopolyposis. The purpose of this study was to document the number of adenomas found in patients with Lynch syndrome.

Methods: A single institution hereditary colorectal cancer database was queried for Lynch syndrome patients, defined as having a germline mutation in a mismatch repair gene. Colonoscopy and pathology records were reviewed for adenomas. Synchronous adenomas per procedure and lifetime cumulative adenomas per patient and were recorded.

Results: The query returned 261 Lynch syndrome patients. Of those, 105 (40%) patients had one or more adenomas. Ten patients (4%) had 10 or more adenomas; 5 patients (2%) had 6-9 adenomas; and 29 patients (11%) had 2-5 adenomas. The maximum number of synchronous adenomas and cumulative adenomas was 22 and 24, respectively. Twenty-four patients of the 105 with adenomas underwent a total colectomy or proctocolectomy and were excluded from long-term follow-up. In the 81 patients that did not have surgery or underwent segmental colectomy, 407 colonoscopies were performed (mean 5 exams per patient). 293 adenomas were detected in 187 examinations (46%). 220 (54%) were normal or detected hyperplastic polyps.

Conclusions: Patients with Lynch syndrome may present with and develop multiple adenomas. Although identification of multiple adenomas prompts testing for polyposis syndromes, Lynch syndrome should also be considered.

COMBINED ENDOSCOPIC-LAPAROSCOPIC SURGERY FOR COMPLEX COLONIC POLYPS: ARE GOOD OUTCOMES MAINTAINED WITH AN AGGRESSIVE THERAPEUTIC ENDOSCOPY PROGRAM?

(P233)

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Purpose: To evaluate the safety and outcomes of combined endoscopic-laparoscopic surgery for complex colonic polyps that are not amenable to conventional colonoscopic excision.

Methods: All patients that underwent combined endoscopic-laparoscopic surgery for a complex colonic polyp at our center from 2009 to 2012 were followed prospectively. Each patient was assessed by a therapeutic endoscopist, prior to referral for combined endoscopic-laparoscopic surgery, and was deemed unresectable based on size or location of the polyp. The main outcome measures were intraoperative and postoperative complications, length of hospital stay, and recurrence.

Results: 24 consecutive patients underwent combined endoscopic-laparoscopic surgery. 15 (63%) patients underwent laparoscopic-assisted colonoscopic polyp excision (eight of these excisions were facilitated by endoloop placement at the polyp base), eight (33%) patients underwent colonoscopic-assisted laparoscopic cecectomy, and one (4%) patient was converted from a colonoscopic-assisted laparoscopic cecectomy to a laparoscopic ileocolic resection. One (4%) intraoperative complication was encountered (anaphylactic antibiotic reaction), and this patient required ICU admission, developed a pulmonary embolism requiring anticoagulation resulting in a polypectomy site bleed. One other patient experienced a postoperative complication (port site bleed). There were no long-term sequelae from these complications. The median length of hospital stay was 2 days (range 1-16). 23 (96%) of the final pathology results were benign, with seven (29%) results of high-grade dysplasia. One (4%) final pathology result was positive for a well-differentiated adenocarcinoma. This patient subsequently underwent a laparoscopic right hemicolectomy and chemotherapy for node positive disease. Three (12%) patients experienced recurrent benign polyps at the previous excision site. These were all removed by colonoscopy. The average time-to-detection of recurrence was 165 days.

Conclusions: Combined endoscopic-laparoscopic surgery for complex colonic polyps is a safe procedure, with good clinical outcomes and low recurrence rates.

EARLY ENDOSCOPIC SURVEILLANCE IS WARRANTED FOLLOWING COLORECTAL CANCER RESECTION.

(P234)

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Purpose: Following resection for colorectal cancer (CRC), current guidelines recommend surveillance endoscopy at one year. The purpose of this study was to determine the yield of early colonoscopy in patients following CRC resection.

Methods: All patients who underwent resection for CRC were identified through a prospective provincial cancer database. Chart review identified those who had a curative resection for Stage I, II, or III CRC from 2008 to 2010. Patients with a complete preoperative colonoscopic evaluation and colonoscopy within 18 months of resection were included. Patients who underwent transanal excision or total abdominal colectomy, and patients with a history of HNPCC were excluded. A clinically significant finding (CSF) was defined as a metachronous cancer, local recurrence, or advanced adenoma (adenomas >1cm, with high-grade dysplasia, >25% villous component, or serrated histology).

Results: 393 patients met our inclusion criteria; of these 270 pts (68.7%) underwent colonoscopy within 18 months of resection and were selected for analysis. At preoperative colonoscopy, 107 pts (39.6%) had synchronous adenomas removed, and 45 pts (16.7%) had advanced adenomas. Surveillance colonoscopy was complete in 266 pts (98.5%). CSFs were 16 pts (5.9%) with advanced adenomas, 1 pt (0.37%) with a metachronous cancer, and 2 pts (0.74%) with a local recurrence. Overall, 19 pts (7.0%) had a CSF on early endoscopic surveillance. In subgroup analysis, patients with synchronous advanced adenoma, and patients with poor bowel preparation at preoperative colonoscopy had a significantly greater risk of a CSF on surveillance endoscopy (15.6% vs. 5.3%, p=0.023; and 21.7% vs. 5.7%, p=0.015, respectively). In multivariate analysis, synchronous advanced adenoma (OR 4.88, p=0.038) and poor bowel preparation at preoperative colonoscopy (OR 4.70, p=0.014) significantly increased the risk of CSFs on surveillance endoscopy.

Conclusions: The rate of clinically significant findings on early endoscopic surveillance following CRC resection was 7.0%. Patients with poor bowel preparation or advanced adenomas on preoperative colonoscopy were at higher risk. These findings support endoscopic surveillance at one year following CRC resection.

THE SCOPE OF DESMOID DISEASE IN FAMILIAL ADENOMATOUS POLYPOSIS.

(P235)

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Purpose: Desmoid disease is a dreaded manifestation of a germline mutation in APC, and the second most common cause of death in affected patients. Here we report our overall experience with FAP-related desmoid disease.

Methods: Cologene database was reviewed and patients with desmoid disease were identified.

Results: There were 15050 affected patients in 858 families. 187 patients in 163 families have desmoid disease. Desmoid reaction was diagnosed in 24 patients, 18 of whom had tumors as well. Desmoid tumors alone were diagnosed in 163 patients. There were 501 tumors: 342 intra-abdominal, 126 abdominal wall and 33 extra-abdominal. 67 patients had one tumor and 120 had multiple tumors. There were 108 women and 79 men. Mean age at desmoid diagnosis was 32.1 years. 67.9% of desmoids followed abdominal surgery, a mean of 5.9 years after the operation. 51% of the desmoids were symptomatic and 49% were found incidentally. Abdominal tumors were staged and treatment according to stage is shown in the table. 6 patients have died from their desmoid disease, 13 patients have died of unrelated causes. 23 patients are receiving TPN, 29 patients have an ostomy. 69 patients developed small bowel obstruction, 20 an enterocuatoeous fistula and 41 ureteric obstruction.

Conclusions: Desmoid tumors have a big impact on patients with FAP

P235

	n	women (%)	Sulindac/Tamoxifen/Raloxifen	Chemotherapy	Surgery
Stage I	67	39 (58%)	23	5	21
Stage II	47	28(60%)	24	12	19
Stage III	44	21(47%)	34	21	26
Stage IV	29	20(70%)	20	17	16
Total	187	108 (58%)	101	55	82

HOT VERSUS COLD ENDOSCOPIC POLYPECTOMIES: IS ONE SAFER THAN THE OTHER?

(P236)

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Purpose: Colonoscopy is a routine procedure performed for diagnostic or therapeutic reasons. The decision to perform a hot or cold biopsy is left to the discretion of the endoscopist with no strong evidence to support one polypectomy method over the other. The aim of this study is to evaluate the incidence of postpolypectomy complications in patients undergoing cold or hot endoscopic polypectomy.

Methods: Retrospective analysis of patients who underwent colonoscopy at Ochsner Health System from January 2006 to December 2006. The primary outcome measures were the incidence of postpolypectomy bleeding, perforation and postpolypectomy syndrome within 30 days of cold or hot endoscopic polypectomy. Any patient on anticoagulation therapy was excluded from our study population. The t-test was used for statistical analysis with p value < 0.05 considered significant.

Results: A total of 219 patients underwent endoscopic polypectomy with 197 hot polypectomies and 22 cold polypectomies. The median age of the group was 59. The average polyp size for cold polypectomy was 8 mm with the most common location the sigmoid colon. The average size for hold polypectomy was 10 mm with the most common location also the sigmoid colon. Seven of the 219 patients (3.2%) presented with a postpolypectomy complication, all of these 7 patients had hot polypectomies. In this group of 7 patients, 5 were located in the sigmoid colon, 1 in the transverse colon and 1 in the ascending colon. The average size in the complication group was 11 mm. No patient with cold polypectomies presented with a complication. The incidence of postpolypectomy complications after hot polypectomy was 2.5% for bleeding, 0.5% for perforation and 0.5% for postpolypectomy syndrome. There was a statistically significant difference in postpolypectomy complications between cold and hot polypectomy (p value = 0.02).

Conclusions: Our study indicates that polyps that can be adequately treated with cold polypectomy should be treated this way to avoid the risk of clinically significant postpolypectomy bleeding, perforation or postpolypectomy syndrome associated with hot polypectomy

PROGNOSTIC ROLE OF P53 MRNA EXPRESSION IN PATIENTS FOLLOWING CURATIVE RESECTION FOR STAGE I-III COLORECTAL CANCER: ASSOCIATION WITH COLON CANCER STEM CELL MARKERS.

(P237)

J. Huh, H. Kim, Y. Kim
Seoul, Republic of Korea

Purpose: The present study was performed to examine the prognostic role of p53 mRNA expression and analyze its relationship with the expression of CD44 and CD133 mRNA in patients with colorectal cancer.

Methods: We retrospectively reviewed 137 consecutive patients who underwent curative surgery for stage I-III colorectal cancer in 2006. Prognostic factors including wild-type p53 (wt-p53), cyclooxygenase-2, CD44, and CD133 mRNA levels were determined using reverse transcriptase-polymerase chain reaction and clinical outcomes were analyzed.

Results: Wt-p53 mRNA expression was correlated with the expression of CD44 and CD133 mRNA (P = 0.005 and P = 0.013, respectively). With a median follow-up period of 64 months, the 5-year disease-free survival rate of patients with elevated wt-p53 mRNA expression was significantly higher than that of those patients with low levels of wt-p53 mRNA expression (84.9% and 67.6%, respectively; P = 0.014). A multivariate analysis identified three independent factors that significantly affected the disease-free survival: depth of tumor invasion, lymph node metastasis, and wt-p53 mRNA expression. The 5-year disease-free survival rate in patients with stage III tumors differed significantly between the low and high wt-p53 expression groups. In stage III cancers, high wt-p53 expression was associated with better survival than low wt-p53 expression in patients treated with adjuvant chemotherapy (P = 0.005). A significant association between combined p53/CD44 expression and survival was evident (P = 0.006).

Conclusions: P53 mRNA expression is a useful predictor of survival in patients with colorectal cancer, with a significant association with CD44 mRNA expression.

FACTORS PREDICTING LONG-TERM SURVIVAL IN COLORECTAL CANCER PATIENTS WITH A NORMAL PREOPERATIVE SERUM LEVEL OF CARCINOEMBRYONIC ANTIGEN.

(P238)

J. Huh, H. Kim, Y. Kim
Seoul, Republic of Korea

Purpose: The aim of this study was to determine which clinicopathological factors influenced the long-term survival after potentially curative resection of colorectal can-

cer patients with a normal preoperative serum level of carcinoembryonic antigen (CEA).

Methods: A total of 1732 patients who underwent curative surgery for primary nonmetastatic colorectal cancers from 1997 to 2009 were analyzed. Of these patients, 1128 (65.1%) had normal level of preoperative CEA (< 5 ng/mL).The predicting factors for survival were analyzed.

Results: When the serum CEA cutoff value was set at 2.4 ng/mL (median value), the high CEA groups displayed a higher percentage of older patients, males, large diameter tumors, advanced T and N categories, and positive perineural invasion, compared to the low CEA groups. Multivariate analysis revealed that age, T category, N category, number of lymph nodes retrieved, operative method, lymphovascular invasion, perineural invasion, postoperative chemotherapy, and preoperative serum CEA level ≥ 2.4 ng/mL were independent predictors for 5-year overall survival, while tumor location, tumor size, T category, N category, lymphovascular invasion, and perineural invasion were independent predictors for 5-year diseases-free survival.

Conclusions: Even if patients with colorectal cancer have a normal preoperative CEA before surgery, CEA may be useful for prognostic stratification using 2.4 ng/mL as the cutoff.

THE VALUE OF THE PRETREATMENT HEMATOLOGICAL BIOMARKERS IN PREDICTING THE LONG-TERM SURVIVAL IN COLORECTAL CANCER.

(P239)

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Purpose: Prior studies demonstrated the association of some inflammatory hematological parameters [e.g. white cell subtypes, neutrophil-to-lymphocyte ratio (NLR) and platelet lymphocyte ratio (PLR)] and cancer-related mortality. Our aim of this study was to determine if these hematological biomarkers are predictors of the long-term mortality in colorectal cancer (CRC) patients.

Methods: A total of 580 unselected cohort of CRC patients who had complete blood count recorded before treatment (surgery or chemotherapy), between January 2004 and December 2006. We excluded patients presented with obstruction, infection, active hematological disease and those receive steroid. The primary outcome (4-year cancer-related mortality) was obtained from our cancer registry. We ran survival analysis by using the hematological parameters [neutrophil count, lymphocyte count, NLR, Platelet count, and PLR] as continuous and categorical (tertile models) primary variables.

Results: The decreased lymphocyte and elevated neutrophil, platelet, NLR and PLR were associated with poor survival in the univariate analysis. After adjusting for cancer stage and other confounding variables, the neutrophil, lymphocyte and NLR were independent predictor of 4-year cancer-related mortality (table 1).

Conclusions: Elevated neutrophil count and NLR are independent predictor of higher cancer-related mortality in colorectal cancer patients. Further studies needed to evaluate the use of these inflammatory markers as a targeted-chemotherapy.

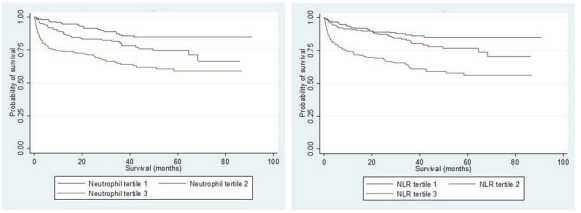

Figure 1: Kaplan-Meier survival curves stratified by neutrophil count and neutrophil/lymphocyte ratio(NLR) tertiles of colorectal cancer patients, chisq=34.3 and 40.8, p<0.001.

SARCOPENIA: SIGNIFICANT PROGNOSTIC INDICATOR FOR COLORECTAL CANCER PATIENTS.

(P240)

A. Rickles, J. Iannuzzi, A. Deeb, K. Kelly, V. Garimella, F. Fleming, J. Monson
Rochester, NY

Purpose: Sarcopenia, or muscle wasting, has been associated with poor survival in patients with advanced cancer; however, there is a paucity of literature describing the effect of sarcopenia in patients with non-metastatic disease. The aim of this study was to determine the effect of sarcopenia on survival in non-disseminated colorectal cancer patients.

Methods: A retrospective chart review was performed for surgical resections of stage I-III colorectal cancer between 2003-2010. Pre-operative CT imaging was used to measure muscle mass area at the level of the third lumbar vertebrae (psoas, erector spinae, and abdominal muscles). Muscle mass was normalized for patient height and sarcopenia was determined by sex-specific values as previously described. Data was collected on patient, tumor, and treatment characteristics. Kaplan-Meier survival curves and Cox Proportional Hazards were used to analyze the primary endpoints of overall, disease-free, and recurrence-free survival.

Results: Out of 214 patients with pre-operative CT imaging 15.9% (n=34) were sarcopenic. Sarcopenic patients were older (72 vs. 66 years, p=0.010), a greater proportion were male (79.4% vs. 48.9%, p=0.001), had a lower mean BMI (24.3 vs. 29.1, p<0.001), and higher ASA class (p=0.027). There were no other statistically significant differences between groups including operative approach, tumor characteristics, and adjuvant chemother-

apy use. On Kaplan-Meier, sarcopenic patients had worse overall (p=0.008), disease-free (p=<0.001, figure1), and recurrence-free survival (p=0.002). After controlling for age, gender, BMI, ASA class, and tumor stage, risk of overall survival was no longer significantly different, however, sarcopenic patients had a significantly greater risk for shorter disease-free survival (HR=2.33, 95%CI=1.19,4.56) and recurrence-free survival (HR=4.40, 95%CI=1.75,11.07).

Conclusions: Colorectal cancer patients with sarcopenia are at a significantly increased risk for poor disease-free and recurrence-free survival even after controlling for patient characteristics. This study suggests that sarcopenia has significant prognostic implications and that future research should focus on oncologic interventions for this vulnerable population.

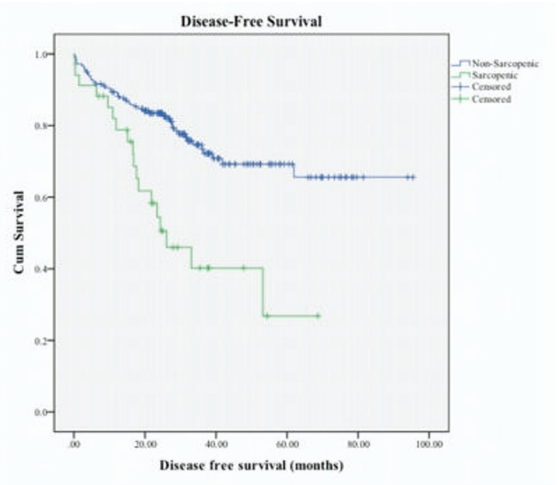

Figure 1. Kaplan-Meier curve showing statistically significantly shorter Disease-Free Survival for patients with sarcopenia (p<0.001).

P239 Table 1: The multivariate adjusted hazard ratios of 4-year cancer-related mortality of various hematological parameters among colorectal cancer patients.

	Hazard Ratio	95% Confidence Interval	P value
Absolute neutrophil count (continuous)	1.08	1.05-1.12	<0.001
Neutrophil count tertile			
2nd tertile	2.07	1.21-3.55	0.008
3rd tertile	2.60	1.57-4.28	<0.001
Absolute lymphocyte count (continuous)	1.05	1.01-1.08	0.012
Lymphocyte count tertile			
2nd tertile	0.80	0.52-1.21	0.284
3rd tertile	0.73	0.45-1.16	0.185
Platelet count (continuous)	1.00	1.00-1.00	0.526
Platelet count tertile			
2nd tertile	0.70	0.45-1.09	0.119
3rd tertile	0.85	0.54-1.32	0.459
NLR (continuous)	1.05	1.03-1.07	<0.001
NLR tertile			
2nd tertile	1.15	0.67-1.99	0.608
3rd tertile	2.31	1.42-3.77	0.001
PLR (continuous)	1.00	1.00-1.00	0.347
PLR tertile			
2nd tertile	0.64	0.39-1.05	0.078
3rd tertile	1.12	0.71-1.78	0.631

NLR= neutrophil/lymphocyte ratio, PLR=platelet/lymphocyte ratio.

COMPARISON OF THE SITES AND ASSOCIATED RATES OF RECURRENCE BETWEEN EMVI POSITIVE AND EMVI NEGATIVE RECTAL CANCER.

(P241)

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Purpose: The presence of extramural venous invasion in rectal cancer confers a poor prognosis. It is associated with increased rates of recurrence and decreased overall survival. As this phenomenon is usually associated with more advanced tumours, almost exclusively T3 and above in terms of staging, they commonly receive pre-operative chemoradiotherapy (CRT). It is unclear as to whether EMVI positive tumours demonstrate specific patterns of recurrence and metastases. We compared the rates and sites of recurrence following CRT between EMVI positive and EMVI negative tumours.

Methods: The MRI and CT scans of consecutive patients presenting with primary rectal cancer to our institution were reviewed. Only patients who were suitable for pre-operative CRT followed by surgery were included and patients with metastases on presentation were excluded. Demographic data and treatment details were recorded in addition to rates and sites of recurrence. Patients were divided into EMVI positive and EMVI negative based on the initial local staging MRI scans.

Results: A total of 156 patients (81 EMVI positive and 75 EMVI negative) were included. All patients had R0 resections and tumour clearance from the circumferential resection margin (CRM). In the EMVI positive group 19/81 (23.5%) of patients developed recurrent disease compared to 18/75 (24%) in the EMVI negative group at 3 years. The sites are shown in the table below: 74.6% of patients were disease free at 3 years in the EMVI negative group compared with 76% of patients in EMVI positive group.

Conclusions: There is no significant difference in the recurrence rates of EMVI positive and EMVI negative tumours following CRT. However EMVI positive tumours preferentially metastasize to liver. Local recurrence rates are similar in EMVI positive and negative tumours when there is clearance of the CRM.

THE ROLE OF CHEMOKINE RECEPTOR CXCR3 AND CXCR4 IN COLORECTAL CANCER METASTASIS.

(P242)

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Purpose: Chemokines and their receptors play key roles in cancer metastasis. We previously reported that CXCR3 promoted lymph nodes (LNs) metastasis, and that CXCR4 did liver metastasis in xenograft mice models (Cancer Res, 2004; Oncogene, 2007; Ann Surg Oncol.2009). In addition, using clinical samples, expressions of CXCR3 and CXCR4 were correlated with the poorer prognosis of the patients with colorectal cancer (CRC). A purpose of this study is to examine whether CXCR3 and CXCR4 can be novel therapeutic targets against CRC metastasis.

Methods: 1) Evaluation of the expression levels of CXCR3 and CXCR4 in clinical samples by quantitative RT-PCR and immunohistochemistry. 2) In vitro assays such as migration, proliferation and MMP expression using several human CRC cell lines such as SW620. 3) Investigation of in vivo metastatic activities in a mouse model using three kinds of stable transfectants; CXCR3-, CXCR4- and CXCR3/CXCR4 double- knockdown clones. 4) Investigation of in vivo metastatic activities in a mouse model using CXCR3 inhibitor (AMG487) and CXCR4 inhibitor (AMD3100).

Results: 1) The expression levels of CXCR3 and CXCR4 were significantly higher in metastatic foci within LNs and liver compared with primary tumors, while ligands for CXCR3 and CXCR4 are not. 2) CXCR3 promoted cell migration, proliferation and MMP-9 expression, while CXCR4 did only migration. We found the synergistic effect between CXCR3 and CXCR4 in migration and intracellular signaling (ERK1/2 and Akt/PKB). 3) Six weeks after inoculation, CXCR3-, CXCR4-, and CXCR3/CXCR4 double-knockdowns significantly reduced metastasis to LNs, liver and lungs, compared with the control ($P < 0.05$). Importantly, its suppressive effect on lymph node metastasis was significantly stronger in CXCR3- and CXCR3/CXCR4 double-knockdowns. In addition, CXCR3- and CXCR3/CXCR4 double-knockdowns significantly decreased the dissemination of cancer cells to liver and lungs, even after 2 weeks. 4) AMG487 or AMG487/AMD3100 reduced the metastatic frequencies to LNs and lungs.

Conclusions: Targeting CXCR3 and CXCR4 can be a promising therapy against CRC metastasis.

P241 Sites of recurrence

Site	EMVI positive (19/81 - 23.5%)	EMVI negative (18/75 - 24%)
Liver	10 (52.6%)	3 (16.6%)
Lung	6 (31.6%)	11 (61.1%)
Local	3 (15.8%)	4 (22.2%)

THE EXPRESSION OF CHEMOKINE RECEPTORS CCR6, CXCR2, AND CXCR4 ARE NOT ORGAN-SPECIFIC FOR DISTANT METASTASIS IN COLORECTAL CANCER.

(P243)

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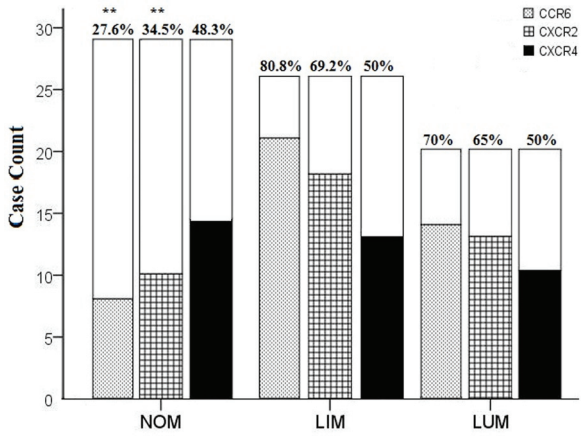
Beijing, China

Purpose: Liver and lung are the most common organs affected with metastasis in colorectal cancer (CRC), and the interaction of chemokines and chemokine receptors (CKRs) plays an important role in the metastatic process. This study was conducted to investigate the organ-specificity of CKRs in CRC distant metastasis.

Methods: Surgical specimens of primary tumors from 46 patients with metachronous distant metastasis were retrieved retrospectively (20 lung metastasis, 26 liver metastasis). As a control, the records of 29 patients without distant metastasis were randomly retrieved from our database and their specimens were re-assessed. The expressions of CKRs including CCR6, CXCR2, and CXCR4 were determined by immunohistochemistry, and were compared among the groups.

Results: The expression rates of CCR6 and CXCR2 were both significantly higher in the metastasis group compared to the non-metastasis group ($P < 0.05$), with no statistical difference between the lung metastasis and liver metastasis subgroups. The expression of CXCR4 was not significantly different between the metastasis and non-metastasis groups. Multivariable analysis suggested that preoperative serum carcinoembryonic antigen level, CCR6, and CXCR2 were the independent factors associated with distant metastasis.

Conclusions: The expression of CCR6 and CXCR2 in CRC could predict metachronous distant metastasis, but they have no organ-specificity for metastasis.



EXPRESSION OF LYMPHANGIOGENIC GROWTH FACTOR VEGF-D AND ITS RECEPTOR VEGFR-3 IN COLORECTAL CANCER.

(P244)

M. Baek, T. Ahn, E. Shin
Cheonan, Republic of Korea

Purpose: Lymphangiogenesis plays an important role in the growth and metastasis of cancer. The aims of this study are to investigate the expression of VEGF-C, VEGF-D and its receptor VEGFR-3 in colorectal cancer, which is known to be involved in lymphangiogenesis in tumor tissue; and to determine the relationships between VEGF-C,D/VEGFR-3 expression, lymphangiogenesis and clinicopathologic variables in colorectal cancers.

Methods: Immunohistochemical staining of VEGF-C, VEGF-D, VEGFR-3 was performed in colorectal cancer tissue by using tissue microarray for 106 patients who underwent surgery and lymphatic vessels were detected using immunohistochemical staining of podoplanin (D2-40 antibody), which is known as an specific marker of lymphatic endothelial cell. Intratumoral lymphatic vessel density (LVD) was quantified by counting the number of stained vessels. We examined the relationship between lymphangiogenesis and tumor progression in colorectal cancers. Also, the impact on the prognosis of patients was investigated.

Results: VEGF-D and VEGFR-3 expression in cancer tissue was related to LVD (p=0.032, 0.003), but there was no relationship with VEGF-C (p=0.666). The LVD was correlated with lymph node metastasis (p=0.045), vascular invasion (p = 0.036) and lymphatic invasion (p = 0.010). There was no relationship between VEGF-C, VEGF-D, and VEGFR-3 expression and survival rate, but the prognosis of the patients was correlated with the lymphatic invasion (p=0.022) and lymph node metastasis of colorectal cancer (p = 0.011).

Conclusions: Our data provide evidence for a clinical correlation between VEGF-D and VEGFR3 expressions in colorectal cancer patients and it seems likely that VEGF-D expression can influence lymphangiogenesis via VEGFR3. Based on this finding, blockade of VEGF-D and VEGFR3 expression may suppress lymphangiogenesis and lymph node metastasis in colorectal cancer patients. Future research uncovering the important substances that are involved in lymphangiogenesis will help to elucidate the mechanisms of the growth and metastasis of colorectal cancer.

USE OF GENOMIC CLASSIFIERS (COLOPRINT) FOR PERSONALIZED TREATMENT DECISIONS IN STAGE II AND III COLON CANCER PATIENTS.

(P245)

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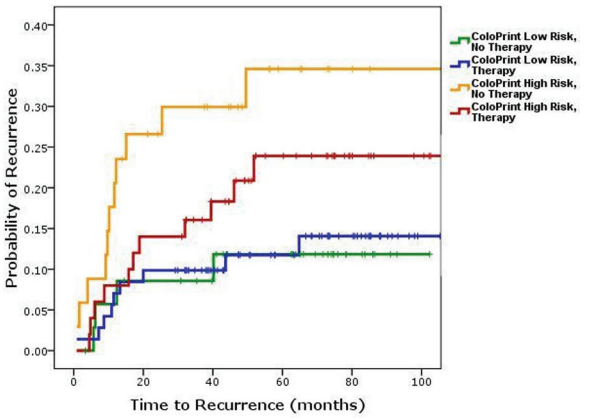
Purpose: Many patients with stage II and III colon cancer are cured by surgery alone and might not need adjuvant treatment. However, those patients with a high risk of relapse need to be identified for adjuvant chemotherapy treatment. ColoPrint is a gene expression classifier that distinguishes patients with low or high risk of disease relapse.

Methods: The ColoPrint assay was validated in frozen tissue specimens from stage II (n=96) and III patients (n=95) treated at a tertiary cancer center from 2003 to 2008. Patient characteristics and recurrence outcomes were determined by retrospective chart review. Recurrence free survival (RFS) outcomes were evaluated by Cox proportional hazards regression.

Results: Median follow-up was 64 months. ColoPrint classified 56% of stage II and III patients as being at low risk. The 3-year RFS was 90.6% for Low Risk and 78.4% for High Risk patients (HR of 2.33, 95% CI: 1.11 – 4.9; p=0.025). In multivariate analysis ColoPrint (HR 2.41; 95% CI: 1.14 – 5.06; p=0.02) and stage (HR 2.70; 95% CI: 1.24 – 5.90; p=0.01) were the only significant factors to predict outcome. In stage II, clinical high risk factors as described in NCCN guidelines only identified 3 of 11 patients with a relapse as high risk. In contrast, ColoPrint identified 8/11 stage II patients with a relapse as high risk. In stage II and III combined, low risk ColoPrint patients had a good outcome independent of stage or chemotherapy treatment (90.1% 3-year RFS for treated patients, 91.4% for untreated patients) while ColoPrint high risk patients treated with adjuvant chemotherapy had 3-year RFS of 84%, compared to 70.1% 3-year RFS in untreated patients (p=0.026).

Conclusions: ColoPrint can distinguish low and high risk in stage II and stage III patients and may help the identification of patients at higher risk who are more likely to benefit from additional treatment. Combination of ColoPrint with molecular markers like MSI and clinical factors are currently evaluated in this study and will also be assessed in the worldwide multi-institutional prospective clinical study PARSC (http://www.clinicaltrials.gov/ct2/results?term=PARSC).



THE ROLE OF INTELECTIN-1 IN WNT-DRIVEN COLORECTAL CANCER: ASSESSING ITS VIABILITY AS A THERAPEUTIC TARGET.

(P246)

P. Skellorn, P. Sutton, D. Vimalachandran, K. Reed, A. Clarke, D. Pritchard, J. Jenkins
Liverpool, United Kingdom; Chester, United Kingdom; Cardiff, United Kingdom

Purpose: Colorectal cancer is the second commonest cause of cancer-related death in the United Kingdom. The Wnt signalling pathway is aberrantly active in the majority of colorectal tumours. Previous work by the group has shown that the expression of Intelectin-1 is upregulated following activation of the Wnt signalling pathway. This study aimed to examine the effect of reducing Intelectin-1 expression on a colorectal cancer cell line, and specifically the effect that reducing the expression of this protein has upon activation of the Wnt pathway.

Methods: Intelectin-1 expression was knocked down with siRNA in the HT29 colorectal cancer derived cell line and the HEK293 human embryonic kidney cell line. Proliferation and cell death were measured using cell counts. Wnt pathway activation was measured using the TOPflash assay, a luciferase-mediated luminescent assay that measures promoter activity of LEF/TCF transcription factors known to be implicated in Wnt signalling. The HEK293 cell line was used rather than a colorectal cancer cell line because it has a low-basal level of Wnt activity, and so provides more sensitive results in the TOPflash assay. The HEK293 cell line is also the accepted standard cell line to be used in the TOPflash assay.

Results: Transfecting HT29 cells with 10pM Intelectin-1 siRNA significantly reduced the intra-cellular concentration of Intelectin-1 by 45.44%, a fold-change of 0.55, at 72 hours. Within the same timeframe proliferation of HT29 cells was significantly reduced by 67.74%, a fold-change of 0.32 and apoptosis was significantly increased by 167.9%, a fold-change of 1.7. LEF/TCF Wnt promoter activity in HEK293 cells was also significantly reduced by 67.63%, a fold-change of 0.33.

Conclusions: Knocking down Intelectin-1, significantly reduced: cell proliferation and activation of the Wnt signalling pathway, and significantly increased apoptosis. Intelectin-1 auto-regulates Wnt activation within colorectal cancer cells and is therefore a potential viable therapeutic target for the treatment of colorectal cancer. Further investigation of this protein in murine models of intestinal APC loss and colorectal cancer is required to inform future clinical trials.

HSPA1A AND HSPB1 HAVE A ROLE IN MEDIATING CHEMORESISTANCE IN COLORECTAL CANCER CELLS.

(P247)

S. Lee, N. Dempsey-Hibbert, P. Sutton, D. Vimalachandran, T. Wardle, J. Williams
Chester, United Kingdom; Liverpool, United Kingdom

Purpose: Colorectal cancer (CRC) is the fourth most common cause of cancer death worldwide, accounting for approximately 610,000 deaths in 2008. Whilst surgery is the mainstay of treatment, chemotherapy is employed for high-risk disease or for patients in whom the disease is inoperable. The heat shock protein (HSP) family of molecular chaperones have been studied in CRC, and increased levels of two HSPs, HSPB1 and HSPA1A, have been implicated in anti-apoptotic mechanisms, chemoresistance and increased tumour invasiveness. The aim of this study was to determine if inhibition of these two proteins improved the chemosensitivity of a CRC cell line to 5-Fluorouracil (5-FU), oxaliplatin or irinotecan.

Methods: Gene silencing of HSPA1A and HSPB1 was achieved using a lipid-based siRNA transfection technique before addition of 5-FU, oxaliplatin and irinotecan to HT29, a CRC cell line. Cytotoxic and cytostatic effect of combination therapies were assessed using flow cytometry and plate based fluorometric assays and compared to the use of chemotherapy agent alone. Level of HSPA1A and HSPB1 were analysed using flow cytometry to confirm effectiveness of gene-silencing. Negative controls were achieved using non-targeting and RISC-free siRNA.

Results: Lipid based siRNA transfection technique was effective in specifically decreasing the level of HSPA1A and HSPB1. A reduction in the level of HSPB1 increased cell death significantly when combined with 5-FU ($p=0.0012$) whereas a reduction in the level of HSPA1A increased cell death significantly when combined with irinotecan ($p=0.0313$). Reduction of both HSPA1A and HSPB1 resulted in a significant increase in cell death when combined with oxaliplatin ($p=0.0005$ and $p=0.0084$ respectively).

Conclusions: Both HSPA1A and HSPB1 have a role in chemoresistance against 5-FU, oxaliplatin and irinotecan in CRC cells. Inhibition of these two HSPs had a synergistic effect with other chemotherapeutic drugs. These findings need further in-vivo confirmation but may herald a role for new HSPB1 inhibitors such as OGX-427 in combination with traditional chemotherapy in patients with CRC. These results may also support the development of HSPA1A inhibitors in the future.

INHIBITING HSPC1 POTENTIATES THE CHEMOTHERAPEUTIC EFFECTS OF 5-FU, OXALIPLATIN AND IRINOTECAN IN COLORECTAL CANCER CELLS.

(P248)

S. Lee, N. Dempsey-Hibbert, P. Sutton, D. Vimalachandran, T. Wardle, J. Williams
Chester, United Kingdom; Liverpool, United Kingdom

Purpose: Colorectal cancer (CRC) is the second most common cause of cancer related death in the UK, accounting for over 16,000 deaths each year. Whilst surgery is the mainstay of treatment, chemotherapy is employed for high-risk disease or inoperable patients. Heat shock protein (HSP) C1 is elevated in CRC and its client proteins (HER2, pan-Akt and pNF-κB) control cell proliferation and apoptosis. Inhibition of HSPC1 can induce cell death in CRC cell lines, and thus it is an attractive therapeutic target. We sought to determine the effect of adding HSPC1 inhibitors to traditional chemotherapy regimens in CRC cell lines.

Methods: The CRC cell line HT29 was treated with a combination of HSPC1 inhibitors (17-DMAG, HSP990 and AUY922) and chemotherapy agents (5-fluorouracil (5-FU)/oxaliplatin/irinotecan). Apoptosis, necrosis and biochemical activity were assessed using flow cytometry and plate based fluorometric assays. Flow cytometric analysis of client proteins and co-chaperones was performed at specific time intervals (t=1-12h, 24h, 48h) to determine the rate at which inhibition of HSPC1 activity occurs.

Results: 17-DMAG significantly ($p<0.05$) potentiated the effect of all three chemotherapy agents whereas HSP990 and AUY922 only significantly potentiated the effect of oxaliplatin. These results were reflected in the reduction of HSPC1 client protein levels following inhibitor treatment. 17-DMAG and HSP990 are potent, irreversible inhibitors of client proteins whereas AUY922 has a reversible client protein degradation effect. Reduction in the levels of client proteins are observed shortly (t=2h) after administration of HSPC1 inhibitors.

Conclusions: The combination of HSPC1 inhibitors with traditional CRC chemotherapy drugs significantly ($p<0.05$) increases cell death. Synergistic effect of individual HSPC1 inhibitors and traditional CRC chemotherapy drugs are specific. This effect occurs rapidly and may be mediated by a reduction in HSPC1 client proteins. Further work is needed to determine if these findings are observed in vivo. This study suggests that HSPC1 inhibition may have a future role in CRC treatment.

EXPRESSION OF SPARC IN THE COLORECTAL CARCINOMAS.

(P249)

T. Ahn, M. Baek, E. Shin
Cheonan, Republic of Korea

Purpose: Secreted protein acidic and rich in cysteine, SPARC (also known as osteonectin; or basement-membrane-40, BM-40), is a member of a family of matricellular proteins, whose function is to modulate cell-matrix interactions and cell functions. Although there is growing evidence for an important role for SPARC in a variety of cancers, few results have been reported on the effects of SPARC expression in colorectal carcinoma.

Methods: In this study, the expression of SPARC was evaluated by immunohistochemistry using tissue microarray in 232 cases of colorectal carcinomas and analyzed the result with the clinicopathological parameters.

Results: SPARC immunostaining revealed cytoplasmic localization in colorectal cancer and in the stroma. High SPARC expression positively correlated with the advanced stage, (P = 0.042) lymph node metastasis (P=0,036) and lymphatic invasion (P=0,020) of colorectal cancer. Colorectal cancer patients with high SPARC expression also had a poorer prognosis than patients with low SPARC expression (P=0.042). Survival analysis showed that the level of SPARC expression was an independent prognostic indicator for the overall survival of patients with colorectal cancer (P < 0.016).

Conclusions: Our results show that SPARC expression is common in colorectal carcinoma patients and has close relationship with tumor progression and prognosis. Elevated SPARC expression can be used as a potential unfavorable prognostic marker for patients with colorectal carcinoma.

TUMOR BUDDING PREDICTS RECURRENCE AFTER CURATIVE RESECTION FOR T2N0 COLORECTAL CANCER.

(P250)

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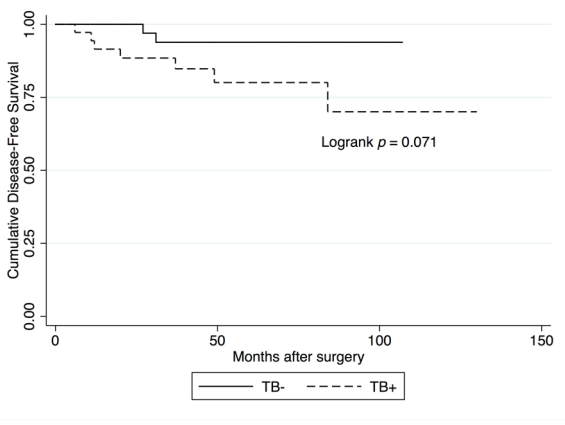
Purpose: Tumor budding (TB) is defined as the presence of a cluster of up to four poorly differentiated cells along the invasive margin. TB may increase the risk of recurrence in colorectal cancer, but its effect in T2N0 colorectal cancer is unknown. Therefore the objective of this study was to determine impact of TB on recurrence and disease-free survival (DFS) after curative resection for T2N0 colorectal cancer.

