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**THE SOCIETY FOR SURGERY OF THE ALIMENTARY TRACT**

**PROGRAM BOOK ABSTRACT SUPPLEMENT**

**FIFTY-FIRST ANNUAL MEETING**

Ernest M. Morial Convention Center  
New Orleans, Louisiana  
May 1–5, 2010

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PLEASE BRING THIS PROGRAM BOOK ABSTRACT SUPPLEMENT WITH YOU TO THE ANNUAL MEETING.
## SSAT Schedule-at-a-Glance

### Sunday, May 3, 2010

<table>
<thead>
<tr>
<th>Time</th>
<th>Session/Event</th>
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<tbody>
<tr>
<td>7:00 AM</td>
<td>Opening Session</td>
</tr>
<tr>
<td>7:15 AM</td>
<td>Plenary A (Plenary Session I)</td>
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<tr>
<td>7:30 AM</td>
<td>Presidential Address</td>
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<tr>
<td>7:45 AM</td>
<td>Guest Oration</td>
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### Monday, May 4, 2010

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<tr>
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<td>7:15 AM</td>
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### Monday, May 4, 2010

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<th>Time</th>
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<tr>
<td>7:00 AM</td>
<td>Clinical Ward Rounds: Ostomy Complications</td>
</tr>
<tr>
<td>7:15 AM</td>
<td>Quick Shots Session II</td>
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<tr>
<td>7:30 AM</td>
<td>Video Session II: Colon-Rectal &amp; Hepatobiliary</td>
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### Tuesday, May 5, 2010

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### Wednesday, May 5, 2010

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<tr>
<td>7:00 AM</td>
<td>Plenary Session VI</td>
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</tbody>
</table>

### Posters

- **Monday, May 3, 2010**: Poster Session I (Authors available @ posters 12:00 PM - 2:00 PM)
- **Tuesdays**: Poster Sessions II and III (Authors available @ posters 12:00 PM - 2:00 PM)

### Video Sessions

- **Monday**: Video Session I (Colon-Rectal & Hepatobiliary)
- **Tuesday**: Video Session III (Minimal Access GI Surgery)
- **Wednesday**: Video Session II (Breakfast at the Movies)

### Quick Shots Sessions

- **Monday**: Session II
- **Tuesday**: Session I

### Other Events

- **Wednesday**: ANNUAL BUSINESS MEETING
- **Wednesday**: SSAT/AHPBA Joint Symposium: Colorectal Cancer, Liver Metastases
SSAT PLENARY, VIDEO, AND QUICK SHOT ABSTRACTS
Printed as submitted by the authors. ¶ indicates a paper that is also being presented at the Residents & Fellows Research Conference. Participation in and attendance at this conference is by invitation only.

Monday, May 3, 2010
7:45 AM – 8:15 AM
244-245
PRESIDENTIAL PLENARY A (PLENARY SESSION I)

287
The Effects of RAGE Signaling on the Development of Colorctal Liver Metastases
BACKGROUND: The receptor for advanced glycation end-products (RAGE) is a transmembrane protein implicated in tumor cell migration and invasion. RAGE expression in colorectal cancer increases with increasing Dukes’ stage.
PURPOSE: We hypothesized that RAGE signaling contrib- utes importantly to the pathogenesis of metastases and that blocking the signaling pathway will reduce tumor development and growth in a mouse model of colorectal adenocarcinoma liver metastasis.
MATERIALS AND METHODS: Balb/c mice (n = 24) under- went portal vein injection with 2 x 10^7 CT26 colorectal adenocarcinoma cells (syngeneic). Mice received either daily intraperitoneal injections of 100 mg SC RAGE (the solu- ble extracellular component of the RAGE receptor used as a competitive inhibitor) or vehicle. CT26/B6 mice (n = 10 per group) underwent portal vein injection with 2 x 10^7 MC38 colorectal adenocarcinoma cells (syngeneic) that had been stably transfected with different RAGE con- structs (full-length [FL], cytosolic tail-deleted [dominant negative (DN)] cell surface competitive inhibitor, or mock transfectant [MD]). RAGE null mice (CT26/6 background) and littermate controls (RAGE +/-) underwent portal vein injections with 2 x 10^7 MC38 wildtype cells (n = 10 per group). Mice were sacrificed and evaluated in a blinded fashion on days 21 and 28 for tumor incidence, number of tumor nodules, and overall tumor burden. Data was analyzed using ANOVA followed by student t-test and chi-square.
RESULTS: Pharmacologic RAGE blockade with sRAGE significantly reduced the incidence of hepatic tumor nodule development (Day 21: 83.3% versus 16.7%, p < 0.03), the number of hepatic tumor nodules observed (Day 21: 2.2 ± 1.7 nodules versus 0.17 ± 0.41 nodules, p < 0.03), and reduced tumor burden (Day 21: 10.7 ± 22.3 mg versus 0.0007 ± 0.002 mg, Day 28: 256.8 ± 198.6 mg versus 76.7 ± 170.6 mg, p < 0.05). Stable transfection of the tumor cells with functional FL RAGE resulted in significantly increased tumor burden when compared to cells transfected with RAGE deficiency (Day 28: 1330 ± 1140 mg versus 271 ± 252 mg, p < 0.05). Tumor burden was significantly reduced in RAGE null mice compared to littermate controls (Day 28: 705 ± 1293 mg versus 1442 ± 1931 mg, p < 0.002).
CONCLUSION: These data indicate that RAGE signaling plays an important role in the development of colorectal liver metastases. Further work is needed to evaluate the mechanism of these observations and to develop strategies that exploit RAGE signaling pathways as novel targets for therapeutic intervention.

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The Preoperative Manometric Pattern Predicts the Outcome of Surgical Treatment for Esophageal Achalasia
Jenaro Salvador*, Mario Costantini, Giovanni Zannotti, Tiziana Morbin, Christian Rizzetto, Lisa Zanatta, Martina Cirolo, Elena Finotti, Emanuela Guinolli, Lorelana Nicoletti, Francesco Cavallini, Gianfranco Da Dalt, Emanuele Ancona Department of Surgical and Gastroenterological Sciences, Clinical Chirurgica I, University of Padua, Padua, Italy
BACKGROUND: A new manometric classification of esophageal achalasia has been recently proposed, with a suggested correlation with the final outcome of treatment. The aim of this study was to investigate this hypothesis in a large group of patients undergoing laparoscopic Heller myotomy for esophageal achalasia.
PATIENTS AND METHODS: We evaluated the patients who underwent surgery as first treatment from 2001 to May 2009. Patients with sigmoid-shaped esophagus were excluded. Symptoms were scored using a detailed questionnaire for dysphagia, regurgitation, and chest pain; barium swallow, endoscopy, and esophageal manometry were performed, before and 6 months after surgical treatment. All manome- tric tracings were reviewed and re-classified according to Patterson et al. (Gastroenterology 2008;135:1526). Patients were divided in three groups according to their manometric pattern: 3) no distal esophageal presurization (wave amplitude <30 mmHg; 80 pts); 2) rapidly propagated compartmentalized presurization (panesophageal presurization >30 mmHg; 126 pts); 3) rapidly propagated presurization attributable to spastic contraction. 23 pts.
Treating failure was defined as a postoperative symptom score >10th percentile of the preoperative score (i.e., >10).
RESULTS: 229 consecutive achalasia patients (M: 124, F: 105) represented our study population. Demographic and clinical parameters (age, sex, symptom score, duration of symptoms, LES resting and residual pressure) were simi- lar among the three groups. Median follow-up was 31 months (IQR 14–56). The failures of surgical treatment were significantly different in the three groups (p < 0.002, Fisher’s test: group 1 (n=90, 11.3%), group 2 (n=412, 3.2%) and group 3 (n=62, 26.6%). At univariate analysis, manometric pattern (p = 0.001), a resting LES pressure >30 mmHg (p = 0.001) and a low chest pain score (p = 0.002) were the only factors predictive of a positive final result. At multivariate analysis, these three factors were independ- ently associated to a failure of treatment.
CONCLUSION: This is the first study from a surgical group that assessed the surgical outcome of the 3 manometric achalasia subtypes: patients with panesophageal presurization and no distal esophageal presurization have a better outcome after laparoscopic Heller-Dor myotomy.

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Long-Term Follow-Up After Anti-Reflux Surgery in Patients with Barrett’s Esophagus
Jorg Zehetner*, Steven R. Demeter, Shanin Ayaz, Jose L. Cortales, Florian Augustin, Helen J. Sohn, John C. Licham, Jeffrey A. Hagen, Tom R. Demeter Department of Surgery, Kick School of Medicine, University of Southern California, Los Angeles, CA
BACKGROUND: Factors associated with progression of Barrett’s to cancer remain unclear, and the impact of med- ical or surgical therapy on the natural history of Barrett’s remains uncertain. In part this uncertainty is related to the low rate of progression (0.5% per year in the literature) and the long time interval necessary to follow patients adequately for evaluation of progression. The aim of this study was to assess progression of Barrett’s in patients followed long-term after anti-reflux surgery.
METHODS: A retrospective chart review was performed of all patients with Barrett’s esophagus who underwent anti- reflux surgery from 1989 to 2009. From the 303 patients identified, 234 had follow-up >5 years (705 patient years) and formed the study group. The fundoplication was clas- sified either as intact or failed based on postoperative endoscopy.
RESULTS: Median age in the 75 patients was 54.5 years (range 29–77) and 68% were males. A Nissen fundoplica- tion was used in 87% and a partial fundoplication in 13%. Median follow-up after fundoplication was 8.9 years (range 5–18). Progression of any kind was seen in 8% at a median of 94 months. Progression consisted of Barrett’s to high-grade dysplasia (HGD) in 4 patients, low-grade dys- plasia (LGD) to intramucosal cancer (IMC) in 1 patient, and Barrett’s to IMC in 1 patient (Table 1). Regression was seen in 31% of patients, and consisted of loss of dysplasia in one patient with LGD and loss of intestinal metaplasia in 24%. Patients with progression were significantly more likely to have a failed fundoplication (67% vs. 16%, p = 0.0129). The risk of progression from Barrett’s to HGD was 0.6% per patient year and from Barrett’s to IMC 0.2%. In patients with a failed fundoplication the risk of progres- sion to HGD/IMC was 2.6% per patient year, compared to 0.36% for those with an intact fundoplication.
CONCLUSION: Compared to established rates for Barrett’s progression in the literature, anti-reflux surgery appears to reduce the risk with long-term follow-up, but only in patients with an intact fundoplication.

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Pay-for-Obesity: Performance Metrics Ignore Differences in Complication Rates and Cost for These Patients Undergoing Two Common General Surgical Procedures
Kenzu Heine*, Andrew D. Shin, Elizabeth C. Wick, Martin A. Makary Surgery, Johns Hopkins, Baltimore, MD
BACKGROUND: New pay-for-performance metrics are being increasingly used to measure the quality of surgical care, yet these metrics air blind to a patient’s inherent risk for complications and potentially increased costs. Morbid obesity is a known risk factor for surgical complications, yet the impact of obesity on complications and costs has not been well-defined. We hypothesize that morbid obesity has a significant effect on outcomes and costs following commonly performed general surgical procedures.
METHODS: We studied 36,483 patients using administra- tive claims data from seven Blue Cross/Blue Shield Plans who underwent cholecystectomy for cholecystitis or appendectomy for acute appendicitis over a five-year period (2002–2006). For each procedure, we compared 30- day complications as well as total direct medical costs

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1ST SIST • ANNUAL MEETING • MAY 1–5, 2010 • NEW ORLEANS, LA

Table 1. Characteristics of Patients with Progression (n = 6)

<table>
<thead>
<tr>
<th>Patient</th>
<th>Age (years)</th>
<th>Time to Progression (months)</th>
<th>Initial histology</th>
<th>Final histology</th>
<th>Barrett’s to HGD</th>
<th>Barrett’s to IMC</th>
<th>Barrett’s to LGD</th>
<th>Barrett’s to IMC</th>
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<tbody>
<tr>
<td>1</td>
<td>51</td>
<td>135</td>
<td>IM</td>
<td>HGD</td>
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<td>No</td>
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</table>

Notes: 1) Barrett’s to LGD: High-grade dysplasia, IM (Intramuscular cancer)
Disappearing Colorectal Metastases After Chemotherapy: Should We Be Concerned?  
Mark G. Van Vederveldt, Michael C. De Jong, Timothy M. Pavlik, Richard D. Schulik, Luiz Diaz, Michael A. Choti  
Surgery, Johns Hopkins Hospital, Baltimore, MD

BACKGROUND: With increasing efficacy of preoperative chemotherapy for colorectal liver metastases (CRLM), more patients will develop a comprehensive radiological response (CR) in one or more lesions on preoperative cross-sectional imaging. We sought to investigate the rate in which these lesions remain untreated and untreated intraoperatively and the impact of residual CRLM on postoperative outcomes.

PATIENTS AND METHODS: Radiological response to preoperative chemotherapy was evaluated for 172 patients undergoing surgical therapy for CRLM in between 2006 and 2008. Preoperative chemotherapy CT scans were compared to post-chemotherapy images and intraoperative findings. Furthermore, outcomes with regard to recurrence pattern and survival were determined.

RESULTS: CR occurred in 179 of the 617 lesions (29%) of those treated with preoperative chemotherapy. Of these, 111 (62%) were detected intraoperatively using a combination of palpation and intraoperative ultrasonography. The CRLM of one or more lesions was observed in 54 patients (31%). In 26 of these patients (48%), all CRLM lesions were detected intraoperatively. In 28 patients, at least one lesion remained undetected intraoperatively. Of these, 23 (82%) had CR lesions that were left untreated. When comparing outcomes between patients with completely treated vs. untreated CRLM sites, one year intrahepatic recurrence rate was higher in those with untreated CRLM sites (32% vs 43%, p = 0.005). However, the majority of these patients were able to undergo repeat surgical therapy upon recurrence and the overall survival was not statistically different between groups (3-yr OS 78% vs. 66%, p = 0.64).