Methods: All patients who underwent surgery for stage I (pT2N0) colorectal cancer at a single institution from 2000 to 2010 were reviewed. Patients with hereditary colorectal cancer syndromes, inflammatory bowel disease, positive resection margins, who received neoadjuvant or adjuvant therapy, or died within 90-days of operation were excluded. Tumor budding was independently assessed by two blinded pathologists, according to Ueno's criteria. Patients were divided into two groups: TB- (≤ 9 budding foci within 1 hpf) and TB+ (≥10). Cox proportional hazards regression determined the independent effect of TB on disease-free survival (DFS).

Results: A total of 85 patients (49 TB- and 36 TB+) were included. Overall recurrence rate was 11% (9/85) with mean follow-up of 46.2 (SD 31.5) months. Inter-rater reliability for TB assessment was excellent (κ=0.85). TB+ patients were more likely to be younger (65.7 (SD 11.4) vs. 70.5 (SD 10.6), p=0.047) and have rectal tumors (68% vs. 38%, p=0.007), but were otherwise similar to TB- patients. There were more recurrences in TB+ vs. TB- patients (19% vs. 4%, p=0.033). On univariate analysis, there was a trend towards lower DFS in the TB+ group (Figure). Multivariate analysis demonstrated that TB+ was independently associated with poor DFS (HR 5.37, 95% CI 1.05 – 27.54) after adjusting for age, tumor location, and anastomotic leak (*a priori* confounders).

Conclusions: High TB was independently associated with increased recurrence and lower DFS after T2N0 colorectal cancer. TB offers additional prognostic information that may impact treatment strategy.



DOES THE LEVEL OF ARTERIAL LIGATION AFFECT POSTOPERATIVE PROGNOSIS IN RECTAL CANCER SURGERY? PROPENSITY SCORE MATCHED ANALYSIS.

(P251)

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Purpose: It is considered that high tie arterial ligation (level of inferior mesenteric artery) is preferred over low

tie arterial ligation (level of superior rectal artery) from oncologic considerations in rectal cancer surgery, but consensus does not exist on the level of arterial ligation. The aim of this study was to describe whether high tie or low tie is the preferred method in rectal cancer surgery.

Methods: We evaluated a total of 838 patients who underwent radical surgery for rectal cancer with stage I, stage II, and stage III. The data was based on medical records collected between 1997 and 2000 as part of a joint study undertaken by the Japanese Study Group for Postoperative Follow-up of Colorectal Cancer, including 18 major medical centers. Data sets were analyzed using propensity score matched proportional hazard models and Kaplan-Meier method to evaluate the effect of the level of arterial ligation on survival.

Results: There were 613 patients (359 men and 254 women; median age of 62 [23-92] years) who were matched after propensity score matched analysis. Median follow-up was 76 (1-153) months, and there were 241 with stage I, 167 with stage II, and 205 with stage III. In matching survival analysis, there were no significant difference in overall survival rate between high tie group and low tie group (HR=0.947 [95% CI, 0.657-1.364]; p=0.769).

Conclusions: The level of arterial ligation does not affect post-operative prognosis in rectal cancer patients. It was suggested that low tie might be the preferred method with regard to anatomic considerations such as anastomotic circulation and sexual function.

THE IMPACT OF HISTOPATHOLOGICAL FEATURES IN SURVIVAL OF STAGE I-II COLORECTAL CANCER PATIENTS.

(P252)

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Purpose: A small but significant group of patients with node negative colorectal cancer will develop recurrent disease and may therefore benefit from adjuvant therapy. Determination of clinicopathological variables that could predict an adverse prognosis is essential to plan treatment. The study aim was to identify histopathological parameters associated with poor outcome in patients with Stage I-II colorectal cancer.

Methods: After IRB approval, all the patients with Stage I-II Colorectal cancer who underwent surgery with curative intent and negative margins, from 12/2002 to 1/2010, were identified from a prospective database. Demographics, operative and tumor variables were obtained by chart review. Patients with concomitant diseases or adjuvant treatment were excluded. Pathological variables were abstracted from pathology reports and review of slides.

Results: 193 patients (median 69 years, 42% male) underwent surgical treatment for colon (72.1%) and rectal (27.9%) cancer. Surgical procedures included: Right colectomy (36.8%), low anterior resection (24.9%), left colectomy (19.2%), proctocolectomy (10.4%), subtotal colectomy (5.7%) and APR (2.1%). The median number of Lymph Nodes (LN) dissected was 29.6. The median follow-up was 1520.6 (105-3107) days. 54 patients (27.9%) died during the follow up period. Deceased and alive groups were well matched for demographics, ASA score, surgical procedures, number of LN dissected and comorbidities. Statistical Analysis revealed that perineural invasion (PNI) was significantly associated with the deceased group ($p < 0.01$). Vascular and PNI were each associated with a <12 LN dissected ($p<0.001$). All other histopathological variables were not correlated with prognosis. Lower number of LN dissected was noted in the deceased group; however this difference did not reach statistical significance, most likely due to the high median of LN found (29.6).

Conclusions: PNI appears to be an independent poor prognosis factor affecting survival. Adjuvant chemotherapy may be considered in this group of patients. Although the absolute number of LN was not associated with prognosis, patients with PNI had a significant higher possibility of having <12 LN dissected.

P252

Factor	p-value	Hazard Ratio [95% CI]
Tumor Size	p = 0.163	1.086 [0.967 ; 1.219]
Tumor Stage (II vs. I)	p = 0.631	0.83 [0.388 ; 1.773]
Differentiation (Low vs. High)	p = 0.855	1.115 [0.348 ; 3.567]
Perineural Invasion (1 vs. 0)	p = 0.012	3.19 [1.294 ; 7.864]
Mucinous Features (1 vs. 0)	p = 0.916	1.045 [0.457 ; 2.393]
Vascular Invasion (1 vs. 0)	p = 0.999	1.001 [0.378 ; 2.648]
Budding (1 vs. 0)	p = 0.446	0.748 [0.354 ; 1.579]
Number of Lymph Nodes	p = 0.221	0.988 [0.969 ; 1.007]

p: Wald Chi-Square test (Maximum Likelihood Estimates) - Cox Multiple Regression.
(1): Positive; (0): Negative.

RECURRENCE PATTERNS IN PATIENTS WITH RECURRENCE AFTER RECTAL CANCER SURGERY IN RESPECT OF THE TUMOR LOCATION AND THE PREOPERATIVE CHEMORADIATION.

(P253)

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Purpose: The objective of the current study was to evaluate the patterns of recurrence in patients who underwent curative radical resection of rectal cancer in respect of preoperative chemoradiation and tumor location.

Methods: A retrospective review of 2,490 patients underwent curative resection for rectal cancer from January, 2000 to December, 2007 was conducted. A total of 410 patients with recurred rectal adenocarcinoma met inclusion criteria. The patients were divided on two categories, based on the preoperative chemoradiation therapy (PCRT), namely; PCRT (n=101) and non-PCRT (n=309) group. For non-PCRT group, the patients were classified as upper (anal verge ≤ 7cm, n=191) and lower (anal verge > 7cm, n=118) group on the basis of the tumor location. PCRT and tumor location were correlated with recurrence patterns.

Results: The number of organ for the first episode of recurrence was not significantly different between PCRT and non-PCRT groups and single recurrence was most common in both groups (81.4% vs. 75.4%). Although tumor location of PCRT group was lower than that of non-PCRT group (5.1cm ± 2.3cm vs. 6.9cm ± 3.6cm from anal verge), the most common site of recurrence was lung in both groups (29.7% vs. 32.7%) and the second site was liver (16.8% vs. 20.4%) without significance. Into the sub-groups by tumor location, the results showed that more patients of the lower group developed in the lungs as the first recurrence site (27.1% vs. 36.6%), however, lesser patients of the lower group developed in the livers (22.9% vs. 18.3%) without significance. Recurrence pattern according to the PCRT and tumor location did not correlate with survivals.

Conclusions: The most common recurrence site for rectal adenocarcinoma was lung regardless of PCRT and tumor location. Recurrence pattern according to the PCRT and tumor location did not correlate with survivals.

OVEREXPRESSION OF HER-2 IN COLORECTAL CANCER TISSUE, BUT NOT IN SERUM, CONSTITUTES AN INDEPENDENT WORSE PROGNOSTIC FACTOR.

(P254)

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Purpose: Her-2 overexpression is an independent predictor of shorter overall survival and disease free survival and an important biomarker of tumorigenesis and molecular targeted therapy in invasive primary breast cancer and advanced gastric cancer. Conflicting data existed regarding Her-2 overexpression and clinicopathological implications in colorectal cancer (CRC). This study was undertaken to determine Her-2 overexpression in both serum and CRC tissue, its clinicopathological and targeted therapeutic implications in CRC.

Methods: Ninety five CRC patients and sixty healthy controls were prospectively enrolled. Her-2 expression status in serum and CRC tissue was examined by chemiluminescent immunoassay and immunohistochemical staining (IHC), respectively. The results were confirmed using fluorescent in situ hybridization. Clinicopathological parameters were analyzed according to Her-2 expression status.The survival analysis was performed by the Kaplan-Meier method and Log rank test.

Results: Serum Her-2 levels were increased in CRC patients compared with those of healthy controls. However, serum Her-2 level was not significantly associated with prognostic indicators. Her-2 expression study of CRC tissue revealed Her-2 overexpression in 23 patients (25%): 13 patients (14%) showed moderate overexpression and strong in 10 patients (11%). Overall survival of patients with negative Her-2 expression was significantly better than patients with positive Her-2 expression (P=0.018). Disease-free survival of patients with Her-2 overexpression was significantly shorter than that of patients with negative IHC expression (P=0.021).

Conclusions: Her-2 overexpression in CRC tissue, but not in serum, was a significant independent worse prognostic factor. Examination of Her-2 expression status could also be valuable for the targeted therapeutic management of CRC.

RELIABILITY OF THE DIAGNOSIS OF PERINEURAL INVASION AS A PROGNOSTIC INDICATOR IN COLORECTAL CANCER.

(P255)

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Purpose: Perineural invasion (PNI) has emerged as an adverse prognostic marker in colorectal cancer, however

its applicability may be limited due to variable inter-observer variability. The aim of the study is to assess the impact of immunohistochemical stains (S100) in the recognition of PNI, to evaluate inter-observer variability (IOV) and to correlate the presence of PNI with other prognostic factors.

Methods: After IRB approval patients with colorectal cancer who underwent surgical treatment from 1/2002 to 12/2009, were identified from a prospective database. Only cases in which clinical/surgical information and slides/blocks were available were included. Clinical and histological parameters were obtained by chart review. H&E and S100 stained slides of the tumors were reviewed. IOV in the detection of PNI by both H&E and S100 was assessed between two gastrointestinal pathologists. Time required to read the H&E and S100 slides and the number of positive slides for PNI were recorded.

Results: 139 colorectal cancer patients (mean 64 years, 67% female) were included in the study (colon: 46, rectum: 93), with a mean follow-up of 50.8 months. PNI was noted in 44% (pathologist A) and 52% (pathologist B) of cases on H&E slides; and 63% and 58% on S100, respectively. The time to diagnosis went from 3.2 (H&E) to 1.1 minutes (S100) for pathologist A and from 2.4 (H&E) to 1.8 minutes (S100) for pathologist B. IOV showed good levels of agreement for both H&E (k=0.75) and S100 (k=0.72). Overall recurrence rate was 17%, mean time to recurrence was 36 months. PNI by both H&E and S100 was an independent predictor of mortality (OR 3.39,p<0.05) after controlling other factors such as budding, node status and vascular invasion. Receiving Operator Curve demonstrated that PNI in only 1 slide is predictive of prognosis. No differences amongst sites were noted.

Conclusions: PNI can be effectively identified on routine H&E stain with good interobserver variability. It is also an independent predictor of mortality. Even though S100 stain does not significantly impact on sensitivity or specificity, its use significantly reduced time to diagnosis (p=0.05).

PROGNOSTIC FACTORS PREDICTING SURVIVAL IN INCURABLE STAGE IV COLORECTAL CANCER PATIENTS WHO UNDERWENT PALLIATIVE PRIMARY TUMOR RESECTION & CHEMOTHERAPY.

(P256)

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Purpose: The aim of this study is to evaluate prognostic factors predicting survival in incurable stage IV colorectal cancer patients who underwent palliative primary tumor resection(PTR) and chemotherapy. The identification of prognostic factors related to survival could allow the selection of patients who may benefit from palliative PTR and chemotherapy.

Methods: We retrospectively analyzed clinicopatholgical parameters and survival of 103 patients with incurable stage IV colorectal cancer, who underwent palliative PTR and chemotherapy between 2006 and 2010. Palliative PRT was performed with regional lymph node dissection for complete local control. Prognostic factors were evaluated by univariate and multivariate analysis.

Results: The median follow-up time was 17.5 months (range 2.4-60.5) for the total cohort (n=103). There were five independent factors related to overall survival in univariate analyses[body mass index(BMI), tumor grade, pT, pN stage and local clearance of the primary tumor]. A multivariate analysis revealed that pN stage and local clearance of the primary tumor were prognostic factors related to overall survival. Median survival months (95%CI) were pN- : 29.7(22.55 – 35.99) months vs. pN+ : 17.1(15.0 – 19.41)months and R0 : 18.57(16.65 – 20.48) vs. R1 : 12.67(9.45 – 15.88) vs. R2 : 3.03 months.

Conclusions: Complete resection of primary tumor and no metastatic regional lymph node status were related to favorable oncologic outcomes in incurable stage IV colorectal cancer patients who underwent palliative PTR and chemotherapy.

OBESITY IS NOT ASSOCIATED WITH ADVANCED STAGE OR GRADE COLON CANCER ON PRESENTATION.

(P257)

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Purpose: Colon cancer is the third most common cancer and the second leading cause of cancer death worldwide. Obesity is a known risk factor for colon cancer. Increased BMI is also associated with a higher prevalence of advanced adenomatous polyps, the precursor lesion of colorectal cancer. The purpose of this study was to investigate whether obesity (BMI>30 kg/m2) is associated with advanced stage or grade colon cancer on presentation.

Methods: The study was nested in a cohort of 800 colon cancer patients diagnosed between 2004 and 2008 in Manitoba, who underwent surgical resection. Tumor characteristics and complete BMI data was collected on 672 of 800 patients. Two logistic regression models were built, testing if BMI and other potential risk factors were associated with having more advanced cancer (stage III/IV) or a higher grade tumor (grade 3/4). Multivariate analysIs using Cox proportional regression models was performed.

Results: Multivariate analysis revealed that BMI of ≥30 kg/m2 is not associated with high stage or grade cancer on

presentation. Male gender had decreased odds of advanced stage cancer (odds ratio 0.724 [0.529-0.990 CI], p=0.04). Male gender also had decreased odds of higher grade cancer (odds ratio 0.624 [0.421-0.925 CI], p=0.019) on univariate analysis, however this was not statistically significant on multivariate analysis. Right-sided cancers had much greater odds of having higher grade pathology (odds ratio 3.708 [2.156-6.376 CI], p<0.0001). Neither did age nor socioeconomic status demonstrate an association with high stage or grade cancer on presentation.

Conclusions: The lack of association between obesity and advanced or more aggressive colon cancer seen in our study is likely a result of multifactorial etiology, including pathophysiology of disease, difficulty in assessing representative BMIs in cancer patients, and variability in screening habits or diagnostic success rates in the obese population. Our research confirms the conclusion from multiple other studies that right-sided colon cancers, more often seen in females, are associated with more aggressive pathology.

LOSS OF E-CADHERIN EXPRESSION IS ASSOCIATED WITH POOR PROGNOSIS IN COLORECTAL CANCER.

(P258)

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Purpose: Epithelial to mesenchymal transition (EMT) is known to be associated with tumor progression, invasion, and metastasis in colorectal cancer (CRC). The aim of this study is to evaluate expressions of E-cadherin, vimentin, smooth muscle antibody (SMA) and fibronectin and reveal the association with clinic-pathologic variables and disease outcome in stage III CRC.

Methods: Tissue samples were obtained from 415 patients with stage III CRC treated from 2006 to 2007 at Samsung Medical Center. And, formalin-fixed and paraffin-embedded samples were examined by immunohistochemistry (IHC) to reveal the level of expression of E-cadherin, vimentin, SMA and fibronectin. EMT-related gene expression was evaluated for the intensity of immunohistochemical staining and the proportion of the stained epithelial cells.

Results: Among the 415 patients, 223 tissue samples came from colon cancer. Microsatellite instability was detected in 35 patients (8.4%), significantly higher in colon cancer (11.2% vs. 5.2%, p=0.028). 407 cases (98.1%) showed positive expression for E-cadherin. There was no significant difference between colon and rectum in expression of positive markers except vimentin (28.3% vs. 5.2%, p<0.001, respectively). In univariate analysis, preoperative carcinoembryonic antigen (CEA) level more than 5ng/ml (p=0.002), advanced stage (p=0.001), positive vascular invasion (p=0.008), positive perineural invasion (p<0.001) and lower degree of E-cadherin expression (p=0.038) significantly affected poor disease-free survival. Advanced stage (p=0.045, relative risk=8.436, 95% CI=1.502-67.655), perineural invasion (p=0.003, relative risk=2.037, 95% CI=1.278-3.246) and lower degree of E-cadherin (p=0.014, relative risk=3.916, 95% CI=1.318-11.630) were poor prognostic factors affecting disease-free survival in multivariate analysis. Level of E-cadherin expression showed significant difference in terms of overall survival in univariate analysis (p=0.013), but not in multivariate analysis (p=0.192).

Conclusions: E-cadherin expression can be the predictive factor of prognosis affecting disease-free survival in stage III CRC.

PLATELET COUNT CHANGES DURING COLORECTAL CANCER COURSE. A POTENTIAL NOVEL DIAGNOSTIC AND PROGNOSTIC TOOL.

(P259)

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Purpose: Elevated platelets in cancer is associated with poor prognosis. Existing studies usually consider isolated values or thrombocytosis, not individualized or evolutive values. Our aim was to study platelet count evolution in colorectal cancer and their posible changes related to cancer events or treatments.

Methods: We studied retrospectively 129 patients operated for colorectal cancer and 32 with colon resection for a non tumoral process. We collected basal, pre and postoperative platelet counts and analyzed variations related to cancer events or treatments.

Results: Patients were distributed in five groups: 1) who developed metastases (n=29), 2) with synchronic metastases (n=32), 3) whith only local recurrences (n=17), 4) without recurrences and metastases (n=52) and 5) non tumoral (n=32). In primary cancer diagnosis (106) there is an increase in platelet count, greater than 25% from the basal in 6 previous months prior to the rise, of 70.69% (41/58) in groups 1-3 compared with 8.33% in group 4 (4/48) and 6.45% (2/31) in group 5. There are significant differences (p<0.001) between groups in this increase incidence but not in thrombocytosis related to diagnosis incidence. From 49 developed metastases, 31 (63.27%) are preceded by a similar increase; from 37 local recurrences, 25 (67.57%) have it also. There is a significant association (p<0.001) between metastases and recurrences development and the preceding increase. Thrombocytosis appearing later than three months from primary surgery (24-34% in groups 1-3, 13.5% in 4 and

3.1% in 5) is associated significantly ($p<0.01$) with belonging to groups 1-3 and with development of metastases, recurrences and second recurrences (not with second metastases). In group 5 platelet remained stable during all the study.

Conclusions: Our study suggests an association between colorectal cancer events and the existence of a preceding increase in platelet count, from nearly 70% (primary diagnosis, except group 4) and nearly 65% (metastases and recurrences). Postoperative thrombocytosis is associated with metastases and recurrences. More studies are needed to clarify if all increases are related to cancer and the real significance of these findings.

INCREASING COLORECTAL CANCER SCREENING RATES AMONG HISPANIC MEN THROUGH PATIENT NAVIGATION.

(P260)

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Purpose: Colorectal cancer (CRC) can be prevented if precancerous polyps are removed. Being low income, uninsured and Hispanic are associated with low CRC screening rates, sigmoidoscopy or proctoscopy. Many Hispanic men seek care only after symptoms occur. While data indicate the incidence and death rate of CRC among Hispanic men has declined in the last decade, Hispanics are more likely to be screened later and diagnosed with advanced stage CRC compared to non-Hispanic whites. The goal of University Health System (UHS) CRC Screening Male Navigation Program is to develop a model to reduce cancer mortality by screening 300 men for colorectal cancer. The target population includes male, UHS CareLink (county financial assistance program) members, age 50 and older with no prior CRC screening.

Methods: Our program aids in reducing the impact of CRC through the implementation of a multi-component, evidence-based intervention using open-access endoscopy, bilingual patient navigation, one-on-one patient education, assisted transportation to and from screening appointments and colonoscopy services provided by a bilingual, Hispanic, colorectal surgeon. This approach uses a combination of: 1) culturally appropriate, social cognitive theory based techniques to educate patients, remove myths and provide overall social support; and 2) system changes to remove organizational, financial and other major barriers associated with the completion of CRC screening colonoscopies.

Results: To date, the navigation team examined 585 medical records for eligibility, contacted 407 (70%) potential participants and successfully navigated 236 (58%) men through CRC screening. In total, 77 (33%) men had polyps removed of which 4 (2%) were confirmed cancerous.

Conclusions: Access to cancer screening, treatment and education is a proven strategy to successful changes in reducing premature deaths related to cancer. Use of a culturally competent patient navigation team and physician increases the likelihood Hispanic men will complete a CRC screening. Successfully navigated men became role models in their neighborhoods. Their personal stories have been used to demonstrate how easily barriers can be overcome to get this much needed cancer screening.

DETECTION OF CANDIDATE BIOMARKERS FOR COLORECTAL CANCER BY AMPLIFIED QRT-PCR, IN WHOLE-BLOOD FROM AHCRE+ APCFL/FL AND AHCRE+ APC+/+ MICE, A PRELIMINARY STUDY.

(P261)

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Purpose: The single most influential factor dictating survival of colorectal cancer (CRC) is the stage of the disease at the time of diagnosis. An effective screening program could reduce the overall stage at presentation, thus significantly improving disease survival. The current screening programme in the UK (faecal occult blood testing) is inadequate, predominantly due to poor uptake. Previous work by the group has identified a panel of eleven candidate biomarkers for colorectal carcinogenesis, which could potentially be implemented in an improved screening test. This study attempts to utilise qRT-PCR, both with and without an RNA amplification step, to detect these candidate biomarkers in the blood of AhCre+ APCfl/fl mice, which model colorectal carcinogenesis following acute APC loss, and AhCre+ APC+/+ which serve as controls.

Methods: Blood samples were extracted by cardiac puncture under terminal anaesthesia and snap-frozen in liquid nitrogen from three AhCre+ APCfl/fl and three AhCre+ APC+/+ mice. RNA extraction was performed using the PAXgene® Blood RNA Kit (PreAnalytix). RNA amplification was performed using the MessageBOOSTER™ Whole Transcriptome cDNA Synthesis Kit for qPCR, (epicentre). qRT-PCR was performed using the LightCycler® 480 System (Roche).

Results: Only CK18 showed a significantly increased fold-change in expression (1.2), in the AhCre+ APCfl/fl samples compared to AhCre+ APC+/+ samples prior to RNA amplification. Following the amplification step significantly increased fold-changes in the expression of both CK18 (1.4) and Nucleolin (1.2) were seen in the blood of AhCre+ APCfl/fl mice when compared to AhCre+ APC+/+ mice.

Conclusions: Two of our original panel of eleven candidate proteins known to be implemented in CRC carcinogenesis are detectable in whole blood. The detection of these proteins (CK18 and Nucleolin) in the blood permits their consideration for use as a screening tool. Further in vivo work is required to establish this potential.

IMPACT OF ROUTINE COLONOSCOPY ON INCIDENCE OF COLORECTAL CANCER IN A SEMI-URBAN NIGERIAN HOSPITAL.

(P262)

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Purpose: To examine the impact of routine use of colonoscopy on the incidence and clinicopathological features of colorectal cancer in a Nigerian tertiary health facility

Methods: All cases of colorectal cancer seen in Obafemi Awolowo University Teaching Hospital Complex from 1991 to 2011 were retrospectively reviewed. The year of study were divided into two. The first is 1991 – 2006 which is a period that colonoscopy were not routinely done. The second is 2007-2011 which is the period colonoscopy were routinely done for lower gastrointestinal condition. The clinicopathological of the patients were reviewed. The yearly hospital incidence was noted.

Results: Over the 20 year period, 490 cases of colorectal cancer were seen which account for 46.4% of all gastrointestinal cancers. The average yearly incidence of the cases rose from 10-20 cases in 1991-2006 to 50-75 cases per year in 2007-2011. The male to female ratio changed from 3:2 in the first period to 1:1 in the second period. The incidence of occurrence of colorectal cancer in individual younger than 50 years also increases from 18.5% to 43.8% in the last 5 years. There is relative increase in the caecal pole tumor in the second period, though rectal tumor is the most common site in both periods. There is also increase in the occurrence of mucinous adenocarcinoma especially in those below 50 years. There is significant reduction in those patients presenting with metastatic disease at presentation in the second period ($p<0.036$). Though the resection rate increased in the second period, colostomy rate also increased marginally in the second period. We found also that there is increase use of combination adjuvant therapy in the second half. Analysis of the survival period showed an improvement in the survival period in the last period.

Conclusions: This study showed that judicious use of colonoscopy for symptomatic patients with lower gastrointestinal symptoms may help to increase the detection rate of colorectal cancer in rural and semi rural setting of developing countries. With increase occurrence of colorectal cancer in the young, screening age for colorectal cancer should be lower in such setting.

SURGICAL TRENDS AND OUTCOMES OF COLORECTAL CANCER IN THE AGING POPULATION: A DECADE ANALYSIS.

(P263)

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Purpose: The incidence of colorectal cancer in elderly patients is likely to increase with the aging population. This study aims to examine the surgical trends and outcomes of colorectal cancer treatment in the elderly.

Methods: Using the Nationwide Inpatient Sample 2001-2010, a retrospective review of surgical cases for colorectal cancer was conducted. Patients were stratified within age groups of 45-64; 65-69; 70-74; 75-79; 80-84 and >85 years old. Post-operative complications and yearly trends were analyzed. A multivariate logistic regression was used to compare mortality and morbidity between individual groups >65 and patients 45-65 years old while controlling for gender, comorbidities, procedure type, diagnosis and hospital status.

Results: Among the estimated 1,043,108 colorectal cases sampled, 64% of cases were performed on patients >65, and 23% on patients >80. Emergent/urgent operations were performed in 34% of cases. Patients >80 were 1.7 times more likely to undergo urgent operation than those <65. During 2009-2010, patients <65 accounted for 47% of the laparoscopic cases performed in the elective setting compared to 14% for patients >80. Overall mortality over the 10 year period has decreased by 5.71% with the most considerable decrease observed in the population >85 (7.68%). Patients >80 had an associated $9,492 lower hospital charge and an increased 2.5 days length of stay compared to patients age <65. On multivariate logistic regression analysis, the risk of morality is increased by 1.32 in the 65-69 group, 2.02 in the 70-74 group, 2.5 in the 75-79 group, 3.15 in the 80-84 group, and 4.72 in the >85 group when compared to patients age 45-64 ($p<0.01$). The risk of morbidity is increased by 1.25 in the 65-69 group, 1.40 in the 70-74 group, 1.54 in the 75-79 group, 1.68 in the 80-84 group, and 1.96 in the >85 group compared to patients age 45-65 ($P<0.01$).

Conclusions: The majority of colorectal surgery for colorectal cancer is performed on the aging population. Despite the improved outcomes seen over the last 10 years for mortality, the risk-adjusted mortality and morbidity of the elderly continues to be substantially higher than the younger population.

A NEW LOOK AT THE VOLUME AND OUTCOME RELATIONSHIP IN SURGERY FOR COLORECTAL CANCER.

(P264)

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Purpose: Surgeon and hospital factors have a significant impact on treatment outcomes for colorectal cancer (CRC). Limited research has been done to assess cost and quality of treatment by surgeon-volume. We aim to identify the surgeon factors impacting cost and quality of surgical care for CRC.

Methods: The University HealthSystem Consortium database was queried for patients who underwent colon resection for cancer from 2008 to 2012. Patients were grouped by surgeon-volume. Outcomes of interest were post-operative complications, ICU admission, readmission rate, inpatient hospital length of stay (LOS) and direct hospital cost. Average surgeon-volume per year was categorized as high (>6) or low (1-6) based on the distribution of surgeon-volume.

Results: 29,972 patients over age 18 were identified for inclusion. 25,426 underwent resection by high-volume surgeons (HVS) and 4,547 by low-volume surgeons (LVS). LVS were more likely to admit patients to the ICU than HVS (21% v 33%, $p<0.01$). Average LOS was shorter for HVS compared to LVS (8.9 v 11.2, $p<0.01$). Patients operated on by HVS had a lower 30-day readmission rate than LVS (5.8% v. 8.3%, $p<0.01$). HVS had a lower complication rate than LVS (8.3% v 12.2% $p<0.01$). HVS were more likely then LVS to perform the procedure laparoscopically ($p<0.01$). Hospital direct cost for both open and laparoscopic colectomies were lower when performed by HVS compared to LVS ($p<0.01$). Results are adjusted for age, gender, race, insurance status, admission severity of illness and procedure urgency.

Conclusions: Surgeons who perform greater than 6 colectomies per year for colon cancer are more likely to use laparoscopy, less likely to admit patients to the ICU, have lower complication and readmission rates, and shorter LOS. Hospital cost is significantly lower in patients operated on by high volume surgeons. As health care costs continue to escalate and health care reform efforts gain momentum, factors leading to high-quality, cost-effective care need to be identified.

LONG-TERM RESULTS OF INTERSPHINCTERIC PROTECTOMY FOR VERY LOW-LYING RECTAL CANCER.

(P265)

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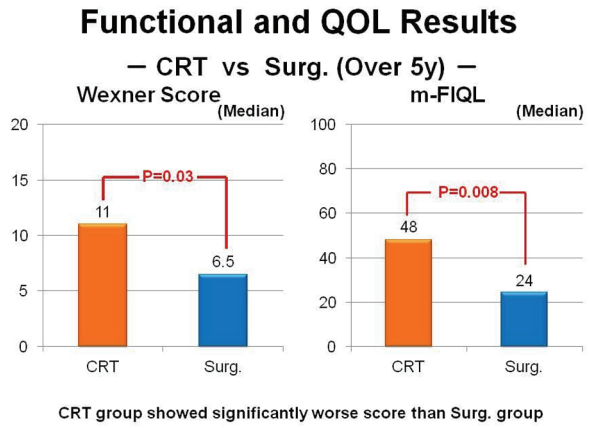
Purpose: Lower rectal cancers located less than 5cm from the anal verge are traditionally treated by abdominoperineal resection(APR). While, sphincter-preserving operations for very low-lying rectal cancer close to the anus have advanced in the last twenty years with a new surgical procedure of intersphincteric resection(ISR). The aim of this retrospective study was to evaluate long-term oncologic and functional outcomes, and quality of life(QOL) in patients with or without preoperative chemoradiation therapy(CRT) followed by ISR.

Methods: 164 patients with very low rectal cancer locates within 5cm from the anal verge underwent curative ISR with preoperative CRT(n=51, CRT group) or without preoperative CRT(n=113, Surg. group) between 2000 and 2007 at our institute. CRT(45Gy delivered over a 5-week period with continuous infusion of 5-fluorouracil) was performed in 51 patients with T3 clinical tumors. The data of these 164 patients were analyzed for 7-years survivals, postoperative bowel function and QOL at over 5-years. Bowel function was investigated using Wexner incontinence score (0=perfect continence, 20=major incontinence). QOL was also assessed with modified Fecal Incontinence Quality of Life Scale(m-FIQL, 0:Excelent, 100:Bad).

Results: Oncologic results; After a median follow-up of 72months in both group(range,1-145), estimated 7-year disease-free survival was 67% for Surg. group and 66% for CRT group($p=0.90$). Estimated 7-year overall survival was 78% for Surg. group and 74% for CRT group($p=0.44$). The 7-years local relapse-free survival rate was 79% for surg. group and 87% for CRT group in clinical T3 or T4 patients ($p=0.22$). Functional results; The median Wexner incontinence score at over 5-years after stoma closure was 11(range,6-20) in CRT group and was 6.5(range, 1-16) in Surg. group($p=0.03$). QOL results; Modified FIQL scale at over 5-yers after stoma closure showed 29 in this series. This scale also showed 24 for Surg. group, and 48 for CRT group($p=0.008$).

Conclusions: With long-term follow up, oncological and functional outcomes after ISR for low-lying rectal cancer are acceptable, although functional and QOL results show worse score in patient with preoperative CRT than in patients without CRT.



ONCOLOGIC IMPACT OF ANASTOMOTIC LEAKAGE IN RECTAL CANCER SURGERY: THE ROLE OF FIBRIN GLUE.

(P266)

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Purpose: There is still controversy about the oncologic impact of anastomotic leakage after rectal cancer surgery. This study examined the influence of anastomotic leakages on oncologic outcome. The role of fibrin glue as an anastomotic sealant was also delineated.

Methods: Between January 1999 and December 2010, patients with rectal cancer who underwent curative surgery were retrospectively reviewed. Predictive factor for leakage and oncologic outcomes were evaluated.

Results: In total, 1148 patients were included, with 46.9 months median follow-up. Anastomotic leakage was diagnosed in 76 (6.6%). Multivariable logistic regression analysis indicated fibrin glue was associated with a lower rate of anastomotic leakage (Odds ratio: 1.9, 95% confidence interval: 1.0-3.6, p = 0.038). The prevalence of mortality and local recurrence were not significantly higher in patients diagnosed with anastomotic leakage. In multivariate analysis, patients with anastomotic leakage had a significantly worse 5-year disease-free survival rate and overall survival than those without anastomotic leakage (hazard ratio: 1.9, 95% confidence interval: 1.0–3.5, p = 0.036 and hazard ratio: 3.7, 95% confidence interval: 1.7–7.9, p < 0.001, respectively) and fibrin glue was not associated with local recurrence, disease-free survival and overall survival.

Conclusions: Anastomotic leakage was a major independent prognostic factor for long-term survival. Fibrin glue has a protective effect of anastomosis, but no oncologic advantage.

DOES PREOPERATIVE WEIGHT LOSS REDUCE THE RISK OF ABDOMINOPERINEAL RESECTION AND IMPROVE LONG-TERM OUTCOMES IN OBESE PATIENTS?

(P267)

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Purpose: Obesity is associated with rectal cancer carcinogenesis and poor surgical outcomes due to metabolic syndrome, obesity-related comorbidities and the technical challenge of manipulating fatty tissue. Thus, weight loss is advised to improve surgical outcomes. However, the recommendation mostly relies on indirect evidence of single BMI observations. This study aimed to assess the relationship between BMI alterations and treatment outcomes in rectal cancer patients.

Methods: The records of 120 consecutive patients with stage II or III rectal adenocarcinoma who underwent preoperative chemoradiation from 1998-2007 were reviewed from an IRB-approved database. 8 patients were excluded due to insufficient data. BMI at diagnosis and surgery was compared. BMI reduction was defined as ≥5% during observation; patients were grouped by BMI (kg/m^2) as obese (≥30) or nonobese (<30). Pathologic response, sphincter preservation rate, 5-year overall survival (OS) and 5-year disease-free survival (DFS) were compared. Chi-square and Student's t-tests were used to analyze outcomes for BMI alterations; $p<0.05$ was considered significant.

Results: 112 patients including 36 obese patients (32%) were identified. The mean interval between diagnosis and surgery was 90 days. The obese and nonobese groups did not differ in complete pathologic response rates (mean 26.5%, p=0.66). Although distal lesions were more common in the nonobese group (45% vs 39%, p=0.78), the abdominoperineal resection (APR) rate was lower (17% vs 31%, p=0.17). In a subgroup analysis, the APR rate was 50% lower for patients who reduced BMI by ≥5% versus those who did not (17% vs 34%). BMI-reduction patients were likely to have longer 5-year DFS (100% vs 72%, p=0.14) and 5-year OS (100% vs 86%, p=0.33). No improvements in APR rate or 5-year DFS and 5-year OS were found for BMI-reduction patients in the nonobese group.

Conclusions: Rectal cancer in obese patients is associated with a lower likelihood of sphincter preservation, as compared to nonobese patients. However, trends towards increased sphincter preservation rate, 5-year DFS, and 5-year OS were found after weight reduction.

OUTCOMES OF MANAGEMENT FOR GASTROINTESTINAL STROMAL TUMORS ORIGINATING FROM THE LOWER GASTROINTESTINAL TRACT.

(P268)

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Purpose: This study was performed to identify clinicopathologic prognostic factors for tumor recurrence and survival for GIST originating from the lower GI tract.

Methods: 101 patients (mean age, 56.7 years, M:F = 63:38) with the small and large bowel GISTs were operated in our institution. We retrospectively analyzed the clinicopathologic factors related to the outcome.

Results: The primary site of tumor was small bowel in 71 patients (70.3%) and colo-rectum in 30 patients (29.7%). The median size of the tumor was 7.4 cm. Seventy-six tumors (76%) were classified as high-risk and 24 as low-risk GISTs. Seventeen patients (16.8%) had synchronous metastases. Forty eight patients (47.5%) received adjuvant glivec therapy and neoadjuvant glivec was used in 3 patients. Among 75 patients (74.3%) in whom R0 resection was accomplished, 27 patients (36%) developed local recurrence (n=8, 29.6%) or distant metastasis (n=19, 70.4%). Subsequent resections were performed in 8 patients with local recurrence, and 4 patients underwent liver resections for distant metastasis. The overall 5-year disease free survival (DFS) was 52.3% (median, 35.0 months (1~165 months)). Larger tumors (≥ 5cm), mitotic count of 5 or more, ki-67 staining > 10 %, mucosal involvement and high-risk GIST were significantly associated with shorter DFS. During median follow-up of 58.0 months, the 5-year overall survival (OS) was 81.8% (median, 59.0 months (1~165 months)). Old age (>50 years), synchronous distant metastases and incomplete tumor resection were factors associated with significantly poor survival. Multivariate analysis revealed that mucosal involvement of GIST was independent prognostic factor for DFS (HR 9.8, 95% CI, 1.1–91.8, P =0.044) and incomplete tumor resection was independent prognostic factor for OS (HR 4.7, 95% CI, 1.9–11.7, P =0.0001).

Conclusions: Incomplete tumor resection was significantly associated with overall survival and mucosal involvement was associated with increased tumor recurrence. Although overall survival is relatively favorable owing to adjuvant medical therapies, our results indicate that complete surgical resection is the most important means of cure for GISTs originating from the lower GI tract.

ONCOLOGICAL OUTCOMES FOLLOWING ANASTOMOTIC LEAKS IN RECTAL CANCER SURGERY.

(P269)

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Purpose: Recurrence of rectal cancer following curative surgery is a significant clinical issue carrying a poor prognosis. Anastomotic leak (AL) is postulated to be a risk factor for disease recurrence, however literature is conflicting as to its significance. An analysis of patients undergoing anterior resection (AR) for rectal cancer was undertaken to examine effect of AL on oncological outcomes.

Methods: All patients undergoing curative AR for rectal cancer from 2003–2009 were included in the study. Data was collected on radiological/histological staging, anastomotic leaks, distant spread (DS) and local recurrence (LR) over 3-5 years. Leaks were classed as either symptomatic (found at theatre or on CT) or asymptomatic (found at routine proctogram).

Results: 357 patients underwent AR, 21 developed symptomatic leaks (5.88%) at a median of 10 days postoperatively. 15 patients had asymptomatic AL (4.2%). 16 patients developed LR (4.48%), at a median of 615 days postoperatively. LR in patients who developed symptomatic AL (9.52%) was notably higher than those who had not leaked (4.16%) and those with asymptomatic AL (0%). Of those patients who did not have definitive proof of DS preoperatively (n = 337), 85 (25.22%) had detectable metastases on postoperative follow-up imaging, at a median of 391 days postoperatively. In patients without AL, 24.05% (n=76) who had no definitive evidence of DS preoperatively went on to develop DS, compared to 38.09% in the symptomatic AL group and 21.05% in the asymptomatic AL group.

Conclusions: This study supports the hypothesis that symptomatic AL is associated with poorer oncological outcomes in terms of both LR and distant disease spread. Opinion is divided as to whether AL is associated with increased rates of disease recurrence. Several studies have found no increased risk of LR/DS following leak, whilst others (including a meta-analysis) have identified poorer oncological outcomes following AL. One suggestion is that symptomatic AL promotes immunosuppression to enable malignant cells to propagate – thus explaining the difference in LR/DS between symptomatic and asymptomatic leaks. In view of the conflicting literature, the significance of AL on disease relapse should be further investigated.

POSTOPERATIVE COMPLICATION OF A SINGLE-STAGED OPERATION AFTER ON TABLE LAVAGE FOR LEFT-SIDED MALIGNANT COLORECTAL OBSTRUCTION IS COMPARABLE TO ELECTIVE SURGERY.

(P270)

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Purpose: The purpose was to assess the safety of single-stage resection, on table lavage, and immediate anastomosis in patients with obstruction of left-sided colorectal cancer.

Methods: From 2000 to 2011, 1225 patients underwent a single-stage resection and immediate anastomosis for treatment of left-sided colorectal cancer. There were 1054 (86.0%) and 171 (14.0%) cases of Non-obstructed (NOB) and Obstructed (OB) colorectal cancer, respectively. On table lavage using a Neo Intraoperative Colonic Irrigator (NICI) was performed in patients presenting with obstruction before anastomosis. NOB CRC was performed using a conventional bowel preparation, preoperatively. The outcome was assessed according to development of major postoperative complications; anastomosis leakage (AL), acute renal failure (ARF), postoperative obstruction (POB), surgical site infection (SSI), and mortality.

Results: Obstructed left-sided colorectal cancers showed adverse preoperative conditions (Age, WBC, Hemoglobin, albumin level, and advanced tumor stage). On table lavage time for OB was 17.5 minutes (range: 14-60 minutes). And mean operation time for OB was statistically longer than that of NOB ($p<0.001$); OB was 210 minutes (range: 120-480 minutes) and NOB was 180.9 minutes (range: 60-420 minutes). Overall major postoperative complications of OB did not show a significant increase, compared with those of NOB (23.4% vs. 19.4%, $p=0.220$). AL, ARF, POB, and SSI were similar in both groups (AL: OB 6.4% vs NOB 4.7%; ARF: OB 4.1% vs NOB 2.0%; POB: OB 7.0% vs 6.4%, SSI: OB 4.7% vs NOB 2.7%). Mortality of OB (4.1%) was significantly higher than that of NOB (1.1%) ($p=0.004$). Seventeen of 19 of mortality were result from postoperative surgical complications.

Conclusions: On table lavage and one-staged anastomosis can be performed in the majority of patients with malignant colon obstruction without a significant increase in postoperative morbidity, compared with non-obstructed left-sided colorectal cancer. However, postoperative mortality in patients with obstructed colorectal cancer will be more susceptible to postoperative adverse events, compared to those with non-obstruction.

LAPAROSCOPIC TME: SHORT- AND LONG-TERM RESULTS IN A SINGLE INSTITIONAL SERIES INCLUDING 516 PATIENTS.

(P271)

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Purpose: to assess short and long-term oncologic outcome after laparoscopic total mesorectal excision (TME) for rectal cancer in a single Institution series including 516 patients.

Methods: We reviewed the prospective database of 516 unselected consecutive patients with histologically proven cancer of the mid and distal rectum undergoing laparoscopic TME between January 2000 and January 2012. Those with T3-T4 or N+ received long course preoperative radiochemiotherapy. Surgical technique and follow-up were standardized. Data evaluated included short and long-term results with survival outcomes calculated using the Kaplan-Meyer method.

Results: Some 516 patients underwent laparoscopic TME. Conversion to open surgery was required in 4.8 % of patients. Adjuvant treatment was given in 60.5 % (312/516) of the patients. A Sphincter-preserving surgery was performed in 484 patients, while an abdominoperineal resection of the rectum was necessary in 32 cases. The overall postoperative mortality rate was 1.7 %. The overall morbidity rate was 30.9 %. Clinical anastomotic leak occurred in 17 (82/484 pts) % of the patients. The reoperation rate was 11 %. With respect to short-term oncological variables, mean (SD) distal resection margin was 2.9 (2) centimetres and the mean (SD) number of lymph nodes intraoperatively collected was 15.5 (9.3). A R0 resection rate was obtained in 95. 9 (495/516)% of the patients. Mean (range) follow-up period was 72 (10 - 156) months. Overall and disease free survival rate were 71.3% and 63.4 %, respectively. There was no case of trocar site recurrence. The local recurrence rate occurred in 5.3 %. of the patients after curative resection.

Conclusions: The results of these study with large number of patients over a long follow-up period suggested that laparoscopic TME is safe with a good oncological outcome.

LAPAROSCOPIC VERSUS OPEN TOTAL MESORECTAL EXCISION FOR RECTAL CANCER; A SYSTEMATIC REVIEW AND META-ANALYSIS.

(P272)

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Purpose: Due to a lack of definitive long term results, the oncological safety of laparoscopic rectal cancer surgery remains controversial. Non-randomized studies show laparoscopic total mesorectal excision to have several short-term benefits compared to open surgery. In this systematic review of randomized trials, we aim to prove laparoscopic TME to be as safe as open TME and to have a faster short-term recovery.

Methods: We searched MEDLINE, EMBASE, CENTRAL and Current Contents from 1990 to March 2011. In addition, we hand searched the clinical trials and controlled trials databases for ongoing trials. Only randomized controlled trials were egliable for inclusion, selection and data collection was performed by 2 independent reviewers.

Results: We selected 28 studies out of 714 results, including 2146 patients. Data was analysed according to intention to treat with a mean conversion rate of 14,7%(range 0-35%)in the laparoscopic group. The five-year disease free survival did not differ between both groups (Odds ratio 1.01, 95%CI 0.77-1.34), as did the overall survival (1.15 95%CI 0.88-1.50) and local recurrence rate (1.13 95%CI 0.77-1.66). As for the short term results, the surgical time was longer with a mean difference of 38 minutes (95%CI 25-51), and the costs were higher for laparoscopic TME with differences between 300 and 2000 euro. The number of resected lymph nodes and surgical margins did not differ. The length of hospital stay was significantly shorter by 3 days (3.6 95%CI 3.1-4.2), as was time to first bowel movement and a reduced need for oral analgesia. The number of complications did not differ significantly, with an exception for a lower wound infection rate (0.62 95%CI 0.42-0.91) and bleeding complications (0.30 95%CI 0.10-0.93) in the laparoscopic group.

Conclusions: In this meta-analysis, laparoscopic TME has shown to be as safe oncologically as open TME. The surgical time is longer and costs are higher, but postoperative recovery is significantly faster. Increasing laparoscopic experience and volume can reduce the length and costs of the procedure. Ongoing trials as the Dutch COLORII, the American CTSU and the Australian A La CaRT will confirm these results in a few years' time.

ANTERIOR RESECTION WITH TME: LONG-TERM ONCOLOGICAL OUTCOMES WITHOUT PREOPERATIVE RADIOTHERAPY.

(P273)

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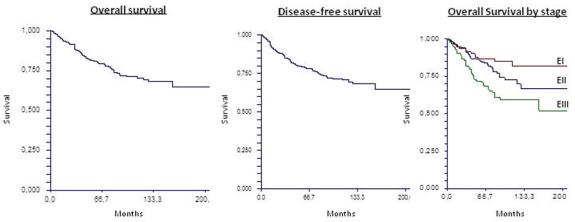
Purpose: Preoperative radiotherapy (PRT) in rectal cancer has been increasingly used in order to reduce local recurrence (LR). However, adequate TME has decreased LR rate to less than 5%. Moreover, there are no clear data supporting systematic PRT in terms of potential risks and long-term oncological benefits. Thus the aim of this study was to analyze long-term outcomes of anterior resection in rectal cancer without PRT.

Methods: 556 consecutive patients who underwent curative anterior resection for rectal cancer between jan-90' and dec-06' were analyzed. Exclusion criteria included PRT (8%), postoperative deaths (1.9%), abdominoperineal resection (8.6%) and total proctocolectomies (0.5%). Patients were analyzed in terms of disease location and TNM staging. Long-term outcomes including LR rate, disease-free (DFS) and overall survival (OS) were analyzed by Kaplan-Meier method.

Results: In 495 patients, disease location was 32.5%, 41.2% and 26.3% for upper, middle and low rectum, respectively. There were 26.7% of patients with stage I, 39.6% with stage II, and 33.7% with stage III disease. The overall LR rate was 3.2%, with no differences regarding disease location (3.1%, 2.9% and 3.8%, P=0.89) for upper, middle and lower rectum, respectively. LR rate by stage was 1.6%, 2.5% and 5.4% for stage I, II and III, respectively, P=0.13. There were no differences in LR rate between N1 and N2 stage III (3.4% vs. 9.8%, p=0.09). Among patients with N2 stage III disease, those with more than 5 positive nodes presented a higher LR rate (2.9% vs. 16.1%, p<0.001). Media follow-up time was 74.6 months (95% CI: 70-78). Five-year OS and DFS rates were 79% (95%CI: 76-83) and 78% (95%CI: 75-82), respectively. Five-year OS by stage was 86% (95%CI:80-92), 84% (95%CI:79-89), and 70% (95%CI: 63-78) for stage I, II, III with no differences between N1 and N2 patients (p=0.3). Five year OS for patients with more than 5 positive nodes was 55% (CI 95%: 37-73, p<0,001).

Conclusions: Adequate TME without PRT is associated with a low LR rate and excellent long-term oncological outcomes. Patients with more than 5 positive nodes were associated with a higher LR rate and worse OS.



DOES PATHOLOGY MATTER? COLORECTAL RESECTIONS FOR GYNECOLOGIC VERSUS COLORECTAL MALIGNANCIES: AN ACS-NSQIP STUDY.

(P274)

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Purpose: Surgical resection remains primary therapy for both gynecologic and colorectal cancers. However, whether resections performed for different oncologic diagnoses have similar short-term outcomes remains unclear. This will become increasingly important as ACS NSQIP expands to additional subspecialties over the coming years, particularly gynecologic-oncology. We hypothesized that patients undergoing colorectal resections would have similar outcomes regardless of whether the malignancy being resected is a gynecologic or colorectal primary.

Methods: In the 2010-2011 ACS-NSQIP PUF, we identified 4944 women undergoing open colorectal resections for either colorectal or gynecologic malignancies. Baseline characteristics were compared by primary diagnosis. Multivariable logistic regression was used to assess the impact of diagnosis on three outcome measures: major complications, extended length of stay and unplanned readmission. As a secondary analysis, we investigated the specialty of the operative surgeon. All analyses were performed in SAS 9.3 (Cary, NC) and were IRB approved (HSC#1210E23262).

Results: Of our total cohort, 236 patients had colorectal resection due to a primary gynecologic malignancy. On unadjusted analysis, major complications were seen in 26.93% of the colorectal malignancy group but 68.6% of the gynecologic malignancy group (chi sq p<0.001). The median LOS was 6 days for the colorectal group and 8 days for the gynecologic group (p<0.001). Multivariate analyses demonstrated that gynecologic malignancy predicted higher odds of both major complications and extended length of stay >75th percentile, but not of unplanned readmission (see TABLE). Of the 236 colorectal resections for gynecologic malignancy, 185 were performed by gynecologist-oncologists.

Conclusions: Short term outcomes after colorectal resection do differ based on the malignancy being resected. This may be due in part to more extensive malignant disease or additional procedures performed, including debulking. As ACS-NSQIP extends to other surgical specialties, it will be increasingly important to robustly capture these concurrent procedures such that outcomes are fairly considered on a per hospital basis.

STUDY ON THE RELEVANCE OF THE POSTOPERATIVE PROGNOSIS OF COLORECTAL CANCER AND OBESITY-RELATED FACTORS.

(P275)

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Purpose: Obesity is an important prognostic factor, and some studies report it as a risk factor for the development of colorectal cancer (CRC). However, controversy exists about the influence of the factor on survival in CRC patients. Obese patients are also threatened by other factors such as cardiovascular or cerebral vascular event. Therefore, it has been unclear whether obesity purely influences on their postoperative survival, and if so, what index can predict the survival. The aim of this study is to evaluate the correlation between the obesity-related factors (ORFs) and prognosis in CRC patients.

Methods: Between 2004 and 2009, 761 patients who underwent tumor resection for CRC were retrospectively analyzed. Height, weight, body mass index (BMI), circumstance of waist and hip were utilized as ORFs. The relationships between these ORFs and survival outcomes were assessed using cox proportional-hazards model. To assess the influence of individual ORFs on the cause-spe-

P274

Outcome (Gyne vs CR Malignancy)	Adjusted OR*	95% CI	P-Value
Major Complication (n= 4944; c=0.73)	5.702	4.176-7.785	<0.001
LOS > 75th Percentile (n=4944; c=0.71)	1.741	1.297-2.336	<0.001
Unplanned Readmission - 2011 Only (n=2682 ;c= 0.62)	0.802	0.489-1.314	0.382

*Adjusted for age, gender, race, ASA score, BMI, smoking status, alcohol consumption, functional status, diabetes, cardiac comorbidities, pulmonary comorbidities, renal failure, chemotherapy, radiation, procedure performed, wound classification, operative duration >3 hours, and preoperative factors including weight loss, WBC, albumin, creatinine, platelet count and hematocrit.

cific mortality, competing risk (cancer specific death, vascular related death, other-cause death) regression analysis was also conducted.

Results: A total of 761 patients, 421 in stage I-II, 222 in stage III and 118 in stage IV, were included in this study. Univariate analysis demonstrated only the increased BMI was associated with better postoperative survival (Hazard Ratio (HR) 0.91, p=0.049). Divided into four different categories according to BMI (underweight; BMI<20, normal weight; BMI 20-25, overweight; BMI 25-30 and obese; BMI>30), from cox hazard regression, hazard risk became smaller in the higher BMI group (underweight: HR 2.03, p=0.004, overweight; HR 0.28, p=0.007) compared to normal weight group. In competing risk regression, increased BMI decreased the risk of death from cancer (Sub Hazard Ratio 0.90, p=0.003). This indicates BMI is a predictive index of cancer specific death. Otherwise, it has no relation with vascular related death, other-cause death.

Conclusions: Among several ORFs, BMI is considered the most valuable in terms of prediction of postoperative survival in CRC patients, where the negative correlation was identified. This protective effect of the increased BMI was observed only in cancer specific death.

SELF-EXPANDABLE METALIC STENT VERSUS SURGICAL INTERVENTION FOR UNRESECTABLE OBSTRUCTIVE COLORECTAL ADENOCARCINOMA.

(P276)

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Purpose: Self-expandable metallic stent (SEMS) is reported to be useful to avoid large bowel obstruction in patients with obstructive colorectal cancer (CRC). Although SEMS is gaining the acceptance as a palliative treatment for obstructing colorectal cancer, the efficacy of this modality in a palliative treatment has not been quantified when compared to those treated with surgical interventions, including stoma creation or tumor resection. The objectives of this meta-analysis are to evaluate the effectiveness of SEMS in terms of mortality, morbidities and long-term survival rate, compared to surgical interventions.

Methods: A literature search of Pubmed and Cochrane library controlled trials registry was conducted on all studies comparing SEMS with surgical interventions, such as stoma creation or tumor resection in patients with unresectable obstructive CRC. The outcomes of interest were defined as mortality, morbidities, stoma creation rate, perforation rate and long-term survival rate, and these data were extracted from individual studies.

Results: Ten studies met our inclusion and exclusion criteria. They reported on the outcomes of 762 patients, of whom 383 (50.3%) underwent the insertion of SEMS and 379 (49.7%) underwent any surgical intervention. The insertion of SEMS significantly decreased mortality (odds ratio [OR] = 0.23 [0.09 – 0.58], p =0.01), complication (OR = 0.39 [0.19 – 0.81], p < 0.01) and need of stoma creation (OR = 0.10 [0.02 – 0.44], p < 0.01). On the other hand, the insertion of SEMS increased the perforation of large bowel (OR = 5.86 [1.77 – 19.41], p < 0.01). Finally, the computed hazard ratio (HR) demonstrated that the insertion of SEMS had no impact on poor prognosis (HR = 1.05 [0.87 – 1.29], p = 0.60).

Conclusions: The insertion of SEMS is useful in terms of the decreased mortality, complication and need of stoma creation with no correlation with poor prognosis. Taking into account the safety application of this modality, the further improvement to prevent perforation of large bowel is needed.

LONG-TERM ONCOLOGIC OUTCOMES IN ROBOTIC TOTAL MESORECTAL EXCISION.

(P277)

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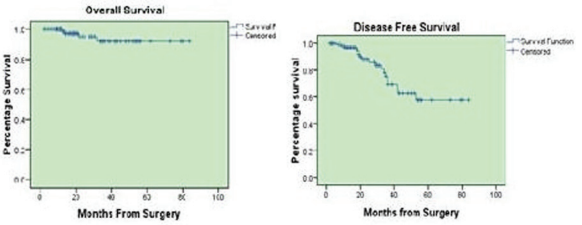
Purpose: Robotic mesorectal excision for rectal cancer is gaining recognition because of its potential benefits in difficult pelvic space. Whether the technical advantages could be translated into better oncologic and survival outcome is still under investigation. We aimed to evaluate our experience with robotic total mesorectal excision for rectal cancer in terms of recurrence and survival.

Methods: We retrospectively evaluated our prospectively collected data of patients who underwent total mesorectal excision for stage 1-4 rectal cancer between August 2005 and June 2012 in a suburban tertiary center. Local recurrence, distant metastasis, overall and disease-free survival were the primary outcomes. Data was analyzed using SPSS version 16. Mean and standard deviation were calculated for continuous data. Kaplan Meier curve was used to evaluate the trend in survival over a follow up of 2 years. P value of less than 0.05 was considered statistically significant.

Results: The initial 102 consecutive cases of rectal cancer that underwent robotic total mesorectal excision were included in the study. Mean age was 62 (34-88 years), mean BMI was 27.8 (18-41) and mean length of follow up was 25.8 months (2- 84 months). Male to female ratio was 2:1. Stage I-IV distribution was 20% (n=21), 34% (n=35), 38% (n=39) and 7% (n=7%) respectively. Neoadjuvant chemoradiation therapy was given in 70% (n=72) of patients. The level of the tumor was low rectum in 59%, mid rectum in 26% and upper rectum in 13%. Circumferential margin was positive in 3 (2.9%) cases and there were 2 threatened margins. Two patients had posi-

tive distal margin. There were 55 (54%) low anterior resections, 24 (23.5%) ultralow resections and 23 (22.5%) abdominoperineal resections. In stages I-III local recurrence rate was 2% (n=2) and distant metastasis was found in 8.4% (n=8) of patients. Two year overall and disease-free survival was 95.3% and 74.5%, respectively.

Conclusions: Ocologic outcomes for robotic total mesorectal resection is comparable to previously published data for open and laparoscopic approaches. Therefore, robotic total mesorectal resection is a safe and oncologically sound approach to rectal cancer.



LAPAROSCOPIC VERSUS OPEN RESECTION FOR TRANSVERSE AND DESCENDING COLON CANCER. MULTICENTER HISTORICAL STUDY OF 1,832 PATIENTS IN JAPAN.

(P278)

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Purpose: Most of randomized clinical studies of laparoscopic colorectal cancer resection were not including transverse and descending colon cancer patients. To clarify short and long term results of laparoscopic transverse and descending colon cancer resection, multi-center historical study was performed.

Methods: Patients were registered from 42 Japanese institutions which were members of Japan society of laparoscopic colorectal surgery. Number of the patients who received transverse and descending colon cancer resection was 1,926 from 2006 to 2008. Ninety-four patients were excluded because of non-curative resection and insufficient data. Finally 1,832 patients of 959 laparoscopic and 872 open colectomy were eligible.

Results: Gender male/female (574/385 laparoscopic vs 506/367 open), age (68 vs 70), comobidity (56% vs 60%), and location of transverse/descending colon (650/309 vs 609/264) were similar in both groups. Conversion to open colectomy was 4.4 % because severe adhesion, bleeding, technically difficult, and so on. Operative time was significantly longer in laparoscopic group (209 vs 167min., p<0.0001). Laparoscopic group was less blood loss count (35 vs 88g, p<0.0001), shorter postoperative hospital stay (10 vs 12 days, p<0.0001), and less postoperative complications (16% vs 25%) significantly. Pathological stage was significantly different as I: 43%, II: 25%, III: 27% in laparoscopic and I: 18%, II: 50%, III: 31% in open group. According to stage, 3-year overall survival was 99% vs 96% in stage I (p=0.04), 96% vs 94% in stage II (p=0.37), and 90% vs 87% in stage III (p=0.25). 3 year relapse-free survival was 98% vs 93% in stage I (p=0.0003), 89% vs 86% in stage II (p=0.21), and 78% vs 71% in stage III (p=0.13).

Conclusions: As other part of colon cancer resection, laparoscopic transverse and descending colectomy was better short term result than open. Three-year OS and RFS were similar in stage II and III, and laparoscopic group was better in stage I.

OVERALL SURVIVAL IS NEGATIVELY IMPACTED BY POSTOPERATIVE COMPLICATIONS FOLLOWING CURATIVE RESECTION OF RECTAL CANCER BUT NOT COLON CANCER.

(P279)

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Purpose: To test the hypothesis that patients who undergo colorectal resections for cancer and suffer a postoperative complication have worse long-term outcomes in overall survival when compared to those individuals with an uneventful postoperative course.

Methods: A multi-institutional, retrospective review of a prospectively collected colorectal database. Patients who underwent resection with curative intent for colon and rectal cancer from 1982-2012 were included in the study. Postoperative complications were documented prospectively and long-term outcomes were analyzed and compared using chi square analysis. Survival was analyzed using the Kaplan-Meier method.

Results: Curative resection was performed in 993 patients with colon cancer and 807 patients with rectal cancer. Colon cancer resection was associated with a postoperative complication rate of 12%. The 5-year overall survival was unaffected by the occurrence of postoperative complications in this population (69.3% without complication vs. 66.6% with complication; p = 0.96). The overall complication rate found in the rectal cancer patients was 22%. In this population, postoperative complications were associated with a decreased overall 5-year survival (76.2% without complication vs. 69.3% with complication, p = 0.038). The most common complications observed were perirectal abscess (23%), intra-abdominal abscess (20%) and atrial fibrillation (11%).

Conclusions: Colorectal cancer is the 3rd most common malignancy worldwide and the 4th most common in the United States. Despite advances in surgical technology and technique, postoperative complications following colorectal resections do frequently occur. Our data shows that overall survival in rectal cancer patients following

resection is negatively impacted by postoperative complications. These differences are not seen in patients undergoing colon cancer surgery. Accordingly, we feel that long-term outcomes can be improved by reducing the incidence of negative postoperative events. This strongly highlights that expert surgical technique and colorectal specialist involvement is paramount in the successful treatment of rectal cancer.

LAPAROSCOPIC SURGERY FOR RECTAL CANCER: DOES CONVERSION HAVE ANY IMPACT ON LONG-TERM ONCOLOGICAL OUTCOMES? (P280)

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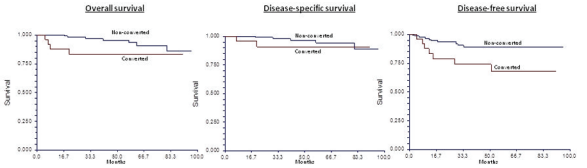
Purpose: Impact of conversion on laparoscopic surgery for colorectal cancer has been previously reported. However, especially in rectal cancer, the effect of conversion in terms of local recurrence (LR) and five-year overall (OS), cancer-specific (CSS) and disease-free (DFS) survival has rarely been reported. The aim of this study was to evaluate whether conversion jeopardizes LR rate and long-term survival in patients who underwent laparoscopic surgery for rectal cancer.

Methods: A prospectively collected database of 1078 laparoscopic colorectal resections performed at a single institution between January 2003 and December 2011 was analyzed. Surgical and long-term oncological outcomes of patients who required conversion were compared with those laparoscopically completed cases. T-test and chi-square test were used as appropriate. Kaplan-Meier method was used to compare survival.

Results: Of 164 rectal cancer patients operated on laparoscopically, 14.6% (n: 24) required conversion. There were no differences related to age, BMI, ASA III-IV, previous surgeries, disease location, preoperative radiochemotherapy rate and operation performed between groups. Converted patients were associated with a higher proportion of males (83% vs. 48.9%, p=0.001), prolonged operative time (280 min vs. 218 min, p<0.01), higher intraoperative bleeding (186 vs. 68 ml, p<0.001) and prolonged hospital stay (6.5 vs. 4.3 days, p=0.01). There were no postoperative deaths in this series. Postoperative morbidity revealed a trend towards a higher complication rate in converted patients (29.2% vs. 17%, p=0.16). LR rate was 1.2% (2 patients in the non-converted group). Media follow-up time was 44 (CI95%: 32-56) vs. 40 (CI95%: 36-44) months for converted and non-converted patients (p=0.5). There were no differences in five-year OS and CSS between groups (85% vs. 94%, p=0.07 and 91% vs. 94%, p=0.42 for converted and non-converted patients, respectively). Five-year DFS was worse for converted patients (73% vs. 89%, p=0.007)

Conclusions: Conversion did not negatively affect either overall or cancer-specific survival. However, converted patients were associated with a worse disease-free survival.



IMPROVING QUALITY OF LIFE FOR PEOPLE WITH INCURABLE LARGE BOWEL OBSTRUCTION: RCT OF COLONIC STENT INSERTION. (P281)

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Purpose: Surgery remains the dominant management for the treatment of large bowel obstruction (LBO), with emerging data on the role of self-expanding metallic stents. The aim of this study was to compare colonic stenting with surgical decompression for patients with an incurable LBO.

Methods: Patients with a malignant incurable LBO were randomized to surgery or stent insertion. Stoma rates; procedure time; length of hospital stay; complications/readmissions; quality of life (QoL), measured using the EuroQol EQ-5D instrument; 30 day mortality; and overall survival were compared between groups on an intention to treat basis.

Results: 52 patients were included in the analysis. A stent insertion was successful in 19/26 (73%) patients, with none of these patients requiring a stoma. 7/26 (27%) stent patients had a stoma formed, compared with 24/26 (92%) of surgery patients (p < 0.001).There were no stent related perforations or deaths in any patients. Stented patients had a reduced: procedure time (p = 0.01); post procedure stay (p = 0.01); days nil by mouth (p = 0.002); days before free access fluid (p = 0.001); days before free access solids (p = 0.02); days to first flatus (p = 0.001); and days to first bowel movement (p = 0.002), compared to surgery patients, and a 28% post procedure complication rate compared to 50% of surgery patients (p = 0.1). During the first 12 months post procedure 73% of stent patients were readmitted into hospital (acute or palliative) compared to 50% of surgery patients (p = 0.09), and there was no difference in the total length of stay in hospital between the 2 groups (p = 0.5). Surgery patients had significantly reduced QoL compared to stented patients from baseline to: 1 week; 2 weeks and 12 months. There was no significant difference in QoL from baseline to: 4 weeks, 3 months, or 6 months. Stented patients had an 8% 30 day mortality rate compared to 15% for surgery patients (p =

0.7). Median survival was 5.2 months for stented patients and 5.5 months for surgery patients (p = 0.6).

Conclusions: Use of metallic stents in patients with an incurable LBO has a number of advantages with faster return to diet, long term decreasing stoma rates and some QoL benefits.

SHORT-TERM OUTCOMES FOR POSTRADIOTHERAPY LAPAROSCOPIC RECTAL CANCER SURGERY: A SINGLE CENTER EXPERIENCE.

(P282)

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Purpose: Several studies have confirmed the advantage of pre-operative radiotherapy (RT) for advanced rectal cancers. We have analysed our data to compare short term outcomes for patients who had pre-operative RT for rectal cancers, specifically to look for differences between laparoscopic and open approach.

Methods: Data was collected prospectively between September 2005 to September 2012 of all patients who underwent elective rectal cancer surgery after adjuvant RT with curative intent.

Results: A total of 95 patients had rectal cancer surgery after RT during this period.33 patients had short course RT (25 Gy) and 62 had long course RT (45Gy). 60 patients had low anterior resection with de-functioning loop ileostomy and 35 patients had APER. 87 patients had R0 resection and 8 patients had R1 resection. The table below shows comparison between open and laparoscopic groups.

Conclusions: There is no difference in the short term outcomes for patients who had rectal cancer surgery following pre-operative RT, between laparoscopic and open groups, other than significantly reduced hospital stay in the laparoscopic group.

LAPAROSCOPIC COMPLETE MESOCOLIC EXCISION FOR RIGHT COLON CANCER: NECESSARY?

(P283)

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Purpose: CME has been promoted as improving oncologic outcomes for right (R) colon cancer. Unlike rectal cancer, local failure for colon cancer is low. This study analyzes the long-term outcomes of proper embryologically based oncologic (EBO) Lap R colectomy for cancer performed without routine use of CME.

Methods: From July 1998 to October 2012, 125 consecutive Lap R colectomies for cancer were identified from a prospectively maintained database. Metastatic disease excluded 12 patients. Peri-operative data, morbidity and mortality was analyzed for all 113 patients, with 84 patients with >24 mo. follow-up operated prior to 10/2010 considered in local recurrence (LR) and survival analysis. While embryologic planes were always respected, EBO, not formal CME, was performed.

Results: Right colectomy was performed on 50 men and 63 women, mean age 75 (47-95). Mean BMI was 26.9 (13.7-50.6). Location of cancer was cecum, n=52; ascending colon, n=31; hepatic flexure, n=14; transverse colon n=16. Laparoscopic extended right colectomies were performed in 16 patients (14.2%). Median operative time was 171 min (93-504); EBL 100 ml (25-650). Four patients were transfused. Mean lymph node harvest was 21.4 (6-55). Median time in days to: clears 1; house diet 3; flatus 2; bowel movement 3; discharge 4. Overall morbidity rate was 21%. There were no anastomotic leaks. There was 1

P282 Comparison between Open and Laparoscopic Group

	OPEN(n=44)	LAPAROSCOPIC(n=51)	p value
Male Age (median)	2566 (36 - 82)	3068 (29 - 89)	0.8435
SCRTLCRT	1232	2130	0.2289
AR + IleostomyAPE	2717	3318	0.9180
pT4pT3	323	131	0.4650.706
R0R1	395	483	0.465
Lymph Nodes (Median)	12 (2 - 28)	13 (0 - 45)	0.926
Length Of Stay (Median)	13 (5 - 23)	7 (2 - 23)	0.032
Anstomotic Leak	1	0	0.4632
30 Day Mortality	0	1	1.0
30 Day Re-operation	4	2	0.4106
30 Day Re- admission	4	11	0.1571
Local Recurrence	0	1	1.0

SCRT= Short course radiotherapy, LCRT= Long course radiotherapy, AR = Anterior resection, APE = Abdominoperineal excision

mortality (0.9%). Oncologic analysis of 84 patients operated >24 mos. ago showed mean follow-up of 40.5 months (0-167.3). Local recurrence was 3.6%, with no isolated local recurrences. Metastatic rate, 13%, all with stage III disease. Disease specific survival (DSS) by stage was I (n=21), 100%; II (n=35), 100%; III (n=28), 58.6%. Overall DSS=85.3%.

Conclusions: Proper embryologically based oncologic laparoscopic resection for right colon cancer results in LR of 3.3% and 5YDSS of 85.3%. These outcomes call into question the need for the extensive nodal dissection being advocated in CME surgery.

OUTCOMES IN 132 PATIENTS FOLLOWING LAPAROSCOPIC TOTAL MESORECTAL EXCISION FOR RECTAL CANCER WITH GREATER THAN 5-YEAR FOLLOW-UP.

(P284)

R. Huang, D. McKeever, M. Greenfield, G. Marks, J. Marks
Wynnewood, PA

Purpose: The role of laparoscopic (Lap) TME for rectal cancer is questioned. Currently prospective trials are underway to evaluate this. We analyze our long-term results using Lap TME in the treatment of rectal cancer to evaluate its oncologic outcomes.

Methods: A prospective laparoscopic database was queried to identify all patients operated upon for rectal cancer from April 1997 to September 2007. 151 patients were identified. Metastatic disease excluded 19 patients, leaving 132 patients to be analyzed for perioperative and oncologic outcomes. Procedures included LAR, n=35; transanal abdominal transanal proctosigmoidectomy (TATA), n=77; and APR, n=20. All surgeries were TME or pTME.

Results: Lap TME was performed on 89 men (67%) and 43 women, mean age 61 (22-55). Mean BMI was 25.9 (15.6-39.5) 83% of patients had cancers in the distal third of the rectum. Preop chemoradiation was administered in 119 (90.2%) with median dose of 5500 cGy (3800-10080). Mean EBL was 300 ml (25-5000) and 6 (4.5%) were transfused. Seven patients (5.3%) underwent conversion, 5 to lap-assisted. Mean largest incision length was 4.5 (1.2-21) cm. Pathologic stage of disease: complete response: 24%; I: 36%; II: 22%; III: 18%. There were no mortalities. Overall morbidity was 23.5%, with no anastomotic leaks and 5 (3.8%) delayed anastomotic stricture/fistula. There were no port site recurrences. Mean follow-up was 69.4 months (7.6-168.0). Overall LR was 5.3% (n=7). There was only one isolated LR (0.8%). Mean time to local recurrence was 13.9 months. Overall metastatic rate was 18.2% (n=24). By stage, disease specific survival (DSS) was: CR: 86.3%; I: 87.4%; II: 86.4%: III: 77.4%. Overall 5 year survival was 84.8%, with 5 patients (3.8%) deceased within 24 months.

Conclusions: This series represents the largest experience of rectal cancer treated by laparoscopic TME reported in the literature with greater than 5-year follow-up. The long term data confirms that laparoscopic TME can be performed with lasting low local recurrence (5.3%) and excellent 5-year survival (84.8%).

RECTAL CANCER SURGERY BY HIGH VOLUME SURGEONS RESULTS IN IMPROVED ONCOLOGIC OUTCOMES AND SPHINCTER PRESERVATION.

(P285)

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Purpose: Evidence suggests that surgical outcomes in rectal cancer are improved for patients undergoing resection by high volume surgeons. The aim of this study was to determine the trend in the treatment of rectal cancer with regards to surgeon volume in our province over the past 15 years, and the effect of surgeon volume on patient outcomes.

Methods: All patients diagnosed with invasive rectal cancer in 1997, 2007 and 2011 were identified within a provincial cancer registry. Patients who did not undergo definitive surgical resection were excluded. Charts were reviewed to extract important pre-operative, intra-operative, and post-operative data. Surgeons were coded, and subsequently classified as high volume (HV) if they were in the highest quintile, and low volume (LV) for all others. The two groups were then compared directly with regards to outcomes in 1997, 2007 and 2011.

Results: A total of 192 rectal cancer surgeries were performed by 52 surgeons in 1997, which increased to 284 by 50 surgeons in 2007 and 365 by 55 surgeons in 2011. HV surgeons performed 32%, 71%, and 70% of cases in 1997, 2007, and 2011 respectively. There was no significant difference between the patients treated by HV or LV surgeons in each year with regards to age, stage at diagnosis, or use of neoadjuvant chemoradiation. The mean number of lymph nodes discovered increased from 8 in 1997 to 17 in 2011 with no difference between HV or LV surgeons. However by 2011, HV surgeons had a higher rate of pathologic grade 3 TME specimens (76% vs 63%; p=0.02) and a lower rate of CRM positivity (6% vs 12%;p=0.01). The 5 year local recurrence rate for surgery performed in 2007 by HV and LV surgeons was 3% vs 13% respectively. The APR rate was significantly lower in HV surgeons with no difference in leak rate or in 5-year overall survival.

Conclusions: HV surgeons perform the majority of rectal cancer procedures in our province. Rectal cancer surgery performed by HV surgeons results in higher rates of

grade 3 TME resection, lower rates of CRM positivity, decreased local recurrence rates and increased sphincter preservation.

A NEGATIVE MARGIN IS A NEGATIVE MARGIN: EVALUATING DISTAL RESECTION MARGINS IN RECTAL CANCER.

(P286)

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Saint Louis, MO

Purpose: Sphincter preserving low anterior resection has become the preferred procedure for rectal cancer located above the sphincter complex. This has led to the adoption of shorter distal resection margins (DRM) than were historically accepted. The literature currently supports DRM >1cm, but there is controversy as to the oncologic adequacy of margins ≤1cm as there is concern for increased local recurrence rates.

Methods: A single institution retrospective cohort study was performed from 1995-2010. All patients with rectal cancer who underwent sphincter preserving low anterior resection with a DRM ≤1cm were included. We excluded patients with Stage IV disease, recurrent disease, positive circumferential margins, and positive DRM.

Results: 82 patients were identified with a mean age of 59 years, 71% were male. Tumors were located on average 5.7cm from the anal verge, and the average DRM was 7.5mm (range 3-10mm). All patients received neoadjuvant radiation therapy, and 55% received postoperative chemotherapy. After a median follow-up of 41 months, there were only 3 local recurrences (3.7%) and 11 distant recurrences (13.4%). These numbers preclude statistical analysis to determine predictors of recurrence.

Conclusions: Our local recurrence rate of 3.7% in a cohort of rectal cancer patients with subcentimeter DRM compares favorably with other published series (see table). With the current use of neoadjuvant radiation therapy, subcentimeter DRM are oncologically acceptable. There needs to be a large multicenter study to further evaluate predictors of recurrence with subcentimeter DRM.

COMPARISON OF LAPAROSCOPIC AND OPEN SURGERY FOR OBESE PATIENTS WITH COLORECTAL CANCER: PROPENSITY SCORE ADJUSTED ANALYSIS.

(P287)

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Purpose: Obesity and overweight have become a global problem in the last few decades. Despite that there is an obvious technical difficulty associated with the presence of increased intra- and extra-peritoneal fat, the differences on outcomes following LC and OC in obese and overweight patients are unclear. The aim of this study is to assess postoperative complication following LC and OC in obese and overweight colorectal cancer (CRC) patients.

Methods: Between 1990 and 2012, a total of 583 CRC patients with a body mass index >25 consecutively underwent colorectal resection were identified in our institution. Regression adjustment using propensity scores were applied to reduce selection bias and better clarify the effect of LC and OC. Dose response of BMI with risk-adjusted postoperative complication rate in LC and OC was evaluated using fractional polynomial plot.

Results: 248 patients underwent LC and 335 underwent OC. In unadjusted analysis there was no significant difference between LC and OC in postoperative complication (LC 32% vs. OC 37%, p = 0.17). The propensity score were calculated using year at the operation, age, sex, body mass index (BMI), tumor size, tumor location, depth of invasion, number of lymph node retrieved and presence of metastatic lymph node (c-index = 0.90). In the analysis adjusted with propensity score, LC was not associated with higher risk of postoperative complications (OR = 0.95 [0.60 – 1.51], p = 0.83). In fractional polynomial plot, the trend of dose-response in both groups was considered similar across overall BMI measurement (Figure 1).

Conclusions: There was no difference in the outcome of LC and OC for obese and overweight CRC patients. These results suggest that it is reasonable to perform LC to obese and overweight CRC patients.

P286 Influence of Subcentimeter Distal Resection Margin on Local Recurrence

	n	Distal Margin	Local Recurrence	Follow-up
Present study	82	≤1cm	3.7%	41 months
MSKCC (DCR-2010)	103	<0.8cm	6%	69 months
	524	>0.8cm	4%	
CCF (DCR-2011)	198	≤1cm	4.3%	50 months
	586	>1cm	4.4%	

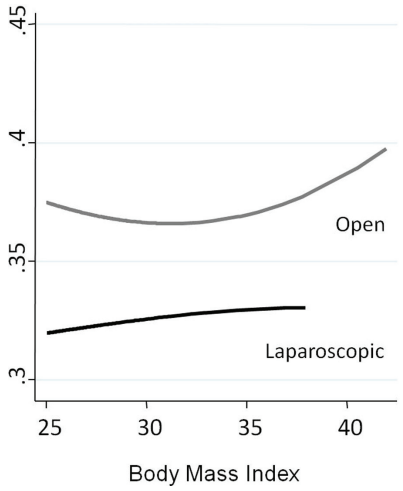

Figure 1.

Fractional polynomial plot. The similar dose response of body mass index on postoperative complication was observed.

INCREASING INCIDENCE OF TRANSIENT ADULT INTUSSUSCEPTION: SURGERY MAY NOT BE AS NECESSARY.