CONCLUSIONS: In our study, we found CR to occur commonly in patients undergoing preoperative chemotherap for CRLM. However, the majority of these CR lesions were identified intraoperatively. Among those patients with undetected and untreated lesions, long-term outcome was good despite a high risk of intrahepatic recurrence. This finding may be related to favorable tumor biology, patient selection, and opportunities for salvage surgery. Therefore, aggressive surgical therapy should be considered in patients with marked response to chemotherap, even when all CR lesions cannot be identified.
416 Single Incision Laparoscopic Liver Resection of Colorectal Liver Metastases
Amir G. Jaferv,1,2 Age P. Belghamzer1,2,3 Jo-Jo James1,3 Beth Murgottawitz1,2,3,10, Kim P. Connors1,2,3
1Department of Surgery, King’s College Hospital; 2NHS Foundation Trust, London, United Kingdom; 3Department of Surgery, Princess Grace Hospital, London, United Kingdom

We present a case of a 53 year old woman with a segment 2 colorectal liver metastasis. A left lateral sectionectomy was performed laparoscopically through a single umbilical incision. Hepatic parenchyma was divided using ultrasonic coagulation. Inflow and outflow pedicles were divided with laparoscopic staplers. The resected liver specimen was extracted by extending the umbilical incision to 5 cm length. The patient made an uncomplicated recovery, resuming oral diet and ambulation within 24 hours. The resection margin was clear. The aim of the video is to demonstrate the single incision approach is technically feasible and safe in selected patients requiring liver resection.

417 Single Incision Laparoscopic Completion Proctectomy and Ileal J-Pouch-Anal Anastomosis in an 18 Year-Old Male with Ulcerative Colitis Refractory to Medical Therapy
Alexandre Bouchard1, Jiona M. Young-Fadok2 Mayo Clinic-Phoenix, Phoenix, AZ

Laparoscopic-assisted completion proctectomy and ileo-pouch-anal anastomosis (IPAA) is usually performed with multiple ports and an extraction incision. To further reduce the number of incisions and abdominal wall trauma, we used a single-incision (SI) device to introduce 2 instruments and the laparoscope through the same small abdominal opening. The patient underwent a previous SI laparoscopic total colectomy through the ileostomy site. For the second stage, we introduced the SI device in the same site. At the end of the procedure, the only incision in the patient’s abdomen was that used for the diverting loop ileostomy. A SI proctectomy and IPAA is feasible, and can be performed safely.

418 Intra-Operative Ultrasound During Laparoscopic Cholecystectomy: A Video Library
Jason M. Pfleger1, Michael Parker1, Humaid J. Aboin, C. Daniel Smith2, Steven P. Bowers2
Mayo Clinic-Florida, Jacksonville, FL

Laparoscopic cholecystectomy (LC) is one of the most commonly performed surgical operations in the United States. Despite this, bile duct injuries remain problematic. Intra-operative ultrasound (IOUS) performed during LC has been reported to decrease the risk of bile duct injury, provide cost-savings compared with routine use of intra-operative cholangiogram, and lower the conversion rate to open cholecystectomy. IOUS is relatively easy to perform, but few surgeons routinely utilize this technique. We present a video library of normal and abnormal ultrasound findings during LC in an effort to assist other surgeons in mastering this valuable skill.

419 Laparoscopic-Assisted Isolated Caudate Lobe Resections
Edward Liu1, Juan M. Sarmento2
Surgery, Emory University School of Medicine, Atlanta, GA

Two cases of laparoscopic caudate lobe resection for focal nodular hyperplasia are demonstrated, one approached from the right side and the other from the left side. The laparoscopic technique is nearly identical to the open method, but has superior anatomic views and details. Both cases utilized a 7 cm hand-assist port in the upper midline through which the tumors were removed. The estimated blood loss were under 200 cc, and both patients were discharged home within 4 days. Pathology reports demonstrated normal liver parenchyma surrounding the FNH and post-surgery imaging confirmed complete tumor resection.

420 Laparoscopic Low Anterior Resection with Transrectal Specimen Extraction and Intracorporeal Anastomosis
Philip A. Onotolo1, Jun S. Yoo2, Barun D. Prystowsky3
Surgery, Duke University Medical Center, Durham, NC

Laparoscopic colorectal resection is associated with reduction in 30-day postoperative morbidity without compromising long-term patient outcome. Minimally invasive approaches continue to be refined. Employing hybrid natural orifice techniques, we demonstrate laparoscopic anterior resection with transrectal specimen extraction and intracorporeal anastomosis. Potential benefits of this approach include reduction in postoperative wound infection rates, currently around 6%, as well as incisional hernia rates, which can be up to 10% in some series reporting on laparoscopic colorectal resections. A prospective study using this technique is required to make definitive recommendations.

421 Laparoscopic Ventral Mesh Rectopecty for Rectal Prolapse
Perpaolo Siller1,2, Vito M. Stoic3, Domenico Benavoli4, Luana Franceschilli5, Lodovico Pattini6, Achille Gasperi4
Surgery, University of Rome Tor Vergata, Rome, Italy

Laparoscopic Ventral Mesh Rectopecty (LVR) is a novel approach for internal/external rectal prolapse, with excellent outcomes and minimal morbidity. It improves obstructed defecation symptoms, without inducing new-onset constipation, evident with posterior rectopecty. A preoperative multidisciplinary workup and selection is mandatory. Ideal surgery should correct anatomy, preserve/improve function, treat anterior/middle compartments, avoid sequels and be minimally invasive. In this video, LVR resumes all these key qualities: anterior rectal mobilization (avoiding autonomic nerve injury), use of a mesh (biologic/not) to support anterior wall and middle compartment, all through mini-invasive approach.

422 Laparoscopic Anterior Resection for Sigmoid Cancer With Transanal Extraction Using TEM (Transanal Endoscopic Microsurgery)
Janette A. Schmid1, Patricia Wyse1
General Surgery, MGH, Boston, MA

We describe combined TEM excision of a rectal polyp with laparoscopic anterior resection for sigmoid cancer using transanal assistance. The patient is a 75-year-old male with a sigmoid cancer and a 1.2 cm sessile rectal polyp located 18 cm and 7 cm from the anal verge respectively. The rectal polyp was resected using TEM followed by suture closure. Following complete laparoscopic mobilization and transection of the rectosigmoid, the TEM proctoscope was inserted intraperitoneally through the open rectal stump and used to extenorect and transect the specimen followed by placement of the Anrel for laparoscopic stapled colorectal anastomosis.

2:15 PM – 5:00 PM
243 PLENARY SESSION III: QUALITY, OUTCOMES, & RISK ASSESSMENT

423 Are You Calling Me a Poor Performer? Comparison of Outlier Identification Methods in Hospital Surgical Quality Improvement Programs
Karl Y. Bilimoria1,2, Ryan F. Mehrotra3, Mark E. Cohen3, David J. Bernet4, Bruce L. Hall5, Clifford Y. Ko1,5
1Division of Research and Optimal Patient Care, American College of Surgeons, Chicago, IL; 2Department of Surgery, Feinberg School of Medicine, Northwestern University, Chicago, IL; 3Department of Surgery, University of Colorado, Denver, CO; 4Department of Surgery, Washington University St. Louis, St. Louis, MO; 5Department of Surgery, UCLA, Los Angeles, MO

BACKGROUND: Surgeons and hospitals are being increasingly assessed by oversight agencies and insurers regarding surgical quality, and much of this information is beginning to be reported publicly. Our objective was to compare various methods used to classify hospitals as outliers (poor performers) in established quality assessment programs.

METHODS: From the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP, 2007), hospital risk-adjusted 30-day mortality and mortality were assessed for general surgery at 181 hospitals (n = 164,153) and for colorectal surgery at 108 hospitals (n = 17,050). Outlier detection methods currently employed in established quality improvement programs were compared.

RESULTS: Using the most common criterion of a p-value <0.05 (used by ACS NSQIP; New York and California CABG programs, ASCO’s QOP) identified 13 outliers for morbidity and 5 for mortality. Using the method employed by Medicare (lowest quintile), 31 outliers were identified for morbidity and mortality. Hierarchical models identified 34 morbidity outliers and 5 mortality outliers. Alternate, more rigorous outlier detection methods identified fewer hospitals as poor performers (Bonferroni correction = 13 outliers for morbidity and 0 outliers for mortality); false detection rate = 27 outliers for morbidity and 0 outliers for mortality). Similar results were observed for colorectal surgery (table).
CONCLUSIONS: There was considerable variation in the number of outliers identified using different detection criteria. Quality programs need to justify their outlier detection methodology based on the intent of the program (i.e., quality improvement vs. reimbursement). Surgeons and hospitals should be aware of variability in methods used to assess their performance as these outlier designations will likely have referral and reimbursement consequences.

425 Repair of Symptomatic Giant Paraesophageal Hernias in Elderly (>70 Yrs) Patients Results in Improved Quality of Life

Bian E. Louis 1, Maurer Birtz 2, Jeradine Ottina 1, Alex Fatuvi 2, Ralph W. Aye 1

1Thoracic Surgery, Swedish Medical Center and Cancer Institute, Seattle, WA; 2Thoracic Surgery, St. Joseph’s Health Center, Toronto, ON, Canada

BACKGROUND: Giant paraesophageal hernias (PEH) involve herniation of a substantial portion of the stomach and/or other visera into the posterior mediastinum. When these hernias are discovered they are usually symptomatic and occur more commonly in the elderly. The laparoscopic approach has gained favor to manage PEHs because of reported excellent results, low morbidity and very low mortality. There is a perceived risk of operating on these patients with symptomatic PEHs because of concern for complications including death. There also remains a question of benefit. We sought to review our clinical and quality of life outcomes for giant PEH repairs in patients >70 years old.

METHODS: We performed a retrospective chart review of consecutive patients with age greater than or equal to 70 years with giant PEH (>3 cm and/or Type II–III) with 2003 to October 2009. Demographic, operative, clinical and quality of life data were collected from the clinic chart, hospital medical record and patient phone interviews. Quality of life data were gathered using the Quality of Life in Reflux and Dysphagia Questionnaire (QOLRAD), GERD-HRQoL and Dysphagia Severity Score Index. Standard statistical analysis was performed using SPSS 15.

RESULTS: Fifty-eight consecutive patients with median age of 80 years (range: 70–91 yrs) presented for repair of symptomatic giant PEH. There were 34 females. Nine patients presented urgently or emergently with symptoms of incarceration/strangulation. There was no 30-day or in hospital mortality. Nine patients experienced at least one major morbidity, and 9 patients experienced minor morbidity. At a mean follow-up 1.2 years (range: 2 m to 5 yrs), 81% of patients were entirely symptom free compared to baseline (P < 0.0001). Short-term QOLRAD measured 4–8 weeks post-operatively improved significantly from 5.1 to 6.1 (P = 0.002). Long term QOLRAD measured at a minimum of one year from the date of surgery improved from 4.8 to 6.6 (P < 0.001). Long term GERD-HRQoL scores improved from 14 to 3.84 (P < 0.003). There was no difference in the Dysphagia Severity Score Index.

CONCLUSIONS: These data support repair of symptomatic giant paraesophageal hernias in patients aged 70 years or greater. These hernias can be repaired in the elderly with minimal surgical mortality and acceptable morbidity in both the elective and emergent setting. A significant number of patients undergoing repair can expect resolution of the symptoms they suffered from pre-operatively. These findings are further supported by significant improvements in both short-term and long-term quality of life.

426 Redefining Mortality After Pancreatic Cancer Resection

James E. Carroll, Jillian K. Smith, Jessica P. Simons, Melissa M. Murphy, Sing Chau Ng, Shimul A. Shah, Zheng Zhou, Jennifer F. Teng

Surgery, Surgical Outcomes Analysis & Research, University of Massachusetts Medical School, Worcester, MA

INTRODUCTION: Distinct outcome measures such as in-hospital and 30-day mortality have been used to evaluate pancreatectomy results. We posited that these measures could be compared using national data, providing important information for evaluating published outcomes after pancreatectomy.

METHODS: Patients undergoing resection for pancreatic cancer were identified from the linked SEER-Medicare databases (1991–2002). Mortality was analyzed and trend tests were utilized to evaluate risk of death (VTEs) from 560 days of resection and from 60 days to 2 years. Univariate analysis assessed patient characteristics such race, gender, marital status, socioeconomic status, and complications.

RESULTS: 1904 patients were identified: 7.4% (n = 140) died within the first 30 days, 81.6% of whom were during the same hospitalization. Postoperative in-hospital mortality was 8.9% (n = 153), 76% of which was within 30 days, 96% of which was within 60 days. Risk of death decreased significantly over the first 60 days (P < 0.001). After 60 days, the risk did not decrease through 2 years (P = 0.8835). Univariate analysis showed no difference between the two groups in terms of race, gender, marital status, and socioeconomic status, but patients dying within 60 days were more likely to have experienced a complication (48.4% vs. 16.3%; P < 0.001).

CONCLUSIONS: In-hospital and 30-day mortality after resection for cancer are similar nationally; thus, comparing mortality utilizing these measures is acceptable. After a 60-day post-resection window of increased mortality, mortality risk then continues at a constant rate over two years, suggesting that mortality after pancreatectomy is not limited to early (“complication”) and late (“cancer”) phases. Determining ways to decrease perioperative mortality in the 60-day interval will be critical to improving overall survival.

427 Patients Admitted with Acute Abdominal Conditions are at High Risk for Development of Symptomatic Venous Thromboembolism (VTE) but Often Fail to Receive Adequate Prophylaxis

Emily Pearell 1, Uzah Sheth 1, Darlene Fenech 1,2, Jaber K. Refaat 1,2, J. Charles Victor 1,2, Robert S. Miledi 1,2, James E. Carroll 1,2, Jillian K. Smith 1,2, Jessica P. Simons 1,2, Melissa M. Murphy 1,2, Sing Chau Ng 1,2, Shimul A. Shah 1,2, Zheng Zhou 1,2, Jennifer F. Teng 1,2

Surgery, University of Toronto, Toronto, ON, Canada; Surgery, Mount Sinai Hospital, Toronto, ON, Canada; Surgery, Sunnybrook Health Sciences Centre, Toronto, ON, Canada; 1Siena Lane School of Public Health, University of Toronto, Toronto, ON, Canada

INTRODUCTION: There is Level 1 evidence supporting thromboprophylaxis in adults admitted with acute abdominal conditions. Many patients admitted with acute abdominal conditions but who did not have surgery for at least 24 hours following admission were identified as receiving inadequate VTE prophylaxis. As such, the rate of VTE prophylaxis was recorded.

METHODS: Charts of 350 patients (50 from each of the seven adult teaching hospitals) admitted with acute abdominal conditions and who did not have surgery were reviewed. All patients were identified as those who did not receive adequate VTE prophylaxis. Among these patients, the number of VTEs was recorded and compared to the number of VTEs in patients admitted with acute abdominal conditions. A P value was calculated comparing these groups.

RESULTS: Of the 350 patients reviewed, 159 (45.4%) were identified as receiving inadequate VTE prophylaxis. Of these patients, 30 (18.8%) had no evidence of VTE. Of the remaining patients, 129 (81.2%) had evidence of VTE. The absolute number of VTEs was not provided. The proportion of patients who received adequate VTE prophylaxis was compared to the proportion of patients who received inadequate VTE prophylaxis. A P value of 0.0001 was calculated, indicating a significant difference.
RESULTS: Of 350 patients (173 males, 177 females, mean age 64.7), 152 (43.4%) were admitted for bowel obstruction, 69 (19.7%) for biliary conditions and 122 (34.9%) for other conditions. Eighty (22.9%) patients (17.4%) had a history of cancer. Seventeen (4%) had a history for VTE. One hundred and forty-two (40.6%) patients had a HIDA scan (mean time 5.4 days) following admission. Two hundred and forty seven (70.6%) received prophylaxis (174 unfractured hip, 73 low molecular weight heparin) at a time of admission (96.8%) or prior to surgery (2.8%). VTE prophylaxis prescription varied according to hospital (range 46–84%), disease (range 63–75%), and surgery/no surgery (78.2 vs 64.2%). Overall, 12 patients (3.4%) developed symptomatic VTE. Two (16.7%) had a history of VTE. Eleven (9.1%) received prophylaxis.

CONCLUSIONS: Patients admitted with acute abdominal conditions are at high risk for the development of symptomatic VTE. There is variation in the rate of VTE but a gap in care exists. Knowledge transfer strategies are required to ensure all patients receive adequate prophylaxis.

428 The Yield of Non-invasive Testing in Post-Cholecystectomy Patients with Suspected Bile Duct Injury

John M. Mikulik1, Gregory A. Pollock1, Raul A. Azad2,1, Christopher Eager2, Dayna S. Early1, Steven A. Edmundowicz1, Daniel Mullally1, Faris Murad1, Jerry Nalls1, Sreenivasu J. Jomaligodala1

1Gastroenterology, Washington University, St. Louis, MO; 2Surgery, Washington University, St. Louis, MO; 3Kaiser Permanente, Washington DC

BACKGROUND: Cholecystectomy is associated with significant morbidity in patients who experience a bile duct injury. The incidence of bile duct injury (lack) with a laparoscopic technique is 0.5 to 3% as compared to open cholecystectomy rates of 0.1 to 0.5%. In this retrospective review, we determined the yield of non-invasive imaging in the diagnosis of bile leaks.

METHODS: A retrospective review of 137 post-cholecystectomy patients with clinical suspicion of bile duct injury was performed. Suspicion of injury was based on fever, pain, and changes in liver function tests. We included patients who had a cholecystectomy via an open or laparoscopic approach, post-operative suspicion of bile duct injury with imaging (CT or HIDA) following cholecystectomy and/or ERCP between 2002 and 2009. Patient age, sex, duration to ERCP, radiologic method and findings, pre-ERCP liver function tests, operative indication, surgical method and the site of leak on those with positive ERCP were evaluated. The sensitivity and the positive predictive value of the most common complications included sepsis (11%), surgical site infection (11%), and pneumonia (5%). On multivariate analysis, variables associated with 30-day mortality included age (>60 y), neurologic or disease or event, elevated BUN (>40 U/L), and high intraoperative transfusion (≥3 units). Preoperative variables associated with serious complication included male gender, BMI, poor functional status, current smoking, preoperative sepsis, and thrombocytopenia. Operative variables associated with serious complication included high intraoperative transfusion requirement (≥3 units), and prolonged operation time (>360 minutes). A complication risk score consisting of 1 point for each of the preoperatively determined variables predicted the risk of serious complications (p < 0.0001), see the following Table.

<table>
<thead>
<tr>
<th>Risk Factor Score</th>
<th>Incidence of Serious Complication</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>10%</td>
</tr>
<tr>
<td>1</td>
<td>19%</td>
</tr>
<tr>
<td>2</td>
<td>24%</td>
</tr>
<tr>
<td>3</td>
<td>39%</td>
</tr>
<tr>
<td>4</td>
<td>67%</td>
</tr>
<tr>
<td>5</td>
<td>100%</td>
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<tr>
<td>P &lt;0.0001</td>
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</table>

DISCUSSION: The rate of serious complication after DP was 23%. A preoperatively-determined prognostic scoring system predicts the risk for serious complications after DP. This scoring system should be utilized when counseling patients preoperatively, obtaining informed consent, and comparing quality outcome measures between institutions.

430 Multivisceral Transplantation with Preservation of Native Liver, Pancreaticoduodenal Complex and Spleen: Indications and Long-Term Outcome

Ray Cui1, Guilherme Costa, Geoffrey Bond, Kyle Solyh, William C. Stein, Guosheng Wu, Dolly Martin, Rakesh Sindhi, George V. Mazuriegos, Karmen M. Abe-Elmagd

1University of Pittsburgh, Pittsburgh, Pa

Due to scarcity of cadaver liver donors, modification of the originally described multivisceral transplplant (MVTx) operation was introduced at our institution nearly 20 years ago. Native liver was preserved and donor stomach, duodenum, pancreas and intestine were transplanted en bloc with anterograde exenteration of the head and neck and the spleen and upper abdominal organs. This is the first report to outline proper indications, different recipient technical modifications, and long-term outcome.

METHODS: Out of a total of 279 adult visceral transplants, 29 (11%) patients received modified MVTx grafts between May 1990 and November 2009. Of the 29 modified MVTx recipients, 18 were female and were made with a median age of 63 years (range 19–58). Maintenance anticoagulation with Warfarin was used in 16 cases. Ten patients (25%) had a history for VTE.

RESULTS: Extensive pseudo-obstructive syndrome was the most common complication (36%). There was a trend toward an increase with a prevalence in male patients 55%. The second most common indication was Gardner’s Syndrome and/or extensive desmoids tumors (28%). In the remaining recipients (17%), prior gastrectomy and/or duodenoanastomosis were concomitant with the development of short bowel syndrome due to Crohn’s disease (n = 3) and vascular thrombosis (n = 2). Preservation of native duodenoanastomosis with preservation of the splenic vascular system was technically feasible in 5 patients with extensive pathology of the native duodenal and pancreaticoduodenal complex and spleen was performed in most of the pseudo-obstructive patients. Native duodenoanastomosis with preservation of the splenic vascular system was technically feasible in 5 patients with extensive pathology of the native duodenal and pancreaticoduodenal complex and spleen was performed in most of the pseudo-obstructive patients. Native duodenoanastomosis with preservation of the splenic vascular system was technically feasible in 5 patients with extensive pathology of the native duodenal and pancreaticoduodenal complex and spleen was performed in most of the pseudo-obstructive patients. Native duodenoanastomosis with preservation of the splenic vascular system was technically feasible in 5 patients with extensive pathology of the native duodenal and pancreaticoduodenal complex and spleen was performed in most of the pseudo-obstructive patients. Native duodenoanastomosis with preservation of the splenic vascular system was technically feasible in 5 patients with extensive pathology of the native duodenal and pancreaticoduodenal complex and spleen was performed in most of the pseudo-obstructive patients.
BMM was not significantly associated with risk of postoperative complications including infection, dehiscence, and reoperation (Table 1). Greater waist circumference independently predicted increased risk of superficial infections (OR 1.19, 95% CI 1.19–3.30, p = 0.008). Risk of wound disruption, dehiscence and reoperation was increased with expanding waist circumference but the association did not achieve statistical significance. Overall, increased waist circumference predicted a significantly greater risk of having one or more postoperative complications (OR 1.56, 95% CI 1.04–2.34, p = 0.034).

CONCLUSIONS: Although BMI is easily calculated, it is an indirect measure of obesity that fails to account for differences in fat quantity and distribution. Waist circumference, a direct measure of central adiposity, is a better predictor of short-term complications and can be used to identify patients who may benefit from more aggressive infection control and prevention.

432 Impact on Hospital Systems by Esophagectomy (EG) and Pancreatoduodenectomy (PD): Objective Comparison of Surgical Complications Using the Accordion Severity Grading System
Donald E. Low\*, Madhankumar Kappusamy, Yashihi Heshmuto, L. William Taveno
General Surgery, Virginia Mason Clinic, Seattle, HI

INTRODUCTION: EG and PD are complex GI operations that can impact a hospital system if the complication rate is high. The recently reported Accordion Severity Grading System of Surgical Complications (ASGS) quantifies the amount of treatment (Tx) required to manage surgical complications by using readily available variables with minimal subjectiveivity. (Ann Surg. 2009;250(2):177-86).
For the first time the ASGS will allow grading and comparison of complications between individual case series to determine the impact of each operation on a hospital support systems.

METHODS: From prospective IRB-approved databases we retrospectively assigned ASGS categories 1-6 to all postoperative complications documented in consecutive cases through December-2008 (EG = 463 and PD = 507) by a single esophageal or pancreatic surgeon respectively, in a tertiary-referral, resident-training hospital. Grade 1—mild, Grade 2—moderate with pharmacologic Tx, Grade 3—severe with invasive Tx not requiring general anesthesia (GA), Grade 4—severe invasive Tx with GA, Grade 5—severe with organ failure, Grade 6—postoperative death.

RESULTS: (Tables 1 & 2) Standard outcome measures were similar for EG and PD. As ASGS grade increased the number of cases decreased and this decrease was similar (statistically) for EG vs. PD. As ASGS increased so did LOS and the increase was similar for EG vs. PD.

CONCLUSIONS: EG and PD have a remarkably similar incidence of standard outcome measures. As the expected the new ASGS correlates with LOS. For the first time severity grading of a complication, based on the amount of intervention required to treat, provides a clinically relevant tool for comparing complication rates between very different complex operations. Surprisingly their impact on the hospital system was the same.

Table 1. Traditional Outcome Measures EG PD

<table>
<thead>
<tr>
<th>Outcome Measure</th>
<th>EG (n = 463)</th>
<th>PD (n = 507)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paraparesis Mortality</td>
<td>2 (0.43%)</td>
<td>5 (1.0)</td>
</tr>
<tr>
<td>Overall mortality</td>
<td>211 (46%)</td>
<td>222 (44%)</td>
</tr>
<tr>
<td>Median length of hospital stay (LOS in days)</td>
<td>10 (IQR 8-12)</td>
<td>9 (IQR 7-8)</td>
</tr>
<tr>
<td>Patients requiring specific complications</td>
<td>121 (26%)</td>
<td>135 (27%)</td>
</tr>
<tr>
<td>Patients with complications not specific to operation (pneumonia, DVT, etc.)</td>
<td>90 (19%)</td>
<td>88 (17%)</td>
</tr>
</tbody>
</table>

443 Predicting Post-Operative Mortality in Colorectal Cancer Surgery: A Systematic Review of the Accuracy of POSSUM, P-POSSUM and CR-POSSUM
Colin Richards*, Fiona Leitch, Paul G. Horgan, Donald C. McMullan
University Department of Surgery, Glamorgan Royal Infirmary, Glamorgan, Unltd Kingdom

INTRODUCTION: The Physiological and Operative Severity Score for the enUmeration of Morbidity and mortality (POSSUM) model and its Portsmouth (P-POSSUM) and colorectal (CR-POSSUM) modifications are used extensively to monitor post-operative outcome. This systematic review assessed the predictive accuracy of each POSSUM model after colorectal cancer resection.

METHODS: The review was undertaken according to a predefined protocol. Major electronic databases, including Medline, Embase, Cochrane Library and Pubmed were searched using appropriate MeSH and free text terms. Abstracts were scanned and full text obtained for potentially relevant articles. The reference list of each article was then hand searched. Each study was entered into an electronic database using a data extraction tool. Two independent reviewers assessed each study against explicit inclusion criteria (colorectal cancer-specific data, actual and predicted mortality rates). Predictive accuracy for mortality was assessed by calculating weighted observed:expected (O:E) ratios with 95% confidence intervals (CI) for each POSSUM model.

RESULTS: 345 abstracts were scanned before 48 articles were progressed to data extraction. After applying inclusion criteria, 18 studies, published between 1991 and 2009 were included in the final review. 10 studies (4799 patients) reported data on POSSUM, 17 studies (6576 patients) reported data on P-POSSUM and 11 studies (4998 patients) reported data on CR-POSSUM. The majority of operations were elective open colorectal cancer resections. Pooling of the data returned a weighted O:E ratio of 0.31 (CI 0.17-0.45), range 0.11-0.80 for POSSUM, 0.90 (CI 0.52-1.28, range 0.20-3.60) for P-POSSUM and 0.62 (CI 0.43-0.80, range 0.21-1.15) for CR-POSSUM.

CONCLUSION: There was also significant heterogeneity in the reported O:E ratio for each POSSUM model, in particular P-POSSUM. Pooling of the data demonstrated P-POSSUM as the most accurate with a weighted O:E ratio nearest to 1. POSSUM had a weighted O:E ratio furthest from 1. CR-POSSUM, despite development specifically for use within colorectal surgery, was not as accurate as P-POSSUM and consistently over-predicted mortality.

Tuesday, May 4, 2010
7:30 AM – 9:15 AM
244-245
VIDEO SESSION II: BREAKFAST AT THE MOVIES

512 Flexible Endoscopic Cricopharyngeal Myotomy for Zenker’s Diverticulum
Richardus A. Pennec*, Danny V. Martinez, Trudie A. Goets, Erwin Rieder, Lee L. Swanstrom
Minimally Invasive Surgery, Legacy Health System, Portland, OR

Treatment of symptomatic Zenker’s diverticulum has traditionally been via a transcervical excision of the diverticulum with a cricomyotomy, or endoluminal division of the septum between the esophagus and diverticulum using a rigid laparoscopic GIF stapler. When these approaches are not feasible or desirable, a cricopharyngeal myotomy may be performed through a flexible endoscopic approach. This video demonstrates the procedure using a standard endoscope and needle-knife, specialized dissecting tips, and endoscopic clips for wound edge approximation. The operation is quick and straightforward, and results in a one night patient stay with excellent emptying of the diverticulum and no leak.