(P288)

J. Ngu, S. Tan
Singapore

Purpose: In contrast to children, a demonstrable etiology is usually seen in adults with intussusception. However, with the increasing availability of CT, transient intussusceptions without obstruction have become common findings. We review the need for surgery as definitive treatment of adult intussusception.

Methods: From January 2003 to January 2011, 36 patients were diagnosed with intussusception in our institution. We reviewed their medical records for symptomatology, imaging findings, the outcomes of their management, along with any recurrences.

Results: 36 patients, with a median age of 49.5 (range, 20-94) years, had CT features of intussusception. 16 (44.4%) had colonic intussusceptions. 11 underwent surgery – 9 had adenocarcinoma and 2 had benign lesions. The remaining 5 did not undergo surgery for various reasons – 3 had lesions suspicious for malignancy and 2 had no identifiable lead point on CT. 20 (55.6%) patients had enteric intussusceptions. 11 underwent surgery – none of their lesions were malignant. 3 patients who underwent exploratory laparotomy had no abnormal findings intra-operatively – all 3 had no CT evidence of obstruction or lead points. Of the 9 patients who did not undergo surgery, 8 had no lead points or evidence of obstruction on CT and their symptoms resolved spontaneously. 1 patient had CT findings of a lead point causing obstruction – she declined surgery but her symptoms resolved with conservative treatment. The lead point was subsequently reported as an ileal lipoma on interval barium study. All 9 patients had no recurrences, over a median follow-up of 39.0 (range, 5-111) months.

Conclusions: Adult colonic intussusception remains commonly associated with malignancy and surgery is indicated even if symptoms of obstruction resolve. A substantial number of adult enteric intussusceptions may be transient findings on CT and do not recur. Not all require operative management – surgery should be indicated only for symptomatic patients who do not respond to conservative treatment.

EXTRALEVATOR ABDOMINOPERINEAL RESECTION WITH BIOLOGICAL MESH RECONSTRUCTION: SHORT-TERM RESULTS.

(P289)

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Purpose: Extra-levator abdomino-perineal excision of the rectum (eLAPE) is set to replace conventional abdomino-perineal excision. eLAPE has been shown to produce better short-term oncological outcomes by reducing intra-operative perforation (IOP) and circumferential resection margin (CRM) involvement (R1) rates. The extended nature of the perineal prone dissection however, leaves a substantial defect in the pelvic floor. The aim of our study was to assess short-term results in patients undergoing eLAPE and examine the role of biological mesh reconstruction.

Methods: A retrospective audit of all patients who have undergone an eLAPE in our department since introduction of this technique in Oct 2010. All patients had biological mesh recontruction of the perineal defect using Surgissis® Biologic Graft (Biodesign™, Cook Medical, USA).

Results: 23 patients, 15 males; 8 females, median age 68 (range 52-90), median BMI 26 underwent eLAPE during the study period. All were performed for low rectal cancers, median tumour height 10 mm from dentate. 14 patients had neo-adjuvant radiotherapy (RXT) (13 long-course chemoRXT, 1 short-course). 16 patients had a lap assisted eLAPE (69%, 1 conversion). The median operating time was 240 minutes including the time for repositioning the patient and mesh reconstruction. There were 3 IOP (13%), 2 were in patients who had previously undergone major pelvic surgery. Median length of stay was 7 days. There were 2 readmissions (9%). R1 resection was reported in 2 patients (8.6%). At a median follow-up of 11 months, there was no local reccurence. Perineal wounds healed primarily in 10 patients (47%). All 13 who had delayed wound healing were in the neoadjuvant group (median time to wound healing 4 months). 2 required wound debridement and Vaccum Assisted Closure therapy (VAC®, KCI, USA).

Conclusions: Our results show that eLAPE with biological mesh reconstruction is safe and feasable but has a high incidence of delayed perineal wound healing, especially in patients who have undergone neoadjuvant RXT The oncological benefits derived from this technique seem to come at the cost of significant wound morbidity similar to conventional APE.

OUTCOME OF ANTERIOR RESECTION VERSUS EXTRALEVATOR ABDOMINOPERNEAL EXCISION OF RECTUM FOR RECTAL CANCER.

(P290)

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Purpose: Abdominoperineal excision resection of rectum (APER) has recently been shown to have worse outcome compared to anterior resection. The aim of this study was to compare outcome of extra-levator (EL) APER to low (≤5cm) anterior resection (AR). The secondary aim was to compare outcome of low to middle/high rectal cancer.

Methods: Patients with primary low rectal cancer treated by a single surgeon were examined using a prospectively maintained database. The primary outcome was 3-year overall survival (OS); secondary outcomes were disease free survival (DFS) and resection margin status. Survival was assessed using Kaplan-Meier survival curves.

Results: Between 2006 and 2012, 133 patients underwent low AR and 31 ELAPER. APER was associated with significantly more T3-4 tumours (versus T0-2) compared to low AR (62.5% [20/32] versus 34.6% [46/133], p=0.004). No differences were noted in nodal status. The overall margin positive resection rate was 3.4% (9/261), which was 9.4% (3/32) following ELAPER and 2.3% (3/130) following low AR (p=0.088). Comparing ELAPER and low AR, 3-year OS (83% versus 96%, p=0.213) and 3 year DFS (84% versus 88%, p=0.546) were similar. Resection margin positive (versus negative) status was associated with reduced 3-year OS (50% versus 95%, p=0.010) and DFS (50% versus 88%, p=0.192).

Conclusions: ELAPER can lead to equivalent outcome compared to low anterior resection. High quality surgery (i.e. complete microscopic resection) is a more important determinant of survival.

SITE OF CIRCUMFERENTIAL RESECTION MARGIN INVOLVEMENT IN STANDARD VERSUS EXTRALEVATOR ABDOMINOPERINEAL EXCISION OF RECTAL CANCER.

(P291)

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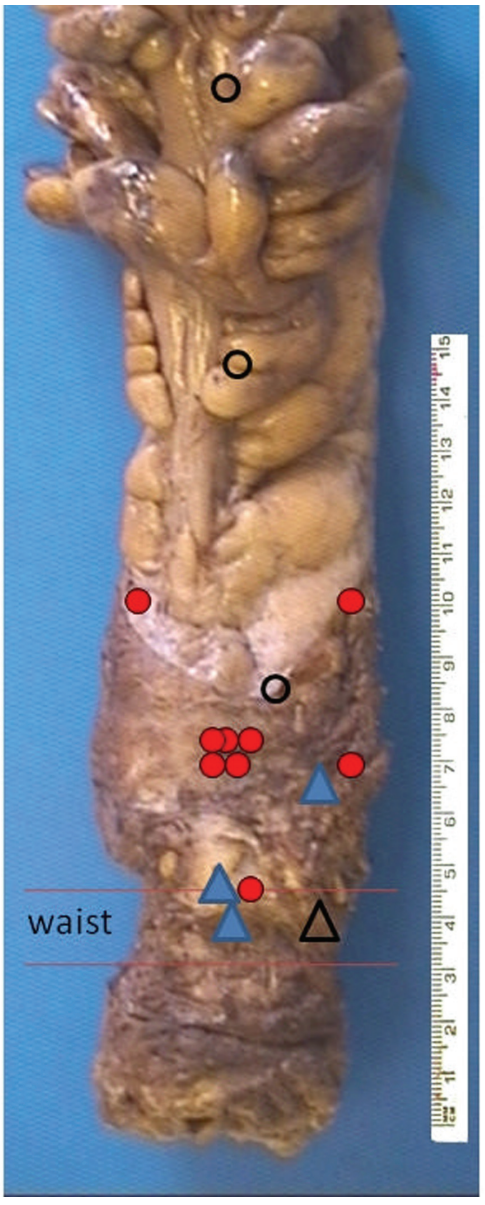
Purpose: A surgical 'waist' has been described in conventional abdominoperineal excision (CAP) specimens and is associated with a higher rate of involved margins and local recurrence. Extralevator (ELAP) surgery enables a radical excision and is associated with improved oncological outcomes. This study aimed to determine the rate and position of circumferential resection margin (CRM) involvement in patients undergoing CAP and ELAP resection.

Methods: Retrospective analysis of a prospectively collected database reported by a single histopathologist. Consecutive patients undergoing abdominoperineal excision of rectum with curative intent from 04/05 to 09/12 were included. The distance from the anal verge to the site of CRM involvement was mapped on a virtual specimen. The surgical waist was defined as 31-46 mm from the anal verge.

Results: 80 patients were identified (22 females, median age 68 years (IQR 59-74 years). 2 patients were excluded (palliative resection and salvage surgery for intra-operative bleeding). 7/78 patients developed local recurrence, of which, only one patient had an involved CRM (median follow up 25 months (IQR 11-42 months)). There were 40 ELAP and 38 CAP operations. There were no differences in median age (68 years ELAP versus 69 years CAP, p> 0.05) or distance of tumour from anal verge or intra-operative perforation (IOP) (11% ELAP versus 15% CAP, p=0.46). ELAP patients had more advanced tumours ((T3/T4) 25/40 versus 15/38, p=0.035) and more use of neoadjuvant chemoradiotherapy (28/40 versus 18/38, p= 0.036). In univariate analysis, ELAP surgery was associated with a higher rate of CRM involvement (31% versus 11%, p=0.03); however, this difference disappeared after accounting for tumour stage. Of the patients with positive CRM, 3/4 CAP patients had an involved margin at the surgical waist compared to 1/12 of the ELAP patients (p=0.027). Despite a higher rate of CRM involvement and more locally advanced tumours in the ELAP group, there was no difference in local recurrence between the ELAP and standard groups (3/40 versus 2/38, p=0.53).

Conclusions: ELAP surgery is effective at reducing CRM involvement at the surgical waist.



Specimen photograph – mapping of site of CRM involvement using blue triangles (CAP) and red circles (ELAP). Clear circle/triangle = posterior involvement.

ARE SUBCENTIMETER DISTAL MARGINS SAFE IN PATIENTS WITH LOW RECTAL CANCER UNDERGOING PROCTECTOMY WITH COLOANAL ANASTOMOSIS?

(P292)

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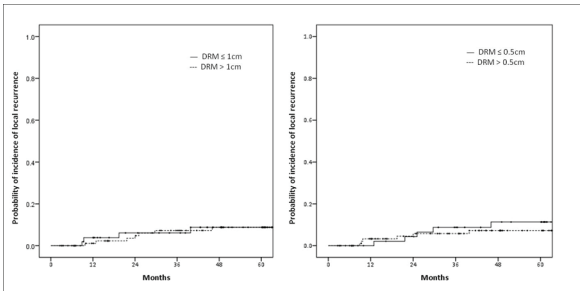
Purpose: Proctectomy with coloanal anastomosis (CAA) gives the last chance to avoid permanent stoma formation for very low lying rectal cancer. We aim to determine whether shorter distal margins after proctectomy with CAA affect the oncologic outcome in low rectal cancer.

Methods: A total of 153 consecutive patients with low rectal cancer who underwent proctectomy with CAA between 1998 and 2008 were evaluated retrospectively from a prospective cancer database. The local recurrence rate and disease–specific survival were compared with respect to the length of the distal margin.

Results: Among the 153 patients evaluated, the distal resection margin was ≤1 cm in 95 patients, >1 cm in 58 patients, ≤0.5 cm in 51 patients and >0.5 cm in 102 patients. The mean tumor distance from the anal verge was 4.1 ± 1.0 cm and the mean distal margin was 1.2 ± 1.0 cm. The 5–year local recurrence rate was 8.9% and the 5–year disease–specific survival rate was 83.9%. When the cohort was categorized on the basis of the distal margin, the 5–year local recurrence rate was 8.8% in patients with a distal margin ≤1 cm and 8.8% in patients with a distal margin >1 cm, 11.4% in patients with a distal margin ≤0.5 cm, and 7.3% in patients with a distal margin >0.5 cm. There was no statistically significant association between the length of the distal margin and local recurrence or between the length of the distal margin and survival, regardless of whether neoadjuvant chemoradiation was used. Likewise, multivariate analysis showed that local recurrence or disease–specific survival was not associated with distal margin length irrespective of whether this was ≤1 cm or ≤0.5 cm.

Conclusions: Sphincter preservation using proctectomy with CAA can be achieved with safe oncologic outcomes even with distal margins less than 0.5cm. Therefore, subcentimeter distal margin may not be an adverse factor in planning sphincter–saving surgery for low rectal cancer.



THE MORBIDITY OF THE ABDOMINOPERINEAL RESECTION IN THE MODERN ERA: HOW ARE WE DOING 1 CENTURY AFTER THE ORIGINAL WORK OF DR. WILLIAMS ERNEST MILES.

(P293)

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Purpose: A century after its introduction, the abdominoperineal resection [APR] remains an important

part of the armamentarium of pelvic surgeons. In the early 20th century, APR was associated with significant morbidity and mortality. At present it is unclear whether advances in surgical care or patients related factors are the main outcome driver. We aimed to study the morbidity and outcome of APR in the modern era.

Methods: A retrospective review was conducted of patients who underwent APR in a single organization between 1998 and 2012. Data analyzed included patient related factors and outcome variables such as complications, transfusion, intensive care unit [ICU] admission, length of stay, discharge to nursing home, readmission, and reoperation.

Results: 123 patients were analyzed [74 males (60%), median age 64 years, median BMI 29 kg/m2]. Indication for surgery was rectal cancer 76%, anal cancer 21%, and inflammatory bowel disease 3%. The rate of preoperative radiotherapy and chemotherapy was 72% and 59%. Laparoscopic resection was done in 39 patients (32%). Median operative time was 285 minutes with median blood loss of 400 ml (blood transfusion rate 14%). The 90 day complications rate was 43%, including wound infection/dehiscence 14%, small bowel obstruction 11%, pelvic abscess 7%, urinary tract infection 7%, cardiac arrhythmia 5%, and pulmonary embolism 4%. Median length of hospitalization was 7 days and 14% of patients required ICU care. Nursing home admission was noted in 14%. The 30 days and 1 year readmission rates were 18 and 34%. 90 days reoperation rate was 8%. The 90 day mortality rate was 1%.

Conclusions: APR related mortality is negligible in the 21st century. However the morbidity associated with APR remains significant.

A LARGE COMPARISON STUDY BETWEEN ROBOTIC AND LAPAROSCOPIC RESECTION TO EVALUATE AND DEFINE THE ROLE AND APPLICATION OF NEW TECHNOLOGY.

(P294)

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Purpose: The use of the daVinci® robot for colorectal resection is increasing. Literature comparing robotic versus laparoscopic colorectal surgery is limited. We present the largest comparative series to date of 240 consecutive patients, 120 robotic colorectal resection (RR) and 120 laparoscopic resection (LR) for benign and malignant disease.

Methods: We conducted a retrospective review of prospectively collected data on a consecutive series of patients who underwent either laparoscopic or robotic colon resection at a teaching hospital. We included all patients from April, 2009 to October, 2011 with benign and malignant disease. Data including patient demographics, type and length of procedure, conversion rate and complications was gathered. Number of lymph nodes and margins were assessed for malignant lesions. We compared the length of the procedure early in our experience to the latter cases.

Results: A total of 240 patients were evaluated, 120 LR and 120 RR. The average age was slightly higher in the LR (LR 59.7 vs. 64.4, p=0.007). The sex distribution was similar (p=0.52) and there was no difference in the prevalence of previous operations (p=0.19). The LR group had a higher incidence of comorbidities (p=0.0001) there was no difference in complication rates (6.7% for RR and 10.8 for LR, p=0.36). The number of lymph nodes harvested were similar between both RR and LR groups (16.8 +/- 6.6 vs. 18.1 +/- 10.2, p=0.44). There were four conversions to open, all in the RR (1.9%). Resections for malignancies was greater in the LR group (p=0.001). The average operating room time for the RR was longer compared to LR (p=0.0001). The operating room time for the first 30 cases averaged 189 minutes while the last 30 cases averaged 137 minutes (p=0.0001).

Conclusions: Our data confirms safety and efficacy of robotic resection. The use of the robot is an acceptable alternative to laparoscopy and demonstrates superior technical advantages in colon resections. A multi-central prospective analysis is encouraged. Long-term follow up is required to evaluate the survival advantage in malignant pathology and realize the benefit of improved pelvic nerve preservation.

A CASE-MATCHED STUDY COMPARING LONG-TERM OUTCOMES OF LAPAROSCOPIC VERSUS OPEN ABDOMINOPERINEAL EXCISION FOR RECTAL CANCERS.

(P295)

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Purpose: Whilst it is widely accepted that laparoscopic APERs are associated with early postoperative recovery, its long term oncological benefits when compared with open APERs remains uncertain. The aim of this study was to compare long term and oncological outcomes of open and laparoscopic APERs.

Methods: Case control study for which data was collected prospectively from 2001 to 2012. Inclusion criteria were elective APERs with curative intent (stage I to III). To minimise selection bias, laparoscopic cases were matched to open cases using propensity scores (1:1, near neighbour). Outcomes were R0 rate, estimated 3-year recurrence as well as overall- and recurrence-free survival rates (Kaplan-Meier curves).

Results: A total of 123 APERs were performed during this period(37 laparoscopic, 86 open). After 1:1 matching

for age, gender and stage, baseline parameters were similar (standardised mean differences of covariates or interactions < 0.25, p=0.996) in both groups (37 in laparoscopic and 37 in open group). Median follow up was 4.2 years. In comparison to conventional APER, laparoscopic APER had a similar R0 rate (89% versus 87%, p=0.72) and estimated cumulative 3 year-recurrence incidence (6% versus 8%, p=0.25). The estimated three-year overall and recurrence-free survival was 87% and 84% versus 81% (p=0.20) and 70% (p=0.18), respectively.

Conclusions: There is no significant difference in the long term outcomes between APERs done using open or laparoscopic approach.

HAND-ASSISTED VERSUS STRAIGHT LAPAROSCOPIC VERSUS OPEN PROCTOSIGMOIDECTOMY FOR RECTAL AND SIGMOID CANCER: A CASE-MATCHED STUDY OF 100 PATIENTS.

(P296)

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Purpose: The use of laparoscopy in anterior and low anterior resections remains open to discussion. The aim of this study is to assess the role of laparoscopy in proctosigmoidectomy for rectal and sigmoid cancers by analyzing short-term outcomes, oncologic results, long-term survival, and to compare hand-assisted to straight laparoscopy and open resections.

Methods: Patients undergoing hand-assisted anterior resection for rectal or sigmoid cancer between September 2006 and July 2012 were case-matched to straight laparoscopy and open counterparts based on the year of surgery, procedure type, pathologic tumor stage and location. Patient characteristics, operative and postoperative outcomes were compared.

Results: During the study period, 25 patients underwent hand-assisted laparoscopic resection (HALS). This group was matched to 25 straight laparoscopic and 50 open cases. Patient characteristics and short-term outcomes are summarized in the table. The patients who underwent HALS had higher rates of cardiac (76vs.64vs.26%;p<.0001) and hypertensive (72vs.68 vs.42%;p=0.02) conditions compared to straight laparoscopy and open groups, respectively. History of previous abdominal operations was higher in the straight laparoscopy group (16 vs.56vs.36%;p=0.01). The rate of neo-adjuvant chemoradiation was more frequent in open group (4 vs.8vs.24%;p=0.04). Open surgery was more frequently performed for patients with low lying rectal cancer. Mean estimated blood loss was lower in the straight laparoscopy group (233 vs.137 vs.411 ml;p=0.005). Mean specimen length was larger in the HALS group (29 vs.23 vs.27 cm;p=0.009). Median length of hospital stay was shorter after straight laparoscopic surgery (6 vs. 4 vs. 6 days; p=0.04). No patients died during the early postoperative period. Overall survival (2.32±1.62 years) was similar in all groups (p=0.08).

Conclusions: Both hand-assisted and straight laparoscopic proctosigmoidectomy appear oncologically safe and effective as open surgery. Due to its short term benefits and better visualization laparoscopy may be offered to patients with sigmoid and rectal cancers by experienced minimally invasive surgeons.

OUTCOMES FROM HANDSEWN AND STAPLED ANASTOMOSES FOR MID AND LOW PRIMARY RECTAL CANCERS.

(P297)

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Purpose: To evaluate outcomes for hand sewn and stapled anastomoses for mid and low level primary rectal cancers.

Methods: Cases were identified from a prospectively maintained database (2006-2012). Included patients underwent surgery with curative intent for primary rectal cancer with an anastomosis at 7cm or less from the anal verge. Cases were divided into two groups depending on the method used to fashion the anastomosis; either a circular stapling device or a hand sewn colo-anal pull through technique.

Results: 138 patients were identified for inclusion with 71 stapled and 67 hand sewn anastomoses. The mean age and gender of the hand sewn (HS) group were 41 males; 57-years vs 47 males; 65 years in the stapled (ST) group. The median tumour height was 4.7cm in the HS group and 9.7cm in the ST group. There was no significant difference in the TNM stage between the two groups. Clear resection margins in the HS group (R1 n=1) were not significantly different to those achieved in the ST group (R1 n=2). The HS group developed major 7 (10%) and minor 11 (16%) complications compared to 2 (3%) and 4 (6%) respectively in the ST group respectively. The incidence of anastomotic leaks were higher in the HS group 3 (7%) compared to 2 (3%) though there was no significant difference in post-operative fistulas or readmission rates. The 5-year overall survival for the ST and HS patients and disease free survival was not significantly different.

Conclusions: This study demonstrates that hand sewn colo-anal anastomosis for mid and low primary rectal tumours offers a safe alternative to anastomotic stapling devices. No significant difference was seen in surgical margins or anastomotic leak rate.

LONG-TERM ONCOLOGIC OUTCOMES IN ROBOTIC TOTAL MESORECTAL EXCISION.

(P298)

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Purpose: Robotic mesorectal excision for rectal cancer is gaining recognition. We aimed to evaluate our experience with robotic total mesorectal excision for rectal cancer in terms of recurrence and survival.

Methods: We retrospectively evaluated our prospectively collected data of patients who underwent total mesorectal excision for stage 1-4 rectal cancer between August 2005 and June 2012 in a suburban tertiary center. Local recurrence, distant metastasis, overall and disease-free survival were the primary outcomes. Data was analyzed using SPSS version 16. Mean and standard deviation were calculated for continuous data. Kaplan Meier curve was used to evaluate the trend in survival over a follow up of 2 years. P value of less than 0.05 was considered statistically significant.

Results: The initial 102 consecutive cases of rectal cancer that underwent robotic total mesorectal excision were included in the study. Mean age was 62 (34-88 years), mean BMI was 27.8 (18-41) and mean length of follow up was 25.8 months (2- 84 months). Male to female ratio was 2:1. Stage I-IV distribution was 20% (n=21), 34% (n=35), 38% (n=39) and 7% (n=7%) respectively. Neoadjuvant chemoradiation therapy was given in 70% (n=72) of patients. The level of the tumor was low rectum in 59%, mid rectum in 26% and upper rectum in 13%. Circumferential margin was positive in 3 (2.9%) cases and there were 2 threatened margins. Two patients had positive distal margin. There were 55 (54%) low anterior resections, 24 (23.5%) ultralow resections and 23 (22.5%) abdominoperineal resections. In stages I-III local recurrence rate was 2% (n=2) and distant metastasis was found in 8.4% (n=8) of patients. Two year overall and disease-free survival was 95.3% and 74.5%, respectively.

P296 Patient characteristics, operative and postoperative outcomes

	Hand-assisted lap. surgery n = 25 (%25)	Lap. surgery n = 25 (%25)	Open surgery n = 50 (%50)	P value
Age (years)	66.48 ± 10.46	65.36 ± 13.20	58.90 ± 11.86	0.03
Gender (F/M)	11/14	15/10	18/32	0.14
ASA score	3 (1-4)	3 (1-4)	3 (1-4)	0.85
BMI (kg/m2)	28.05 +/- 4.62	27.57 +/- 5.16	30.29 +/- 16.22	0.98
Tumor localization				
Sigmoid colon	8 (32 %)	8 (32 %)	16 (32 %)	0.94
Rectum	17 (68 %)	17 (68 %)	34 (68 %)	
Stage				
0	2 (8 %)	1 (4 %)	2 (4 %)	0.99
I	10 (40 %)	12 (48 %)	24 (48 %)	
II	7 (28 %)	6 (24 %)	12 (24 %)	
III	6 (24 %)	6 (24 %)	12 (24 %)	
Harvested lymphnodes (n)	34.81 +/- 17.75	23.84 +/- 11.37	28.88 +/- 16.49	0.11
Operative time(min)	185.92 +/- 57.83	173.12 +/- 44.25	169.67 +/- 98.36	0.71
Conversion	2 (8%)	2 (8%)	-	1
Defunctioned anastomosis	6 (24 %)	3(12 %)	7 (14 %)	0.56
Postoperative results				
Time to bowel movements (days)	3.83 +/- 2.31	3 +/- 1.63	3.6 +/- 1.12	0.3
Deep venous thrombosis	0	1 (4 %)	2 (4 %)	0.6
Urinary retention	4 (16 %)	1 (4 %)	2 (4 %)	0.13
Urinary tract infection	0	0	2 (4 %)	0.36
Anastomotic leak	0	0	4 (8 %)	0.18
Postoperative ileus	4 (16 %)	2 (8 %)	4 (8 %)	0.5
Wound infection	4 (16 %)	1 (4 %)	4 (8 %)	0.35
Sepsis	1 (4 %)	0	0	0.5
Reoperation	3(12%)	0	5(10%)	0.28
Readmission	2(8 %)	2(8 %)	6(12%)	0.83
Recurrence	2 (8 %)	0	8 (16 %)	0.09

Conclusions: Overall and disease-free survival for robotic total mesorectal resection is comparable to previously published data for open and laparoscopic approaches. Robotic resection results in a lower local recurrence rate. Therefore, robotic total mesorectal resection is a safe and oncologically sound approach to rectal cancer.

THE IMPACT OF LAPAROSCOPY ON TIME TO INITIATION OF ADJUVANT CHEMOTHERAPY AND SURVIVAL IN COLON CANCER PATIENTS.

(P299)

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Purpose: Delaying initiation of adjuvant chemotherapy (CT) more than 8 weeks after surgical resection for colorectal cancer adversely affects overall patient survival. Prior studies have shown postoperative complications, length of stay, and increasing age negatively impact the time to CT. The effect of a laparoscopic (LX) surgical approach on initiation of CT has not been studied. The goal of this study was to determine if a LX approach to colon cancer resection affects the timing of adjuvant CT and outcomes.

Methods: A prospectively maintained colorectal cancer database was queried for patients with stage II or III colon cancer who underwent surgical resection and adjuvant CT between the years 2003 and 2010. Patients were categorized according to surgical approach: open or LX. Age, gender, body mass index (BMI), tumor stage, ASA class, postoperative complications, time from surgery to initiation of CT, and long-term oncologic outcomes were compared.

Results: Of 90 cases included, 31 (34.4%) were performed laparoscopically. Age, gender, ASA class, BMI, tumor stage, and postoperative complications were similar for LX and open cases, while length of stay was 2 days shorter for LX cases ($p<0.01$). The proportion of patients who received adjuvant CT more than 8 weeks after surgery did not differ between the groups (33.5% open vs 38.7% LX, $p=0.77$). In the open group, patients receiving CT more than 8 weeks after surgery had decreased disease-free (DFS) and overall survival (OS) compared to those receiving CT less than 8 weeks postoperatively ($p =0.013$, 0.014 respectively). However, delay in CT more than 8 weeks did not affect DFS or OS in the laparoscopy group ($p=0.93$, 0.51 respectively) and the LX population as a whole had similar outcomes to the open group who had earlier initiation of CT.

Conclusions: The benefits of quicker recovery after LX surgery did not translate into earlier initiation of adjuvant CT in this study. However, a LX approach negated the inferior oncologic outcomes of patients who received delayed initiation of CT. These results need to be validated in larger studies and underlying potential causes warrant exploration.

COMPARISON OF SHORT-TERM AND LONG-TERM OUTCOMES IN OPEN SURGERY GROUP, LAPAROSCOPIC SURGERY GROUP AND CONVERSION TO OPEN SURGERY GROUP DURING LAPAROSCOPIC COLORECTAL CANCER SURGERY.

(P300)

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Purpose: There have been various debates about oncologic safety since the beginning of laparoscopic colorectal surgery. But there are few reports about long-term outcomes of cases which had open conversion during laparoscopic surgery. The purpose of this study is to investigate how open conversion which was conducted during laparoscopic surgery affect in short-term and long-term outcome.

Methods: There were 99 patients who had open conversion from on the 1st of January in 2008 to 31th December in 2010. The medical records were analyzed retrospectively. To do case matching, two other groups were selected based on sex, age, name of operation, TNM staging system (Group1; Conversion group, Group2; Open surgery group, Group3; Laparoscopic surgery group). So in total 297 patients participated in this study. For the statistical analysis of the three groups, two-way ANOVA, Generalized estimation equation and Kaplan-Meier method were used in this study

Results: The mean follow-up time of this study was 36 months. The three groups showed no differences in sex, age, name of operation and TNM staging system. There were no significant differences in BMI, preoperative obstruction, preoperative distant metastasis, preoperative CEA level, also. But there was significant difference in previous operation history($p=0.021$), especially there was more previous operation history in Group2 than Group3 patients(p-0.018). Postoperative diet process was faster in Group3, there were no differences between Group1 and Group2($p=0.001$). Postoperative complication was more common in Group2 than Group3($p=0.003$). The overall survival curve($p=0.361$) and disease free survival curves($p=0.693$) among three groups did not show significant differences

Conclusions: There were some differences in postoperative diet process and postoperative complication among three groups. But statistically no difference was found in overall survival and disease free survival. It seems that conversion during laparoscopic operation doesn't affect survival of colorectal cancer.

PATTERNS AND TREATMENTS OF RECURRENCE FOLLOWING PULMONARY RESECTION FOR COLORECTAL METASTASES.

(P301)

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Purpose: Pulmonary resection currently represents the best therapeutic option for lung metastases from colorectal cancer. However, the recurrence rate is high. The purpose of the current study was to evaluate the pattern of recurrence and treatments of patients (pts) with recurrence after curative pulmonary resection of lung metastases from colorectal cancer.

Methods: 112 pts who underwent curative surgery for primary colorectal cancer and lung metastases from 1992 to 2010 were investigated in our prospective database. Among 112 pts, 76 experienced a recurrence. Overall survival (OS) was defined as the interval between the date of recurrence after pulmonary resection and the date of death or last follow-up. Kaplan-Meier analysis was used to estimate survival outcomes. And, clinicopathologic factors were analyzed by use of univariate and multivariate regression analyses.

Results: Of 76 pts occurred recurrence, 40 pts had a primary colon cancer and 36 had a primary rectal cancer. Primary tumor was stage I in 4, stage II in 6, stage III in 33, and stage IV in 33 pts. Lung metastases were bilateral involvement (26.3%) and multiple lesions (39.5%). With a median follow-up time of 32.7 months (1.5-172.4) after recurrence following pulmonary resection, the sites of recurrence included lung (n = 38), liver (n=12), others (n=11), and multiple (n=15). The 3-year OS were 71.3%, 83.3%, 42.9%, and 0% respectively ($p<0.01$). The treatments for recurrence included surgery (n=35), chemotherapy (n=37), and palliative care (n=4). The 3-year OS were 84.1%, 38.9%, and 0% respectively ($p<0.01$). Of 35 pts who had surgery, 22 pts were pneumonectomy and 12 pts were hepatectomy. Curative resection was achieved in all pts except one patient with pneumonectomy. On univariate and multivariate analysis, factors affecting OS were recurrence site following pulmonary resection and treatment for recurrence.

Conclusions: Following resection of lung metastases, pulmonary recurrence was frequent. Our results suggest that surgery for recurrent disease following pulmonary resection of colorectal metastases is feasible treatment when it becomes curative resection.

OVERCOMING THE CHALLENGES OF PRIMARY TUMOR MANAGEMENT IN PATIENTS WITH UNRESECTABLE METASTATIC COLORECTAL CANCER AND AN ASYMPTOMATIC PRIMARY TUMOR.

(P302)

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Purpose: This study aimed to evaluate the rate of symptom-directed surgery followed by systemic chemotherapy and to estimate the impact of initial primary tumor resection on survival in patients with unresectable metastatic colorectal cancer and an asymptomatic primary tumor.

Methods: Between 2005 and 2011, a total of 192 consecutive patients with newly diagnosed stage IV colorectal cancer were identified. Of the 192, we finally analyzed 95 patients with unresectable and asymptomatic colorectal cancer.

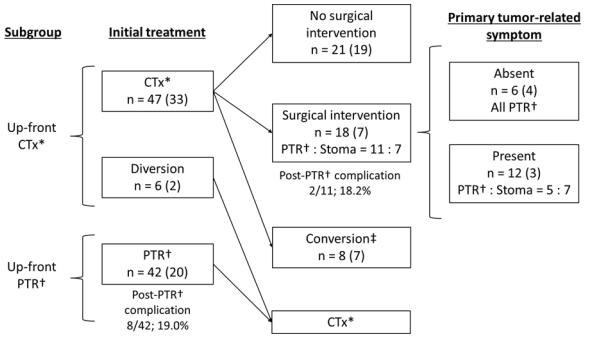
Results: Fifty-three of the 95 patients with an intact primary tumor received systemic chemotherapy (up-front chemotherapy group). The remaining 42 patients underwent primary tumor resection as first-line therapy (up-front primary tumor resection group). Twelve up-front chemotherapy patients required symptom-directed late surgery. Overall 1-year and 2-year rates of symptom-directed surgery were 19.1% and 26.1%, respectively. In patients with non-traversable lesions by colonoscope at diagnosis, 64.3% required late intervention within 1 year. Competing risk regression analysis revealed only colonoscopic traversability at diagnosis was significantly associat-

P301 Multivariate Analysis

	Hazard Ratio	[95% Confidence Interval]	p value
recurrence site following pulmonary resection			
lung	1.00		
liver	1.28	0.45-3.68	0.648
other	1.94	0.65-5.77	0.235
multiple	9.41	2.83-31.30	<0.001
treatment for recurrence			
surgery	1.00		
chemotherapy	3.08	0.96-9.65	0.053
best surpportive care	36.95	8.83-154.52	<0.001

ed with symptom-directed late surgery (subhazard ratio: 7.9, P=0.004). Median overall survival time was comparable between the two groups at 26.8 months for up-front primary tumor resection group and 21.5 months for the up-front chemotherapy group (hazard ratio: 0.82, confidence interval: 0.50–1.35).

Conclusions: Around 75% of up-front chemotherapy patients with unresectable and asymptomatic stage IV colorectal cancer can be spared initial resection of the primary tumor. Colonoscopic findings of non-traversable lesions at diagnosis may predict late surgical intervention. No significant survival benefit associated with initial primary tumor resection was identified in our series.



Detailed flow diagram of 95 patients with unresectable asymptomatic stage IV colorectal cancer after initial treatment and the presence of primary tumor-related symptoms for surgical intervention in patients receiving up-front chemotherapy

*CTx: chemotherapy

†PTR: primary tumor resection

‡In the up-front PTR group no cases were converted to resectable disease

Numbers in parentheses are numbers of patients with colonoscope-traversable lesions

POSTOPERATIVE OUTCOME OF POSITIVE PERITONEAL CYTOLOGY IN COLORECTAL CANCER.

(P303)

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Purpose: The detection of free cancer cells within the peritoneal cavity at the time of surgery has been shown to influence the prognosis in other abdominal cancer, but its significance in colorectal cancer is still not clearly defined. The aim of this prospective study, using a large number of patients at single institution, is to demonstrate postoperative outcome in patients with positive peritoneal cytology undergoing surgery for colorectal cancer.

Methods: From July 2004 to September 2010, we reviewed 2309 patients who underwent operation for primary colorectal cancer at our institution. Patients with at least 24 months follow-up period were included in our study.

Results: Excluding 374 patients with rectal cancer below the peritoneal reflection. Thus this study included 1935 patients. There were 569 patients with stage I, 496 stage II, 541 stage III, and 329 stage IV, according to the UICC classification. Overall, 85 patients (4.4%) had positive peritoneal cytology. Among the subgroup of 1284 patients with pT3 or pT4 tumors, 6.6% had positive peritoneal cytology. Curative resection was performed in 30 patients without (stage II (2) or III (16)) or with distant metastases (stage IV (12)), and non-curative resection was performed in 55 patients. All patients received adjuvant chemotherapy. The median follow-up period of the 30 patients with curative resection was 43 months (rages, 9 – 89 months). Peritoneal recurrence, liver metastasis, intra-abdominal lymph node metastasis, local recurrence, and others (such as lung metastasis) occurred in 23 patients with curative resection. At the time of described, 16 patients were alive (7 patients were alive with no evidence of recurrence), and 9 patients achieved 5-year survival. Among 55 patients who underwent non-curative resection, there were only 3 survivors after two years.

Conclusions: The present study suggests that detection of free cancer cells is associated with higher recurrence, although curative resection might be effective for long-term survival even if they had distant metastases. Moreover cytological examination may prove to be beneficial to determine which patients should receive more-aggressive adjuvant therapy and closer surveillance.

PELVIC EXENTERATION FOR PRIMARY LOCALLY ADVANCED AND RECURRENT RECTAL CANCER: IS IT A BALANCE BETWEEN SURVIVAL AND QUALITY OF LIFE?

(P304)

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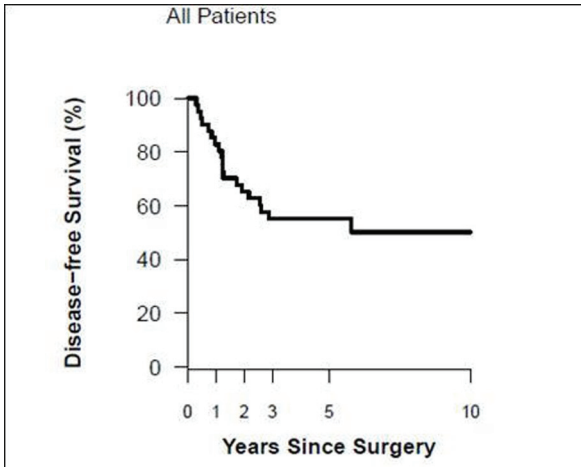
Purpose: While total pelvic exenteration (TPE) provides cure for some patients with primary locally advanced and recurrent rectal cancer, the impact of this extensive procedure on long term quality of life (QOL) has not been well assessed. The aim of this study is to hence evaluate the long-term QOL for patients undergoing TPE in the context of the early results and long term oncologic outcomes that may be expected.

Methods: Data for patients with primary locally advanced and recurrent rectal cancer who underwent total pelvic exenteration from March 1980 to July 2011 were obtained. Early and long-term outcomes and QOL were determined.

Results: 44 patients (66% male), 29 with primary locally advanced and 15 with recurrent rectal cancer, mean age 59.8 ± 10.8 years were identified. Ten patients with recurrent disease underwent chemo and/or radiother-

apy before or after previous surgery. Microscopically clear surgical margins were obtained in 34 patients (77.3%). Overall major complication rate after TPE was 43% and similar for primary and recurrent rectal cancer (44.8% vs 40%, P=1). After a median follow-up of 3.7 years, local recurrence occurred in 14.6 % (primary: 19.2% vs. recurrent rectal cancer: 6.7%, P=0.39), and distant recurrence in 17.1% (15.4% vs 20.0%, P=0.69) patients. The 5-year overall survival rate was 61.3% and disease free survival 55.2% and similar (66.3% vs. 53.3 %, P=0.35 and 60.3% vs 46.7%, P=0.44) for primary and recurrent rectal cancer. Cancer specific survival rates were 77.3% for primary and 71.1% for recurrent cancer (P=0.36). Quality of life assessed at after TPE was high, the mean SF 12 physical scale was 38.2 ±6.7 in the primary and 46.5 ±9.2 in the recurrent group (P=0.43), mean SF 12 mental scale was 52.6 ± 10.9 and 55.5 ± 4.9, respectively (P=1). Cleveland global quality of life (CGQL) scores were 0.7 +/- 0.1 and 0.8 +/- 0.02 respectively (P=0.06)

Conclusions: Despite a significant complication rate associated with the procedure, in suitable patients with primary locally advanced and recurrent rectal cancer, TPE is associated with good oncologic outcomes and acceptable QOL on prolonged follow-up.



A COMPARATIVE OUTCOME ANALYSIS OF SYNCHRONOUS COLON AND LIVER RESECTIONS VERSUS A STAGED PROCEDURE IN A COMMUNITY-BASED SETTING.

(P305)

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Purpose: Traditionally, colorectal cancer with hepatic metastases has been managed by a staged surgical procedure. Some studies have shown no difference in operative morbidity or mortality when a synchronous surgical intervention is performed at a high volume institution with selected patients. Our study seeks to examine the outcomes at a community based single center practice to determine if synchronous surgery is an acceptable option at these centers.