513 Laparoscopic Pancreatoduodenectomy
Sujit Kulkarni*; David Vivas, Taniya Danani, Parish C. Shah
Los Alamos Hospital, New York, NY

Laparoscopic pancreaticoduodenectomy is technically challenging but gaining interest as international experience grows. We present a case of a 25 year old female who was diagnosed with a pseudopapillary tumor in the head of the pancreas abutting the SMV. Our video will demonstrate our technique for a totally laparoscopic pancreaticoduodenectomy with vascular isolation of the SMV via a caudal-cranial approach. We have applied this technique to both benign and malignant lesions of the pancreas and ampulla with excellent results.
A Standardized Approach to Minimally Invasive Transhiatal Esophagectomy

James Lopez*, Amy N. Hacsi, Efrat Ben-David
General Surgery, University of Florida, Gainesville, FL

We present a case of a 76 year old male patient who was diagnosed with an esophageal cancer in the distal third of his esophagus. This was biopsy proven to be adenocarcinoma and staged by endoscopic ultrasound as a T2, N1 lesion. After receiving appropriate neoadjuvant chemoradiation, the patient was brought to the operating room for a transhiatal minimally invasive esophagectomy. Although there a variety of ways to perform the operation, we demonstrate our technique in attempts to standardize the operation. The benefits of our operative methods have led to improved patient outcomes, when compared to the results of open esophagectomies, as well as optimal oncologic treatment.

Laparoscopic Bile Duct Cyst Resection

Guido M. Malata*, Michael L. Kendrick
Mayo Clinic, Rochester, MN

Bile duct cysts are an uncommon condition that may cause significant morbidty and are considered a risk factor for hepatobiliary malignancy. Standard treatment is resection and has traditionally been performed using an “open” laparotomy incision. Laparoscopic resection and reconstruction is feasible and safe as reported in the existing literature in small series. A minimally invasive approach requires experience in both hepatobiliary surgery and advanced laparoscopic skills. This video presents a 47 year-old female who presented with a symptomatic Type IV bile duct cyst and demonstrates the key technical aspects of extraperitoneal bile duct resection with Roux-en-Y reconstruction.

Central Pancreatectomy with Pancreaticogastrostomy: Open and Laparoscopic Approaches

Lauren Amor Fernandez-Cinca*
Surgery, Hospital Clinic, Barcelona, Spain

Central pancreatectomy (CP) was described for benign lesions of the neck or proximal body of pancreas. Recent studies reported the efficacy of pancreaticogastrostomy with a gastric portion (P-G-P) as an alternative method of reconstruction after pylorus-preserving pancreatecto-duodenectomy. CP with PG-PG reconstruction was performed using open and laparoscopic approaches. Open approach was indicated in a patient with an endocrine tumor on right side of neck of pancreas. Laparoscopic approach was performed in a patient with an endocrine tumor on the neck of pancreas.

SIT ANNUAL MEETING • MAY 1-5, 2010 • NEW ORLEANS, LA

10:00 AM - 11:15 AM

243 BASIC SCIENCE PLENARY
(PLENARY SESSION IV)

Insulin, Leptin, and Tumoral Adipocytes Promote Murine Pancreatic Cancer Growth

Patrick R. White*, Helen M. Trau, Kathryn M. Dalbe, Sue Wang, Deborah A. Swartz-Basile, Henry A Pitt, Nicholas J. Zytomierski
Department of Surgery, Indiana University School of Medicine, Indianapolis, IN

BACKGROUND: Obesity has been associated with an increased incidence and enhanced progression of human pancreatic cancer. We previously developed a model in congenitally obese, leptin-deficient and leptin-resistant, mice where pancreatic cancers grew faster, metastasized more often, and shortened survival compared to lean mice. In this model, obese mice had more adipocytes in the tumor microenvironment, and tumor weight correlated with body weight and insulin, but not leptin. To further understand these associations, we developed a diet-induced overweight model of murine pancreatic cancer. In this model we tested the hypothesis that overweight mice would have increased serum insulin and leptin levels as well as larger pancreatic tumors with more adipocytes.

METHODS: Thirty lean C57 female mice were fed either a control 10% fat (n = 10) or a 60% fat diet (n = 20) starting at 6 weeks of age. At 11 weeks, all mice were inoculated with 2.5 x 10^5 PAN02 murine pancreatic cancer cells. After 6 weeks, the mice were injected with BRDU, and tumors that developed in 18 animals as well as sera were harvested. The mice were categorized as Lean or Overweight if they weighed less or more than the mean final weight of the 60% fat diet animals (23.8 g). Tumors were stained for BRDU and H&E to measure proliferation and adipocyte infiltration, respectively. Two observers blinded to animal weight assessed these parameters in 10 high-powered fields of each tumor. Serum levels of insulin and leptin were determined by RIA and ELISA, respectively. Data were analyzed by Student’s t-test, Wilcoxon rank-sum, or Pearson correlations as appropriate.

<table>
<thead>
<tr>
<th>Mouse Weight</th>
<th>Tumor Weight</th>
<th>Insulin</th>
<th>Leptin</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(g)</td>
<td>(ng/ml)</td>
<td>(ng/ml)</td>
</tr>
<tr>
<td>Lean</td>
<td>20.2 ± 0.2</td>
<td>0.6 ± 0.2</td>
<td>0.18 ± 0.02</td>
</tr>
<tr>
<td>Overweight</td>
<td>30.5 ± 0.4</td>
<td>1.3 ± 0.5</td>
<td>0.46 ± 0.21</td>
</tr>
</tbody>
</table>

RESULTS: All mice survived until harvest, and no metastases were observed. Animal and tumor weight as well as serum insulin and leptin data are presented in the previous Table. Significant correlations were observed between mouse and tumor weight (R = 0.56, p < 0.02), mouse weight and serum leptin (R = 0.64, p < 0.001), as well as tumor adipocytes and BRDU (R = 0.59, p < 0.01).

CONCLUSION: These data suggest that 1) mouse weight correlates with pancreatic tumor size and serum leptin, 2) overweight mice have larger tumors as well as elevated serum insulin and leptin, and 3) tumor adipocytes correlate with tumor cell proliferation. We conclude that overweight mice with increased serum insulin and leptin as well as adipocytes as in the adipocyte microenvironment have enhanced pancreatic cancer growth.

Involvement of Osteopontin in the Matrix Degrading and Proangiogenic Changes Mediated by Nicotine in Pancreatic Cancer Cells

Surgery, Thomas Jefferson University, Philadelphia, PA; *Pathology, Anatomy and Cell Biology, Thomas Jefferson University, Philadelphia, PA; †Jefferson Pancreatic, Biliary & Related Cancer Center, Thomas Jefferson University, Philadelphia, PA

INTRODUCTION: Substantial evidence indicates that exposure to cigarette smoke is associated with an elevated risk for pancreatic ductal adenocarcinoma (PDA). However, the mechanisms underlying the effects of nicotine on the development or progression of PDA remain to be investigated. Previously, we showed that nicotine promotes the expression of osteopontin (OPN), an isoprotein of OPN protein that targets cancer cells a migratory phenotype. Here, we explored the potential proangiogenic and pro-metastatic role of nicotine in PDA through studying its effect on the expression of matrix metalloproteinase-9 (MMP-9) and vascular endothelial growth factor (VEGF), and evaluated the role of OPN in mediating these effects. We also analyzed the expression of MMP-9 and VEGF in PDA specimens from smokers and nonsmokers.

METHODS: MMP-9 and VEGF mRNA and protein in Mia-Paca, AsPC-1 and HS766T PDA cell lines treated with or without nicotine (3-300 nM) were analyzed by real time PCR and ELISA, respectively. Transient transfection and luciferase-labeled promoter studies evaluated the effects of OPN on the transcription and translation of MMP-9 and VEGF. Real time PCR and immunohistochemistry were used to analyze the mRNA expression levels and localization of OPN, MMP-9 and VEGF proteins in matched invasive human PDa and surrounding non-malignant tissues in 52 smokers and 25 non-smokers and intraductal papillary mucinous neoplasms, IPMN (n = 6, 2 smokers, 4 nonsmokers).
Nicotine significantly enhanced the expression of MMP-9, VEGF, and OPN mRNA and protein in PDA cells. Blocking OPN with silena or OPN antibody prevented the nicotine-mediated increase of both MMP-9 and VEGF. Changes in OPN gene in PDA cells or their treatment with recombinant OPN protein significantly increased MMP-9 and VEGF mRNA and protein expression levels and induced their promoter activities. In invasive PDA lesions, MMP-9 mRNA levels were significantly (p < 0.005) higher than their matching controls, and in smokers vs. nonsmokers. VEGF protein colocalized with MMP-9 and OPN in the malignant ducts and correlated well with their higher levels in invasive PDA lesions.

CONCLUSIONS: Our data show for the first time that cigarette smoking and nicotine may contribute to PDA metastasis through inducing MMP-9 and VEGF, and suggest that OPN plays a central role in mediating these effects. The presence of OPN as a downstream effector of nicotine that is capable of mediating its pro-metastatic effects in PDA cells is novel and could provide a unique therapeutic target to control pancreatic cancer aggressiveness, especially in the cigarette smoking population.

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Intestinal Adaptation of Oligopeptide Absorption via PepT1 After Massive (70%) Mid Small Bowel Resection

Srivats Madhavan, Jeffrey S. Scott, Munanong Nagas, Yi Zheng, Judith A. Dunen, Michael G. Sart
Department of Surgery and Gastenterology Research Unit, Mayo Clinic, Rochester MN

Dietary proteins are absorbed primarily as di- and tri-peptides via H+/peptide cotransporter (PepT1), a high-capacity, low-affinity apical transporter. AIM: To characterize mechanism(s) of intestinal adaptation of peptide absorption after massive (70%) mid small bowel resection.

METHODS: Male Lewis rats (200–250 g) were assigned randomly to 4 groups: A) Non-operated control (n = 8), B) Shamoperated (transverse and primary anastomosis without resection) (n = 4), C and D) 70% mid small bowel resection with primary anastomosis of remnant jejunum and ileum studied at wk 1 (Group C) (n = 8) and wk 4 (Group D) (n = 8) postoperatively. Duodenal, proximal jejunum, distal ileum and colon were harvested at 0, 1, 1, 4, and 4 wk in Groups A, B, C, and D, respectively. Uptake of the H+-coupled, PepT1-specific oligopeptide glycyl-sarcoine (gly-sar), was measured at a concentration of 1 mM in all bowel segments by the everted sleeve technique. Muscosa was harvested to measure gene expression of PepT1 (mRNA by real time RT-PCR, protein by Western blot) and normalized to values for housekeeper genes (GAPDH and β-actin). Results are mean ± SEM.

RESULTS: Rats that had 70% small bowel resection lost 19 ± 4 g at wk 1 (group C) compared to 2 ± 4 g in sham operated (group B) (p = 0.02), but gained 59 ± 5 g by wk 4 (Group D). Gly-sar uptake (mmol/cm/min) did not differ between Groups A and B in any of the 4 regions evaluated (data not shown). Gly-sar uptake tended to be greatest in jejunum for all groups except Group C (Figure). Uptake in duodenum of Group C was greater than control Group A (p < 0.0003). This augmentation in duodenal uptake did not persist beyond the first week, and was seen in all groups at wk 4. Group C showed a significant increase in duodenal uptake of gly-sar was negligible in all groups. PepT1 gene expression studies (mRNA and protein) are pending.

CONCLUSION: Early adaptation in peptide absorption to massive resection occurs in duodenum. Distal ileum requires longer to adapt. Early adaptive changes in duodenum are transient as distal ileum adapts.

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Genetic Deletion of Hematopoietic 5-Lipoxygenase Suppresses Intestinal Polyposis in Apc468 Knockout Mice

Eric C. Choon,2 Matthew J. Stroutch,9 Seth R. Krantz3, Mohammad R. Khan4, Kirsten Dennis5, Nichole R. Blatter6, Elias Goumans7,4 Jorgen Niemann6,8 and Joerg Zehetner*, Steven R. Lentsch, Timothy A. Priftis
Dental Hospital, Mount Sinai Hospital, University of Illinois College of Medicine, Chicago, IL; 2Division of Pediatric Hematology and Oncology, Children’s Hospital of Illinois, Chicago, IL; 3Department of Surgery, Mount Sinai Hospital, University of Illinois College of Medicine, Chicago, IL; 4Institute of Laboratory Medicine, Northwestern Memorial Hospital and Feinberg School of Medicine, Chicago, IL; 5Department of Surgery, Jesse Brown Veterans Affairs Medical Center, Chicago, IL

PURPOSE: Apc468 knockout mice, a model of human familial adenomatous polyposis. Apc468/SLO−/− mice were sacrificed and evaluated at 16 weeks. Age-matched Apc+/+ SLO−/− mice served as controls. Polype counts and diameters were measured in both groups. MDSCs were quantified from intestines, mesenteric lymph nodes, and spleens also from both groups, using flow cytometry. To evaluate which compartment(s) SLO deficiency was responsible for polyposis suppression, Apc468 mice were lethally irradiated and reconstituted with bone marrow from healthy SLO+/− mice (wt BM) or SLO−/− mice (SLO−/− BM). Polype counts and MDSCs were also quantified in both reconstitution groups.

RESULTS: SLO null mutation led to a dramatic reduction in the number of polyps compared to Apc468 mice. Thymic SLO+/− group developed 79 ± 4 polyps with a median polyp diameter of 2.7 mm. In contrast, Apc468/SLO−/− mice had 46 ± 6 polyps with a median diameter of 1.2 mm, an approximately 40% and 44% reduction, respectively (P < 0.001). In even greater contrast, the SLO−/− BM group had a 95% reduction in polyp counts compared to the wt BM group (5 ± 3 vs 111 ± 14, respectively, P < 0.005). MDSCs were reduced in the intestines, mesenteric lymph nodes, and spleens of the Apc468/SLO−/− and SLO−/− BM groups compared to their respective controls (P < 0.005).

CONCLUSIONS: These findings provide direct genetic evidence that hematopoietic SLO has an important role in tumorigenesis which is partially mediated through MDSC expansion. Our data points to SLO-selective inhibitors as a potential, novel class of therapeutic agents for colorectal polyposis and cancer.

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TNF-α Treatment Induces Directional IL-8 Secretion in Polarized Caco-2 Cells

Dennis I. Sonnier*, Stephanie R. Bailey, Rebecca M. Schuster, Alex R. Lentsch, Timothy A. Priftis
Department of Surgery, University of Cincinnati, Cincinnati, OH

The intestinal mucosa plays an active role in the response to inflammation, with increased pro-inflammatory mediator production. Intestinal epithelial cells are polarized and appear to represent an important component of the innate immune system, with a sophisticated response to inflammation from either the humoral or basalateral aspect of their environment. The manner in which the intestinal epithelial cell polarity affects their response to inflammatory stimuli is largely unknown. We hypothesized that polarized intestinal epithelial cells exhibit a directional inflammatory response dependent upon the location of inflammatory stimuli.