Methods: A retrospective review was performed of patients at our institution who underwent surgical management of colorectal cancer with hepatic metastases between the years of 2003-2011. The patients were divided into groups based on those who underwent synchronous surgery (SS) and those who underwent a staged procedure (SP). The complications, outcomes, and mortality between the two groups were compared. Recorded data included age, OR time, estimated blood loss (EBL), packed cell transfusion, ICU days, days on the ventilator, anastomotic leak, ileus, abscess, biloma, cardiac event, pulmonary event, survival at one year, and post operative chemotherapy.

Results: SS was performed in 15 patients while 26 underwent a SP. The mean age of the SS and SP group was 57.6±2.1 and 61.9±2.3, respectively (see Table 1). Hospitalization length in the SS (n=15) and SP (n=26) patients was 11.4 ±1.8 and 16.3±1.6, respectively (p=0.06). Transfusion of packed red blood cells (p=0.04), anastomotic leaks (p=0.02), ileus (p=0.01), and post operative chemotherapy (p=0.01) were all found to be significantly higher for SS patients relative to SP patients (see Table 2). The other variables, including death, one year survival, and OR time, were not statistically significant between the two groups. Although not statistically significant, surgical site infections were higher in the SP group (20.0%) compared to the SS group (6.7 %).

Conclusions: Synchronous colorectal cancer resection with hepatic metastasis can be performed in a community based setting with acceptable mortality rates and one year survival. However, the higher complication rates of synchronous resections translate into excess patient morbidity and make staged procedures a safer option.

DEFYING THE NORM: AGGRESSIVE EARLY STAGE COLON CANCERS THAT DEVELOP DISTANT METASTATIC RECURRENCES.

(P306)

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Purpose: Colorectal cancer (CRC) is the 3rd leading cause of cancer and cancer deaths in the US. Five-year overall survival (OS) rate from CRC is 64.3% and is up to 90.1% in early stage (I and II) cancer. We were interested in identifying factors associated with early stage colon cancer patients who ultimately developed distant metastases.

Methods: An IRB approved retrospective study was performed on early stage colon cancer patients operated on with curative intent from 2000-2011 who later developed distant metastatic recurrence. Factors evaluated

include age, gender, preop CEA level, pathologic factors, adjuvant chemotherapy use, recurrence location, time to recurrence and OS.

Results: There were 55 patients identified. Patient characteristics are in Table 1. The majority of patients had right sided, 22(40%), or sigmoid, 25(45.5%), cancer. Most patients, 44(80%), had stage II colon cancer at diagnosis with 40(72.7%) being T3. Median tumor size was 4.65 cm (range 1.5-13). Median number of lymph nodes collected was 13 with 20(36.4%) patients that had less than 12 removed at the time of surgery. Forty (72.7%) did not have lymphovascular invasion (LVI) and of the 6 that did have LVI, 3(50%) had adjuvant chemotherapy. Of the 44 with stage II tumors, 19(43.2%) received adjuvant chemotherapy. Median time to disease recurrence was 15.2 months (range 3.7-57, 95% CI 11-19) with a 2-year recurrence free survival of 24%. Median OS was 53 months (range 16-138, 95% CI 46-78) with a 2-year actuarial survival rate of 96% and 5-year of 46%. On multivariate analysis, no features were identified as statistically significant in being associated with distant recurrences.

Conclusions: There is a high cure rate in early stage colon cancer. However, a subset of patients will develop recurrent metastatic disease. No specific pathologic features of the primary tumors predict a higher risk of distant recurrence. Future studies need to evaluate molecular and genomic markers that increase this risk despite favorable tumor characteristics. Vigilant surveillance of patients with early stage colon cancer should remain the standard to allow prompt detection and treatment of recurrences.

P305 Outcome and Complication Data for SS and SP Patients

Variable	SS (n=15)	SP (n=26)	p value
Total OR time (min)	371.6±35.0	372.1±25.0	0.99
Total Estimated Blood Loss (ml)	820.7±252.0	613.5±68.0	0.43
Transfused Units (#)	1.1±0.4	0.2±0.2	0.04
Hospital Length of Stay (days)	11.4 ±1.8	16.3±1.6	0.06
ICU Length of Stay (days)	2.1±0.4	4.2±1.4	0.14
Surgical Site Infection	6.7% (1)	20.0% (5)	0.25
Hepatic Failure	0% (0)	4.0% (1)	0.43
Anastomotic Leak	33.3% (5)	4.0% (1)	0.02
Ileus	66.7% (10)	24.0% (6)	0.01
Abscess	33.3% (5)	12.0% (3)	0.10
Biloma	13.3% (2)	8.0% (2)	0.59
Venous Thromboembolic Event	13.3% (2)	11.5% (3)	0.89
Cardiac Event	0%(0)	15.4% (4)	0.11
Death	6.7% (1)	0% (0)	0.18
One year survival	93.3% (14)	100.0% (26)	0.19
Post Operative Chemotherapy	20.0% (3)	64.0% (16)	0.01

P306 Table 1. Characteristics of patients with early stage colon cancer who developed distant recurrences

Characteristics	N
Median Age At Diagnosis (years)	66 (30-81)
Gender: Male, Female	31 (56.4%), 24 (44.6%)
Location of Primary Tumor: Right, Tranverse, Left, Sigmoid	22 (40%), 1 (1.8%), 7 (12.7%), 25 (45.5%)
Pathologic Stage: I, II	11 (20%), 44 (80%)
T Stage: T1, T2, T3, T4	1 (1.8%), 10 (18.2%), 40 (72.7%), 4 (7.3%)
Median Tumor Size (cm)	4.65 (1.5-13)
Median Lymph Nodes Collected	13 (1-44)
Tumor Differentiation: Moderately, Poorly, Unknown	51 (92.7%), 2 (3.6%), 2 (3.6%)
Lymphovascular Invasion: Yes, No, Unknown	6 (10.9%), 40 (72.7%), 9 (16.4%)
Adjuvant Chemotherapy: Yes, No	20 (36.4%), 35 (63.6%)
Site of Recurrence:Liver, Lung, Both Liver and Lung, Other	33 (60%), 10 (18.2%), 1 (1.8%), 11 (20%)

COMPARISON OF LAPAROSCOPIC VERSUS OPEN PALLIATIVE SURGERY FOR PATIENTS WITH INCURABLE STAGE IV COLORECTAL CANCER.

(P307)

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Purpose: Although laparoscopic surgery for colorectal cancer has been widely applied, there are a few reports about surgical treatment in stage IV colorectal cancer. The purpose of this study was to compare outcomes of laparoscopic surgery with those of open surgery in patients with unresectable metastatic colorectal cancer.

Methods: We retrospectively reviewed medical records of patients who underwent palliative resection with incurable stage IV colorectal cancer from January 2001 to December 2010. Short-term and long term outcomes were compared between laparoscopic and open surgery

Results: Of the 280 patients, 61 (21.8%) underwent laparoscopic surgery and 219 (78.2%) were treated with open resection. There was no difference in demographics between the two groups except for site of tumor. Conversions were required in 2 patients (3.2 %) due to fixed or bulky tumors. In short-term outcome, amount of blood loss was less in the laparoscopic group (100.5 vs 200 ml, $p = 0.014$), although operation times is shorter in the open group (162.68 vs 199.59 min, $p = 0.003$). Patients in the laparoscopic resection showed earlier times to gas out (2.96 vs 3.75 days, $p < 0.001$) and intake of liquid food (5.39 vs 6.13 days, $P < 0.001$) compared with patients in the open surgery. Duration of hospital stay in laparoscopic resection was shorter (10.36 vs 12.35 days, $p < 0.001$). The complication rate was less frequent in the laparoscopic group compared with open procedure (32.8% vs 47.5%, $p = 0.043$). Although univariate analysis showed that laparoscopic surgery was associated with 3 year overall survival (Hazard Ratio (HR) = 5.09, 95% Confidence Interval (CI) = 22.08-29.77, $p = 0.024$), there was no difference of the overall survival between two groups using multivariate analysis (HR = 0.863, 95% CI = 0.604-1.233, $p = 0.419$).

Conclusions: In patients with incurable stage IV colorectal cancer, laparoscopic surgery seem to have better short-term outcomes and non-inferior long-term outcomes compared with open resection. Palliative laparoscopic resection can be a safe and feasible option in patients with unresectable metastatic colorectal cancer.

EXTRA-ANATOMICAL LAPAROSCOPIC COLORECTAL EN-BLOC RESECTIONS FOR LOCALLY ADVANCED CANCERS: SHORT-TERM OUTCOMES.

(P308)

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Purpose: It is debatable whether or not it is feasible to do curative reactions for locally advanced colorectal cancers involving adjacent structures, using the laparoscopic approach. In spite of excellent views, absence of tactile sensation during laparoscopy makes the procedure challenging for dissection in extra-anatomical planes. The aim of the present study was to compare the short term outcomes of en-bloc resections done using both open and laparoscopic approach in a single centre.

Methods: Data was collected prospectively from Feb 2008 to October 2012 of all en-bloc resections done for colorectal cancers. Both elective and emergency resections were included in the analysis.

Results: A total of 55 patients had en-bloc resections (21 open and 21 laparoscopic) during this period. Median age was 67 year (open) and 71year (lap). Among this 12 procedures (10 open and 2 laparoscopic) were done as emergency, 43 were elective resections. 22 (open) and 20 (lap) were left sided resections. Anatomical structures involved include abdominal wall (3), stomach (5), uterus (20), prostate (2), small bowel (9), spleen (2), bladder and ureter (14). Clear margins (R0 resection) were obtained in 22/34(open) Vs 15/21(Lap) ($p=0.2023$). Median length of stay was 13 days (open) Vs 5 days (lap). There was no significant difference in the anastomotic leak (0 open Vs 2 lap, $p=0.0672$), 30 day re-operation (3 open 5 laparoscopic, $p=0.259$) and 30 day mortality rates (1 open Vs 0 lap, $p=0.708$) between the two groups.

Conclusions: It is possible to achieve R0 resection for locally advanced colorectal cancers using the laparoscopic approach with no difference in the short term outcomes compared with open surgery. Laparoscopic approach has an added advantage of significantly shorter hospital stay.

SIMULTANEOUS LAPAROSCOPIC COLORECTAL AND HEPATIC RESECTIONS FOR COLORECTAL CANCER: INITIAL EXPERIENCE.

(P309)

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Purpose: Laparoscopic resection for colon cancer has been accepted as a standard alternative for conventional open procedure. On the other hand, several reports

showed that laparoscopic liver resection is safe and feasible. However, there are little data regarding patients requiring simultaneous laparoscopic colorectal and hepatic resections. We analyzed short-term outcomes of simultaneous laparoscopic colorectal and hepatic resections for colorectal cancer.

Methods: From May 2008 to October 2012, 23 patients with primary colorectal cancer and synchronous hepatic metastases underwent simultaneous laparoscopic colorectal and liver resection. A retrospective analysis of prospectively collected data was carried out.

Results: The median age of the patients was 60.0 years (range, 43-75 years) and median BMI was 23.7 kg/m2 (range, 17.7-28.3 kg/m2). The primary cancer located on ascending colon in 2 cases, sigmoid colon in 9 cases, rectosigmoid colon in 6 cases, and rectum in 6 cases. Single-lesion liver metastasis was found in 15 cases and two or more lesion was found in 8 cases. Procedures for hepatic metastases were 6 hemihepatiectomies, 8 sectionectomies, 2 bisegmentectomies and 7 wedge resections. The median operation time was 286.0 minutes (range, 183-551 minutes) and median blood loss was 350.0 mL (range, 50-900 mL). There was no open conversion. The median postoperative stay was 8.0 days (range, 5-23 days). Overall complication rate was 17.4% (4/23). Among the four patients who developed complication, two patients needed emergency exploration due to anastomosis leakage. There was no mortality.

Conclusions: The simultaneous laparoscopic colorectal and hepatic resection for colorectal cancer is safe and technically feasible in selected patients.

PHASE II STUDY OF SYSTEMIC CHEMOTHERAPY AND PREOPERTIVE SHORT-COURSE RADIOTHERAPY FOR LOCALLY ADVANCED RECTAL CANCER WITH RESECTABLE DISTANT METASTASIS.

(P310)

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Purpose: The aim of this retrospective study was to determine the clinical outcome and the oncologic outcomes after upfront systemic chemotherapy and short-course radiotherapy (RT) with delayed surgery.

Methods: Between march 2009 and august 2012, 30 patients were selected for upfront chemotherapy and short-course RT (25Gy). 28 patients was performed delayed surgery, 2 patients was not performed surgery due to progression disease. The patients had locally advanced primary rectal cancer with synchronous and potentially resectable distant metastases. Adjuvant chemotherapy was administered to 23 patients at end of the surgery. All patients who were performed surgery underwent total mesorectal excision (TME). The median duration between short course RT and surgery was 12.7 weeks (range, 3-21).

Results: The median patient age was 60.0 years (range, 33-73). Total toxicity of neoadjuvant chemotherapy was 10 patients (33.3%). Toxicity was neutropenia (n = 3, 10%), thyrombocytopenia (n = 1, 3.3%), general weakness (n = 2, 6.8%), nausea and vomiting (n = 3, 10.3%), diarrhea (n = 2, 6.8%), Cr elevation (n = 1, 3.3%). R0 resection of lesion was achieved 23 patients (76.7%). R1 resection of lesion was performed 5 patients (16.5%). Postoperative morbidity was 10 patients (35.7%). Complication was wound infection (n = 3, 10.7%), anastomotic leakage (n = 5, 17.9%), obstruction (n = 1, 3.6%), intraabdominal abscess (n = 1, 3.6%). The median follow up duration was 14.4 months. The 2 year overall survival for all patients was 80.2% and 2 year disease free survival rates was 41.8%. The overall recurrence was noted in 10 patients (43.3%) after R0 resection. There have been no local recurrence. The recurrence pattern was liver (n = 2, 8.7%), lung (n = 5, 21.7%), paraaortic node and multiple node (n = 1, 4.3%), neck node + multiple node (n = 1, 4.3%), appendix (n = 1, 4.3%).

Conclusions: Upfront chemotherapy and short course RT with delayed surgery is a valuable alternative treatment approach for patients with synchronous distant metastasis.

PELVIC EXENTERATION FOR PRIMARY LOCALLY ADVANCED RECTAL CANCER: A REVIEW OF THE ACS-NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM DATABASE.

(P311)

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Purpose: Pelvic exenteration is sometimes the only possibility of cure for the treatment of locally advanced rectal cancer in selected patients. Pelvic exenteration can be a daunting procedure with historically high mortality and substantial morbidity. The aim of this study is to determine the incidence of 30-day complications in a contemporary cohort of patients and to identify perioperative risk factors associated with complications following pelvic exenteration

Methods: Patients who underwent pelvic exenteration for primary locally advanced rectal cancer were identified by ICD9 and CPT codes from the NSQIP database (2005-2010) Complications were divided into major (cardiac, respiratory, neurological, renal, organ space infection, return to operating room, venous thrombo-embolism and post-op sepsis) and minor (urinary tract infection and superficial wound infection). The main end points studied were 30 day mortality and morbidity. Risk-adjusted 30 day

outcomes were assessed by use of univariate and multivariate regression analyses, adjusting for patient characteristics and comorbidities.

Results: A total of 121 patients underwent pelvic exenteration for primary locally advanced rectal cancer. Other procedures performed were Cystectomy (26), total abdominal hysterectomy and salpingo-oopherectomy (10), Prostatectomy (16), vaginectomy and reconstruction (13), Sacrococcygeal excision of tumour (4), abdominoperineal excision of rectum (2), lobectomy of liver (2) and adrenelectomy (1). Overall 30- day mortality was 0.8%. Major complications and minor complications occurred in 29.4% and 28.1% of patients, respectively. There were no perioperative factors found to be significantly associated with 30-day outcomes

Conclusions: Pelvic exenteration for primary locally advanced rectal cancer is a safe operation in carefully selected patients. Thirty-day morbidity for both major and minor complications is appreciable but not prohibitive. In this series, there were no significant perioperative variables predictive of 30 day outcomes.

PELVIC MULTIVISCERAL RESECTION FOR COLORECTAL CANCER: A MULTI-INSTITUTIONAL ANALYSIS OF RISK FACTORS AND 30-DAY OUTCOMES.

(P312)

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Purpose: The incidence of and risk factors for morbidity and mortality after pelvic exenteration for rectal cancer are poorly described. This project was designed to analyze the morbidity of complex pelvic surgery for rectal cancer and to identify prognostic factors using a large multi-institutional dataset.

Methods: The ACS-NSQIP Participant Use Files from 2005-2010 were queried for complete pelvic exenterations (CPE) (n=179) and for lesser multivisceral pelvic surgeries involving cystectomy (GI/GU) (n=222) or hysterectomy (GI/GYN) (n=400) as treatment for rectal cancer. Perioperative risk factors and postoperative complications were compared across surgery types. Further analysis was conducted on CPE cases to identify prognostic factors for any complication (AC) and for death and serious morbidity (DSM).

Results: Compared to lesser resections, patients with CPE were more likely to be smokers, have preoperative radiation therapy (RT), transfusion, and longer operative time (OT)(all p<0.05). Although 30-day mortality rates were low, the AC, DSM, and LOS were all higher for CPE compared to GI/GU and GI/GYN resections (Table 1). In the CPE group, the most common complications were wound infection (19%), sepsis (14%), organ space infection (11.8%) and return to OR (11.7%). In univariate analysis the following factors were associated with AC: functional status (p=0.025), 10% weight loss (p=0.009), and OT>450 min (p<0.001). Despite the higher utilization of RT in the CPE group (37% vs. 13.5% in GI/GU vs. 29% in GI/GYN, p<0.001), this factor was not associated with increased complications. Multivariate analysis identified operative time as the only clinical factor independently associated with AC or DSM (p=0.043 and p=0.035).

Conclusions: This analysis determined that despite high morbidity rates CPE for rectal cancer is being performed with low 30-day mortality. The findings that the strongest predictor of post-operative complications was extended OT and that preoperative RT did not increase morbidity indicate that outcomes can be improved with better preoperative multidisciplinary and perioperative multispecialty surgical planning.

Table 1

	CPE (n=179)	GI/GU (n=222)	GI/GYN (n=400)	*p* Value
Any Complication	94 (52.5%)	103 (46.4%)	154 (38.5%)	0.005
DSM	67 (37.4%)	70 (31.5%)	100 (25%)	0.008
30-day Mortality	2 (1.1%)	4 (1.8%)	1 (0.2%)	0.127
Median LOS (Range)	10 (4-112)	8 (0-71)	7 (1-64)	<0.001

CHARACTERISTICS OF INPATIENT CASES WITH METASTATIC COLON CANCER AMONG PERSONS UNDER 50 YEARS OF AGE IN THE US, 2001-2010.

(P313)

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Purpose: To assess comorbidities, primary cancer sites, and metastases in colon cancer among younger persons within inpatient settings in the U.S. from 2001-2010.

Methods: Hospital discharge records from the nationally-representative Healthcare Cost and Utilization Project were used in this retrospective cohort analysis. Inclusion criteria included age 18-50 years with any diagnosis of colon cancer. A generalized binomial regression was used to assess the association of distant metastases with Elixhauser comorbidities and colon cancer site after controlling for patient demographics, payer, year, and hospital characteristics.

Results: Overall, 188,318 inpatient admissions were observed, averaging 43.1±6.3 years of age, 6.9±7.2 days length of stay, and $47,671±64,863 in charges (USD, 2012). Primary colon cancer sites included sigmoid (20.1%), cecum (9.2%), ascending (9.1%), appendix (6.5%), transverse (5.2%), descending (4.5%), hepatic flexure (2.5%), and splenic flexure (2.4%); 34.6% of cases were unspecified by site and 7.1% overlapped sites. The most prevalent comorbidities were anemia (27.0%), fluid and electrolyte disorders (26.6%), miscellaneous gastrointestinal disorders (22.1%), intestinal obstructions

(20.3%), hypertension (19.0%), surgical complications (17.5%), metabolic disorders other than diabetes (12.1%), liver disease (8.9%), esophageal disorders (8.4%), and diabetes (7.4%). Distant metastases were noted in 57.6% of cases, primarily involving the liver or other digestive organs (27.9%), lymph nodes (20.2%), other gastrointestinal sites (13.6%), lung (8.8%), genitourinary system (3.8%), bone (3.4%), and central nervous system (1.4%). Results of the multivariate binomial regression found significantly higher ($p<0.05$) associations of distant metastasis with cancer of the splenic flexure, overlapping or unspecified colon cancer, anemia, coagulopathy, depression, liver disease, fluid and electrolyte disorders, pulmonary circulation disorders, and wasting syndrome.

Conclusions: Metastatic colon cancer is common among younger persons in inpatient settings, warranting further research to assess its burden of illness and to develop novel treatment approaches.

OPEN RECTAL SURGERY WITH LONG MID-LINE INCISION VERSUS LAPAROSCOPIC RECTAL SURGERY WITH UPPER MID-LINE INCISION IN PATIENTS WHO UNDERWENT PROTECTOMY COMBINED WITH LIVER METASTASECTOMY: COMPARISON OF SHORT-TERM OUTCOME.

(P314)

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Purpose: In patient with rectal cancer and synchronous liver metastasis, the benefit of laparoscopic rectal resection is still not definite. The aim of this study was to compare short-term outcomes between open rectal surgery with long mid-line incision(OL) and laparoscopic rectal surgery with upper mid-line incision(LU) in patients with rectal carcinoma and sychronous liver metastasis.

Methods: Between January 2001 and July 2012, ninety-seven patients with rectal cancer and synchronous liver metastasis undergoing rectal and hepatic resection were included for study. All patients underwent total mesorectal excision and simultaneous open liver resection. Medical chart were reviewed retrospectively. Short-term outcomes were assessed in terms of operation time, hospital stay, start of diet and postoperative complication.

Results: Of 97 patients, sixty-five patients were OL group and thirty-two patients were LU group. There was no conversion to open rectal surgery in LU group. Operation time was longer in the LU group than in the OL group(median: 405.1 vs 352.5 min, p=0.03). Hospital stay was shorter in the LU group than in the OL group(median: 10.9 vs 13.9 days, p=0.018). Time to first diet was faster in the LU group than in the OL group(median: 5.7 vs 6.5 days, p=0.048). The rates of postoperative complication were not different between two groups.

Conclusions: Laparoscopic rectal surgery with upper mid-line incision seems to have better short-term outcomes compared with open rectal surgery with long mid-line incision. In patients with rectal cancer and synchronous liver metastasis, laparoscopic rectal surgery with upper mid-line incision can be an alternative surgical option for combined resection.

DO ANASTOMOTIC LEAKS IMPAIR POSTOPERATIVE HEALTH-RELATED QUALITY OF LIFE AFTER RECTAL CANCER SURGERY? A MATCHED CASE-CONTROL STUDY.

(P315)

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Purpose: To explore the potential effect of clinically evident anstomotic leaks on Health-Related Quality of Life (HRQoL) after rectal cancer excision.

Methods: A sex-, age-, and stage-matched case-control study was conducted on 25 low anterior resection (LAR) patients complicated by an anastomotic leak (Clavien classification II, n=14 and III, n=11) and 50 LAR patients with an uncomplicated course. This was a retrospective study on prospectively collected HRQoL data at fixed assessment time-points (baseline, 1, 3, 6 and 12 postoperative months) utilizing validated questionnaires (SF-36, GIQLI, EORTC QLQ-C30 and EORTC QLQ-CR29).

Results: No differences were observed at the baseline scores. Sixteen "anastomotic leaks" patients remained with a temporary loop ileostomy for at least 6 months. Several measured scores at the postoperative assessment time-points were worse at the "anastomotic leak" vs the "uncomplicated" group of patients.

Conclusions: Anastomotic leaks have an adverse effect on postoperative HRQoL.

FINANCIAL COST OF ANASTOMOTIC LEAK IN COLORECTAL SURGERY.

(P316)

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Purpose: Anastomotic leak is a known complication of colorectal surgery and has a profound effect on a patient's clinical course. While the prodigious use of medical resources occurring after this complication has been described, the actual direct cost of these additional services have not. The aim of this study is to quantify the financial burden of an anastomotic leak.

Methods: Retrospective review was performed to identify all patients who underwent colon or rectal resections with anastomoses within a single colorectal surgery unit

from July 2009 to August 2012. Anastomotic leaks were identified by radiological confirmation or the clinical judgment of the attending surgeon. Cases of anastomotic leak were matched to cases without leak, controlling for variables affecting baseline hospitalization costs including medical comorbidities, operative approach, type of operation, and other complications. The direct technical and professional costs of the initial operative hospitalization, subsequent imaging, procedures and operations, and office visits related to anastomotic leak were obtained and analyzed for each patient.

Results: Of 211 patients, 18 patients (8.5%) had anastomotic leaks. There was a mean difference in cost of $52,052 (±$43,856, median $39,944, range -$4465 to $176,231) between those with leaks and those without, representing a mean increase in cost of 222% (±188%, median 153%) and a mean 3.2-fold (median 2.5-fold) difference in cost between the leak and non-leak patients. This difference in cost can be attributed to increases in length of stay, readmissions, imaging studies, interventional radiology procedures, additional operations, and office visits. (Table)

Conclusions: Anastomotic leaks result in a significant financial burden to the healthcare system. The current compensation system which does reimburse for costs associated with this complication may change given the shift toward a pay-for-performance system and a broader definition of surgical quality. Thus, investments in new technology and systems of quality control to reduce anastomotic leak rates are not only beneficial to patients, but may also minimize financial losses.

GOING BEYOND THE AIR LEAK TEST – OUR INITIAL EXPERIENCE WITH A NEW GRADING SYSTEM UTILIZING FLEXIBLE ENDOSCOPY FOR THE INTRAOPERATIVE EVALUATION OF RECTAL ANASTOMOSES.

(P317)

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Purpose: To evaluate an intraoperative anastomotic grading system utilizing flexible endoscopy to identify rectal anastomoses at high risk of anastomotic leak (AL).

Methods: This is a retrospective review of 51 patients who underwent proctectomy with intraoperative flexible endoscopic assessment of the rectal anastomosis. A 3-tiered endoscopic anastomosis grading system was utilized.

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Postoperative time-point	SF-36 (domains,p)	GIQLI (domains,p)	EORTC-QLQ-C30 (domains,p)	EORTC-QLQ-CR29 (domains,p)
1 month	RLPF,0.001 RLEP,0.03	Global QoL,0.03 EF,0.03	RF,0.03 SF, 0.01	"Embarrassment",0.03 "Stoma problems",0.007
3 months		PF,0.03	PF,0.03	"Pain",0.003 "Embarrassment",0.03 "Stoma problems", 0.03 "Sore skin",0.04
6 months	RLPF,0.01 RLEP,0.03 General Health,0.03	Global QoL,0.01 EF,0.008 PF,0.004	QoL,0.003 Dyspnea,0.03 Diarrhea,0.01	"Body image",0.03 "Stoma problems",0.03
12 months	RLPF,0.0001 RLEP,0.03 Emotional well-being,0.03 SF,0.009 General Health,0.02	Global QoL,0.005 EF,0.007		"Anxiety",0.004 "Body image",0.02 "Sore skin",0.005

(RLPF: Role limitations due to physical function, RLEP: Role limitations due to emotional function, EF/RF/SF/PF: Emotional/Role/Social/Physical Function)

P316 Differences in peri-operative and post-operative course contributing to cost of anastomotic leak

	No Anastomotic Leak	Anastomotic Leak	Difference in Case-Matched Pairs
Hospital Admissions	1.2±0.4 (1-2)	2.8±1.2 (1-5)	1.6±1.1 (0-4)
Total Length of Stay for all Admissions (Days)	6±2.5 (3-11)	24±15 (6-67)	18±16(-1-64)
Imaging Studies	0.2±0.4 (0-1)	3.2±2.5 (0-9)	3±2.4 (-1-8)
Procedures (Interventional Radiology)	0	2.5±3.2 (0-11)	2.5±3.2 (0-11)
Operations	1.1±0.3 (1-2)	2.6±1.4 (1-5)	1.4±1.4 (0-4)
Office Visits	1.7±0.7 (1-3)	4.6±3.4 (1-14)	3±3.5 (-1-11)

Grade 1 anastomosis was defined by circumferentially normal mucosa on both sides of the staple line. Grade 2 anastomoses had <30% of the mucosa on one side of the staple line with evidence of ischemia. Grade 3 were those where 30% or more of the mucosa appeared ischemic on one side of the staple line, or where any mucosal congestion / ischemia was present on both sides of the staple line.

Results: Of the 51 patients studied, 42 were Grade 1, 7 were Grade 2, and 2 were Grade 3. The air leak test was negative for all patients except one. The total anastomotic leak rate for this series was 18%. Six of the 42 patients (14%) with Grade 1 anastomoses developed AL. Three of these (7%) represented symptomatic AL requiring minor drainage procedures. The remaining 3 patients had an incidental finding of AL for which no intervention was necessary. Of patients with grade 2 anastomoses, 3 of the 7 patients experienced an AL (43%). Both grade 3 anastomoses were taken down at the time of the index surgery and reconstructed; neither developed a subsequent leak. Overall, intra-operative endoscopy led to a change in the operative plan in 5 patients (10%). Additionally, 6 high risk mid rectal anastomoses were not diverted based upon the healthy endoscopic appearance of the anastomosis. Only 1 of these patients experienced a symptomatic leak, requiring transanal drainage.

Conclusions: This pilot study demonstrates that the use of flexible endoscopy to evaluate high risk rectal anastomoses may influence surgical decision making in a substantial number of cases. Moreover, a grading system based on the appearance of the perianastomotic mucosa may be useful in identifying patients at especially high risk of anastomotic leak. Further studies are needed to validate these findings.

COMPRESSION ANASTOMOSIS IS ASSOCIATED WITH A LOW RATE OF ANASTOMOTIC LEAKAGE: INTERMEDIATE RESULTS OF WCCA RETROPRESS STUDY.

(P318)

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Purpose: Anastomotic leaks remain a significant problem after low anterior resection (LAR).The purpose of this study is to evaluate the morbidity including anastomotic leaks following compression anastomosis in LAR.

Methods: Multi center, observational, consecutive retrospective data collection of patients treated with compression anastomosis for LAR with an anastomosis <12cm from the anal verge

Results: 58 patients, 38 (66%) females, of a mean age of 60 (range 35-82) years underwent LAR at 4 US medical centers. The average BMI was 28.7 (range: 18.9-46.4). The diagnosis was carcinoma; (36), rectal prolapse (15), and diverticular disease (7). Anastomoses were a mean of 8 (range 1-12) cm from the anal verge and stomas were created in 13 patients (22%). There were 2 (3.4%) anastomotic leaks, 1 of which required surgical intervention and the second with IV fluids combined with NPO. Additional morbidity included delayed ileus (1 case), abdominal pain (1) treated with Tylenol, death (1) where patient readmitted with pneumonia on POD13. 2 patients suffered from post-operative fever, additional 2 from shortness of breath, and 1 patient was suffering from Nausea and vomiting POD4 treated by nasogastric tube for 1 day.

Conclusions: This intermediate retrospective series revealed a leak rate of 3.4% following LAR created with a compression anastomosis.

PERIOPERATIVE USE OF STATIN DOES NOT REDUCE THE INCIDENCE OF ANASTOMOTIC LEAK.

(P319)

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Purpose: Statins are known to impact the pro-inflammatory response and be protective for endothelial function in certain patient populations. This has been defined as immunomodulation. It has been hypothesized that statins may have a similar function in reducing the inflammatory response and consequential complications in colorectal resections. This study looks at whether the use of statins in the perioperative period reduces the incidence of anastomotic leaks in colorectal surgery.

Methods: A retrospective chart review was performed on patients who underwent elective and emergency colorectal resection between Jan 2008-Dec 2011. We compared demographic data, comorbidities and incidence of anastomotic leak rates between patients on statins perioperatively and those who were not. Statistical analysis was performed with Fischer's Exact Test and Pearson Chi-Square.

Results: 1767 colorectal resections were performed during the timeframe. 338 patients were on statins perioperatively for cardiovascular risks. Anastomotic leak in the Statin group was 6.2% vs 7% in the non Statin group ($p = 0.62$). Among those 28.5% were managed by surgical exploration vs 19.3% in the non Statin group. About two third of the patients in each group had an elective surgery as an index procedure, and there was similar number of segmental and non-segmental resections in each group. Also, there were no statistically significant differences between the two groups in term of gender, age, BMI, hypertension, diabetes mellitus, Crohns disease and postoperative complications.

Conclusions: Use of Statins perioperatively did not have effect on the rate of anastomotic leak in our patient popula-

tion; the benefits of the attenuated proinflammatory response of statins seen in patients of cardiovascular risk are likely overcome by the severity of post-surgical inflammation.

THE IMPACT OF LAPAROSCOPIC COLORECTAL SURGERY ON SMALL BOWEL OBSTRUCTION AND VENTRAL HERNIA FORMATION: A LARGE HEALTHCARE ORGANIZATION'S EXPERIENCE.

(P320)

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Purpose: The short-term benefits of laparoscopic compared to open colorectal surgery have been established. There is a paucity of data on the risk of adhesive small bowel obstruction (SBO) and incisional ventral hernia (VH) following laparoscopy. The aim of this study was to determine the rates of SBO and VH following laparoscopic and open colorectal surgery in a large healthcare maintenance organization.

Methods: The electronic medical records from a database of 14 hospitals serving 3.6 million patients in Southern California were reviewed. Patients 18 years and older, undergoing elective abdominal colorectal surgery between August 2008 and August 2011, with a minimum follow-up of 3 months were included. The crude incidence rates were calculated and relative risks of SBO and VH in the laparoscopic and open colorectal surgery groups were determined. Multivariable proportional hazard modeling was used.

Results: 4613 patients underwent 2790 laparoscopic resections (60.5%) and 1823 open resections (39.5%). Median age was 63 years, 48.9% were males, and 54.7% were non-Hispanic whites. The most common indications for surgery were colorectal carcinoma (46%) and diverticulitis (18.8%). The median follow-up was 2.4 years. Table 1 summarizes the crude incidence, unadjusted and adjusted hazard ratio (AHR) for VH and SBO. Patients undergoing laparoscopic colorectal surgery were less likely to develop VH [AHR: 0.70 (0.52, 0.94); p=0.02 for VH requiring operative repair and AHR: 0.60 (0.44, 0.82); p=0.001 for VH managed conservatively]. Similarly laparoscopic surgery was associated with less SBO [AHR: 0.40 (0.22, 0.72); p=0.002 for SBO requiring operative intervention and AHR: 0.42 (0.31, 0.57); p<0.0001 for SBO managed non-operatively].

Conclusions: The rates of SBO and VH were significantly lower in patients undergoing laparoscopic colorectal surgery compared to open resection. A wider adoption

P320 Crude Incidence, Unadjusted and Adjusted Hazard Ratio (95% CI) for Long Term Outcomes Comparing Laparoscopic and Open Procedures

	Crude Incidence/ 1000 Person Years (95% CI)	Unadjusted Proportional Hazard Model HR (95% CI)	Unadjusted Proportional Hazard Model P Value	Adjusted Proportional Hazard Model # HR (95% CI)	Adjusted Proportional Hazard Model # P Value
VH WITHOUT OR WITH REPAIR					
Open Procedure	83.6 (75.0, 93.3)	1.00 (1.00, 1.00)	—	1.00 (1.00, 1.00)	—
Laparoscopic Procedure	41.3 (36.4, 46.8)	0.49 (0.42, 0.58)	<0.0001*	0.64 (0.52, 0.80)	<0.0001*
VH WITHOUT REPAIR					
Open Procedure	33.9 (29.1, 39.6)	1.00 (1.00, 1.00)	—	1.00 (1.00, 1.00)	—
Laproscopic Procedure	16.8 (14.0, 20.2)	0.47 (0.37, 0.59)	<0.0001*	0.60 (0.44, 0.82)	0.001*
VH WITH REPAIR					
Open Procedure	39.4 (33.8, 46.0)	1.00 (1.00, 1.00)	—	1.00 (1.00, 1.00)	—
Laparoscopic Procedure	21.1 (17.8, 25.1)	0.53 (0.42, 0.67)	<0.0001*	0.70 (0.52, 0.94)	0.02*
SBO WITHOUT OR WITH SURGERY					
Open Procedure	73.8 (65.9, 82.8)	1.00 (1.00, 1.00)	—	1.00 (1.00, 1.00)	—
Laparoscopic Procedure	20.5 (17.2, 24.4)	0.28 (0.23, 0.34)	<0.0001*	0.41 (0.31, 0.54)	<0.0001*
SBO WITHOUT SURGERY					
Open Procedure	45.3 (39.6, 51.8)	1.00 (1.00, 1.00)	—	1.00 (1.00, 1.00)	—
Laparoscopic Procedure	14.8 (12.2, 18.0)	0.31 (0.25, 0.39)	<0.0001*	0.42 (0.31, 0.57)	<0.0001*
SBO WITH SURGERY					
Open Procedure	18.5 (14.8, 23.0)	1.00 (1.00, 1.00)	—	1.00 (1.00, 1.00)	—
Laparoscopic Procedure	3.8 (2.6, 5.7)	0.21 (0.13, 0.33)	<0.0001*	0.40 (0.22, 0.72)	0.002*

#Adjusted for age, sex, ethnicity, body mass index, Charlson co-morbidity index, prior abdominopelvic surgery, the presence of a stoma, indication for operation, type of operation, and the occurrence of short-term postoperative complication.

* P<0.05

of the laparoscopic technique in colorectal surgery can impact the incidence of these two potential long-term sequelae of abdominal surgery.

COST AND OUTCOMES ARE SIMILAR BETWEEN ROBOTIC AND LAPAROSCOPIC ABDOMINOPERINEAL RESECTION: A RETROSPECTIVE ANALYSIS FROM MORE THAN 300 US HOSPITALS.

(P321)

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Purpose: Minimally-invasive abdominoperineal resection (APR) has been shown to be oncologically equivalent to open APR with several short and long-term benefits. Given the technical difficulty of performing laparoscopy in the deep pelvis, robot-assisted APR has been suggested as an alternative approach with some visual and technical advantages. To our knowledge, there are no large national comparisons between these two procedures. This paper aims to compare outcomes between robotic and laparoscopic APRs in the United States.

Methods: The University Health System Consortium Clinical Database was reviewed from 2008 to 2012, using International Classification of Disease 9th Clinical Modification (ICD-9CM) codes to identify patients over the age of 18 who received a laparoscopic or robotic APR and to identify conversions to open surgery.

Results: for the study period of 48 months, 1,297 patients underwent minimally invasive APR during this study period (204 robotic, 1,093 laparoscopic). More patients in the robotic group underwent urgent surgery (5.39% vs. 2.65%, p=0.0465). The laparoscopic group had more patients with diabetes, chronic pulmonary disease, and rheumatoid arthritis. There were no statistically significant differences in short-term morbidity (9.8% vs. 10.9%, p=0.7126) or mortality (0% vs. 0.7%, p=0.6193) between the robotic and laparoscopic groups, respectively. Severity of illness, length of stay, and readmission rates were also similar. The laparoscopic group had a higher conversion rate than the robotic group (10.9% vs. 4.85%, p<0.05). The cost difference between the two procedures was not significant (robotic $17,803+9,105, laparoscopic $17,755+9,309, p=0.9459).

Conclusions: Robotic and laparoscopic APRs have similar perioperative outcomes with near-identical costs of care. Robotic APRs have a lower conversion rate, and may offer a technical advantage for minimally invasive surgery in the deep pelvis.

IS THERE A ROLE FOR EPIDURAL ANESTHESIA IN LAPAROSCOPIC COLORECTAL SURGERY?

(P322)

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Purpose: Numerous but small studies have been published demonstrating the superiority of epidural anesthesia over patient controlled analgesia in delivering better pain control, faster return of bowel function, and shorter length of stay. The aim of this study was to evaluate various modes of analgesia in patients undergoing laparoscopic colorectal surgery.