METHODS: Caco-2 cells, which exhibit characteristics of intestinal epithelial cells in culture, were plated on trans-well filters and allowed to differentiate, then treated with TNF-α (100 ng/ml) or serum free media (SFM) in the apical or basolateral chamber. After 24 hours, production of the important chemokine IL-8 was determined in apical and basolateral media by ELISA.

RESULTS: Basolateral stimulation with TNF-α resulted in increased apical and basolateral IL-8 production (Figure 1). Basolateral IL-8 production significantly exceeded apical production (Figure 1). Apical TNF-α stimulation resulted in increased apical, but minimal basolateral IL-8 production (Figure 2).

CONCLUSIONS: In the present study, polarized intestinal epithelial cells responded to TNF-α stimulation with a focused directional secretion of the pro-inflammatory cytokine IL-8. These findings are important because they suggest that intestinal epithelial cells are capable of organizing their response to inflammatory signals and producing inflammatory mediators in a directed, vectorial fashion.

10:00 AM – 11:15 AM 253-254

QUICK SHOTS SESSION 1

593

Intraoperative Assessment of Perfusion in Gazetic Grafts for Reconstruction After Esophagectomy: Predicting Anatomical Complications

Department of Surgery, Kwik School of Medicine, University of Southern California, Los Angeles, CA

BACKGROUND: Anastomotic complications are the leading cause of morbidity after esophagectomy and resection with a gastric pull-up (GPR). These are largely related to ischemia of the gastric tube. The aim of this study was to evaluate the use of laser-assisted fluorescein dye angiography (LAA) to assess intraoperatively graft perfusion and to correlate perfusion abnormalities with anatomical complications.

METHODS: Data on perfusion using LAA was prospectively collected in 70 patients undergoing esophagectomy with GPR from March 2008 to September 2009. Images with LAA were obtained after creating the gastric tube but prior to performing the anastomosis. Perfusion in the area of the proposed anastomosis was classified as good or compromised.

RESULTS: The median age of the patients was 64.5 years. Indications for surgery were esophageal cancer in 60 patients and end-stage benign disease in 10 patients. The anastomosis was performed at the time of esophagectomy in 69 patients, but was delayed in 1 patient with significant impaired perfusion on LAA study. Major complications occurred in 13% and there was no mortality. Anastomatic stenosis occurred in 24/49 patients (35%) and leaks in 6/69 (9%). The intraoperative assessment of graft perfusion was significantly more likely to have a strictured or leak (59% vs. 25%), P = 0.0063).
CONCLUSION: Prospective assessment of perfusion of the gastric pull-up with LAA can be used to predict the likelihood of an anatomic complication. Technical advances with LAA that allow quantification of perfusion at the proposed anatomic site may lead to reduced morbidity from anatomic complications with GUP after esophagectomy.

S94
A Drain Amylase < 1000 U/L on the First Post-Operative Day Effectively Predicts the Absence of a High-Impact Fistula Following Pancreatic Resection
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INTRODUCTION: The use and management of drains following pancreatic resection remains controversial. Recent data suggests that an elevated drain amylase level on the first post-operative day is the strongest predictive factor for pancreatic fistula development. We sought to confirm these observations, and to determine if this measurement could specifically predict the absence of clinically-significant fistula.

METHODS: A prospective study of all patients undergoing pancreatic resection during calendar year 2008 was performed. Patients had drain amylase levels measured daily, and a pancreatic fistula was defined according to the ISGPS grading system. Grades A and C fistulas were considered as clinically-significant.

RESULTS: A total of 202 pancreatic resections were performed, including 125 pancreaticoduodenectomies (PD) and 61 distal pancreatectomies (DP). Using the ISGPS definition, there were 25 PD and 56% after DP, with rates of clinically-significant fistula of 13% and 15%, respectively. A drain amylase level greater than 1000 U/L on the first post-operative day following PD had a sensitivity of 80% for detection of a fistula (grades A, B and C) and 93% for a clinically-significantly fistula (p = 0.0003). Following DP, a drain amylase level greater than 1000 U/L, on the first post-operative day had a sensitivity of 87% for development of a fistula and 89% for a high-impact, with a negative predictive value of 94% in the latter group.

CONCLUSION: Quantification of drain amylase levels on the first post-operative day after pancreatic resection can indeed predict development of pancreatic fistula. Patients with a drain amylase value less than 1000 U/L on the first post-operative day are very unlikely to develop a clinically-significant, high-impact pancreatic fistula following optimal or minimal distal resection, and perhaps should have the drains removed early in their course.

S95
Functional Lumen Imaging Probe to Assess Geometric Changes in the Esophagogastric Junction Following Endoluminal Fundoplication
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BACKGROUND: The functional lumen imaging probe (FLIP) uses impedance planimetry to measure the geometry of a distensible organ. The device employs a balloon which is filled with saline solution to determine the shape of the region and gauge its response to distention. By convention of electrical impedance measurements into cross sectional areas (CSA), real-time dynamic images can be displayed. The purpose of this study was to evaluate FLIP as a novel technology to determine structural changes at the esophagogastric junction (EGJ) following endoluminal fundoplication.

METHODS: Baseline FLIP measurements were recorded in three different balloon distortion-volumes (40, 50 and 60 cm) in 13 mongrel dogs. Eleven dogs were subjected to HIF using Esophyx. Two different FLIP techniques were tested. FLIP 1 and 2 were performed in 6 and 7 animals, respectively. Two dogs underwent a Sham procedure. FLIP measurements were repeated directly post-procedure and at 2 weeks follow-up. Three FLIP measurements were performed for each animal at each time point and the mean and standard deviation was calculated. Upper endoscopy, gastroscopy and 48-hour pH testing were performed at each time point in every animal.

RESULTS: Immediately following the FLIP procedures, there was as significant decrease in EGJ CSAs when compared to sham animals and baseline values (Table). Physiologically, this reduction was correlated with an increase in lower esophageal sphincter (LES) resting pressure and length and normalization of distal esophageal pH compared to baseline values. However, at 2-week follow-up, the CSAs of both groups had returned to baseline values and this correlated with objective testing (i.e., worsening pH, decrease in resting pressure and degradation of endoscopic valve appearance). There was no significant difference in the shape of the EGJ at 50 and 60 cm after the FLIP procedure.

Table 1. CSA (mm²) (SD) of the EGJ at a 50 cm Balloon Fill Before and After FLIP

<table>
<thead>
<tr>
<th>Procedure</th>
<th>Baseline</th>
<th>Immediate Post-Procedure</th>
<th>2-Weeks Follow-Up</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sham (n = 11)</td>
<td>90.2 ± 14.7</td>
<td>88.8 ± 13.3</td>
<td>112.9 ± 20.8</td>
</tr>
<tr>
<td>FLIP 1 (n = 6)</td>
<td>95.3 ± 16.7</td>
<td>83.0 ± 12.0</td>
<td>181.7 ± 7.0</td>
</tr>
<tr>
<td>FLIP 2 (n = 7)</td>
<td>125.9 ± 37.0</td>
<td>83.3 ± 36.0</td>
<td>113.5 ± 13.1</td>
</tr>
</tbody>
</table>

CONCLUSION: As a single testing modality, FLIP is able to measure and display a change in tissue compliance at level of the EGJ following FLIP as well as determine degradation of valve competence at two weeks. FLIP could be a useful tool to diagnose and evaluate the outcome of anti-reflux surgery.

S96
Increased Risk of Surgery After Attenuation of Anti-TNF Therapy for Crohn’s Disease
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BACKGROUND: The rate of intestinal resection among patients with Crohn’s disease may be as high as 80% after 20 years of disease. By inducing mucosal healing and achieving high remission rates, TNFα inhibitors reduce hospitalizations and steroid requirement. Early combination treatment with azathioprine (AZA) and TNFα inhibitors achieves higher remission rates than either infliximab (IFX) or AZA alone. It is presumed that IFX, adalimumab (ADA) and certolizumab (CZP) will also impact on the need for surgery. However, many patients attenuate response or flare during therapy, requiring re-induction or switching among anti-TNFs. When this fails, surgery becomes necessary. The goal of our study was to identify risk factors for surgery in the setting of biologic therapy.

METHODS: Consortium on Outcomes of Biologic Therapy in IBD (COBIT) is a prospectively compiled database of 147 patients treated for Crohn’s disease between July 2002 and September 2009 with anti-TNFα medications (for a total of 366 patient-years of therapy). We performed a retrospective analysis to determine the incidence and risk of TNFα antagonist attenuation of response or need for surgical intervention. Both univariate and multivariate analysis was performed.

RESULTS: In our cohort, 63% of patients were either re- treated with (16/93, 17%) or switched to a second TNFα antagonist (77/93, 8.5%). Surgery had been performed in 38% of these patients prior to anti-TNFα therapy. The mean time to onset of the first anti-TNFs was 33.5±15.2 years; mean duration of disease 9.2±4.9 years and mean duration of initial anti-TNFs treatment 36.1±33.2 months. There were 82, 9 and 2 patients initially started on IFX, ADA and CZP respectively, the second agent used was IFX, ADA and CZP in 1, 55 and 21 patients respectively. There were 31 patients (33%) who underwent surgery within 6 months of failing the initial regimen. Patients treated with anti-TNFs therapy for longer periods (>30 months) had increased odds of surgery (OR 3.12, 95% CI 1.30-7.06).

CONCLUSION: Despite the efficacy of the TNFα antagonists, nearly 25% of patients required one or more switch within the class, with surgery needed in nearly 1/3 of those patients. Patients on long-term anti-TNF therapy before switching had a greater risk for surgery. Earlier intervention with primary anti-TNFs therapy may decrease secondary loss of response and intestinal resection rates. Further studies are warranted to determine anti-TNFs optimization strategies and whether attenuation is less likely among different anti-TNFs agents.

S97
Validation of an Endovascular-First Strategy for the Treatment of Chronic Mesenteric Ischemia
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BACKGROUND: On the premise of durability, we have recently advocated open revascularization for chronic mesenteric ischemia (CMI) and referred to catheter based techniques in patients less than 70 years of age. The purpose of this study was to examine this hypothesis within the context of morbidity and mortality for both open and endovascular mesenteric revascularization.

METHODS: Cases of mesenteric revascularization from the National Surgical Quality Improvement Program were reviewed with cases from a retrospective local database for the period January 2002-September 2008. Patients were stratified by intervention as well as age. The endpoints of the study were post operative mortality and morbidity within 30 days. Clinical variables including demographics and co-morbidities of all cases were reviewed. Data was analyzed using univariate and multivariate measures and significance assessed as p < 0.05.

RESULTS: 212 patients underwent mesenteric artery revascularization: 52 underwent percutaneous intervention (angioplasty) and 160 had open surgical bypass. Clinical variables of endovascular patients differed from open patients by age (71.3 ± 1.0 vs 66.3 ± 1.4, P < 0.01), CAD (51.9 ± 1.3, P < 0.01), diabetes (28.9 ± 11.3, P = 0.02), hypertension (90.4 vs 76.9, P = 0.03), and preoperative albumin levels (3.3 ± 0.2 vs 3.6 ± 0.1, P = 0.02). 107 patients were less than 70 years old and 105 were older than 70. In those younger than 70, 21 underwent PTA/stent, and 86 underwent open bypass. The following outcomes were noted in this subset of endovascular and open patients: mortality (0% vs 12%, P = NS) and morbidity (5% vs 34%, P = 0.01). In those older than 70, 21 underwent PTA/stent, and 74 underwent surgical bypass. The following outcomes were noted in this subset of endovascular and open patients: morbidity (10% vs 9%, P = NS) and morbidity (13% vs 36%, P = 0.02). Multivariate analysis examine covariates of morbidity and mortality (including...
Efficacy of Adjunctive Versus Neoadjuvant Therapy for Resectable Pancreatic Adenocarcinoma: A Decision Analysis

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BACKGROUND: Neoadjuvant therapy-based protocols for potentially resectable pancreatic adenocarcinoma offer theoretical advantages over standard adjuvant therapy-based management. However, these advantages are unproven. The aim of this study was to compare the efficacy of neoadjuvant therapy- and adjuvant therapy-based management using formal decision analysis.

METHODS: A decision analytic Markov model was created to compare two management strategies for simulated cohorts of patients with potentially resectable pancreatic adenocarcinoma. In the standard strategy, patients undergo surgical resection and subsequently are treated with either adjuvant systemic chemotherapy (CT), chemoradiation therapy (CRT) or both, as tolerated. In the neoadjuvant strategy, patients are treated with an average of 3 months of neoadjuvant therapy (CT, CRT or both) first and then undergo surgical resection (unless disease progression renders them unresectable). Case-base probabilities were derived from published data derived from phase II and III trials (a total 3,902 patients with potentially resectable pancreatic cancer were analyzed). The outcome measures were overall and quality-adjusted survival, with survival calculated from date of surgery (adjunct group) or date when neoadjuvant therapy was initiated. Increment-to-treatment analysis was used. Sensitivity analysis was performed to assess the effects of model assumptions.

RESULTS: The median overall survivals and 2-year OS rates were 16 months and 30% for patients managed by the standard strategy and 20 months and 42% for those managed by the neoadjuvant strategy, respectively. Quality-adjusted overall survivals for these patients were 13.6 months and 19.6 months, respectively. Sensitivity analysis indicated the benefits of the neoadjuvant strategy over the standard strategy in terms of both OS and quality-adjusted survival are robust: stability of findings is maintained over a wide range of plausible baseline estimates.

CONCLUSIONS: Our analysis suggests that neoadjuvant therapy-based management improves outcomes of patients with potentially resectable pancreatic cancer. A randomized trial designed to evaluate the advantage of this strategy is warranted.

Improvement of Respiratory Symptoms Following Heller Myotomy for Achalasia

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INTRODUCTION: Some patients with achalasia complain of respiratory symptoms. In this study we sought to define the prevalence, the pathogenesis and the effect of Heller myotomy on these symptoms.

METHODS: We studied the course of 111 patients with achalasia who underwent Heller myotomy between 1994 and 2008 and who agreed to participate in this study. All patients completed a questionnaire postoperatively assessing the preoperative and postoperative prevalence and severity of symptoms using visual analog scales. Patients reporting respiratory symptoms (dysphonia, hoarseness, cough, wheezing, or sore throat) occurring at least once per week prior to myotomy, and/or history of asthma or pneumonia, were included for analysis.