Methods: 433 patients undergoing laparoscopic or laparoscopic-assisted colon surgery at a single institution were retrospectively reviewed from March 2004 to February 2009. Patients were categorized into 2 groups: right hemicolectomy (175) and low anterior resection/proctectomy (258). 208 patients received epidural alone containing local anesthetic and a narcotic, 143 received "patient controlled analgesia" alone containing a narcotic, and 82 (28%) needed a combination of both in order to achieve adequate pain control. Mode of analgesia, pain score, age, body mass index, American Society of Anesthesiologists classification, diabetes mellitus, estimated blood loss, operative time, return of bowel function (defined by day of first flatus) and length of stay were compared. The data was evaluated using SPSS (17.0, Chicago, IL)

Results: In the right hemicolectomy group, diabetes and combined epidural with patient controlled analgesia were found to have a negative influence on return of bowel function (p<0.011 and p<0.037). In the low anterior resection/proctectomy group, epidural was associated

P321 Comparison of perioperative outcomes

Variable	Robotic(n=204)	Lap(n=1,093)	P value
Mortality, n (%)	0 (0.0)	8 (0.7)	0.6193
Morbidity, n (%)	20 (9.8)	120 (10.9)	0.7126
LOS, Days, Mean±S.D.	7.12±5.01	7.20±4.93	0.8320
ICU, n (%)	30 (14.8)	160 (14.6)	1.0000
Cost, $ Mean±S.D.	17,803±9,105	17,755 ±9,309	0.9459
Readmission, n (%)	17 (8.5)	89 (8.1)	0.8898

LOS: Length of Stay, ICU: Intensive Care Unit, $: United States Dollar, S.D.: Standard Deviation

with a faster return of bowel function by one day ($p<0.001$). Operative time exerted a negative influence on return of bowel function ($p<0.005$). Mean visual analogue pain scores were significantly lower in the epidural group on each of the first 3 post-operative days ($p<0.001$) compared to patient controlled analgesia group.

Conclusions: Epidural anesthesia is associated with a faster return of bowel function in the low anterior resection/proctectomy group but not the right hemicolectomy group. Epidural anesthesia is superior to patient controlled analgesia in controlling post-operative pain, but was inadequate and needed addition of patient controlled analgesia in 28% of patients.

COST-EFFECTIVENESS OF LAPAROSCOPY IN RECTAL CANCER.

(P323)

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Purpose: There is an increasing trend to use of laparoscopy for rectal cancer surgery. While laparoscopic and open rectal resections appear oncologically equivalent, there is little information on the cost of different surgical approaches. With the impending health care crisis and stress on surgeons to optimize healthcare resources and patient outcomes, the cost of care is an important factor. Our goal is to evaluate the cost-effectiveness of laparoscopy in rectal cancer.

Methods: A prospective departmental database was reviewed for elective rectal cancer procedures from 2007-2012. Cases were identified by the ICD-9 code 154.1, and stratified into laparoscopic (LAP) and open (OPEN) groups. Minors, procedures performed through TEM, anorectal, or endoscopic approaches, and open cases not suitable for laparoscopy (super obese, intra-operative radiation therapy, multi-visceral resections, and recurrent cancers) were excluded. Conversions to open remained in the LAP group by intention to treat analysis. The main outcome measures were cost of care, hospital length of stay (LOS), discharge disposition, readmission, post-operative complication, and mortality rates.

Results: 254 cases met inclusion criteria for the analysis- 125 laparoscopic (49%) and 129 open (51%). The groups were similar in age, BMI, and co-morbidities. Operating time ($p< .001$) and cost per OR minute ($p=.0431$) were significantly higher in the OPEN group. The LAP group had significantly lower LOS ($p< .001$) and total hospital cost ($p=.0021$). Post-operative complications, 30-day readmission, re-operation, and mortality rates were similar. However, significantly more OPEN patients required utilization of ICU care ($p=.0303$), SNF ($p=.0318$), and home care services ($p=.0030$) at discharge.

Conclusions: Laparoscopy is cost-effective for rectal cancer surgery, optimizing both healthcare expenditures and patient outcomes. For eligible patients, laparoscopic rectal cancer resection can reduce LOS, operating time, and resource utilization.

P322

Mode of analgesia	Right hemi-colectomy (n=175)	Day to first flatus(Mean ±Std)
Epidural (Epi)	75	3.5 ± 1.3
PCA	70	3.9 ± 1.3
Epi + PCA	30	4.2 ± 1.4
Mode of analgesia	**Low anterior resection (n=258)**	**Day to first flatus(Mean ± Std)**
Epidural (Epi)	133	3.0 ± 1.5
PCA	73	3.9 ± 1.1
Epi + PCA	52	3.9 ± 1.7

P323 Demographic and Outcome Data

Elective Rectal Cancer Procedures	Laparoscopic	Open	P-value
Cases	125	129	
Mean Charlson Score	2.1	2.6	0.0757
Mean Procedure Time (min)	222.1	284.0	< 0.0001
Readmission Rate (30 day)	10%	15%	0.2519
Post-operative Complication Rate	24%	37%	0.3952
Discharge Disposition-Home	97	68	< 0.0001
Mean Total Hospital Costs ($)	$17,214.17	$21,803.65	0.0021
Mean Cost Per OR Minute	$68.36	$103.76	0.0431

LEARNING CURVE OF LAPAROSCOPIC LOW ANTERIOR RESECTION IN TERMS OF LOCAL RECURRENCE.

(P324)

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Purpose: We aimed to test the hypothesis that there was no difference in the local recurrence rate after sphincter-saving laparoscopic rectal cancer surgery between the learning and experienced periods.

Methods: A total of 317 consecutive patients who underwent sphincter-saving laparoscopic rectal cancer surgery with curative intent from August 2004 to December 2008 were evaluated retrospectively. Univariate and multivariate logistic regression analysis were used to determine the independent factors for local recurrence from prespecific and tumor-specific factors. The best-fit model predicted the risk factors for local recurrence and a risk-adjusted sequential probability ratio test was used to assess the learning curve on 265 cases who met the minimum three-year postoperative follow-up duration on the basis of the local recurrence rate.

Results: During a median follow-up of 46.1 months, the local recurrence rate was 7.5% (20/265). TNM stage III [OR = 5.19; 95% confidence interval (CI), 1.73-15.52; p = 0.003], perineural invasion (OR = 4.69; 95% CI, 1.83-12.08; p = 0.001), and tumor height (OR = 0.87; 95% CI, 0.75-0.99; p = 0.041) were identified as independent risk factors for local recurrence after laparoscopic rectal surgery. Having adjusted for the case mix, the risk-adjusted sequential probability ratio test demonstrated a learning curve of 110 cases for local recurrence. Median operative time and grade III to V postoperative complications according to the Dindo classification declined with operative experience ($p < 0.001$ and $p = 0.034$, respectively).

Conclusions: Local recurrence rates decreased with accumulating surgeon experience, as did the other short-term outcomes; 110 procedures were necessary to acquire expertise.

LAPAROSCOPIC COLORECTAL SURGERY: A SIMPLE PREDICTIVE MODEL FOR CONVERSION TO OPEN SURGERY.

(P325)

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Purpose: The best predictive model for conversion in laparoscopic colorectal surgery remains to be determined. Body surface area is a recently described variable associated with conversion that was not included in previous models. The purpose of this study was to identify risk subgroups for conversion to open surgery based on a predictive model including body surface area.

Methods: Design: retrospective cohort study. Setting: a single tertiary care institution. Patients: 916 consecutive patients who underwent laparoscopic colorectal surgery between January 2004 and August 2011. Main outcome measures: conversion rate was evaluated in relation to age, sex, obesity, disease location (colon vs. rectum), type of disease (neoplastic vs. non neoplastic), history of previous surgery, body surface area (large vs. non-large with a cut-off ≥ 1.8 calculated by Mosteller formula), learning curve (more or less than 50 cases), fellow participation (assistant vs. main surgeon), individual colorectal surgeon and tumor penetration according current TNM system. Those showing significant association with the risk of conversion were entered in a multivariable logistic regression model to derive the relative risks of the different subgroups.

Results: Results: disease location, body surface area and male gender were independently associated with risk of conversion. We identified 3 distinct risk subgroups: low risk group (women regardless of location and small males with colon disease), average risk group (large males with colon disease), and high risk group (large male with rectal disease). The conversion rates were 5.6%, 12% and 27.8% respectively, $p<0.001$. In relation to the average risk group, odds ratios for low and high risk groups were 0.45 (IC95% 0.27-0.76,) and 2.93 (IC95%: 1.67-5.15).

Conclusions: This simple 3 variable predictive model stratifies patients with different conversion risks and may help to inform patients, to select cases in the early learning curve, and to assess standard of care.

NATIONAL UTILIZATION OF LAPAROSCOPIC AND ROBOTIC-ASSISTED SURGERY FOR RECTAL CANCER: AN ANALYSIS OF RECENT TRENDS.

(P326)

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Purpose: Over the past decade laparoscopy for colon cancer has been shown to result in reduced costs, faster recovery, shorter post-operative length of stay, and oncologic equivalence to open resection. However, adoption of laparoscopy for rectal cancer has been slower, thus we aimed to examine nationwide trends in the use of laparoscopy and robotic-assisted surgery for elective rectal cancer surgery.

Methods: Using the Nationwide Inpatient Sample we retrospectively identified adults diagnosed with rectal cancer who underwent elective resection between 2005 and 2009. Using sampling weights we estimated proportions of procedures performed using minimally invasive surgery stratified by: procedure type (including laparoscpically [LAP] or robotic-assisted laparoscopic surgery [RALS]), hospital characteristics, and geographic region. Pearson Chi-square and Pearson rho tests were used to assess the statistical significance of trends observed over time.

Results: From 2005 to 2009, the proportion of elective resections for rectal cancer performed LAP increased from 3.3% to 12.1%. The rise in use of LAP in rectal cancer patients was greatest for those who underwent abdominoperineal resection (APR, 2.3% to 20.8%, p<0.0001) and least for those who underwent low anterior resection (LAR, 3.9% to 6.8%, p<0.001). The proportion of resections for rectal cancer performed LAP increased over time in all geographic regions and for all hospital types (Figure 1). In 2009, 17.9% of LAP cases utilized RALS, most commonly for LAR (34.8%) and least commonly for APR (9.2%). The degree of variation increased over the study period and all trends over time were statistically significant (p<0.05).

Conclusions: Minimally-invasive surgery for rectal cancer is being increasingly utilized nationally and varies significantly across regions and hospital types. Despite limited if any patient benefit, as of 2009 robotic-surgery was being used in almost 20% of all laparoscopic cases in the United States. Understanding the sources of regional variation, as well as the costs associated with these procedures, will be increasingly important in a resource-limited healthcare environment. Cost-effectiveness analysis is warranted.

INCIDENCE OF HERNIA IN SINGLE INCISION VERSUS TRADITIONAL MULTIPORT LAPAROSCOPIC COLON RESECTION.

(P327)

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Purpose: Single incision laparoscopic SIL colectomy is feasible, safe and has gained significant interest. Long term outcomes including hernia formation at the extraction site have not been reported. Comparisons with traditional multi port laparoscopic MPL colectomy are lacking to confirm equal or improved outcomes with regard to hernia formation.

Methods: Retrospective review of all patients undergoing MPL colectomy between 8/06 and 6/09 and SIL colectomy between 9/09 and 1/12 at a large tertriary care academic hospital was performed. Extraction of specimen in all of SIL and MPL colectomy was through the midline. Incisional hernias were determined by documentation on physical examination or CT scan. Operative technique (SIL vs MPL), fascial closure (running vs interrupted), type of suture (absorbable vs permanent) and colectomy type were recorded. Preoperative risk factors for hernia formatiion (DM, COPD, BMI, history of incisional hernia, steroid and tobacco use)were recorded and used for statistical analysis. Primary outcome measured was incisional hernia formation.

Results: The total number of patients identified for the study was 226. The MPL group had 115 while the SIL group had 111. Follow-up time in MPL and SIL groups was 38.2 and 14.2 months respectively (p<0.001). Incidence of SSI was 9.57% and 6.30% in the MPL and SIL groups respectively (p=0.51) The incidence of incisional hernia was 7.83% and 13.51% in the MPL and SIL groups respectively (p=0.24). The logistic regression models showed interrupted fascial closure (OR 0.29) and history of incisional hernia (OR 1.34) p=0.0087 as the only significant risk factors for occurrence of incisional hernia.

Conclusions: The incidence of hernia formation in MPL and SIL colectomy is 7.83% and 13.51% respectively, a difference that is not statistically significant. Interrupted fascial closure decreases and history of incisional hernia increases the incidence of hernia formation.

P326 Nationwide Variation in Laparoscopic Surgery for Rectal Cancer

		2009	
	# of cases	% LAP	p-value
REGION			
West	2776	13.6%	0.018
Midwest	3,550	12.7%	
Northeast	2,366	11.2%	
South	4,301	11.1%	
LOCATION			
Urban	12,053	12.6%	<0.001
Rural	941	5.7%	
TEACHING STATUS			
Urban, Teaching	7,685	13.8%	0.019
Urban, Non-teaching	4,368	10.4%	
BEDSIZE			
Large	8,799	12.7%	0.001
Medium	2,706	9.8%	

Prospective randomized studies are needed to increase the body of evidence regarding the benefits and complications of SIL colectomy.

TECHNIQUE OF LAST RESORT: CHARACTERISTICS OF PATIENTS UNDERGOING OPEN SURGERY IN LAPAROSCOPIC ERA.

(P328)

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Purpose: The utilization rates for minimally invasive colorectal resection (MICR) techniques continue to increase. However, open colorectal resection (CR) are still employed for a subset of patients. In this study, the characteristics and short-term outcomes of patients undergoing resection open and MICR were determined and compared in a center where MICR methods are the default approach.

Methods: A retrospective review of all patients who had elective CR over an 11-year period was performed. The MICR cases were either laparoscopic-assisted or hand-assisted. The past medical and surgical histories, indications for surgery, operation performed, and short-term outcomes were assessed. The Charlson Co-Morbidity Index (CMI) was used for risk stratification (high-risk = score ≥ 2).

Results: During the study period there were 1080 CR patients (Open, 141 [13.1%]; MICR, 939 [86.9%]). The open group had more high-risk patients (CMI score ≥ 2, 34.4%; MICR, 22.1%; P = 0.0029) and patients with past history of abdominal surgery (p<0.0001). A significantly higher percentage of open patients had LAR and APR while fewer had right CR. Transfusion (Open 25.7%; MICR 6.8%, p<0.001) and diversion (25.5%; 11.5%, p<0.0001) were more common in the Open group. Significantly more Open patients (open 23.4%; MICR 7.1%, p<0.001) had a second operative procedure (TAH/BSO, bladder resection, SB resection). There were more reoperations in the Open group (open 9.4%; MICR 3.4%, p<0.0002). The mean incision length, bowel function recovery and length of stay were longer for the Open group (p<0.05). Although the leak/abscess rates were similar, the overall complication rate was higher for the Open group (p<0.001).

Conclusions: When MICR methods are the default techniques, patients selected for Open CR are higher risk, have a greater history of prior abdominal operations, have more complex disease, and require diversion and transfusion more often. Not surprisingly, this translates into a longer length of stay, time to first BM, and higher complication rate. Because of the disparity in patient populations in assessing CR results, direct comparison of MICR and Open groups is not reasonable outside a randomized controlled trial.

LAPAROSCOPIC MESORECTAL EXCISION FOR RECTAL CANCER IS ASSOCIATED WITH BETTER SURVIVAL: EXPERIENCE OF A TERTIARY CENTER.

(P329)

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Hong Kong

Purpose: The study aimed to compare the outcomes and survivals of patients who underwent laparoscopic and open resection for rectal cancer.

Methods: Patients who underwent elective radical resection for rectal cancer from 2000 to 2011 in a tertiary center were included. The data were collected prospectively and comparison was made between patients with laparoscopic and open resection. Survivals of patients were compared with univariate and multivariate analysis.

Results: During the study period, 1063 patients (62.1% men) underwent radical resection of rectal cancer. The median age was 69 years (range: 27 to 96 years). Laparoscopic resection was performed in 470 patients

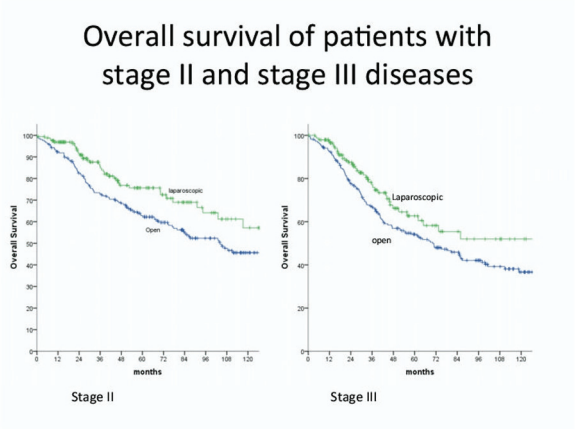
P328 Operative characteristics and post operative recovery parameters

	Open	MICR	P value
Length of incision (cm)	17.81±6.27	7.33±4.07	<0.0001
Length of surgery (min)	264.54±137.4	254.38±98.76	0.41
Time to flatus (Days)	3.47±1.51	2.76±1.17	<0.0001
Time to BM (Days)	4.01±1.79	3.24±1.47	<0.0001
Length of stay (days)	13.01±16.68	7.11±6.47	<0.0001
Complex Operations (%)	33 (23.40%)	67 (7.14%)	<0.001
Diversion rate (%)	36 (25.53%)	108 (11.50%)	<0.001
Intra-operative transfusion rate (%)	25.71%	6.84%	<0.001
Abscess/Leak rate (%)	5 (3.55%)	22 (2.34%)	0.40
Re-operation rate (%)	14 (9.39%)	32 (3.41%)	0.0002

Diversion rate excludes abdominoperineal resections. Complex Operations are those including concomitant resections.

(44.2%). Conversion was required in 32 patients (6.8%). Sphincter-saving operations were performed in 88% of patients (93.2% in laparoscopic group and 83.8% in open group). There was no difference in the gender, comorbidity and age between the two groups. The blood loss and complication rates were significant lower in the laparoscopic group. The 30-day mortality was 0.8% (0.4% in laparoscopic group and 1.0% in open group, p=0.478) and the reoperation rate was 4.3% (4.7% in open group and 3.8% in laparoscopic group; p=0.545). The overall survival and cancer specific survival of patients with non-disseminated disease (Stage I to Stage III) was 66.8% and 76.0%, respectively. Laparoscopic resection was associated with better overall (72.8% vs. 62.9%; p<0.001) and cancer specific survivals (80.1% vs. 73.1%; p=0.008). There was no difference in survival is patients with stage I and stage IV diseases. However, in patients with stage II and stage III diseases, patients with laparoscopic resection were associated with significantly better overall survival (Figure). In multivariate analysis, laparoscopic resection was an independent factor associated with significantly better overall and disease specific survivals.

Conclusions: The overall and cancer specific survivals of patients with laparoscopic resection for rectal cancer are better than those with open resection. The survival benefit is significant in patients with stage II and III diseases.



FACTORS ASSOCIATED WITH CONVERSION FROM LAPAROSCOPIC TO OPEN COLECTOMY USING THE NSQIP DATABASE.

(P330)

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Purpose: Rates of conversion from laparoscopic colectomy (LC) to open colectomy (OC) and associated factors are traditionally reported in clinical trials or reviews of outcomes from experienced institutions. Indications and selection criteria for LC and reporting may be more narrowly defined in these circumstances. With increased adoption and liberalized use of LC, conversion rates beyond those already reported have not been studied. We sought to use data from the National Surgical Quality Improvement Project (NSQIP) to identify factors associated with conversion at a national scope.

Methods: The ACS-NSQIP participant use data file for 2009 was used to identify patients who had undergone colectomy. Laparoscopic converted to open cases were identified using open colectomy as the primary procedure and laparoscopic colectomy listed as "other procedure". Preoperative variables were compared using Levene's test for equality of variance and t-test for equality of means; a p value of <0.05 was considered significant.

Results: The rate of LC was 37.4%. LC was successfully performed in 7965 patients, while 574 patients required conversion to an open procedure, resulting in a 6.7% conversion rate. On univariate analysis, age (p=0.03), American Society of Anesthesiology class (ASA, p<0.01), history of radiation treatment during preceding 30 days (p=0.04), and emergency surgery (p<0.01) were associated with conversion from LC to OC. Patients' sex, weight, body mass index, body surface area, history of diabetes or COPD, history of chemotherapy, use of steroids, and presence of ascites, were not.

Conclusions: As data suggest a trend towards increased utilization and liberalization of laparoscopy for colectomy, there is a need for increased scrutiny of the necessity and causes for conversion. Understanding the risk factors associated with conversion has potential to improve surgical care and patient expectations. In this initial evaluation of NSQIP data, patient's age, history of radiation, ASA status and emergency surgery were associated with conversion from LC to OC. As national data regarding LC becomes more readily available, a scoring system may be developed as a valuable tool for predicting need for conversion

USING THE FRAILTY SCORE TO PREDICT FAILURE OF EARLY DISCHARGE AFTER LAPAROSCOPIC COLORECTAL SURGERY WITH AN ENHANCED RECOVERY PATHWAY.

(P331)

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Purpose: Despite using laparoscopy and enhanced recovery protocols (ERP), some patients are not ready for early discharge. Frailty has been generally accepted as a marker of increased risk, complications and mortality in surgery. Frailty may have the potential to identify patient outcomes. The goal of this study was to evaluate frailty as a predictor of patients who might fail early discharge, so that any defined factors might be addressed and optimized.

Methods: Review of a prospectively maintained database identified all major elective laparoscopic colorectal surgical procedures between 2009-2012. Patients were stratified into the ≤3 and >3 Day of Discharge (DoD) groups, and a modified frailty index (mFI) was calculated. All patients followed a standardized ERP. Student t-tests and Fisher's Exact tests were performed to compare groups, and correlation regression analysis to identify the relationship between LOS and the mFI.

Results: There were 464 ≤3 days patients and 388 > 4 day patients. The groups were similar in age, BMI, Charlson Comorbidity Index, and ASA Class. The mFI ($p<0.001$), operation time ($p<0.001$), post-operative complications ($p< 0.001$), readmission ($p=0.0349$), and re-operation rate ($p=0.0004$) were all significantly lower in the early DoD group. Significantly more patients were discharged directly home in the ≤3 days cohort. Multi-variate analysis demonstrated a higher mFI was indicative of longer LOS; within the >3 day cohort, a mFI of 2 was strongly related to LOS 8-14 days.

Conclusions: Elective colorectal surgery patients with a higher mFI are more likely to fail early discharge. Despite similar demographics, the mFI was distinct, and correlated with longer operating times, length of stay, and readmissions. Using a prospective frailty index to preoperatively identify patients at risk of failing early discharge pre-operatively, should permit better allocation of resources and post-operative.

THE IMPACT OF LAPAROSCOPIC SURGERY FOR RECURRENT CROHN'S DISEASE ON LONG-TERM OUTCOMES.

(P332)

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Purpose: Patients with Crohn's disease often require repeated surgical treatments, and the re-operation rate is reported to be approximately 40% within 10 years. Although the laparoscopic surgery for Crohn's disease is gaining its acceptance, there is a lack of evidence for long-term outcomes of laparoscopic surgery for recurrent Crohn's disease. The aim of this study was to evaluate the long-term outcomes of recurrent Crohn's disease after laparoscopic surgery, compared to open surgery.

Methods: Between September 1994 and December 2011, 89 patients with recurrent Crohn's disease underwent 102 operations in our institute. 47 cases underwent laparoscopic operations (LR group), and 55 cases underwent open operations (OR group). The rate of recurrence requiring further operation was compared.

Results: The median follow up period was 43 (IQR 10.28-65.33) months, the median age at the operation was 35(IQR 31-39) years in LR group, and was 34(IQR 29-43) years in OR group. There was no significant difference between LR group and OR group in terms of sex ratio (42/5 in LR group, 45/10 in OR group). Patients in LR group had more frequently experienced laparoscopic operation at the previous operation than those in OR group (LR group 29.8% vs OR group 5.5%; $p=0.001$). Laparoscopic operation was less frequently chosen in patients involved with complicated Crhon's disease, such as fistula and intra abdominal abscess formation (LR group 27.7% vs OR group 47.3%; $p=0.009$). 12 cases developed recurrent disease requiring operation (LR group 7 cases, OR group 5 cases). The 5-year recurrence free rate in LR group was no inferior to that in OR group (LR group 89.8% vs OR group 93.9%; log-rank test $p=0.869$). Risk-adjusted multivariate analysis demonstrated that laparoscopic surgery was not associated with the development of recurrent disease (Hazard ratio=1.302 [0.214-7.920], $p=0.774$).

Conclusions: Laparoscopic surgery for recurrent Crohn's disease had no impact on the development of recurrence requiring further operation. Given the advantage in postoperative recovery and improved cosmesis, the application of laparoscopic operation should be aggressively considered even in patients with recurrent Crohn's disease.

P331 Table 1: Demographic Data by Day of Discharge

Elective Laparoscopic Cases	< / = 3d	> 4d	p-value
Cases	464 (54%)	388 (46%)	
Mean Age (SD)	58.87 (15.65)	60.93 (19.56)	0.0878
Mean CCI	0.79	0.90	0.4132
Mean MFI	0.67	0.97	< 0.0001
Mean Operating Time (min)	156.96	189.44	< 0.0001
Readmissions Rate (30 day)	4.7%	8.5%	0.0349
Post-operative Complications	8.5%	37.9%	< 0.0001
Re-Operation Rate (30 day)	<1%	7.8%	< 0.0001
Discharge Disposition-Home	456 (98%)	320 (83%)	< 0.0001

CCI- Charlson Co-morbidity Index; MFI- Modified Frailty Index

THE ROLE OF PATIENT EXPECTATIONS ON LENGTH OF STAY AFTER BOWEL RESECTION SURGERY.

(P334)

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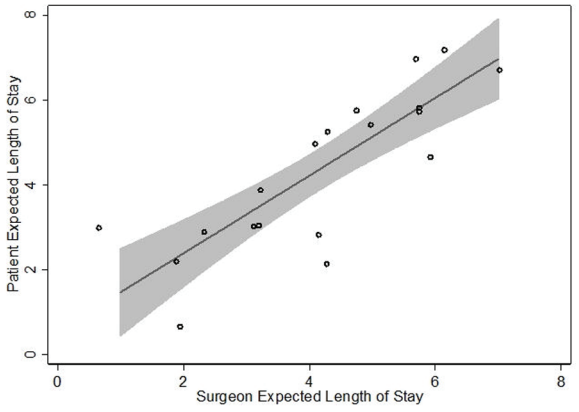
Purpose: There is debate about how Enhanced Recovery Protocols affect hospital length of stay. Our objective was to determine if patient expectations play a role in determining length of stay after bowel resection surgery. We also examined the effect of patients' illness perception, mood, and personality on length of stay.

Methods: This was a prospective pilot study of elective bowel resections at an academic medical center from June 22-August 13, 2012. After a patient had a pre-operative visit with his or her surgeon, the patient and surgeon were asked separately what their expected length of stay was for the given surgery. Patients also completed three standardized psychological surveys—the IPQ-R, PANAS, and MHI-38. Data were compared to the actual LOS of each patient.

Results: We interviewed 19 consecutive patients. Patients' and surgeons' expected LOS are correlated ($p<0.001$). The R-squared value of 0.7314 implies that surgeons' LOS predictions explain 73% of patients' LOS predictions. Surprisingly, neither surgeons' nor patients' expected LOS were much correlated with actual LOS (Pearson's correlation = 0.603 and 0.546, respectively). We also did not find any correlation between patients' scores on the psychological surveys and actual LOS.

Conclusions: Although there is a correlation between patients' and surgeons' expected LOS, neither patients nor surgeons seem to be very good at predicting actual LOS.



A PROSPECTIVE EVALUATION OF BURSTING PRESSURE IN IN-VIVO AND EX-VIVO SEALED INFERIOR MESENTERIC ARTERY USING ENSEAL® BIPOLAR DEVICE: CAN THE DIAMETER AND LENGTH OF STUMP MAKE A DIFFERENCE.

(P335)

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Purpose: Mesenteric vascular ligation is a critical step in colorectal surgery. With the increasing use of minimal access surgical techniques, the need for safe and reliable sealing instruments has become imperative. We aimed to assess our practice of using ENSEAL® Bipolar Device in minimally invasive colorectal surgery with regards to bursting pressure of IMA sealed in vivo during the surgery as well ex vivo and to see the length of stump versus bursting pressure relationship.

Methods: During left sided colectomy, sealed inferior mesenteric artery was immediately harvested . The open end was attached to the bursting pressure testing device and pressure monitored till the seal leaked or burst open. Once the primary seal was assessed, the ENSEAL® Device was used to create secondary seals at different lengths. Results were analyzed on SPSS version 16. Mean and standard deviation was used for continuous data. Pearson correlation test was used to assess relationship between vessels diameter, length and bursting pressure. P-value of < 0.05 was of statistical significance.

Results: 46 specimens were evaluated for bursting pressure from 18 Patients. 18 primary sealed vessels (sealed in vivo at surgery) and 28 secondary sealed vessels (sealed in the laboratory) were assessed. Mean bursting pressure was 862 mmHg, with SD of 282 (89-1430 mmHg). Mean diameter was 4 mm (3-5mm) with SD of 1. Pearson correlation did not show any correlation between diameter and bursting pressure ($p=0.187$) or length and burst pressure ($P= 0.247$). One way ANOVA comparing means of bursting pressures in 4 groups of vessels based on length did not show statistically significant difference (Table 1). One calcified vessel had significantly low burst pressure of 89 mmHg. We did not observe any intra operative or post operative bleed.

Conclusions: Bursting pressure in IMA sealed with ENSEAL® Bipolar Device is significantly higher than physiological pressure and the device can be safely used in sealing IMA during colorectal surgery. Length of the vessel stump does not lead to lower bursting pressure.

P335 Length-burst pressure relationship

Groups (length of vessel)	Number (N= 46)	Bursting pressure mmHg	P-value
1 (1-2cm)	13	924	0.667
2 (3-4cm)	9	892	0.661
3 (5-6 cm)	19	802	0.380
4 (7-10 cm)	5	885	0.677

CLINICAL AND ECONOMIC OUTCOMES FOLLOWING COLECTOMY IN A COHORT OF 115,000: DOES SPECIALTY MATTER?

(P336)

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Purpose: Among general surgery procedures, colectomy accounts for the greatest portion of postoperative morbidity, highest excess of hospital days, and highest mortality. Several factors have been associated with improved outcomes, including laparoscopic surgery and enhanced recovery protocols. Additionally, SCIP measures have been associated with lower infection rates. However, there is limited data exploring the association of outcomes based on surgeon specialty. We present a population-based study comparing outcomes following colectomy based on reported specialty.

Methods: Utilizing Premier Inc.® database, from October 2005 to June 2011 we identified all right, left, and sigmoid colectomies. Two colectomy groups were compared based on primary surgeon: general surgeon (GS) and colorectal surgeon (CRS). Preoperative characteristics and postoperative outcomes were analyzed and compared between groups. In order to reduce confounding factors, multivariate analysis was used for outcome comparisons adjustment based on age, gender, type of hospital, disease severity, and disease process.

Results: A total of 83% (96,459) of colectomies were performed by GS and 17% (19,231) by CRS. There was a difference in regard to disease severity, with more severe cases performed by GS. Colectomy for malignancy was similar between both groups. A total of 82,371 (85.4%) of colectomies in the GS group were carried out in urban hospitals, whereas all CRS colectomies were performed in the urban setting. After adjusting preoperative characteristics for comparative analysis, colectomy performed by CRS resulted in a statistically significant reduction in transfusion rates (14.4% vs 11.5%) morbidity (26.7% vs 25.4%), length of stay (8.3±9.0 vs 6.8±6.5), and mortality (2.4% vs 1.0%). Hospital costs following colectomy by CRS were also significantly reduced than those performed by GS ($18,706 vs $16,008).

Conclusions: This population-based study revealed that, although general surgeons perform the majority of colectomies in the United States, clinical outcomes are more favorable when performed by colorectal surgeons. Furthermore, a significant cost reduction can be found following colectomies performed by CRS.

P336

	General Surgeon (n=96,459)	Colorectal Surgeon (n=19,231)	p value
Preoperative characteristics			
Age (years)	64.1±14.2	63.2±14.3	<0.0001
Female	45,107 (46.8%)	8,652 (45.0%)	<0.0001
Severity of disease*			
Minor	32,081 (33.3%)	7,726 (40.2%)	<0.0001
Moderate	37,608 (39.0%)	7,394 (38.5%)	0.161
Major	18,028 (18.7%)	3,063 (15.9%)	<0.0001
Extreme	8,742 (9.1%)	1,048 (5.4%)	<0.0001
Diagnosis			
Cancer	36,300 (37.6%)	7,273 (37.8%)	0.626
Diverticular disease	31,997 (33.2%)	5,603 (29.1%)	<0.0001
Inflammatory bowel disease	1,902 (2.0%)	723 (3.8%)	<0.0001
Other	26,485 (27.5%)	5,675 (29.5%)	<0.0001
Type of hospital			
Urban hospital	82,371 (85.4%)	19,231 (100%)	<0.0001
Teaching hospital	32,823 (34.0%)	10,258 (53.3%)	<0.0001
Postoperative outcomes			
Length of hospital stay (days)	8.3±9.0	6.8±6.5	<0.0001
Complications	25,733 (26.7%)	4,881 (25.4%)	<0.0001
Mortality	2,316 (2.4%)	187 (1.0%)	<0.0001
Hospital costs (US dollars)	$18,706±24,727	$16,008±16,657	<0.0001

*Severity of disease according to the APR-DRG.

EFFICACY OF TWO TECHNIQUES OF TAP BLOCK ADMINISTRATION IN ELECTIVE COLECTOMY PATIENTS: CONTINUOUS INFUSION CATHETERS VERSUS SINGLE INJECTION.

(P337)

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Purpose: The transversus abdominis plane block (TAP) has been proposed as an analgesic method to decrease intravenous narcotic use and potentially improve return of bowel function after elective colorectal surgery. TAP block administration through two techniques, single injection and continuous infusion catheters, has been utilized at our institution. Our goal was to assess the impact of these two TAP block techniques on postoperative pain scores, intravenous narcotic use, ileus rates, and length of stay (LOS) in elective colectomy patients.

Methods: Retrospective chart review was performed to identify patients who underwent an ultrasound-guided TAP block before elective colectomy at our institution over an 18 month period. Two TAP block groups were identified based on method of administration, TAP-single injection and TAP-catheter. A control group was matched for surgical technique and procedure. Collected data included intravenous narcotic use, pain scores, postoperative ileus rates and LOS.

Results: 90 patients were identified in the study with 30 in each group. The 3 groups showed no statistical difference in age, gender, operative approach and type of surgery. All patients were treated with an enhanced recovery pathway (ERP). Narcotic use over the entire LOS was significantly lower in the TAP-catheter group (23.8 mg vs. 46.5 mg and 38.5 mg in TAP-injection and control groups, respectively; p=0.0026). Postoperative pain scores on days 0, 1 and 2 were lower amongst those receiving the TAP catheter (p=0.005). LOS and rates of postoperative ileus were similar between all groups.

Conclusions: TAP blocks administered through continuous infusion catheters did decrease postoperative pain scores and intravenous narcotic requirements in elective colectomy patients. This type of anesthesia may play a beneficial role in the ERP of colorectal patients. Future studies should involve comparing TAP block continuous infusion catheters to newer single injection long acting local anesthetics.

COLORECTAL SURGERY AFTER KIDNEY TRANSPLANTATION: CHARACTERISTICS OF EARLY VERSUS LATE POSTTRANSPLANT INTERVENTIONS.

(P338)

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Purpose: It has been reported that the majority of colorectal complications after kidney transplantation occur within the first year of transplant. We hypothesized that patients undergoing colorectal surgery <1 year of transplant would have a higher complication rate than those >1 year post-transplant.

Methods: We performed a retrospective review of kidney transplant recipients who had colorectal surgery at our institution from 6/1/00 to 6/1/12. Measured outcomes included major complications at 30 days (Grades II-IV using the Clavien-Dindo classification), postoperative length of stay (LOS), perioperative mortality, reoperations, and readmissions at 60 days. Continuous and categorical variables were compared with Student t tests and Fisher exact tests respectively(α= 0.05).

Results: During the study period, we identified 45 patients (25 male) aged 31-77 (median 55). Graft age ranged from 21 days to 44 years (median 4.6 years). Patients were grouped by post-transplant time of colorectal surgery: <1 year (9/45, 20%) and >1 year (36/45, 80%). Gastrointestinal malignancy (31%), diverticular disease (24%), and ischemic colitis (16%) were the most common indications for surgery. Ischemic colitis was significantly higher in the <1 year group (44% vs 6%, p=0.01). Twenty-one of 45 colorectal cases (47%) were emergent with a higher incidence in the <1 year group (100% vs. 33%, p=0.0003). Patients in the <1 year group also had a higher incidence of blood transfusion (78% vs 31%, p=0.02), longer postop LOS (23.2±12 vs 11.7±10 days, p = 0.02), and higher perioperative mortality rate (33% vs 6%, p=0.047), although these differences were not significant when comparing only emergent cases. There were no significant differences in major complications, reoperations, or readmissions.

Conclusions: Kidney transplant recipients undergoing colorectal surgery <1 year post-transplant have a higher incidence of emergency surgery and ischemic colitis than patients >1 year post-transplant. Despite these findings, patients with grafts <1 year had a similar postoperative complication rate to patients with grafts >1 year.

LOCAL PERIANAL ANESTHETIC INFILTRATION IS SAFE AND EFFECTIVE FOR MINOR ANORECTAL SURGERY.

(P339)

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Purpose: The aim of the study was to evaluate the safety and efficacy of local perianal anesthetic infiltration for anal and perianal operations.

Methods: After informed consent was signed, patients were placed in the prone jack-knifeposition in the operating room. Anesthesia was induced with 40 ml of 0,125% bupivacaine and 0.5% lidocaine infiltration into perianal tissues, avoiding skin infiltration, thus performing posterior perineal block. Surgery was performed. All the operations were registered into the prospectively maintained database, as well as data on postoperative complications over 30 day period. The database as well as all patients' case logs were reviewed, looking for data on postoperative course.

Results: From July 2002 to January 2012 995 consecutive patients underwent operations for anorectal diseases under local perianal anesthetic infiltration technique. No general and/or regional anesthesia was performed in any of the patients. 814 (81.8%) patients were operated for hemorrhoids: 317 (38.9%) had one quadrant, 222 (27.3%) had two quadrant, 268 (32.3%) had three quadrant and 7 (0.9%) had four quadrant hemorrhoidectomy perfomed. 156 (15.7%)patients underwent lateral closed internal sphincterotomy for chronic anal fissure. 11 (1.1%) patients underwent anal or transanal polypectomy for low rectal polyps. 12 (1.2%) patients had fistulectomies for intersphincteric or low transsphincteric fistulas. 1 patient had simultaneous rubber band ligation for hemorrhoids. 1 patient underwent transanal repair of the rectocele and one patient underwent surgery to control the bleeding after hemorrhoidectomy. Mean hospital stay was 1.8 days (1-18 days), 723 patients stayed for 1 day. Complications were observed in 14 (1.4%) patients. Urinary retention occured in 5 (0.5%) patients after the operation. 6 cases of bleeding occured after hemorrhoidectomy (0.7%) and 1 (0.6%) after lateral internal sphincterotomy. In two patients (0.2%) perianal abscess developed: in one after hemorrhoidectomy and in one after sphincterotomy. They required surgical drainage.

Conclusions: Perianal anesthetic infiltration anesthesia for minor anorectal surgery is safe and effective for minor anorectal surgery.

ON-TABLE COLONIC IRRIGATION IN THE TREATMENT OF LEFT-SIDED LARGE-BOWEL EMERGENCIES: 22-YEARS' EXPERIENCE SURVEY.

(P340)

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Purpose: Treatment of lesions in the left side of the colon which require emergency surgery is still controvertial. Because of the difficulties of low anastomosis after colorectal resection and adverse effect of fecal loading, many surgeons prefer a staged surgical approach.

P338 Patient/procedure characteristics and outcomes following colorectal surgery at <1 year versus >1 year after kidney transplantation

	<1 year (n=9)	>1 year (n=36)	p-value
Male, n(%)	5(56)	20(56)	1
Age at time of colorectal surgery, mean y (sd)	49.4(13)	56.25(11)	0.16
Charlson Comorbidity Score, mean(sd)	5.2(2)	5.6(3)	0.60
Preoperative prednisone use, n(%)	7(78)	25(69)	1
Colon cancer, n(%)	0(0)	11(31)	0.09
Diverticular disease, n(%)	1(11)	11(31)	0.41
Ischemic colitis, n(%)	4(44)	2(6)	0.01
Emergency surgery, n(%)	9(100)	12(33)	0.0003
Estimated blood loss, mean ml(sd)	325.6(44)	238.7(213)	0.59
Operative length, mean min(sd)	207.9(40)	201(83)	0.72
Stoma formation, n(%)	7(78)	14(39)	0.06
Received blood transfusion, n(%)	7(78)	11(31)	0.02
Postoperative length of stay, mean days(sd)	23.2(12)	11.7(10)	0.02
operations during index hospitalization, n(%)	2(22)	4(11)	0.58
Readmissions within 60 days, n(%)	3(33)	10(3)	0.70
Major complications (one or more), n(%)	6(67)	12(33)	0.13
Deaths, n(%)	3(33)	2(6)	0.047

Methods: In a rectrospective series of 133 patients (1989 to 2011) requiring emergency surgery for distal colonic obstruction, primary bowel resection followed by immediate anastomosis after intraoperative colonic irrigation was performed. Carcinoma was the cause of the obstruction in 114 cases (86%); 18 patients had diverticulitis (13%), while 1 patient had sigmoid volvulus (1%). The technique of on-table lavage was similar to that described by Dudley et al. in 1980: a caecostomy tube was used for anterograde irrigation and it was removed in the tenth postoperative day.

Results: Four patients died, none for complication related to surgery. There where three anastomotic leaks (2%) and were observed ten radiologic leaks without clinical signs (7%). Three patients needed reoperation. The mean hospital stay was 23 days. Colonic stenting was used in five patients with one mortality (20%) due to perforation in the last five years .

Conclusions: Intraoperative colonic irrigation is an effective method, enabling surgeons to perform primary restorative resection in the management of many distal colonic emergency, avoiding the need of staged operation. Different options for treatment of distal colonic obstruction (colostomy, colonic stent, subtotal colectomy, colonic irrigation, Hartmann's operation) are discussed and compared in terms of clinical outcome, number of procedures and need of performing a permanent stoma. The requirement for surgical training of colonic emergency done by residents is analyzed.

COMPARISON OF ECONOMICS AND CLINICAL OUTCOMES ASSOCIATED WITH LOW ANTERIOR RESECTION AND ABDOMINOPERINEAL RESECTION PROCEDURES IN THE UNITED STATES.

(P341)

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Purpose: Both Low Anterior Resection (LAR) and Abdominoperineal Resection (APR) procedures are utilized to treat rectal tumors. There may be occasions when methods or devices may be utilized that could preserve communication to the anus and avoid conversion of an LAR to APR. We seek to compare the costs of LAR and APR procedures in comparable patient populations.

Methods: The Premier Perspective™ Database (PPD) was used to estimate the incidence, costs and complications associated with LAR versus APR procedures in the United States. PPD is the largest hospital-based, service-level comparative database in the USA providing detailed utilization and cost data categorized under a patients' principal and secondary diagnosis procedure codes. Patients with procedure code for LAR or APR procedures (using ICD-9 codes) between 1, 1, 2009 to 12, 31, 2011 were selected. Propensity score methodology was used to match LAR to APR patients based on patient's demographics and hospital characteristics.

Results: A total of 10,269 patients with a procedure code for either LAR or APR were identified. LAR was used in 7,593 (74%) patients and APR in 2676 (26%) patients. Mean hospitalization cost per discharge was significantly higher in APR procedures compared to LAR procedures, $28,154 vs. $23,846 ($p<0.001$). OR time was approximately 68 minutes shorter for patients undergoing LAR compared to patients with APR procedures ($p<0.001$). Hospital LOS was approximately 2 days shorter for patients undergoing LAR procedures ($p<0.001$). Rates of wound-infection, sepsis, ileus, and blood transfusion were significantly lower among the LAR patients compared to APR patients. Hospital 30-day readmission was 5.8% for the LAR patients compared to 12.8% for the APR patients ($p<0.001$).

Conclusions: LAR procedures were associated with lower rates of complications, hospital readmissions, shorter hospital lengths of stay, lower OR time and lower mean costs when compared to a matched set of patients undergoing APR procedures. These observations highlight the potential cost advantages of further developing methods or instrumentation that would preserve anal function and avoid an APR.

SPINAL VERSUS GENERAL ANESTHESIA IN PATIENTS UNDERGOING KARYDAKIS FLAP FOR PILONIDAL DISEASE: RESULTS OF A PROSPECTIVE PILOT STUDY.

(P342)

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Purpose: The aim of the present non-randomized prospective pilot study was to compare the postoperative recovery between patients undergoing Karydakis flap for pilonidal disease under the regional versus general anesthesia.

Methods: The technique of Karydakis operation was: each sinus was excised with a vertical eccentric elliptical excision. A thick flap was created by undercutting the medial edge and advancing it across the midline so that the whole suture line was lateralized. The intensity of pain was assessed by a 11-point numeric pain rating scala (NRS). The postoperative analgesia consisted of metamizol 3g/die and Oxycodon 5 mg on demand in all cases. All data were collected prospectively.

Results: Between 6/2012 and 11/2012, thirty six consecutive patients (32M, 4F; age 27.8 years) underwent a Karydakis surgery. The mean duration of surgery was 31min, the median postoperative hospital stay was 2 days (range, 1-3). The incidence of the postoperative wound complications was 11%. Twenty one patients received a

spinal anesthesia (group 1), and 15 patients underwent surgery under the general anesthesia (group 2). There was no statistically significant difference between groups regarding the age, gender, BMI, duration of disease, number of previous surgeries, duration of surgery, duration of postoperative hospital stay, wound infection rate, and preoperative pain intensity. Group 1 patients experienced significantly less pain than group 2 patients at the evening after the surgery (0.8 vs. 3 on NRS, p=0.009) and at the postoperative day 1 (2.2 vs. 3.3; p=0.04). The difference was not statistically significantly at the day of discharge from hospital (1.6 vs. 2.3) and at the postoperative day 10 (1.4 vs. 1.4).

Conclusions: Patients undergoing Karydakis surgery under spinal anesthesia experience less pain as compared to patients operated on under general anesthesia, however, this difference is statistically significant only at the day of surgery and at the postoperative day 1.

'BE CLEAR ON CANCER': HOW A NATIONAL PUBLIC HEALTH CAMPAIGN AFFECTS COLORECTAL CANCER REFERRALS AND DETECTION RATES IN THE UNITED KINGDOM.

(P343)

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Purpose: The need to improve outcomes in colorectal cancer has been highlighted by the United Kingdom's Department of Health. A nationwide public health campaign was launched in February 2012. 'Be Clear on Cancer' used the media to raise awareness of the symptoms of colorectal cancer. The aims of this study are to determine the effect that this public health campaign had on the referrals for suspected colorectal cancer and the cancer detection rates.

Methods: Data from a District General Hospital was prospectively collated and retrospectively analyzed. A six month period following the launch of the campaign was compared to six months prior to the campaign. The number of referrals with suspected cancer was recorded. The number of confirmed cancer cases was collected. The detection rate was then calculated. Independent samples students t-test was used for the comparison of the means. Confidence intervals quoted are the 5th and 95th percentiles.

Results: The total number of referrals increased significantly after the campaign (1353v892 p=0.01 CI 43 to 111). This was an increase of 51.7% referrals per month (225.5v148.67). There was no significant difference in the number of cancers detected (9.17v8.17 p=0.576 CI -2.9 to 4.9) with the cancer detection rate being significantly lower after the campaign (3.95%v5.50% p=0.029 CI -2.9% to -0.2%).

Conclusions: The 'Be Clear on Cancer' campaign aimed to increase awareness of the early symptoms of colorectal cancer, the third most common cancer in the United Kingdom. The objective was to diagnose at an earlier stage to improve survival rate. Following the campaign there was a significant increase in the number of referrals to our specialist colorectal clinic. However there was no increase in the absolute number of cancers detected resulting in a significant reduction in the cancer detection rate. If our findings are representative of the United Kingdom as a whole, then the effectiveness of such public health campaigns is to be called into question. Future public health campaigns will have to demonstrate that patients with early colorectal cancer can be more accurately targeted if they are to improve survival and be cost effective.

EFFECTS OF SYNBIOTICS ON GASTROINTESTINAL FUNCTION AFTER COLECTOMY FOR CANCER: RESULTS FROM A PROSPECTIVE RANDOMIZED TRIAL (NCT01479907).

(P344)

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Purpose: To explore the potential benefits of early postoperative administration of synbiotics (combination of prebiotics and probiotics) to patients after colectomy for cancer.

Methods: A prospective randomized single-center double-blind trial was conducted (NCT01479907). The patients were randomized to either synbiotics (n=38) or placebo (n=35) administration at the day they were able to tolerate po liquid diet and for 15 days thereafter. Primary end points were the assessment of gastrointestinal function-related quality of life at 1, 3 and 6 months postoperatively by the use of the validated questionnaire GIQLI (Gastrointestinal Quality of Life Index) and the secondary end points the assessment of functional bowel disorders (diarrhea, constipation) based on the respective domains of the validated instrument EORTC QLQ-C30.

Results: Measured GIQLI "Global scores" at the postoperative assessment time-points were better at the "synbiotics" vs the placebo group [77+1,67 vs 71,35+1,69, p=0,01 (1 month), 76,99+1,7 vs 72,49+1,73, p=0,03 (3 months), 79,22+1,82 vs 72,7483+1,85, p=0,01 (6 months)]. The EORTC QLQ-C30 "Diarrhea" domain score differences from baseline were better after synbiotics administration at the 3rd and 6th months, highlighting a postoperative improvement (-13.33+5,45 vs 4,04+5,6, p=0,045 and -19,1+6,3 vs 2,01+5,45, p=0,003, respectively). No significant effect on "Constipation" scores was observed.

Conclusions: Synbiotics administration may have a beneficial effect on the postcolectomy gastrointestinal function.

PERIOPERATIVE STATIN USE IN COLORECTAL SURGERY: A TRUE PROPHYLACTIC.

(P345)

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Purpose: Increasingly the benefit of perioperative statin use is recognized as decreasing operative complications. While the evidence clearly demonstrates a role for statins in cardiovascular surgery, little data exists on the effect of statin use in colorectal surgery. This study sought to describe statins' pleiotropic effects in colorectal surgery.

Methods: This is a single academic center retrospective review of the American College of Surgeons National Surgical Quality Improvement Project (NSQIP) database from 2005 to 2010 cross-referenced with pharmacy data on statin use in the perioperative period. Patients undergoing colorectal surgery were identified using Common Procedural Terminology codes. Patient characteristics as described by NSQIP were included in the analysis. Statin use was defined as given within 7 days after surgery. Bivariate analysis was performed using Student's T-test, Fisher's Exact test, and Chi-Square as appropriate to the data. Variables reaching a two tailed p-value<0.1 were included in multivariate logistic regression. To adjust for patient selection a propensity score (PS) was developed with good predictive ability for statin use (c-statistic=0.76) and used in the final model. The main end point of the multivariate model was non-cardiac major complications including death at 30 days post-operatively.

Results: A total of 1,184 patients met inclusion criteria. Statin users represented 12% of the total population (n=142) and were statistically significantly more likely to have cardiac comorbidities (p<0.001), a higher ASA class (p<0.001), older age (p<0.001), and have an emergency case (p=0.035). The overall major complication rate including death was 17.4% (n=206). After adjustment using the PS, statin use was associated with decreased risk of non-cardiac major complications, OR=0.44 (95%CI: 0.23, 0.84, p=0.013).

Conclusions: Statin use within 7 days of colorectal surgery nearly halves the non-cardiac major complication rate despite worse baseline characteristics in the statin group. This implies this study may underestimate the pleiotropic statin effect. This report strongly suggests that statins are an unrecognized safeguard that should be added to the surgical prophylactic armamentarium.

THE IMPACT OF COMPLICATIONS AFTER COLORECTAL CANCER SURGERY ON THE PATIENT-SURGEON RELATIONSHIP.

(P346)

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Purpose: Post-colectomy complications are common, yet little is known about their impact on the patient-surgeon relationship, defined as trust and communication. We hypothesized that complications lead to decreased trust in a quantifiable way.

Methods: We performed a population-based survey of stage III colorectal cancer patients in the Georgia and Detroit SEER catchment areas between August, 2011-July, 2012. We queried subjects regarding primary outcomes of trust in and communication with their surgeons. The primary predictor variable was the occurrence of an operative complication. We used chi-square analyses to examine patient factors associated with trust and communication; then compared the patient-surgeon relationship among patients who had experienced complications of surgery with those who had not.

Results: 343 patients have completed the survey for a response rate=55%. Patients reported strong trust (mean 4.45, range 2.00-5.00) as well as good communication (mean 4.70, range 1.75 – 5.00). Trust and communication did not differ significantly by age, gender, race, or education. However, among income quartiles, the working poor were less likely than those who were poor, middle-class, or affluent to trust their surgeons (p=0.003). 24% of patients reported having a post-operative complication. Compared with those without complications, patients who had a complication were more likely to report a worse relationship with the surgeon (odds ratio [OR] low trust=3.04, 95% confidence interval [95% CI]=1.34-6.88; OR poor communication=9.90, 95% CI=1.83-13.58). Among those with a complication, patients stated that their surgeons' management led to decreased trust in 12%, had no effect in 58%, and actually increased trust of the surgeon in 30% of cases .

Conclusions: Most patients described trust in and communication with their surgeon as high or very high. Postoperative complications were common, and patients who experienced a complication reported lower trust and poorer communication than those who did not. However, the relationship between complications and trust was nuanced; in many cases, patients reported that their trust actually increased after a complication.

C-REACTIVE PROTEIN AS A PREDICTOR OF LENGTH OF STAY AFTER COLORECTAL SURGERY.

(P347)

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Purpose: Despite using laparoscopy and enhanced recovery protocols (ERP), some patients are not ready for early discharge. These patients have unpredictable length of stays (LOS) and readmission rates following colorectal surgery (CRS), increasing healthcare utilization. A safe reduction in length of stay (LOS) has become a major focus to optimize cost and efficiency of care. To date, the variables that predict which patients fail early discharge have not been identified. We evaluated CRP as a predictor for delayed recovery and readmission.

Methods: Review of a prospective departmental database identified patients undergoing elective major colorectal surgery. Patients with POD2 CRP and WBC values were included, and were stratified into early (≤3 days) and late (>4 days) Day of Discharge (DoD) groups. All patients were managed with a standardized ERP and discharge criteria. The main outcome measures were the relationship between CRP value, LOS, and readmission rate. Univariate analysis was used to compare groups, and a stepwise Akaike Information Criterion algorithm was used to develop the best logistic model.

Results: 306 patients were identified for analysis- 99 (32%) in the ≤3 day and 207 (68%) in the >4 day groups. Groups were similar in age and co-morbidities. Pre-operative CRP was significantly lower (p=.0215), and operating time shorter (p=.0005) in the ≤3 day group. POD2 CRP accurately predicted shorter LOS (p< 0.001). Using linear regression, for each g/dL increase in CRP level between the pre-operative and POD2 value, the odds of late DoD increased by 24% (OR 1.24). Only male gender, OR procedure time, and increase in CRP from baseline to POD2 were important in predicting late DoD; the change in CRP was strongly associated with LOS >4 days (p=.0102). The overall readmission rate was 9%. CRP level did not significantly correlate with readmissions. For a CRP increase >5.3g/dL, the readmission rate became > 10%.

Conclusions: Low CRP was highly predictive of shorter LOS. Further, a significant change in CRP from baseline to POD2 was associated with an increased risk of a prolonged hospital stay and readmission. CRP can be used to predict LOS and may be a useful indicator of suitability for early discharge.

UNPLANNED READMISSIONS IN COLORECTAL SURGERY ARE IDENTIFIABLE PRIOR TO DISCHARGE USING PREDICTIVE ANALYTICS.

(P348)

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Purpose: Systems for early identification of patients who will likely require unplanned, related readmission (URR) following discharge are necessary. URR affects 7-24% of colorectal surgery (CRS) patients and decreases patient satisfaction, increases healthcare costs, and is a quality indicator. Using only EHR data available prior to discharge and readmission data from the National Surgical Quality Improvement Project (NSQIP), we wished to create models for predicting readmission suitable for real-time use.

Methods: We developed a GI surgery data warehouse including data from EHR and NSQIP. Major colorectal surgery encounters from January 2011 to June 2012 were included. Encounters were randomly partitioned into training and testing sets. Numerous predictive analytic algorithms were used for model generation. Model accuracy, predictive confidence, and other features were examined.

Results: There were 375 encounters with a 16%, 30-day URR rate. The encounters were randomly partitioned into 80% training cases and 20% test cases for modeling. The predictor variables used included age, sex, ethnicity,

P347 Table 1: Demographic Data by Day of Discharge

	≤3 days	>4 days	P-value
Cases	99 (32%)	207 (68%)	
Laparoscopic	87/99 (88%)	112/207(54%)	
Open	12/99 (12%)	95/207(46%)	
Mean Operating Time (min)	176.2	242.5	0.0005*
Mean Pre-op CRP Level	0.63	1.19	0.0215*
Mean POD 2 CRP Level	6.5	11.3	< 0.001*
Mean Pre-op White Blood Cell Count	7.35	7.64	0.4275
Mean POD2 White Blood Cell Count	8.83	9.34	0.2319
Mean Hospital LOS (days, SD)	2.7 (.54)	6.7 (4.3)	< 0.001*
Re-admission Rate (within 30 days)	6%	11%	0.211

LOS- Length of Stay; POD- Post-operative Day

zip code, surgical Apgar score, preoperative hemoglobin, last recorded hemoglobin during encounter, estimated blood loss, transfusion volume, ASA, surgeon, and BMI. From numerous modeling algorithms, using repeated random sub-sampling cross-validation, a Naive Bayes classifier model was found to perform best to predict URR. The accuracy, sensitivity, and specificity of the best-performing model were 91%, 94%, and 73%, respectively.

Conclusions: In a CRS population, URR may be identified using discretely available EHR data, or simple transformations of it, prior to discharge through use of predictive analytic techniques. When incorporated into a clinical decision management system, it may allow for improved targeting of resources to high-risk patients and reduce readmissions. Prospective evaluation with intervention will be required for validation.

READMISSIONS FOLLOWING COLECTOMY: A POPULATION-BASED STUDY.

(P349)

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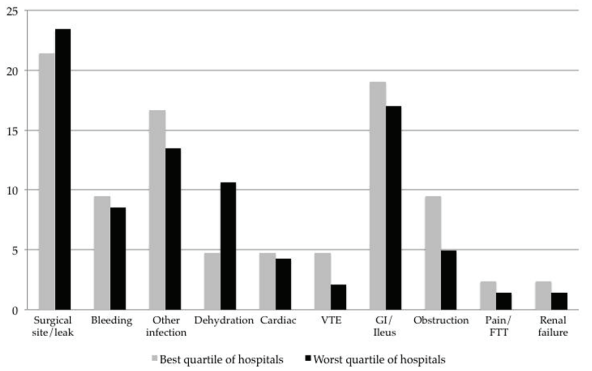
Purpose: Medicare will target surgical readmissions for reimbursement cuts in the near future. We investigated the differences in readmission diagnoses between high and low performing hospitals in a statewide surgical collaborative to identify potentially preventable readmissions.

Methods: This was a retrospective cohort study of patients who underwent laparoscopic or open colectomy between May 2007 and Jan 2011 at 23 hospitals participating in the Michigan Surgical Quality Collaborative colectomy project (n=5170). Preoperative demographic data, comorbidities and case severity were entered into a multivariate logistic regression model to generate hospital-level risk-adjusted 30-day readmission rates. We then compared readmission diagnoses between hospitals with the lowest and highest readmission rates.

Results: We saw significant variability in readmission rates between hospitals. While the overall readmission rate was 7.5%, the average readmission rate in the best quartile was 5.0%, compared to 10.3% in the worst quartile ($p<0.01$). Although readmission rates between high- and low performing hospitals varied significantly, reasons for readmission were similar between these groups. Surgical site complications, including anastomotic leak, accounted for 21.4% of readmissions in the best quartile, compared to 23.4% in the worst quartile ($p=0.49$). Bowel obstruction accounted for 9.5% of readmissions in the best quartile compared to 5.0% in the worst ($p=0.23$). Dehydration and electrolyte imbalances accounted for 4.8% of readmissions in the best quartile compared to 10.6% in the worst ($p=0.20$).

Conclusions: Despite substantial variability in hospital risk-adjusted readmission rates, reasons for readmission are similar between hospitals with the highest and lowest risk-adjusted rates. Identifying and decreasing potentially preventable readmissions in hospitals with high readmission rates will require further study on discharge and readmission processes and coordination of care rather than patient-level data.

Figure 1: Comparison of readmission diagnoses in the best versus worst hospitals by readmission rates



VTE: venous thromboembolism; FTT: failure to thrive

HYPOALBUMINEMIA AS AN OUTCOMES PREDICTOR IN COLECTOMY PATIENTS USING ACS NSQIP DATA.

(P350)

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Purpose: Hypoalbuminemia has been shown to be a predictor of surgical outcomes in noncardiac surgery patients. We specifically wanted to see if this also held true for colectomy patients.

Methods: Using the National Surgical Quality Improvement Program (NSQIP) participant use files for 2005-10 under the data use agreement of the American College of Surgeons and the supervision of our IRB, patients were selected by primary CPT for colectomy. Laboratory and co-morbidity data was assembled and the modified frailty score was also utilized. We identified these ranges of interest: albumin (ALB) <3.5g/dL and <2.5g/dL. NSQIP data points related to postoperative complications consistent with Clavien class IV and V were identified. We also looked at the effect of ALB among patients at stratified levels of frailty. Univariate relationships chi-square testing with trend analysis, and multivariate relationships were explored with logistic regression, using segmentation for verification. Analysis was performed in SPSS 20 (IBM, NY).

Results: A total of 61,796 colectomies were identified with recorded ALB levels. An ALB <3.5g/dL (n=22,619, 36.6%) greatly increased the incidence of mortality (12.4% vs 1.8%, $p<0.001$) as well as Clavien class IV complications (23.7% vs 6.0%, $p<0.001$). Using the lower division point of ALB <2.5g/dL (n=6,343, 10.3%), the risk of mortality and Clavien class IV complications was

even greater, 22.2% vs 3.8%, p<0.001 and 39.7% vs 9.3%, p<0.001 respectively. At all levels of frailty, patients with low ALB had a significantly higher rate of Clavien class IV and V complications (p<0.001). The effect of ALB was greatest in the least frail. Among the patients without any frailty indicators, those who had an ALB <3.5g/dL had an odds ratio for death of 6.7, 95% CI of 5.0 to 8.8. Among the patients with four or more frailty indicators, those who had an ALB <3.5g/dL had an odds ratio for death of 3.0, 95% CI of 2.4 to 3.6. ALB <2.5g/dL was significant even among those patients with an ALB <3.5g/dL, with an increased incidence of mortality (22.2% vs 8.6% p<0.001) and Clavien class IV complications (39.7% vs 17.4% p<0.001).

Conclusions: Low albumin level does contribute to adverse outcomes in colectomy patients.

SURGICAL COMPLICATIONS IMPACT PATIENT PERCEPTION OF HOSPITAL CARE.

(P351)

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Purpose: To assess the impact of surgical complications on the patient responses to HCAHPS "top box" (most favorable) scores.

Methods: Patients undergoing a colorectal procedure from 10/2009 - 06/2012 at a single center who returned an HCAHPS survey were included. HCAHPS domains included: communication with nurses and doctors, understanding medications, staff responsiveness, pain management, discharge information, cleanliness and quietness of environment, overall hospital rating, and hospital recommendation. Patient complications were categorized as major vs minor and "surgical" vs "medical". "Surgical" complications were further stratified as those likely to be perceived by patients as directly related to the "technique" (anastomotic leak, abdomino-pelvic abscess, wound infection etc) versus "medical" (ie, MI, pneumonia etc) Chi-square and Wilcoxon-rank-sum test were used to compare scores.

Results: 1409 surveys were collected for 1233 patients (mean 53 ± 15.7 years, 701 (52.2%) females) who underwent 955 (67.8%) abdominal, 114 (8.1%) anorectal, and 340 (24.1%) stoma related operations. Major complications were identified in 195 (13.8%), minor complications 396 (28.1%), "technique" complications 159 (11.3%) and "medical" 411 (29.2%). Patients without any type of complications were more likely to recommend the hospital compared to those patients with complications (p = .023) (minor vs major (p=.72) or surgical vs medical (p= .5)) Responsiveness of hospital staff was also reported as higher for patients without any complications (p<.0003) (minor vs major (p= .71) or surgical vs medical (p= .95). Patients without complications were more likely to respond favorably to hospital quietness (p=.0019). The other HCAPS domains were similar irrespective of the occurrence of complication or otherwise.

Conclusions: Any type of complication after colorectal adversely impacts patients' self-reported perception of their hospital care as measured by HCAHPS survey. While minimizing and eliminating postoperative complications is desirable, a proportion of these may be inevitable. Strategies aimed at reducing patient risk, educating patients, and counseling when adverse events do occur, may improve patient experience and satisfaction.

PREDICTING READMISSION AND LEAK RATES FOLLOWING COLECTOMY WITH RED CELL DISTRIBUTION WIDTH - A SIMPLE BUT EFFECTIVE TEST.

(P352)

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Purpose: Prediction of readmission and anastomotic leak is an incredibly difficult matter. In an era when length of stay is becoming increasingly important, being able to predict problematic patients who may get readmitted or develop complications would be extremely advantageous. To date, multiple tests including CRP and other levels have attempted to do just this, but none are sufficiently sensitive.

Methods: We performed a single center, retrospective review of patients admitted to the USC Medical Center who underwent colectomy within the last two years to determine the predictive value of red cell distribution width (RDW) on the development of anastomotic leak or readmission within 30 days following hospital discharge.

Results: A total of 118 patients underwent colectomy during this period. Readmission or anastomotic leak occurred in 49 patients (41%). The sensitivity of elevated RDW levels (greater than or equal to 14.0) at detecting future readmission or leak was 89.8%. The negative predictive value for a normalized RDW below 14.0 at predicting the non-occurrence of leak or readmission was 87.7%. The specificity of an elevated RDW was 72.4% and the positive predictive value was 76.5%.

Conclusions: Elevated RDW level is a cost-effective and efficient way to detect possible readmissions and anastomotic leaks following colectomy. A normal RDW is a good predictor of an uncomplicated postoperative course and can allow clinicians to feel more confident in early discharge of patients.

CORRELATION OF FLUID MANAGEMENT AND URINARY RETENTION AFTER AMBULATORY ANORECTAL SURGERY.

(P353)

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Purpose: Urinary retention (UR) is a common postoperative complication of anorectal surgery and a frequent reason for delayed discharge from outpatient facilities and/or unplanned hospitalization or ER visits. The etiology remains largely elusive. Hypothesizing that perioperative fluid overload might be a key factor, we aimed at analyzing the impact of perioperative fluid management and the type of surgery performed on the risk for urinary retention.

Methods: Records of patients undergoing simple ambulatory anorectal surgery (hemorrhoidectomy, fistula-in-ano, warts, fissures) under general anesthesia between 2000-2010 were retrospectively reviewed. Excluded were patients with more complex procedures, patients with known urinary problems, and patients with incomplete data. A variety of data points including length of surgery, perioperative fluid administration and time to void were recorded.

Results: Of 305 analyzed patients, 34 (11%) developed urinary retention. The mean total perioperative fluid administration in patient with UR was 1032 +/- 524 cc compared to 892 +/- 105 cc in patients without, but the difference did not reach statistical significance. The time to 1st void of patients without UR (divided into 3 groups: > 6 hours, 4-6 hours and >4 hours) directly correlated with the average perioperative fluid administration (1275 cc, 995 cc and 878 cc, respectively). The type of surgery was the only other parameter to be associated with UR. Hemorrhoidectomy had a significantly higher incidence of urinary retention than procedures for fistula-in-ano, warts, or anal fissures procedures ($p < 0.05$). Operating room time was not correlated with a risk of urinary retention.

Conclusions: Our review demonstrates recovery of postoperative bladder function after outpatient anorectal surgery is directly related to the perioperative fluid management and the type of surgery performed.

CORRELATION BETWEEN NUTRITIONAL SCREENING TOOLS AND POSTOPERATIVE COMPLICATIONS.

(P354)

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Purpose: Preoperative nutrition has been shown to reduce postoperative complications in selected patients at nutritional risk. A multitude of biological and anthropometric parameters has been suggested along with several scores. The aim of the current study was to correlate various surrogate parameters for malnutrition with complications after major gastrointestinal (GI) surgery.

Methods: A recently performed randomized trial on preoperative nutrition (NCT00512213) provided the study cohort of 152 patients at nutritional risk (Nutritional Risk Score ≥3) with detailed prospective documentation of nutritional parameters (n=20) and potential demographic (n=7) and surgical (n=4) confounders. Risk factors for overall, infectious and severe (Dindo/Clavien III-V) complications were identified by univariate analysis; significant parameters ($P<0.10$) were then entered in a multiple logistic regression model.

Results: Final analysis included 141 patients with complete datasets for the purpose of the present study. Univariate analysis identified low hemoglobin level ($P=0.071$) and upper GI surgery ($P=0.065$) as risk factors for overall postoperative complications. Severe postoperative complications tended to occur more often in patients with low body mass index (BMI) ($P=0.082$), lean body mass ($P=0.028$), and albumin levels ($P=0.097$). Non-compliance with the nutritional intervention ($P=0.079$) was related with postoperative infections. Multivariate analysis identified co-morbidity (OR 6.33, CI 1.75-22.85) and low hemoglobin concentration (OR 2.70, CI 1.16-6.28) as independent risk factors for overall postoperative complications. Compliance with nutritional supplements (OR 0.39, CI 0.16-0.96) was independently associated with decreased infectious complications, while no risk factor was retained after multivariate analysis for severe complications. Interestingly, diverse widely used nutritional parameters had absolutely no correlation with the postoperative morbidity.

Conclusions: No surrogate parameter for malnutrition appeared to be strongly related with overall, severe and infectious complications. Nutritional screening using one single validated instrument is likely enough to select patients for nutritional interventions.

DOES OBESITY INCREASE POSTOPERATIVE COMPLICATIONS AFTER LAPAROSCOPIC COLORECTAL SURGERY? RESULTS FROM A SINGLE-CENTER CASE-CONTROL STUDY.

(P355)

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Santiago, Chile

Purpose: To compare postoperative complications (POC) between obese and non-obese patients undergoing laparoscopic colorectal surgery (LCRS).

Methods: Case-control study, based on patients selected from a prospectively maintained LCRS database operated between July 2007 and June 2012 at our institution. Obese patients (BMI ≥ 30 Kg/m2) were defined as cases, and they

were paired according to gender, age, ASA class, preoperative diagnosis and type of surgery with non- obese patients (BMI < 30 Kg/m2) defined as controls. Intraoperative and POC were documented during a follow-up period of 30 days. Every POC was classified by severity according to Clavien-Dindo score. Statistical analysis: Shapiro-Wilk test, Mann Whitney and chi square.

Results: From a total of 449 patients, 53 obese patients with a mean BMI of 33.13 Kg/m2 were paired with 53 controls with a mean BMI of 25.98 Kg/m2. Median age was 55 and 57 years, respectively; in both groups 39.6% were women. POC were observed in 24.5% of cases versus 28.3% of controls (p = 0.66). Stratified by severity, both groups were similar (p = 0.62). There was no statistical significance in time to feed (1 day for each group) and length of hospital stay (4 days). Four cases and 2 controls had POC requiring reoperation (p = 0.4), 13 required ICU (p = 0.77) and 5 patients had to be readmitted because of POC (p = 0.65).

Conclusions: In this study, the incidence of POC is not increased in obese patients that undergo LCRS.

THE EFFICIENCY OF ESTIMATION OF PHYSIOLOGIC ABILITY AND SURGICAL STRESS SCORING SYSTEM IN PREDICTING POSTOPERATIVE COMPLICATIONS IN FAST-TRACK RECOVERY OF COLORECTAL CANCER.

(P356)

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Purpose: To evaluate the E-PASS in predicting incidence of complications 30 days postoperation in Fast-track recovery of colorectal cancer (CRC).

Methods: 422 patients with CRC from August 2008 and August 2010 at our Gastrointestinal Surgery Center were enrolled prospectively to ascertain the correlation between comprehensive clinical score (CRS) and each index of E-PASS as well as the discriminatory power of E-PASS in testing whether complications occur. Pearson correlation test was used in correlation analyses for continuous variables while Spearman correlation was used for categorical variables, and Kendall's stau-b correlation for ranked data.

Results: In this Fast-track recovery management, complications occurred in 58 (13.74%) cases whereas the predicted number is 31 (O: E=1.9). The results indicated associations between age(r=0.537, P=0.000), blood loss (r=0.228, P=0.000), weight (r=0.123, P=0.011), operative time (r=0.207, P=0.000), blood loss/weight rate (r=0.205, P=0.000) and hospitalization duration (r=0.174, P=0.000) and CRS. Also, occurrence of sever heart disease (r=0.338, P=0.000), sever pulmonary disease (r=0.323, P=0.000) and diabetes (r=0.260, P=0.000) as well as performance status index (r=0.580, P=0.000), ASA stage (r=0.532, P=0.000) and operative incision degree (r=0.288, P=0.000) are found to be related to CRS. The area under the ROC curse is 0.750(P=0.000). Meanwhile, when the predicted complication rate is below 40%, the observed rate is higher than the expected one. In addition, the predictive accuracy increases as the predicted rate rises.

Conclusions: E-PASS is effective in predicting postoperative complications in Fast-track recovery of colorectal cancer. However, the underestimation risk exists when CRS is low. Thus, it indicates that the higher predicted rate is, the more accurate it is.

PROCESS IMPROVEMENT IN COLORECTAL SURGERY: MODIFICATIONS TO AN ESTABLISHED ENHANCED RECOVERY PROTOCOL.

(P357)

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Purpose: Our goal was to evaluate the impact of modification of an enhanced recovery pathway (ERP) on

P356 Comparison of E-PASS scoring system in predicting the number of complications group and the actual number of complications.

Expected Complication rate group (%-%)	Average complication rate (%)	Total number of cases	Predicted number of complications (E)	Actual number of complications (O)	O:E ratio
≤0	-8	169	0	12	-
0-9	4.3	114	4	12	3
10-19	13.9	62	7	14	2
20-29	23.7	31	6	3	0.5
30-39	35.0	22	6	10	1.7
40-49	44.9	13	4	4	1
50-59	55.3	4	1	1	1
60-69	63.3	6	3	2	0.7
70-79	71.1	1	0	0	-
Total	33.7	422	31	58	1.9

patient outcomes in colorectal surgery. After more than a decade of improvement, our ERP had laparoscopic colectomy patients going home a mean of 3.7 days after surgery. We hypothesized that the addition of a Transverse Abdominus Plane (TAP) block and IV acetaminophen to this established ERP would improve patient outcomes and reduce resource utilization.

Methods: After adding TAP blocks and IV acetaminophen to the ERP 12 months ago, a review of a prospective database of a single surgeon's elective major laparoscopic colorectal cases from 2010-2012 was performed. Patients were matched by procedure type, age and gender. The main outcome measures were hospital length of stay (LOS), readmission rate, post-operative complications, and cost of the hospital episode before and after adding amending our ERP. Paired t-tests, Fisher's exact test, and statistical process control (SPC) were used for analysis.

Results: 208 elective major laparoscopic cases were evaluated. Both groups were similar in age, BMI, and comorbidities. LOS was significantly shorter once TAP and acetaminophen were introduced ($p<0.005$), dropping from 3.7 to 2.6 days. There were significantly more complications in the pre-change group ($p=0.019$), but no significant differences in readmissions or mortality. Direct costs were similar, but there was a $500 increase in total margin per case ($p=0.004$) with the ERP changes. Using SPC to examine the effect on outliers there was noticeably less variation from the mean LOS (2.29 vs. 1.90 days, $p<0.001$) after the addition of TAP blocks and IV acetaminophen.

Conclusions: Continuous quality improvement is crucial for ensuring quality outcomes in colorectal surgery. The addition of a TAP block and IV acetaminophen significantly reduced LOS over that seen with a previously established ERP. SPC demonstrated our ERP changes significantly reduced the spread of outliers around our mean LOS.

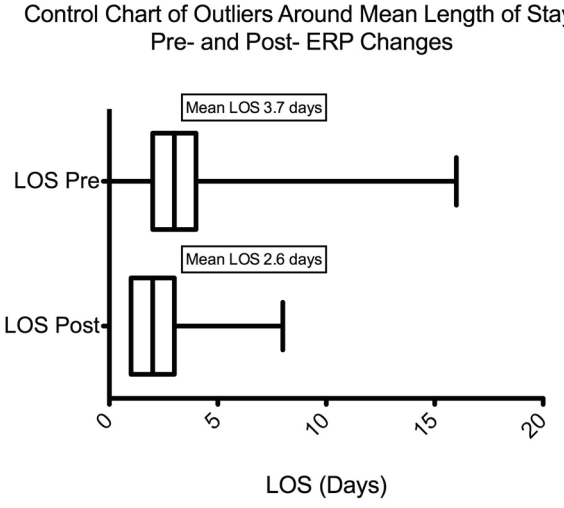

Figure 1: Control Chart of Outliers Around Mean Length of Stay Pre- and Post-ERP Changes.

ERP- Enhanced Recovery Protocol; LOS- Length of Stay

CLINICAL AND ECONOMIC IMPACT OF ENHANCED RECOVERY PATHWAYS FOR RECTAL SURGERY.

(P358)

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Purpose: Previous randomized studies have reported similar morbidity, hospital stay, and higher costs for laparoscopic vs. open rectal surgery, but utilized conventional perioperative care (CC). Enhanced recovery pathways (ERP) may further improve outcomes after laparoscopic rectal surgery, however there is little evidence. Therefore the objective of this study was to compare the impact of ERP on clinical outcomes and costs after laparoscopic and open rectal surgery.

Methods: All patients undergoing elective primary rectal resection and anastomosis at two university-affiliated institutions, one that used ERP as standard of care and the other CC, between 2008 and 2011 were reviewed. Patients were divided into three groups: open-CC (O-CC), laparoscopic-ERP (L-ERP), and open-ERP (O-ERP). Postoperative outcomes were recorded up to 30 days after surgery. Morbidity was graded using the Clavien classification of surgical complications. Total medical costs (derived by micro-costing and including overhead costs) were calculated from an institutional perspective, and expressed in 2011 Canadian dollars ($CAD). Mean difference in cost between groups were calculated, and 95% CI derived from bootstrap estimates (10,000 iterations).

Results: A total of 382 patients were included (O-CC 200, L-ERP 130, O-ERP 52). The three groups were similar in age, gender, body mass index, co-morbid status, malignancy, and ileostomy formation. Length of stay was significantly different between the three groups (Table), and specifically between the O-CC and O-ERP groups ($p=0.04$). Overall morbidity was lower in the L-ERP compared to the O-CC and O-ERP groups (Table), but was similar between the open groups ($p=0.355$). Mean operating room costs were highest in the L-ERP group (5366(SD 945) vs. O-CC 3676(SD 1056) vs. O-ERP 4065(SD 1113) $CAD, $p<0.001$). Total medical costs were lower for L-ERP compared to O-CC (mean difference -1538 $CAD, 95% CI -3504, -75) and O-ERP (mean difference -3146 $CAD, 95% CI -6184, -108). There was no difference in total costs between O-CC and O-ERP.

Conclusions: ERP is associated with improved outcomes after rectal surgery, and especially if laparoscopy is used. ERP may also negate the increased operative costs for laparoscopy.

APPLICATION OF A NOVEL POSTOPERATIVE QUALITY OF LIFE METRIC IN RECTAL CANCER.

(P359)

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Purpose: The postoperative quality of life (PQL) metric is a novel simple, point-of-care tool for rapid quality of life (QoL) assessment in colorectal surgery patients. PQL has been previously validated both pre and post-operatively, and proven as an alternative to the SF-36, but specifically designed for the postoperative abdominal surgery population. PQL has not yet been evaluated in specific patient populations. Our goal was to use PQL to evaluate QoL in patients undergoing rectal cancer surgery.

Methods: Review of a prospective database identified patients undergoing a low anterior resection (LAR) or abdominoperineal resection (APR) for rectal cancer from 2005-2012. Patients were included if PQL scores at baseline and post-operatively were available, and stratified into laparoscopic (LAP) and open (OPEN) groups. Laparoscopic converted to open procedures were included in LAP for intention to treat analysis. Patients were excluded if undergoing a multi-visceral resection, exenteration, or intra-operative radiation therapy. Main outcome measures were overall PQL and score at each time point by procedure and approach. Univariate analysis examined differences between groups.