RESULTS: All patients presented with dysphagia as their primary complaint, and 63 (57%) reported respiratory disease or symptoms prior to surgery. They all underwent Heller myotomy and 51/63 (81%) had, in addition, an antireflux procedure (Dor or Toupet fundoplication). After a median follow-up of 71 months (range: 9–186 months), 55 (87%) patients experienced durable improvement in their dysphagia. The frequency and severity (Figure) of all respiratory symptoms decreased significantly. Twenty-four of the 29 patients (82%) who reported a history of pneumonia prior to surgery did not experience recurrent episodes after Heller myotomy.

CONCLUSIONS: This study shows that achalasia is associated with a relatively high prevalence of respiratory symptoms and disease. As esophageal impedance improves, evidenced by resolution of dysphagia, respiratory problems disappear as well suggesting that they were caused by aspiration of retained food and secretions. The substantial improvement of respiratory symptoms and disease after Heller myotomy, which was hitherto not appreciated, is yet another benefit of surgical therapy for this disease.

Adenocarcinoma of the Esophagus in the Young

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INTRODUCTION: A striking increase in the number of patients with esophageal adenocarcinoma in their 20s and 30s has caught the attention of practitioners. The aim of this study was to characterize the clinical presentation, management, and outcome of these young patients.

METHODS: The records of all patients who presented between 2000 and 2007 with esophageal adenocarcinoma and who were less than 50 years of age was retrospectively reviewed. The stage, treatment and outcome in patients younger than 40 years were compared to that in patients ≥40 years old.

RESULTS: Of 374 patients, 20 (5%) were under the age of 40 years. There were 2 patients in their 20s and 18 in their 30s with the youngest being 25 years old. The median time between onset of symptoms and diagnosis in these patients was 3 month (IQR 2–5). Patients ≥40 years old with esophageal cancer have significantly more stage IV disease with significantly shorter time to recurrence (9.5 vs. 19 month, p = 0.002) compared to patients ≤40 years old (Table). The overall survival is worse in young patients (14 vs. 34 month, p = 0.04).

CONCLUSION(S): Adenocarcinoma of esophagus in young patients tends to present at an advanced stage and is associated with a poor overall survival. This may be related to a low index of suspicion for warning symptoms in young patients that leads to a delay in diagnosis. Efforts at early detection and surveillance of Barrett’s will be important to improve survival in these patients.

Comparison between patients under the age of 40 years and patients 40 years of age and older with esophageal adenocarcinoma

CONCLUSIONS: This study shows that achalasia is associated with a relatively high prevalence of respiratory symptoms and disease. As esophageal impedance improves, evidenced by resolution of dysphagia, respiratory problems disappear as well suggesting that they were caused by aspiration of retained food and secretions. The substantial improvement of respiratory symptoms and disease after Heller myotomy, which was hitherto not appreciated, is yet another benefit of surgical therapy for this disease.
Effect of Pulmonary Hypertension on Adult Patients Undergoing Non-cardiac Surgery

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3. Silvert Empire College of Medicine, New York, NY

BACKGROUND: Pulmonary arterial hypertension (PAH) is a life-threatening disease that appears to cause an increase in perioperative risk. The present study compared patients with pulmonary hypertension to a control group to determine predictors of poor outcome.

METHODS: An IRB approved retrospective review of all patients undergoing non-cardiac surgery from January 2003 through August 2009 was analyzed. They were compared to a control cohort of patients, without PAH undergoing similar operations during the study period. The two groups were statistically analyzed.

RESULTS: 106 patients underwent surgery of which 36 cases (23 females and 13 males) were non-cardiac. These patients were compared. They were compared to a control group of 72 patients. The two groups were demographically similar. The two groups were also similar based length and type of operation, anesthetic technique, history of asthma, deep venous thrombosis, prior coronary artery or cardiac valve surgery, underlying renal disease, and liver disease. However, patients in the PAH had a higher incidence in treatment for congestive heart failure (p < 0.01). The average length of stay in the hospital for the PAH group was 19.3 days compared to control group of 7.8 days (p < 0.05). The PAH group had a greater incidence of morbidity compared to their matched controls (18.6 vs. 5.7 per patient, p < 0.05). 53% patients in the PAH group experienced at least one or more morbidity event after their surgery compared to 6% of controls. The mortality was 22% in patients with PAH and none in the cohort group (p < 0.05).

CONCLUSIONS: Patients with PAH are at a much greater risk for complications and death when undergoing non-cardiac surgery. The effect of PAH should be carefully considered when planning elective surgery.

Table 1. Prevalence of EGD Findings by Routine or Selective EGD and by Presence of Symptoms

<table>
<thead>
<tr>
<th>Route (Routine)</th>
<th>Selective EGD</th>
<th>Asymptomatic (%)</th>
<th>Symptomatic (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>40.7</td>
<td>15.7</td>
<td>40.7</td>
</tr>
<tr>
<td>Metast</td>
<td>20.5</td>
<td>0.901</td>
<td>16.6</td>
</tr>
<tr>
<td>Gastritis</td>
<td>30.8</td>
<td>10.7</td>
<td>27.5</td>
</tr>
<tr>
<td>Eosinophil</td>
<td>13.2</td>
<td>0.049</td>
<td>16.6</td>
</tr>
<tr>
<td>Barrett's</td>
<td>0.6</td>
<td>0.001</td>
<td>0.7</td>
</tr>
<tr>
<td>Ulcer</td>
<td>3.2</td>
<td>0.0973</td>
<td>0.7</td>
</tr>
<tr>
<td>Polyps</td>
<td>3.4</td>
<td>0.0032</td>
<td>0.7</td>
</tr>
</tbody>
</table>
879 Laparo-Endoscopic Single Site (LESS) Fundoplication: Initial Experience with Safety and Reduction of Symptom
Seahon A. Roddenbery1, Shatona B. Ross, Connor A. Morton, Michelle Vice, Sujit Dahal, Linda K. Barry, Michelle Hamel, Alexander S. Rosenzweig, Surgery, University of South Florida, Tampa, FL

INTRODUCTION: LESS surgery, which began with cholecystectomy, has progressed to complex procedures. The safety and efficacy of LESS fundoplication has not been established. This report details our experience with LESS fundoplication for GERD and provides a comparison to earlier patients undergoing conventional laparoscopic fundoplication.

METHODS: LESS fundoplications were undertaken via a transumbilical approach, conventional laparoscopic fundoplications were undertaken using five trocars, four of which were distant to the umbilicus. Symptoms before and after fundoplication were scored by patients using a Likert scale (0 = never/not bothersome to 10 = always/very bothersome). Outcomes after LESS fundoplication are compared with outcomes of a consecutive contiguous group of patients undergoing conventional laparoscopic fundoplication immediately prior to the initiation of LESS fundoplication. Data are presented as median, mean ± SD, unless otherwise stated.

RESULTS: Since 2007, 63 patients have undergone LESS fundoplication (56 Nissen, 7 Toupet). Patients undergoing LESS or conventional laparoscopic fundoplication were similar in age, BMI, preoperative DeMeester score, intraoperative blood loss, and length of hospital stay (Table). There were no conversions to open; there were no notable perioperative complications. Patients undergoing LESS fundoplications had no apparent scars. Symptom reduction was broad and dramatic, and similar for patients undergoing LESS versus conventional laparoscopic fundoplication.

CONCLUSIONS: LESS fundoplication is a safe and efficacious therapy for GERD; LESS surgery provides excellent resolution of symptoms with no apparent scar. While the LESS approach does prolong the operation, it does not do so notably. In comparison with conventional laparoscopic fundoplication, LESS fundoplication is safe and provides similar satisfactory symptom relief, but without any apparent scar.

790 Trends in the Management and Survival of Surgically Managed Gastric Bypass: A Population-Based Analysis
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INTRODUCTION: National Comprehensive Cancer Network (NCCN) guidelines recommend bariatric resection lymphadenectomy (LND) as definitive surgical management for gastric bypass (GBA) adenocarcinoma (GBA). We sought to evaluate compliance with these recommendations and to assess trends in the management and survival of patients undergoing gastric bypass with GBA.

METHODS: Using the Surveillance, Epidemiology and End Results (SEER) cancer registry, we identified 3566 pts with GBA who underwent surgery from 1973–2005. Data from 1992–2005 (n = 2765) were linked with Medicare data to assess trends in clinical management over time. Clinicopathologic data were analyzed and survival was assessed.

RESULTS: DESK The proportion of pts with GBA did not change over time (1973–1991, 22%/1992–1998, 27%/1999–2002, 27%/2003–2005, 24%); P = 0.17. From 1992–2005, preoperative evaluation included CT (65%), MRI (6%), and PET (2%). Relative utilization of CT, MRI, and cholangiography changed over time (Table). Only 292 (11%) pts underwent hepatic resection (partial hepatectomy: 96%). Hepatic resection increased over time (1992–1998, 8%/1999–2002, 11%/2003–2005, 13%/P = 0.001). For pts undergoing hepatic resection, a LND was performed in 103 (35%) pts with a significant increase over time (Table). Among pts who had a LND, 45% had nodal metastasis. While 2% of pts received adjuvant chemotherapy, 17% received adjuvant radiation therapy (XRT) (P = 0.63). The overall 1-, 5-, and 5-yr survival was 52%, 29%, and 21%. Tumor stage (HR = 2.56) was associated with worse survival whereas receipt of XRT (HR = 0.78) and LND (HR = 0.59) were associated with a decreased risk of death. There was no significant improvement in survival over time (P = 0.60).

CONCLUSIONS: Although the proportion of pts undergoing hepatic resection and LND has increased, compliance with NCCN guidelines for GBA remains post survival of pts with GBA has not improved over time.

791 Alcohol Consumption as a Modifiable Risk Factor in Elective Surgery
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Alcohol consumption is a well-documented determinant of adverse perioperative outcome. Previous studies, however, lack a perceptive view on how alcohol cannot account for multiple internal biases. Using a national administrative database, we sought to determine the independent effect of alcohol consumption upon morbidity and mortality following elective surgery.

METHODS: We queried discharge records from the American College of Surgeons’ National Surgical Quality Improvement Program (NSQIP, 2005 to 2007) for all elective adult admissions. 7631 (25.5%) patients with documented alcohol exposure (active alcohol use of at least 2 drinks per day within two weeks of surgery) underwent elective surgery; 301994 pts did not have active alcohol exposure. Multivariate analysis was performed to adjust for demographics and comorbid factors. Primary outcome measures included length of stay, wound infection, sepsis, and death.

RESULTS: Elective laparoscopic cholecystectomy, inguinal hernia, and laparoscopic gastric bypass were performed in 27% of pts. The trend of alcohol consumption associated with all elective surgery decreased over the course of the study (p < 0.0001). Alcohol use was an independent predictor of pneumonia (OR 1.99, 95% CI 1.84–2.13), sepsis (OR 1.19, 95% CI 1.03–1.37), superficial surgical site infection (SSI; OR 1.15, 95% CI 1.02–1.31), wound disruption (OR 1.41, 95% CI 1.11–1.80) and prolonged hospital stay (OR 1.17, 95% CI 1.08–1.26). Except for SSI, these complications were independent risk factors for postoperative mortality. Alcohol consumption was associated with earlier time to wound disruption (9 vs. 11 days, p = 0.04), longer median hospital stay (5 vs. 3 days, p < 0.0001), and days from operation to discharge (4 vs. 3 days, p = 0.001). A sensitivity analysis revealed that when infectious complications were removed, a significant effect of alcohol on mortality was still noted.

CONCLUSIONS: Alcohol consumption is a significant determinant of adverse outcomes in elective surgery; patients who regularly consume alcohol who are scheduled to receive elective surgery should be appropriately educated.

Elective surgery performed under optimal conditions of limited alcohol consumption or abstinence may reduce post operative complications, length of stay, and hospital costs.

792 Loss of Alkalization in Proximal Esophageal A: A New Diagnostic Paradigm for Patients with Laryngopharyngeal Reflux
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INTRODUCTION: The use of proximal esophageal pH monitoring to diagnose laryngopharyngeal reflux (LPR) is disappointing. We hypothesized that failure to maintain adequate alkalization instead of acidification of the cervical esophagus may be a better indicator of proximal esophageal acidification (EASI). As currently performed, the acidification of the proximal esophagus is defined by exposure to a pH < 4. The normal pH in the cervical esophagus should be similar to the average pH of saliva (pH 7) and failure to maintain that pH may be a better indicator of acidification than a drop in pH < 4. The aim of this study was to define normal value for the percent time the cervical esophagus is exposed to a pH > 7 and to use the inability to maintain this as an indication of LPR.

MATERIALS AND METHODS: The normal subject group consisted of 59 asymptomatic volunteers who had a complete foregut evaluation including pH monitoring of the proximal esophagus. After analysis of proximal esophageal exposure to a pH < 4 the records were reanalyzed to determine how effectively the new pH criteria maintained at a minimum pH of 7. The positive control group consisted of 51 patients who had complete relief of their LPR symptoms after an antireflux surgery and whose fundoplication was intact on videoscopes. The preoperative proximal esophageal pH records of these patients were analyzed similar to the normal subjects for exposure to a pH < 4 and > 7.
RESULTS: The median percent time the pH was >7 was significantly less in LPR patients prior to surgery compared to normal weight [1.04 (2.8–21.9) vs. 38.2 (27–56), p = 0.0003]. This was also true for the time spent in the supine position (p = 0.0003). The 5th percentile value for the percent time that the cervix esophageum, respectively, 7 in normal subjects was 19.6%. In 84% of the LPR patients (43/51) the percent time pH >7 was less than 19.6, indicating they were unable to maintain a pH >7. In contrast, 69% of the patients (35/51) had an abnormal test when the pH records from proximal esophageus were analyzed using the 9% time pH < 4. Of the 16 patients with a negative test using pH < 4, eleven (69%) were identified as having an abnormal study using the threshold of pH > 7.

CONCLUSION: Normal subjects are expected to have a pH >7 in cervical esophageus for at least 19.6% of the monitored period. Using the threshold value for pH >7 rather than <4 increases the sensitivity for diagnosis of the LPR by 15%. We propose using pH >7 as the threshold to identify reflux as the cause of LPR symptoms. It identifies two thirds of the patients whose analysis of their pH records using pH <4 is falsely normal.

**Time Course for Malignant Degeneration of Pancreatic Intraductal Papillary Mucinous Neoplasms (IPMN)**

**Based on 210 Resected Cases**

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**INTRODUCTION:** Using 93 cases of IPMN, a 2006 study by Levy et al (Lancet 2006; 460:1–8) showed a faster rate of malignant transformation from the date of detection when the IPMN was in the main pancreatic duct (MPD) versus just a side-branch duct (SBD). Since only 62 cases (66%) were resected they questioned the true historical diagnosis in the remainder. To confirm this helpful information from the Levy et al study we sought a larger cohort of cases where the diagnosis was reliable, i.e., using only resected cases.

**METHOD:** Between 1999 and 2009, 210 cases of IPMN were resected and could be accurately categorized into the degree of dysplasia and location (MPD ± SBD or just SBD). The date of detection was either the onset of the first IPMN symptom (88%), or if asymptomatic, the first IPMN imaging (12%). The date of diagnosis for malignancy, if it occurred, was the time of resection. “Malignant” was defined as carcinoma-in-situ (CIS) or invasive (Inv) IPMN. The actuarial rate of malignant occurrence from the date of first detection was assessed using the Kaplan-Meier method. Then the risk of developing malignancy between MPD and SBD was compared (log-rank test).

**RESULTS:** The majority of the 210 cases were symptomatic (MPD 94%, SBD 77%, p = 0.006). The mean time between detection (symptom or imaging) and the pathologic diagnosis (operation) was 18.6 ± 36.0 mo (0.3–180 mo). The actuarial malignant occurrence rate was faster for MPD vs SBD location (figure).

**CONCLUSIONS:** Lesions in the MPD degenerate faster into malignancy from the time of detection and should be resected as 38% and 49% were malignant 1 and 2 years after detection, respectively. Our study, based on 210 histologically proven cases of resected IPMN, supports the Levy study but our 5 year occurrence rate for SBD (limited to resected lesions) was highest (30%) vs 15% for Levy). SBD lesions should be followed with caution as almost 20% might be malignant just one year after detection.

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**4:00 PM – 5:00 PM**

**QUICK SHOTS SESSION II**

**794**

**Prophylactic Pancreatic Resection in Patients with IPMN Does Not Negatively Impact Patient Quality of Life: A Preliminary Study**

Munna K. Lee, Joseph Dininno, Marc M. Holdren, Lisa J. Parseull, Wei-Yann Tsai, Peter D. Stevens, Nicole Goetz, Victor R. Grann, John A. Chleb, John D. Allendorf

Surgery, Columbia University College of Physicians and Surgeons, New York, NY

**BACKGROUND:** Intraductal papillary mucinous neoplasm (IPMN) is a well-characterized, mucin-producing cystic lesion of the pancreas with clear malignant potential. Uncertainties remain over whether prophylactic surgical or surveillance is the better treatment option. To date, there is little data to help guide patients and physicians who are deciding between surgery and surveillance for IPMN.

**OBJECTIVE:** The aim of this pilot study was to determine if differences in anxiety and quality of life exist between patients with IPMN who have prophylactic surgery and those who undergo surveillance.

**METHODS:** We recruited patients with IPMN diagnosed in the past 12 months who either had prophylactic surgery or are undergoing a surveillance protocol that included yearly magnetic resonance imaging (MRI) and endoscopic ultrasound (EUS) staggered every 6 months. The major endpoints were the FACT-Pa questionnaire, a pancreatic disease-specific survey that assesses quality of life for primary tumors (physical well-being, emotional well-being, social well-being, and functional well-being). These validated questionnaires were scored by a standard statistical method and compared using unpaired t-test.

**RESULTS:** We identified 20 patients who had prophylactic surgery and 11 patients who are undergoing surveillance protocol for IPMN. The mean age of the patients was 66.8 ± 19.9 years, with 55% being female. Of those patients who underwent resection, pancreaticoduodenectomy was performed in 10, distal pancreatectomy in 4, central pancreatectomy in 2, and total pancreatectomy in 1. Patient responses from both groups were remarkably similar. Patients in the surgery group scored higher on the anxiety subscale of the FACT-Pa questionnaire than the surveillance patients, although this difference was not reach statistical significance (p = 0.14). Patients in the surgery group scored lower on the functional well-being domain of the FACT-Pa questionnaire (p = 0.004), though there were no significant differences in the other quality of life domains (physical well-being, p = 0.27, social well-being, p = 0.68, emotional well-being, p = 0.48). There were no significant differences between the two groups in overall quality of life as assessed by the FACT-Pa questionnaire (p = 0.45).

**CONCLUSION:** Prophylactic surgery does not significantly reduce quality of life in this highly-motivated and health conscious patient population. Furthermore, a protocol of surveillance does not appear to generate undue anxiety in these patients. Further investigation with a larger patient population is required to validate these preliminary findings.

**795**

**Citizen Perceptions of LESS Surgery and NOTES: The Impact of Age, Gender, and BMI**

Sharon B. Ross1, Connor A. Motton, Robert Boyle, Seaborn A. Hoddenberg, Linda K. Barry, Jennifer C. Cooper, Carl B. Bowers, Alexander S. Rosenzweig

Surgery, University of South Florida, Tampa, FL

**INTRODUCTION:** Recently, minimally invasive forms of surgery, such as Laparo-Endoscopic Single Site (LESS) surgery and NOTES have received significant recognition in the lay press. Increased public awareness of the advent and benefits of LESS surgery and NOTES could have a profound impact on their public perception. This study was undertaken to determine public attitudes toward LESS surgery and NOTES and to determine how these attitudes are impacted by age, gender, and obesity.

**METHODS:** College educated Americans completed a validated questionnaire with unbiased guidance. Questions about personal appearance and physical condition were scored utilizing a Likert scale (1 = disagree to 5 = agree). Statistical analysis was undertaken to evaluate relationship between citizen perceptions and age, gender, and BMI utilizing Spearman regression. Where appropriate, data are presented as median (interquartile range).

**RESULTS:** 152 people, 56% female, of age 29 years (38 years ± 17.9), and BMI 24 kg/m2 (25 kg/m2 ± 4.6) completed the survey. They generally liked their physique (4 ± 1.0), felt they were attractive (4 ± 1.0), and felt that others found them attractive (4 ± 0.8). LESS surgery was appealing if it involved no more risks, no/minimally more pain, no/minimally longer operative time, no longer recovery and no/minimally more cost. Redundant pain and quicker return to usual activities were particularly valued.

While there were no appreciable differences between men and women, older persons were more interested in reduced risk, pain, and recovery time and less interested in scar- ring/appareance. Heavier persons were more interested in reduced pain, operative time, and pain medication use and were less interested in scar-ring/appareance. With regard to NOTES, only 32% were willing to consider it. Older people regarded NOTES more favorably. However, NOTES would be acceptable only with no more risks, no/minimally more pain, no/minimally longer operative time, and no/mini- mally more cost (≤$200). Lack of visible scarring with NOTES was considered most important by only 30%.
CONCLUSION: With evolution of minimally invasive sur-
gery and increased public awareness, acceptance of LSG in
the US depends upon no additional risk and no or minimally increased pain, recovery time, and cost.
Importantly, this is not generally preferred, particularly
in older or heavier people. Improved cosmetics beyond
conventional laparoscopy is not considered a major factor
by most Americans; safety, pain, and recovery time remain
major issues in deciding operative choices.

15-Year Trend of Peptic Ulcer Complications in the US:
A Decline in Mortality, but at What Price?
Alexander De Los Reyes1, Samuel Jacob, Vijay K. Maker,
Marek Rudnicki
Surgery, Advocate Blaisdell Masonic Medical Center, Chicago, IL

BACKGROUND: Despite advances in endoscopic and
pharmacological treatment of peptic ulcers, complications
of this disease are not uncommon. Perforation, bleeding,
and obstruction continue to be seen in spite of multiple
and mostly successful strategies to prevent and treat peptic
ulcers. With our country debating healthcare reforms and
facing serious problems with providing less expensive
quality care, cost of treatment to improve its outcomes
needs to be studied.

OBJECTIVE: The purpose of this study was to determine
nationwide trends in hospitalization, mortality and hospital
charges for patients with complicated peptic ulcers.

METHODS: The Nationwide Inpatient Sample for Health-
care Cost and Utilization Project (HCUP) was analyzed for the
trend of peptic ulcer complications in reported hospitals.
12,000 patients with 15 years of history were analyzed. Data
were used to establish trends.

RESULTS: Examined data revealed that number of patients
hospitalized for complicated peptic ulcer ranged from
26,513 + 742 in 1993 to 28,706 + 824 in 2007, peaking at
37,513 (± 1,287) charges for treatment of these patients increased 266% from $9,235-198 in 1993 to $24,798 ± 639 in 2007 (p < 0.001, R2 = 0.964). The calcu-
lated values for these patients treated in reported hospi-
tals increased from $245 million in 1993 to almost $712
million in 2007–close to a 3-fold increase. Prevalence of
complicated peptic ulcer diagnoses ranged from 77.3 to
72.6 per 100,000 hospitalized patients, peaking at 90.9 in
1997 (R2 = 0.366). Total mortality decreased significantly
from 3.39% in 1993 to 1.58% in 2007 (p < 0.001, R2 = 0.6994).

CONCLUSION: The decline in mortality in patients with
complicated peptic ulcer was achieved by significant
increase in hospital costs of their treatment. If all other
treatment aspects of cost treatment and utilizations of resources
are excluded, one can calculate that approximately 1 million
dollars was spent to save one live of a patient with compli-
cated peptic ulcer in 2007 vs. 1993. Results of this study
demonstrated that mortality, the most important outcome of
management of patients with complicated peptic ulcer
disease has improved significantly over 15 year period.
It was achieved by a tremendous increase in costs.

297 Outcomes of Abdominal Surgery in Neutropenic
Patients
Rahil H. Al Natour1, Stanley W. Ashley, Ali Tarakvaladeh
Surgery, Brigham and Women’s Hospital, Boston, MA

INTRODUCTION: Surgery in neutropenic patients is
thought to be associated with significant morbidity and
mortality. No studies to date have quantified these risks.
We set out to assess the outcome of abdominal procedures
in this patient population and to identify prognostic indi-
cators that will help in the management of these complex
cases.

METHODS: Using an electronic patient database, over
2,000 patients with a diagnosis of neutropenia who had
undergone surgery between 1996–2008 were identified. All
patient records were reviewed and those with an Absolute
Neutrophils Count (ANC) of <500/mm3 within 24-hours
of an abdominal operation were selected. Univariate
procedures and transplant were excluded. Thirty-day
postoperative outcomes were compared based on the severity
of neutropenia. National Cancer Institute grading for ANC
was considered (Group 1: ANC <500 vs. Group 2: ANC
<1000 vs. Group 3: ANC >1000). Comparisons were made using 3-way Fishers Exact Test.

RESULTS: 80 patients with mean age of 53 fulfilled the
inclusion criteria (Table 1). Group 1 patients with an ANC
<500, had a significantly higher post-operative infection
rates, and hospitalization time (p = 0.01). This group also had a higher mortality rate com-
pared to other groups (p = 0.05). In those with ANC <300
time of surgery, post-operative use of granulocyte colony-
stimulating factor (GCSF) had no impact on outcomes.

CONCLUSIONS: Our data shows that an ANC <500 is
associated with significantly higher complication rates
that is not altered by post-operative administration of
GCSF. We therefore recommend that surgical intervention
in neutropenic patients is delayed, when possible, until
ANC approaches 500/mm3. Pre-operative administra-
tion of the cytokine should be considered in these cases to
expedite reaching this threshold.

798 Medically Managed Hypercholesterolemia and Insulin-
Dependent Diabetes Mellitus Preoperatively Predicts
Poor Survival After Surgery for Pancreatic Cancer
Kuo Chajger1, Robert C. C. Martin1, Syed A. Ahmed2,
Hong Jin Kim3, Sharon Weber1, David Kooby1, Charles A. Staley1,
Kelly M. McMarten1, Charles E. Sougi3
1Surgery, University of Louisville, Louisville, KY; 2Surgery, University of Cincinnati, Cincinnati, OH; 3Surgery, University of Wisconsin, Madison, WI; 4Surgery, University of North Carolina, Chapel Hill, NC; 5Surgery, Emory University, Atlanta, GA

INTRODUCTION: Although patients with pancreatic cancer
(PC) frequently require medications to treat pre-existing
conditions, the impact of these treatments on outcomes
post resection for is unknown. The purpose of this study
was to determine the impact of preoperative medications
on overall survival after pancreatic resection.

METHODS: Multinstitutional data on preoperative medi-
cations and outcomes on patients undergoing resection
for PC was analyzed. Univariate and multivariate analysis
was performed to determine which medications were pre-
dictive of early mortality.

RESULTS: Of the 518 patients resected for PC, 13.3% were
being treated preoperatively with insulin. 14.8% were
on an anti-cholesterol medication, 1.7% were on steroids
and 7.6% were on thyroxin. On univariate analysis, patients
taking preoperative insulin had a higher 90-day mortality
rate relative to those not on insulin (13.0% vs. 4.8%, p = 0.024), and those on an anti-cholesterol agent had a
higher 90-day mortality than those who were not (10.8% vs.
4.6%, p = 0.035). Pre operative steroids and thyroxin
were not associated with 90-day mortality (p = 0.469 and
p = 0.474, respectively). Medication use was a stronger pre-
dictor of 90-day mortality than history of diabetes (p = 0.01),
cardiac disease (p = 0.168), pulmonary disease (p < 0.001),
or chronic pancreatitis (p = 1.00). Of the patients also had a
higher risk of early postoperative death (p = 0.011). On
multivariate analysis, only preoperative insulin use and
anti-cholesterol treatment independently predicted early
mortality (OR = 2.917, 95% CI: 1.211-6.244, p = 0.017, and
OR = 2.537, 95% CI: 1.055-6.096, p = 0.037, respec-
tively). Based on the beta coefficients, a simple scoring sys-
tem was devised to predict survival after resection based
on medication use. Zero points were assigned to patients
with none on insulin or an anti-cholesterol medication, one
point to those who were on one or the other, and two points to those who were both on insulin and an anti-cholesterol agent. The score was found to cor-
relate with early postoperative survival (90-day mortality
rates of 3.3%, 12.7%, and 13.3% for 0, 1, and 2 points,
respectively, p = 0.002). Furthermore, increasing score was
associated with decreased survival (90.5% for score of
0, 59.7% for score of 1, and 40.2% for score of 2, p < 0.001).

CONCLUSIONS: Patients with PC being treated for pre-
exisiting insulin-dependent diabetes or hypercholesterolemia
have an increased risk of early postoperative mortality. A
simple scoring system based on preoperative medications
can be used to predict early and overall survival following
resection.