Results: 213 patients met inclusion criteria- 76% LAR (84 LAP, 67 OPEN) & 24% APR (28 OPEN, 17 LAP). 17 (11 LAR, 6 APR) were converted to open procedures. 1193 PQL questionnaires were analyzed- 284 APR (161 LAP, 123 OPEN) & 909 LAR (499 LAP, 410 OPEN). There were no significant differences in age or co-morbidities by approach. The LOS (< 0.001, < 0.001) & procedure time (0.0390, 0.0015) were significantly shorter LAP for LAR and APR, respectively. In the APR group, LAP had significantly lower readmissions and post-operative complications. The overall PQL was significantly higher for LAP vs OPEN (p= <.0001) and LAR vs APR (p= <.0001). When evaluating post-operative score by time OPEN patients had lower scores for the initial 3 months. By procedure, LAR scores for higher than APR for the initial 60 days, then most patients reported return to normal activities.

Conclusions: Short-term QoL is better for LAP and LAR patients. However, by 60-90 days, most patients return to normal function and differences by approach and procedure cease.

A GOVERNMENT MANDATED SURGICAL SAFETY CHECKLIST DID NOT IMPROVE PERIOPERATIVE PROCESSES OF CARE IN COLORECTAL CANCER SURGERY IN A LARGE POPULATION.

(P360)

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Purpose: Starting April 1, 2010 in Ontario, Canada (pop. 13 million), the provincial government mandated the use of a perioperative SSC in hospital operating rooms to decrease surgical morbidity and mortality. Among CRC patients in the south-central region of Ontario (pop. 1.3 million), we assessed the impact of the SSC on processes of care related to surgical site infection and venous thromboembolism prophylaxis (VTE).

P358 30-day clinical outcomes

	O-CC (n=200)	L-ERP (n=130)	O-ERP (n=52)	p-value
Median length of stay, days [IQR]	10 [8, 14]	4.5 [3, 8]	8.5 [4, 10]	<0.001
Postoperative complications	51% (102)	33% (43)	42% (22)	0.001
Readmissions	6% (11)	7% (9%)	10% (5)	0.309

P359 PQL Results by Surgical Approach and Procedure

PQL Scores (Mean)	By Approach			By Procedure		
	Lap	Open	P-Value	APR	LAR	P-Value
Pre- Operative	77.92	71.99	0.0005*	66.62	77.36	< 0.0001*
0-30 Day	71.48	61.47	0.0023*	60.58	67.09	0.0707
31-60 Day	73.21	65.93	0.0123*	66.19	71.99	0.0479*
61-90 Day	73.50	63.34	0.0176*	67.00	66.87	0.9799
90-120 Day	74.10	69.35	0.3220	74.40	71.83	0.6570
3 - 6 Months	72.30	72.11	0.9595	72.29	72.04	0.9558
6-12 Months	76.19	74.76	0.5256	75.52	75.41	0.9704
1-2 Years	82.28	78.81	0.0929	76.26	80.58	0.0618
> 2 Years	82.42	81.13	0.6868	75.74	79.24	0.4027

Methods: We reviewed charts of all patients undergoing CRC surgery 12 months before (September 1, 2008 to August 31, 2009) and after (July 1, 2010 to June 30, 2011) introduction of the SSC. We considered the intervening months to be a wash-in period. Outcomes included use and timing of preoperative antibiotic administration, maintenance of normothermia, and use of VTE prophylaxis. Multivariable logistic regression models with generalized estimating equations (for nested results at the hospital level) assessed the impact of the SSC on study outcomes.

Results: There were 741 and 659 patients treated 12 months before and after introduction of the SSC, respectively. Mandatory public reporting indicates SSC use in over 95% of patients. For the before and after SSC periods, use of preoperative antibiotics was 90.1% and 90.8% (p=0.662), appropriate timing of antibiotic administration was 34.3% and 39.7% (p=0.050), maintenance of normothermia was 34.7% and 39.3% (p=0.145), and use of VTE prophylaxis was 77.9% and 76.3% (p=0.479), respectively. On multivariable analysis comparing the after versus before SSC periods, the odds ratios (95% CI) were: use of preoperative antibiotics, 1.10(0.73 – 1.67); appropriate timing of antibiotic administration, 1.26 (0.89 – 1.78); maintenance of normothermia, 0.86 (0.64 – 1.15); and use of VTE prophylaxis 0.90 (0.59 – 1.35).

Conclusions: The government mandated SSC did not improve perioperative processes of care among patients undergoing CRC surgery in the south-central region of Ontario. Our results demonstrate persistent gaps in the quality of surgical site infection and VTE prophylaxis among patients undergoing CRC surgery.

ENHANCED RECOVERY AFTER COLORECTAL SURGERY: DOES EARLY DISCHARGE GENERATE MORE READMISSIONS?

(P361)

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Purpose: Enhanced Recovery has been shown to reduce length of post-operative hospital stay (LOS), with no increase in complications or mortality. Early discharge, however, has led to concerns about increased readmissions. This is particularly relevant in the current climate in the United Kingdom where hospitals are penalised for readmissions within 30 days of discharge. The aim of this study was to evaluate the results of our Enhanced Recovery Programme (ERP) with a focus on readmissions. A full time ERP Nurse facilitates the Programme at our Unit including telephone follow-up after discharge.

Methods: A prospectively compiled ERP database of all patients undergoing a major colorectal procedure in our Unit between January 2011 and September 2012 was analysed. Short term outcome data included LOS and readmission rates. Statistical significance was estimated using chi-squared tests.

Results: 352 patients (194 male, median age 68 years) were identified. 54.6% underwent a laparoscopic resection (conversion rate 14.3%). 72.3% of procedures were undertaken for cancers. Overall median LOS was 6 days (range 1-45). 47.2% of patients were discharged ≤5 days. Median LOS in the laparoscopic group was 5 days and 7 days in the open group (p<0.001). In the converted group, median LOS was 8 days. 33 patients were readmitted within 30 days of discharge (9.4%). Laparoscopic readmission rate was lower (6.8%) than the open group rate (13.4%; p=0.05). The readmission rate in the group discharged ≤5 days was 5.9% compared to 12.4% for those discharged later (p=0.04). Median LOS for readmitted patients was 6 days. 15 of 33 readmitted patients (45.5%) had developed a post-operative complication; significantly different to non-readmissions (p<0.001).

Conclusions: This study has shown that readmission rates following major colorectal procedures within an ERP can be kept low; rates at our Unit are comparable to nationally accepted standards. Close nurse-led follow up of patients following discharge may contribute to preventing readmissions. Patients were more likely to be readmitted if they had undergone open surgery or had post-operative complications. Early discharge generated half as many readmissions as later discharge.

THE ENHANCED RECOVERY PROGRAM IN THE VERY ELDERLY.

(P362)

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Purpose: Enhanced Recovery Programme (ERP) has been shown to improve short term outcomes after major colorectal surgery. These results may be based on carefully chosen groups of patients and often exclude those aged 65 and over. The benefits of the ERP in patients who are very elderly (VE) are less well understood. Given the changing demographics of our population, patients in this age group are being increasingly operated upon in colorectal units across the United Kingdom, including our Unit where all patients irrespective of age, co-morbidity or BMI are included in our ERP. Our study aims to evaluate the role of Enhanced Recovery in the VE age group, which for the purpose of this study we have defined as any patient aged 75 or over.

Methods: A prospectively compiled database from January 2011 to September 2012 was used to identify all patients aged 75 years and over who have undergone major elective colorectal resections within our ERP. This data was analysed to study short term outcomes in these patients and compared with patients aged 74 and below.

Results: Of the 352 patients who underwent elective surgery during this period, 107 were identified as VE. 50 were

aged 75-79 years, 49 were aged 80-89 and 8 were aged 90 and above. All but 7 patients underwent surgery for cancer (76 colonic, 24 rectal). 62% underwent laparoscopic surgery. The median length of hospital stay (LOS) in the VE group was 7 days (range=2-28) and median LOS in the younger patient group (<75 years) was 5 days. This difference was statistically significant ($p<0.05$). In the VE group, the median LOS of patients undergoing laparoscopic surgery was 6 days and 11 days for patients undergoing open surgery. Overall, 32% of VE patients were discharged by day 5; 85% (30) underwent laparoscopic surgery. There were 2 mortalities within the VE group (5 mortalities in in overall). There were more complications in the VE group ($p<0.05$).

Conclusions: Our study has shown that Enhanced Recovery is possible in the very elderly and that despite a longer LOS for the majority, patients still gain from the Programme. Patients undergoing laparoscopic surgery in this group appear to benefit most. Our results support our current policy of including everyone in our ERP regardless of their advanced age.

VENOTHROMBOEMBOLISM PROPHYLAXIS: A SNAPSHOT OF REGIONAL PRACTICE AND ASSOCIATED OUTCOMES IN COLORECTAL SURGERY.

(P363)

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Purpose: While best practices have been defined by consensus guidelines, there remains little data on real world usage of thromboprophylaxis and its impact on clinical care. This study sought to describe current thromboprophylaxis(TPPX) practice in Upstate New York and associated colorectal surgery outcomes.

Methods: The Upstate New York Surgical Quality Improvement Program (UNYSQI) is a 13 hospital regional collaborative focused on colorectal outcomes starting in 2010. Using The National Surgical Quality Improvement Program database, UNYSQI evaluates additional colectomy specific variables including in-patient and post-discharge TPPX regimens. Multivariate logistic regression was performed to analyze the effect of TPPX regimen on risk of major complications and Venothromboembolism(VTE).

Results: A total of 807 patients were included and 90% of patients were on heparin or low-molecular weight heparin (LMWH). Combination therapy of sequential compression devices (SCDs) with either heparin (n=447) or LMWH (n=191) was used in 79% of cases. No prophylaxis was ordered in 1.6% of cases (n=13) and SCDS alone in 7.4% (n=60). Post surgical discharge TPPX was prescribed in 6.3% of cases (n=63). On bivariate analysis comparing combination therapy to heparin/LMWH alone there were significantly fewer major complications in the combination therapy group 18% vs. 29% respectively, OR=0.55 (CI:0.32, 0.92). On multivariate analysis comparing pharmacologic TPPX to SCDs or no TPPX, pharmacologic TPPX was protective against major complications OR=0.48 (CI:0.32, 0.71) and VTE OR=0.28 (CI:0.09, 0.91, $p=0.034$).

Conclusions: Combined therapy of pharmacologic and mechanical TPPX was associated with improved outcomes supporting use over pharmacological TPPX alone. Consistent with existing evidence, pharmacological TPPX is associated with decreased risk of VTE and is an essential component of surgical care. While overall rates of pharmacological TPPX were high, nearly 1 in 10 patients received only mechanical prophylaxis and very few patients were prescribed post-discharge TPPX demonstrating the continued need for thromboprophylaxis vigilance and awareness.

IMPACT OF OBESITY ON OUTCOMES OF SINGLE-INCISION LAPAROSCOPIC COLECTOMY.

(P364)

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Purpose: Obesity increases morbidity and affects technical performance in colorectal surgery. Obesity is a factor for selection bias in single incision laparoscopic (SIL) colectomy. However, there are no studies on impact of obesity on SIL colectomy. The purpose of this study is to determine whether obesity impacts outcomes in SIL colectomy.

Methods: Between 2009 and 2012 all patients undergoing SIL segmental colectomy were prospectively entered into database. All colectomies were performed by a single surgeon using standardized technique. Patients undergoing SIL colectomy for any pathologic condition were analyzed. Obesity was defined as BMI≥ 30. Demographic data included age, sex, BMI, ASA score and previous laparotomy. Outcomes included operative time (OT), estimated blood loss (EBL), length of stay (LOS), incision length, conversion rates, 30-day morbidity, and mortality. Statistical analysis consisted of chi-square and Student's t test where appropriate.

Results: 139 consecutive patients were identified, 48(35%) in obese, 91(65%) in non-obese group. There were no significant differences between groups with respect to age ($p=0.2$) sex ($p=0.8$), ASA score ($p=0.4$) and previous laparotomy ($p=0.7$). Operative outcomes were similar for mean OT (154 vs.156 mins;$p=0.8$), EBL (96 vs. 64cc;$p=0.08$), in obese and non-obese group respectively. However, conversion rate (23% vs. 9.9%;$p<0.05$) and mean incision length (7.9cm vs. 5.0cm; $p<0.001$) were significantly higher in obese group. Although the incidence of surgical site infection (SSI) (18.7% vs. 5.4% $p<0.05$) was higher in obese

group, ileus (9.1% vs. 8.8%;p=0.9), anastomotic leak rates (0% vs. 4.4%; p=0.3) and LOS (4.2 vs. 4.3days; p=0.9) were similar between groups. Overall readmission rate was 12.2% and 3.6% reoperation rate with no significant difference between groups. There were no deaths reported in the study.

Conclusions: Our results demonstrate that SIL segmental colectomy in obese patients can be performed safely by an experienced surgeon. Technical complexity related to obesity is associated with increased SSI and a higher conversion rate in SIL colectomies, however, obesity should not be considered a contraindication.

SINGLE PLUS 1 TECHNIQUE FOR MINIMALLY INVASIVE COLORECTAL RESECTION.

(P365)

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Purpose: Single-incision laparoscopic colectomy has emerged as an efficacious approach for colon resection. However, technical challenges such as inadequate visualization and instrument collisions may limit its application. Additionally, it requires an umbilical incision, which has been associated with hernia. We developed a modified technique to overcome these limitations and avoid an umbilical extraction site. We present our experience with "Single Plus 1" laparoscopic colectomy utilizing a Pfannenstiel incision.

Methods: "Single+1" technique was performed for colon resection between June 2011 and September 2012. Procedures commenced with placement of a 5-mm umbilical optical port, followed by insertion of a single-incision device through a 4-cm Pfannenstiel incision. A 5-mm 30° camera and non-articulating instrumentation were utilized. All cases involved an intracorporeal anastomosis.

Results: "Single+1" was performed in 53 patients (58.5% female) with a mean age of 54.3±13.1 years, mean BMI of 26.9±5.3 kg/m^2, and median ASA of 2. Twenty-eight patients (52.8%) had prior abdomino-pelvic surgery. Colon resection was performed for both benign (n=38) and malignant (n=15) disease. Procedures included anterior resection (n=44), right hemicolectomy (n=4), total colectomy (n=2), left colectomy (n=1), transverse colectomy (n=1), and resection rectopexy

P365 Demographic Data and Perioperative Outcomes for Patients Undergoing

Procedure	Anterior Rectosigmoidectomy	Right Hemicolectomy	Other*	Total
Case Volume	n = 44	n = 4	n = 5	n = 53
Sex	20 Male24 Female	1 Male3 Female	1 Male4 Female	22 Male31 Female
Age (years)	54.5±11.1 (range: 34-84)	48.0±20.1 (range: 18-61)	57.4±23.6 (range: 23-77)	54.3±13.1 (range: 18-84)
BMI (kg/m^2)	27.6±5.3 (range: 17.1-44.8)	24.0±6.0 (range: 18.0-32.3)	23.6±3.6 (range: 18.6-28.3)	26.9±5.3 (range: 17.1-44.8)
ASA$^{\gamma}$	2 (range: 1-3)	2 (range: 2-3)	2 (range: 2-3)	2 (range: 1-3)
Past Surgical History	n = 24	n = 2	n = 2	n = 28 (52.8%)
Pathology	31 Benign 13 Malignant	3 Benign 1 Malignant	4 Benign 1 Malignant	38 Benign (71.7%) 15 Malignant (28.3%)
OT (min)	173.4±45.4 (range: 103-300)	150.0±38.0 (range: 104-196)	222.8±71.3 (range: 147-310)	176.3±49.4 (range: 103-310)
EBL (ml)	75.5±85.1 (range: 20-500)	35.0±17.3 (range: 20-50)	75±50 (range: 25-150)	72.4±79.4 (range: 20-500)
Postoperative Complications	n = 2(ileus)	n = 0	n = 0	n = 2 (3.8%)
LOS (days)	3.8±1.9(range: 2-12)	3.0±1.4(range: 2-5)	3.4±1.1(range: 2-5)	3.7±1.8(range: 2-12)
30-Day M&M	n = 1(dehydration)	n = 1(wound infection)	n = 0	n = 2 (3.8%)
Readmission	n = 1(dehydration)	n = 0	n = 0	n = 1 (1.9%)
Specimen Length (cm)$^{\Phi}$	18.4±6.3(range: 11.0-29.5)	19†	28.4†	19.1 6.4(range: 11.0-29.5)
LNE$^{\Phi}$	18.7±7.7(range: 12-40)	15†	9†	17.8±7.6(range: 9-40)

Data represents mean ± standard deviation unless otherwise specified

* includes total colectomy (n=2), left colectomy (n=1), transverse colectomy (n=1), and resection rectopexy (n=1); $^{\gamma}$ represents median value; $^{\Phi}$ for malignant cases only; † 1 malignant case in each group

ASA = American Society of Anesthesiologists score; BMI = body mass index; EBL = estimated blood loss; LNE = lymph node extraction; LOS = length of stay; M&M = morbidity and mortality; OT = total operative time

(n=1). There were no intraoperative complications or conversions. The mean operative time and estimated blood loss for all procedures were 176.3±49.4 min and 72.4±79.4 ml, respectively. The mean length of hospital stay was 3.7±1.8 days. Two patients (3.8%) experienced complications during hospitalization and two (3.8%) developed complications during 30-day follow-up; one (1.9%) required readmission. There were no anastomotic leaks or secondary surgical interventions. For malignant cases, mean lymph node extraction was 17.8±7.6 and all margins were negative.

Conclusions: "Single plus one" laparoscopic colectomy is a novel modality combining the merits of single-incision and reduced port techniques to facilitate colon resection utilizing a Pfannenstiel incision. The approach optimes visualization and exposure while limiting instrument collision and avoiding an umbilical extraction site.

ARE CLINICAL OUTCOMES COMPROMISED DURING ADAPTATION OF SINGLE-INCISION LAPAROSCOPIC COLECTOMY.

(P366)

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Purpose: Single-incision laparoscopic colectomy (SILC) has become an accepted modality for colon resection; however, questions remain regarding its widespread adaptability and reproducible outcomes. After performing over 200 cases, we evaluated if clinical outcomes achieved during initial adaptation of SILC were preserved or possibly enhanced with later experience.

Methods: Data was collected for 203 single-incision laparoscopic colectomies performed between July 2009 and October 2012. A 5-mm 30° camera and non-articu-

P366 Comparison of Early and Late Experience with Single-Incision Laparoscopic Colectomy

Parameter	All SILC Cases (n = 203)	1st Half (n = 101)	2nd Half (n = 102)	p-value
Sex	94 Male (46.3%)	51 Male (50.5%)	43 Male (42.2%)	0.24
	109 Female (53.7%)	50 Female (49.5%)	59 Female (57.8%)	
Age (years)	58.6±14.4(range:19-88)	58.4±12.6(range: 20-88)	58.8±16.0(range: 19-85)	0.85
BMI (kg/m^2)	26.5±4.7(range: 16.3-49.0)	26.6±5.1(range: 16.9-49.0)	26.4±4.3(range: 16.3-37.8)	0.73
ASA*	2(range: 1-4)	2(range: 1-3)	2(range: 1-4)	0.64
Procedure$^{\gamma}$	115 Right Hemicolectomy	51 Right Hemicolectomy	64 Right Hemicolectomy	0.14
	46 Anterior Rectosigmoidectomy	33 Anterior Rectosigmoidectomy	13 Anterior Rectosigmoidectomy	
	14 Total Colectomy	8 Total Colectomy	6 Total Colectomy	
	10 Left Colectomy	5 Left Colectomy	5 Left Colectomy	
	7 Transverse Colectomy	3 Transverse Colectomy	4 Transverse Colectomy	
	11 Other	1 Other	10 Other	
OT (min)	145.7±51.2(range: 60-356)	145.5±47.1(range: 66-300)	145.9±55.1(range: 60-356)	0.96
EBL (ml)	56.2±44.9(range: 10-350)	61.8±53.1(range: 10-350)	50.7±34.2(range: 10-200)	0.08
Conversions	n = 17 (8.4%)	n = 6 (5.9%)	n = 11 (10.8%)	0.21
Postoperative Complications	n = 43 (21.2%)	n = 25 (24.8%)	n = 18 (17.6%)	0.22
Readmissions	n = 10 (4.9%)	n = 4 (4%)	n = 6 (5.9%)	0.53
Reoperations	n = 6 (3%)	n = 5 (5%)	n = 1 (1%)	0.10
LOS (days)	4.2±3.3(range: 1-31)	4.0±3.9(range: 1-31)	4.4±2.5(range: 1-14)	0.53
Pathology	128 Benign (63.1%)	65 Benign (64.4%)	63 Benign (61.8%)	0.70
	75 Malignant (36.9%)	36 Malignant (35.6%)	39 Malignant (38.2%)	
Specimen Length (cm)$^{\Phi}$	20.9±11.0(range: 4.5-88)	22.6±13.4(range: 8.5-88.0)	19.4±8.1(range: 4.5-39.5)	0.22
LNE$^{\Phi}$	20.4±8.5(range: 7-49)†	21.9±7.8(range: 14-47)	19.0±8.9(range: 7-49)	0.15

Data presented as mean ± standard deviation unless otherwise specified

* median values; $^{\gamma}$ other procedures include cecectomy (n=2), small bowel resection (n=4), combined right hemicolectomy with transverse colectomy (n=3), combined right hemicolectomy with transverse colectomy (n=1), and proctocolectomy with J-pouch; $^{\Phi}$ for malignant cases only; † n = 72

ASA = American Society of Anesthesiologists score; BMI = body mass index; EBL = estimated blood loss; LNE = lymph node extraction; LOS = length of stay; OT = total operative time

lating instrumentation were utilized for all cases. Descriptive statistics and comparative analysis were performed to evaluate differences between the first 101 and second 102 cases completed ($\alpha = 0.05$).

Results: The mean age, mean BMI, and median ASA for the cohort of 203 patients were 58.6±14.4 years, 26.5±4.7 kg/m^2 and 2, respectively. The mean operative time (OT) was 145.7±51.2 min and the estimated blood loss (EBL) was 56.2±44.9 ml for all case types. Conversion to open surgery was required in two cases (1%). The mean length of hospital stay (LOS) was 4.2±3.3 days. Postoperative morbidity was 21.2%, including six anastomotic leaks. Ten patients required readmission (4.9%) and six required reoperative intervention (3%). For malignant cases (n=75), mean specimen length was 20.9±11.0 cm, mean lymph node extraction (LNE) was 20.4±8.5, and all margins were negative. Stratifying our cases based on early (n=101) versus late (n=102) experience (Table), we noted sex ($p<0.24$), age ($p<0.85$), BMI ($p<0.73$), and ASA ($p<0.64$) were similar. Case selection ($p<0.14$) and disease pathology ($p<0.70$) were also comparable between groups. With regard to outcomes, there were no significant differences in OT ($p<0.96$), EBL ($p<0.08$), postoperative morbidity ($p<0.22$), readmissions ($p<0.53$), reoperations ($p<0.10$), or LOS ($p<0.53$). Specimen length ($p<0.22$) and LNE ($p<0.15$) were also comparable for malignant cases between the two groups.

Conclusions: Single-incision laparoscopic colectomy can be safely performed in a large cohort of patients. Quality outcomes can be expected even during early adaptation of this technique and is maintained with expansive experience.

BEYOND SCIP: NOVEL APPLICATION OF ROOT CAUSE ANALYSIS FOR INFECTIONS AFTER COLORECTAL SURGERY.

(P367)

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Purpose: Our institution has previously been a high outlier for skin and soft tissue infections (SSIs) after colorectal surgery. Various interventions, such as an OR closing protocol, have proved ineffective at reducing this rate. Therefore, we applied a novel root cause analysis (RCA) process to all SSIs after colorectal surgery in order to better identify causative factors.

Methods: Our RCA algorithm collected data on factors traditionally implicated for SSI via intra-operative nursing and pharmacy data, operative dictations, and NSQIP abstraction. A synoptic case report was generated for each SSI by a multispecialty infection control team that identified both preventable (hypothermia, inappropriate antibiotic type, dose, or timing) and unpreventable (emergency, advanced wound or ASA class, OR time >75th percentile) factors. The surgeon reviewed each report for any discrepancies. We then compared our findings with reported SCIP compliance during that time period. We report our experience for the first year of our SSI RCA program here.

Results: During FY2012, 464 colorectal cases were performed with 24 subsequent SSIs (5%). All underwent RCA review. For 14 (58%) SSIs, both preventable and non-preventable factors were identified, 3 (12%) had only preventable factors, 4 (17%) had only unpreventable factors, and 3 (12%) had neither preventable nor unpreventable factors identified. Despite implicating preventable factors in 17 (71%) of the SSIs, SCIP compliance was 100% during this time period. Reasons behind wrong antibiotic dosing or choice included unplanned colectomy during emergency cases and antibiotic under-dosing for obese or penicillin-allergic patients.

Conclusions: Despite SCIP-compliance, our RCA process identified frequent aberrations in our peri-operative antibiotic procedures. Our novel RCA process collects more detailed antibiotic information than NSQIP or SCIP, whose data points may not be granular enough to truly identify factors contributing to SSIs after colorectal surgery. Thus, institutions may overlook elementary causes for high reported SSI rates. These encouraging preliminary results support continued study of the SSI RCA program regarding effectiveness and durability in reducing SSI.

MICROBIAL SEALANTS DO NOT DECREASE SURGICAL SITE INFECTION FOR CLEAN CONTAMINATED COLORECTAL PROCEDURES.

(P368)

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Purpose: Surgical site infections (SSI) are costly complications that may cause significant morbidity. Microbial sealants are a new class of wound barriers aimed which have decreased SSI in clean wound procedures. Microbial sealant has not been tested in clean contaminated procedures. Colorectal surgery is the ideal specialty to test efficacy because of its high incidence of SSI. We hypothesize use of microbial sealant for clean contaminated procedures will reduce SSI by half.

Methods: This is a single institution, prospective, randomized and controlled study. The primary objective is to determine the rate of SSI when microbial sealant is used. The secondary objective is to compare potential biases such as laparoscopy, age, BMI, diabetes and morbidity (ASA class). The tertiary objective is to correlate patient outcome with SSI. All subjects received the same preoperative care (mechanical bowel prep with oral antibiotics), operative care (Chloraprep and SCIP Guidelines) and postoperative care (glycemic control).

Results: A total of 100 subjects were recruited over 15 months. Fifty received microbial sealant and 50 did not

(control). The incidence of SSI was 12%. The microbial sealant group had 7% SSI and the control group had 5% SSI. The microbial sealant group had more SSI in both laparoscopic and open surgeries. Laparoscopic surgery had one-fourth the rate of SSI when compared to open surgery. Patients who developed SSI tended to be older, heavier, diabetic and morbid patients (higher ASA). Readmission, reoperation and wound dehiscence were also positively correlated with SSI.

Conclusions: Microbial sealant is no benefit in clean contaminated procedures. In fact, use of microbial sealant is associated with a higher incidence of SSI in both laparoscopic and open surgery groups. The secondary and tertiary data match trends in current literature. This validates our conclusion to accept the null hypothesis of no benefit. Further study is needed to label microbial sealant an absolute contraindication in clean contaminated procedures. However, it is clear from this data that microbial sealant is not beneficial and should not be used for clean contaminated procedures.

EFFECT OF UNIFORM NEGATIVE PRESSURE THERAPY ON MIDLINE INCISION INFECTION RATES DURING COLORECTAL CANCER SURGERY.

(P369)

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Purpose: The incidence of surgical site infections following colo-rectal resections is relatively high. The aim of this study is to compare the wound infection rates between Negative Pressure Therapy (NPT) and closed midline incision on all colo-rectal cancer resections over a 2.5 year period. These patients were compared to a group treated over the prior 2.5 years with Primary Sub-cuticular Closure (PSC).

Methods: This is a retrospective analysis of 155 patients who underwent either NPT or PSC for colo-rectal cancer surgery and their respective wound infection rates. All patients from January 2008 to August 2010 who underwent midline incision for colo-rectal cancer resections underwent primary closure of midline skin incision. From August 2010 to September 2012 all patients had undergone NPT. The NPT was removed on the day of discharge and the wound was subsequently steri-stripped. Comparing these two groups, wound infection rates were analyzed. All patients received prophylaxis antibiotics according to SQIP measures.

Results: Treatment and wound infection data from January 2008 to (Present) were analyzed retrospectively. The infection rate for the control group was 11.25% as compared to the results of the group with NPT where the infection rate was 0%.($p=0.0032$). Statistics were assessed with Fisher's exact test.

Conclusions: For patients undergoing colo-rectal cancer resections with midline incision, the NPT approach is associated with a significantly lower wound infection rate compared to the PSC approach.

P369 Colo-Rectal Surgery Clinical and Outcome Data

PROCEDURE	PSC	NPT
Patients	80	75
Infections	9	0
Sex		
Male	37	40
Female	43	35
Age		
Minimum	20	19
Maximum	88	88
Average	54.7	56.2
Race		
African American	46	29
Caucasian	33	45
Native American	0	1

P368 Primary Objective Data

	Total	SSI	No SSI
Population	100	12	88
Microbial Sealant	50	7	43
Control	50	5	45
Laparoscopic Procedure	58		
Microbial Sealant	30	2	28
Control	27	1	26
Open Procedure	42		
Microbial Sealant	19	5	14
Control	23	4	19

Table 2 Primary Objective Data: SSI with microbial sealant, control (no microbial sealant), laparoscopic surgery and open surgery.

SURGICAL SITE INFECTION IN COLORECTAL SURGERY: ASSESSMENT OF LOCAL ANTIBIOTIC SENSITIVITIES.

(P370)

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Purpose: Surgical site infections (SSI) are a cause of significant morbidity after colorectal surgery. Although our hospital was at the median for SSI in the NSQIP database for 2010, we sought to identify strategies to further reduce SSI risk. We utilized our SSI surveillance data to evaluate the need for revisions to our perioperative anticmicrobial prophylaxis regimen of cefazolin/metronidazole and to assess the impact of prophylaxis changes on SSI rates.

Methods: SSI surveillance using Centers for Disease Control and Prevention (CDC) National Healthcare Safety Network (NHSN) definitions following 1904 colorectal procedures performed between 10/2009 and 9/2011 identified 33 superficial incisional and 35 deep incisional or organ/space SSIs. Cultures associated with deep and organ/space SSIs indicated that out of 20 SSIs involving enteric Gram-negative bacilli: 10 (50%) included isolates resistant to cefazolin, 6 (30%) resistant to cefotetan, and 3 (15%) resistant to ceftriaxone. A survey of all enteric Gram-negative aerobic isolates received by our laboratory in 2011 revealed that 84% of isolates resistant to cefazolin, 9% resistant to cefotetan and 7% resistant to ceftriaxone.

Results: With this data we revised our recommendations for colorectal surgery perioperative antibiotics from cefazolin/metronidazole to one two-gram dose of cefotetan within one hour of surgery. The recommendation was made on Jan.1, 2012, with complete adoption by March 1. For procedures performed 4/1/2012-6/30/12, we noted no change in superficial SSI rates but did observe a substantial decrease in deep and organ/space SSI rates, resulting in a standardized infection ratio (SIR) significantly better than the CDC NHSN comparison (p-value <0.05)

Conclusions: Analysis of the sensitivity pattern of the bacterial flora of infections in our hospital led to a change in the choice of antimicrobial prophylaxis used for colorectal surgery. The antibiotic change was associated with improvements in our deep and organ/space SSI space infection rate. We recommend that hospitals utilize their local antimicrobial susceptibility patterns to customize the choice of antimicrobial agents used for SSI prevention

THE IMPACT OF EDUCATION ON DIAGNOSTIC ACCURACY OF BENIGN ANAL DISEASE: A PROSPECTIVE STUDY.

(P371)

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Purpose: Diagnostic accuracy for common benign anal pathologic conditions has been shown in our previous study to be suboptimal across all clinical specialties. The need for educational programs has been established. We prospectively evaluated the impact of education on diagnostic accuracy for benign anal disease.

Methods: Seven common benign anal pathologic conditions were selected: prolapsed internal hemorrhoid, thrombosed external hemorrhoid, abscess, fissure, fistula, condyloma acuminata, and rectal prolapse. Prospectively accrued subjects included attending physicians, house staff, and medical students. Specialties included Surgery, Gastroenterology, and Emergency Medicine. The study consisted of a pre-test (PRE) where participants were asked to evaluate 7 images and identify them. This was followed by an educational lecture. A second assessment of the same images was conducted after (POST). Categorical variables were analyzed using chi square and continuous variables using the nonparametric median test.

Results: There were 205 subjects in the PRE group of whom 188 participated in the POST. Groups were classified based on level of clinical experience: Attending Physician (23), House Staff (78), and Student (104). Overall diagnostic accuracy improved with intervention (50% PRE; 77% POST). Prior to education, only 27% of subjects correctly identified 5 or more conditions. This number improved to 73% post intervention. Accuracy also improved for each condition in all groups when stratified by specialty and clinical experience (See Table). There was a significant association between specialty and median overall accuracy in both PRE and POST assessments (p<.0001), with the greatest impact on Emergency Medicine with a median score of 3 PRE and 6 POST. Level of clinical experience was significantly associated with total median score both at PRE(p<0.0001) and POST(p=.0004).

Conclusions: Educational Intervention improved diagnostic accuracy for common benign anal disease in all specialties, at all levels of clinical experience. These clinical conditions are commonly seen, and educating students and physicians in these common conditions is effective. Therefore, educational programs should be instituted.

USE IT OR LOSE IT: SURGICAL RESIDENTS' ENDOSCOPIC SKILLS DETERIORATE OVER TIME AWAY FROM ENDOSCOPIC PROCEDURES AS MEASURED BY AN ENDOSCOPIC SIMULATOR.

(P372)

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Purpose: To determine if endoscopic skills decrease with increasing time away from formal colonoscopic training using a virtual reality colonoscopy simulator

Methods: Retrospective review of prospectively collected resident data on an endoscopy simulator. Data was collected over a five-year period from 95 different residents performing a total of 830 colonoscopic simulation scenarios. After receiving six weeks of formal clinical training during a dedicated endoscopy rotation, surgical residents completed endoscopy simulation scenarios at varying times ranging from one month to four years since their last endoscopy. Residents were divided into two groups: those having undergone formal endoscopy training within a year's time or less (81 residents) and those who completed their endoscopy rotation a year or more prior to using the simulator(129 residents).

Results: The average time to intubation of the cecum for those residents one year or less out from completion of their endoscopy training was 3.7 minutes, while those greater than one year out from their training was 4.8 minutes ($p<0.0001$). Those residents who had spent a year or more away from their last endoscopy rotation were more likely to cause severe/extreme discomfort as compared to those residents who had completed their last endoscopy within a year or less (14 vs. 5%), ($p<0.0001$).

Conclusions: A significant decline in colonoscopic skill proficiency occurs in residents who are a year or longer out from completion of their last colonoscopy, suggesting ongoing exposure to endoscopic procedures is needed to maintain proficiency. Virtual reality endoscopic simulation is an effective tool to detect differences in colonoscopic skill of surgical residents.

COLORECTAL FELLOWSHIP PROGRAMS IN THE UNITED STATES: HOW ARE WE DOING?

(P373)

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Purpose: Little is known about the outcomes of colorectal surgery in hospitals with an ACGME accredited colon and rectal surgery residency program (CRP).

Methods: Using the Nationwide Inpatient Sample 2009-2010, we identified hospitals with a colorectal residency program using their associated AHA codes and retrospectively reviewed all cases performed for colon and rectal cancer, polyps, diverticular disease, crohns and ulcerative colitis, and ischemic colitis. Patient demographics were listed and outcomes were compared to other hospitals on multivariate regression analysis.

Results: A total of 36,538 cases were identified and 6,971 (19.56%) were performed in hospitals with a CRP. Compared to other hospitals, those with a CRP performed more cases for rectal cancer (16.88% vs. 8.91%; $p<0.001$) and inflammatory bowel disease (14.83% vs. 3.87%; $p<0.001$). CRP hospitals tended to operate less frequently for diverticular disease (27.13% vs. 38.91%; $p<0.001$). On multivariate analysis, cases operated in CRPs had longer length of hospital stay by 0.90 day ($p<0.001$), and higher hospital charges by 16,505 US$ ($p<0.001$). However, patients operated in CRPs were more likely to have a procedure performed laparoscopically (aOR=1.35; $p<0.001$), with lower rates of conversion (aOR=0.97; $p=0.002$) and had lower complication rates (aOR=0.94; $p<0.05$). No difference in mortality was observed.

Conclusions: Despite higher hospital charges and a slightly longer length of stay, hospitals with colorectal res-

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	Attending Physician N (%)		House Staff N (%)		Medical Student N (%)		Overall N (%)	
Anal Conditions	PRE	POST	PRE	POST	PRE	POST	PRE	POST
Total Subjects	23	17	78	72	104	99		
Abscess	13(57)	15(88)	26(33)	48(67)	51(49)	83(84)	90(44)	146(77)
Internal hemorrhoid	16(70)	14(82)	29(37)	46(64)	16(15)	49(49)	61(30)	109(58)
Condyloma	22(96)	16(94)	71(91)	69(96)	63(61)	94(95)	156(76)	179(95)
Thrombosed ext hemorrhoid	14(61)	13(76)	32(41)	56(78)	23(22)	70(71)	69(34)	139(74)
Rectal prolapse	20(87)	16(94)	70(90)	68(94)	92(88)	88(89)	182(89)	172(91)
Anal fissure	15(65)	17(100)	54(69)	70(97)	20(19)	74(75)	89(43)	161(85)
Anal fistula	19(83)	17(100)	39(50)	53(74)	18(17)	44(44)	76(37)	114(60)
Overall Accuracy(mean%)	74.1	90.6	58.7	81.4	38.7	72.4	50.4	77.1

PRE = Pre Education
POST = Post Education

idency programs had better outcomes in terms of lower conversion rates and lower morbidity and used minimally invasive technology more frequently.

IS THERE A "JULY EFFECT" FOR SURGICAL FELLOWS PERFORMING LAPAROSCOPIC COLECTOMIES?

(P374)

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Purpose: The "July effect," referring to inferior patient outcomes at the start of the academic year, has been reported in the surgical literature and disparaged by the media. The purpose of this study was to assess for such an effect in surgical fellows performing laparoscopic colectomy.

Methods: Prospectively data after laparoscopic colectomy performed from 2000-2011 by surgical fellows in an apprenticeship model were examined. Early cases (Jul-Sep) were compared to those performed late in the academic year (Mar-May). Patient demographics, operative findings, complications, transfusion, pathology, and length of stay (LOS) were compared using Chi-square, Fisher's exact test, and Wilcoxon rank sums.

Results: Out of 1543 colectomies performed during the study period 360 met inclusion criteria(laparoscopic with fellow involvement during time periods). The two groups had similar age, gender, and BMI (Fig 1). ASA scores(I, II, III and IV) were evenly distributed between groups($p>0.05$). Elective cases were also similar; 85% early and 86% late ($p>0.05$). Non-elective indications included bleeding, perforation and obstruction. There were no differences in indications for operation between groups ($p>0.05$). Benign disease was the indication in 61% of cases. The most common indications were malignancy (39%), diverticulitis (28%), polyps with preoperative unknown malignancy status (21%), and Crohn's (4%). In the malignant group there was no difference in cancer staging between early and late ($p>0.05$). Distribution of left, right, and total colectomies was also similar between early (44%, 51% and 5%) and late (47%, 48% and 5%) groups ($p>0.05$). There were no differences found in operative time, rate of blood transfusion, conversion, number of lymph nodes harvested, tumor size, proximal or distal margin distance, or complications ($p>0.05$, Fig 1). However, LOS was slightly longer in the late group (6.8v5.9, $p=0.04$).

Conclusions: In this study encompassing more than a decade, no "July effect" was present when laparoscopic colectomy was performed by surgical fellows. Graduated operative responsibility for post-graduate trainees in an apprenticeship model results in a safe and effective method of surgical training despite the time of year.

Figure 1. Surgical Fellows Outcomes

	Early	Late	p value
Number	182	178	
Age (years)	59.9	61.4	0.326
Male %	53.0	46.9	0.245
BMI (kg/m^2)	27.8	28.7	0.548
Elective %	85.2	86.4	0.729
Benign Pathology %	61.5	60.7	0.866
Conversion %	7.1	10.7	0.239
OR Time (min)	185.6	193.2	0.207
EBL (ml)	105.2	126.4	0.107
LOS (days)	5.9	6.8	**0.039**
Complications %	7.7	8.4	0.798
Red Cell Trans Req%	2.3	3.9	0.358
Number of Lymph Nodes	16.9	18.4	0.236
Tumor Size (cm)	3.63	4.26	0.230
Proximal Margin (cm)	12.0	13.8	0.392
Distal Margin (cm)	10.8	10.0	0.079