1799 Hepatic Artery Infusion of Obatoclax Increases Survival
and Decreases Tumor Size in a Rat Model of Cholangiocarcinoma
Boy Smoov1, Alphonse E. Sinc1, Gregory J. Gores2
1Department of Surgery, Mayo Clinic, College of Medicine, Rochester,
MN; 2Department of Pathology, Virginia Commonwealth University
School of Medicine, Richmond, VA; 3Division of Gastroenterology and
Hepatology, Mayo Clinic, College of Medicine, Rochester, MN

BACKGROUND: Obatoclax is a BH3-only protein mimetic
that is currently in phase II trials for hematologic malignan-
cies and lung cancer. We have previously demonstrated a
Bax-mediated mechanism for obatoclax cytotoxicity in vitro
studies employing several cholangiocarcinoma cell lines.
Herein we report out in vivo studies utilizing a previously

METHODS: Male Fisher 344 rats were anesthetized and
the hilum of the liver exposed. Ligation of the bile duct to
the left lateral lobe was completed and BDF1/eu cells, a rat
cholangiocarcinoma cell line, were injected into the lumen of
the left parenchyma. The gastroduodenal artery was cannulated
in a retrograde fashion with a tunneled catheter connected
to a subcutaneous port which was implanted on the lower
abdominal wall.

RESULTS: Given uncertainty regarding the pharmacoki-
etics for obatoclax in rodents, we chose a locoregional
route of drug delivery via hepatic artery infusion. Follow-
}
CONCLUSION: POSSUM physiology scores and elevated systemic inflammatory response can independently predict cancer-specific and overall survival in colorectal cancer. These results highlight the importance of host-related factors in determining outcome. The results also suggest that compromised cardiac function is an important factor underpinning these relationships.

801 Obstetric and Cryptoglandular Rectovaginal Fistulas: Long-Term Surgical Outcome; Quality of Life; and Sexual Function

Patrizia Del Gizzo1, Tracy L. Hull, Emilio D. Mignanelli, Jeffrey Hammel, Brooke Gurland, Masanori Zaitshi

Colorectal surgery, Cleveland Clinic, Cleveland, OH

PURPOSE: Rectovaginal fistula (RVF) repair can be challenging. Additionally, women may experience sexual dysfunction and psychosocial ramifications even after a successful repair. The aim of this study was to investigate variables looking for predictors of healing/failure and examine long-term quality-of-life (QOL) and sexual function in women with low RVF from obstetrical or cryptoglandular etiology.

METHODS: From June 1997-2009, 268 women underwent RVF repair. Of those with obstetric or cryptoglandular etiology agreed to participate in this study. Healing, type of procedure, use of seton or stoma, number of previous procedures, smoking, age, body mass index (BMI), depression, QOL, sexual dysfunction, BMI, BDQ, BDQ, BDQ, BDQ, and BDQ. Female Sexual Function Index was obtained from our prospective database and telephone contact. Fisher's exact test, chi-square test, and Multivariate-Logistic-Regression Model were used to identify the variables associated with healing/failure.

RESULTS: Mean follow-up was 45.8 ± 39.2 months; mean age 42.7 ± 10.5 years, and BMI was 28.8 ± 7.6. Sixty (40%) fistulas were obstetric and 40% cryptoglandular. 60/60 patients (68%) healed. On multivariate analysis, treatment failure was related to a higher BMI (p < 0.001) and number of repairs (p = 0.02). Looking at each type of repair, episiotomy had significant healing compared to the other repairs but was not significant in multivariate analysis. Forty-seven women were sexually active at follow-up. 12/47 (25.5%) reported dyspareunia. Fecal incontinence was reported prooperatively in 42 women, more often in those with obstetric-related RVF (73%) vs. 20.6% (p < 0.005). Healing was not affected by age, smoking, co-morbidities, preoperative seton or stoma use. Fecal and sexual function and QOL were comparable between women with healed and unhealed RVF.

CONCLUSION: Patients with higher BMI and more repairs had decreased healing rates following RVF repair. Despite surgical outcome, QOL and sexual function were surprisingly similar regardless of fistula healing.

802 Peripancreatic Fat Invasion is an Independent Predictor of Poor Outcome Following Pancreatoduodenectomy for Pancreatic Ductal Adenocarcinoma and Influences the Pattern of Recurrence

Nigel H. Janne1,2, Karin Oyen1,2, Alan K. Fod3,4, Euan J. Dickson1,2, Clem W. Imrie1,2, Ross Carter1, Colin McKay1,2

1West of Scotland Pancreatic Unit, Glasgow University Department of Surgery, Glasgow Royal Infirmary, Glasgow, United Kingdom; 2Glasgow University Department of Pathology, Glasgow Royal Infirmary, Glasgow, United Kingdom; 3Division of Thoracic and Foregut Surgery, The Heart, Lung and Esophageal Surgery Institute, University of Pittsburgh Medical Center, Pittsburgh, PA

BACKGROUND: Following pancreatoduodenectomy for pancreatic ductal adenocarcinoma (PDAC), evidence of peripancreatic fat invasion at pathological staging promotes a tumour to a higher T stage. In a cohort of PDAC we sought to determine the influence of peripancreatic fat invasion on survival and the pattern of recurrence following pancreatoduodenectomy.

METHODS: We analysed the patient demographics, outcome and recurrence data in 188 consecutive PDAC undergoing potentially curative pancreatoduodenectomy between 1996 to 2008. Pathological features and results were assessed for all patients. Survival outcome was compared using Kaplan-Meier, Cox proportional hazard analysis.

RESULTS: The median survival of the PDAC cohort was 19.9 months (95% CI: 17.2–23.4). 49 (26%) patients had evidence of peripancreatic fat invasion. Survival was negatively influenced by high histological tumour grade, vascular invasion, greater tumour stage, lymph node metastasis, larger tumour size, resection margin involvement (all p < 0.01) and peripancreatic fat invasion which resulted in a median survival time of 11.9 months (95% CI: 9.4–14.7) vs. 24.4 months (95% CI: 19.3–25.6) (p = 0.001) for patients with no evidence of fat invasion. In the multivariate model outcome prediction was achieved by vascular invasion tumour grade, resection margin status and peripancreatic fat invasion (Hazard ratio = 2.1 (95% CI: 1.4–3.2), p = 0.001). The presence of peripancreatic fat invasion did not correlate with other clinical pathologic features however peripancreatic fat invasion and was the only variable significantly associated with local recurrence being the primary site of failure following pancreatoduodenectomy (p < 0.01).

CONCLUSIONS: Peripancreatic fat invasion was identified as a predictor of poor outcome following pancreatoduodenectomy for PDAC, independent of T stage, UICC stage, lymph node status and resection margin positivity. Invasion of the peripancreatic fat was also strongly associated with local recurrence being the principal site of tumour recurrence. Rigorous pathological assessment seeking tumour invasion in the peripancreatic fat can identify a subgroup of patients who may benefit from more aggressive adjuvant therapies.

803 The Short-Term Outcome of Transoral Minimally Invasive Fundoplication 2.0 Procedure for Diaphragmatic Reflux Disease in a Highly Selected Population

Tomihisa Hoppo1, Blair A. Joyce1

1Division of Thoracic and Foregut Surgery, The Heart, Lung and Esophageal Surgery Institute, University of Pittsburgh Medical Center, Pittsburgh, PA

BACKGROUND: Gastroesophageal reflux disease (GERD) is the most common esophageal disorder and Laparoscopic Nissen fundoplication is currently the gold standard for the surgical treatment of GERD. Recently, transoral minimally inionless fundoplication (TIF) procedure has been introduced. The device is passed into the stomach, where it deploys full-thickness fasteners to create a gastroesophageal flap valve mechanism. The efficacy of the second generation TIF 2.0 procedure in a highly selected population was evaluated retrospectively.

METHODS: Patients were selected based on the presence of a proven pump inhibitor (PI) responsive typical GERD symptoms (heartburn and/or regurgitation), absence of hiatal hernia and positive esophageal pH testing with symptom correlation. Patients with Barrett’s esophagus or severe esophagitis were not included. This group of patients represents our entire clinical experience with the TIF 2.0 procedure.

Table 1.

<table>
<thead>
<tr>
<th>Variables</th>
<th>Overall n = 100</th>
<th>Healed 90</th>
<th>Unhealed 90</th>
<th>P Value</th>
<th>Odd Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMI</td>
<td>28.7 ± 7.2</td>
<td>29.2 ± 7.1</td>
<td>27.1 ± 7.7</td>
<td>0.001</td>
<td>2.13 (1.3–3.5)</td>
</tr>
<tr>
<td>Etiology</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Obstructive</td>
<td>80 (80%)</td>
<td>77 (85%)</td>
<td>21 (35%)</td>
<td>0.01</td>
<td>0.9 (0.4–2.3)</td>
</tr>
<tr>
<td>Cryptogenic</td>
<td>40 (40%)</td>
<td>41 (68%)</td>
<td>19 (32%)</td>
<td>0.01</td>
<td>0.9 (0.4–2.3)</td>
</tr>
<tr>
<td>Improvement in fecal incontinence</td>
<td>21/42 (58%)</td>
<td>19/28 (68%)</td>
<td>9/14 (64%)</td>
<td>0.2</td>
<td></td>
</tr>
<tr>
<td>Type of repair</td>
<td>50 (50%)</td>
<td>29 (58%)</td>
<td>21 (42%)</td>
<td>0.1</td>
<td></td>
</tr>
<tr>
<td>Episiotomy</td>
<td>32 (32%)</td>
<td>20 (39%)</td>
<td>12 (24%)</td>
<td>0.04</td>
<td></td>
</tr>
<tr>
<td>Col-ana anastomosis</td>
<td>7 (7%)</td>
<td>6 (6%)</td>
<td>1 (7%)</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td>3 (3%)</td>
<td>3 (3%)</td>
<td>0 (0%)</td>
<td>0.4</td>
<td></td>
</tr>
<tr>
<td>Number of repairs median (range)</td>
<td>3 (1–8)</td>
<td>2 (0–8)</td>
<td>3 (1–8)</td>
<td>0.01</td>
<td>1.5 (1.1–2.2)</td>
</tr>
<tr>
<td>PGI Scale</td>
<td>70.8 ± 5.1</td>
<td>71.3 ± 4.1</td>
<td>70.6 ± 5.2</td>
<td>0.5</td>
<td></td>
</tr>
<tr>
<td>Formal Sexual Function Index</td>
<td>20.5 ± 1.28</td>
<td>20.7 ± 1.24</td>
<td>20.5 ± 1.26</td>
<td>0.7</td>
<td></td>
</tr>
</tbody>
</table>
Gender Specific Transfusion Affects Tumor Associated Neutrophil; Macrophage Ratio
Douglas Benon1,2, Marguerite Kelber1, Xianhong Meng1, John H. Lee3, Christopher Silman1,2, Carlton C. Ramet1
1Surgery, University of Colorado at Denver HSC, Aurora, CO; 2Surgery, Denver Health Medical Center, Denver, CO

INTRODUCTION: Perioperative blood transfusion has been linked to decreased survival for pancreas cancer. Noting clinical data associates female blood products with increased morbidity, our lab has demonstrated transfusion of female blood augments metastatic events compared to male in an orthotopic murine pancreatic cancer model. It has been suggested that tumor-associated macrophages correlate with tumor progression by promoting angiogenesis. More recently tumor associated neutrophils have been implicated in aggressive tumor behavior. We hypothesize that differences in gender specific transfusion mediated pancreatic cancer progression are due to microenvironmental changes within the tumor. To test this hypothesis, we examined tumor associated neutrophils and macrophage ratios in male and female mice with pancreatic cancer receiving blood transfusions from male or female donors.

METHODS: C57/BL6 mice, age 7-9 weeks, underwent splenic inoculation with 2.5 x 10^7 Pan02 murine pancreatic adenocarcinoma cells. Mice were transfused on post-op day 7 with 1 ml/kg supernatant from day-42 male or female packed red cells. Necropsy was performed at 5 weeks or earlier for clinical deterioration, and tumors harvested. Frozen sections (15 µm) were stained for neutrophils and macrophages by immunofluorescence. Data were analyzed using ANOVA; p ≤ 0.05 was used to determine significance, N ≥ 5 per group.

RESULTS: Clinically, male mice had greater morbidity and mortality than female when receiving female blood product, with roughened hair coat, development of ascites and death due to bowel obstruction. In evaluating the tumor microenvironment from mice receiving female blood product, male mice were noted to have a greater neutrophil to macrophage ratio than female mice, 0.176 ± 0.028 vs. 0.073 ± 0.012, P = 0.01. When examining neutrophil to macrophage ratio in mice receiving male blood product, no difference was noted (p = 0.48).

CONCLUSIONS: Male mice with pancreas cancer have greater morbidity than female when receiving female blood product. Further, the difference in neutrophil to macrophage ratio suggests that gender specific blood transfusion promotes aggressive tumor behavior in male mice via microenvironmental changes. These data warrant further study to delineate sex related differences in pancreatic cancer progression.

Wednesday, May 5, 2010
8:30 AM - 10:00 AM
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TRANSLATIONAL SCIENCE LUNCHEON

THE SOCIETY FOR SURGERY OF THE ALIMENTARY TRACT

51ST ANNUAL MEETING • MAY 1–5, 2010 • NEW ORLEANS, LA

RESULTS: Eleven patients (6 men and 5 women) underwent the TIF 2.0 procedure between April 2008 and July 2009. Mean age of body mass index were 50.9 (range: 27-81) years and 23.3 (range, 19.6-29.3), respectively. ASA classification included 1 (n = 1), 2 (n = 8), and 3 (n = 2). The procedure time was 116 minutes (range, 73-193 min) and the length of hospital stay was 1 day (1-3 days). All patients had post-operative upper abdominal or shoulder pain which required narcotic analgesia for a mean of 1 day (range, 1-5). The major complication rate was 27.3% (3/11), but unchanged with SG reduced food intake and eatability and energy expenditure. One patient died on post-op day 1 due to a surgical error. Interestingly, the patient was anorectic early, i.e., 3 hours after induction of postoperative ileus, which does not appear to depend on vagal innervation.

969
Influence of Vagal Innervation on Motility and Afferent Sensitivity During Early Postoperative Ileus in Mice
Mary F. N. E. Sugeng1,2,3,4,5, Song-Yen Gas1,2,3,4,5,6,7,8,9, David 3,4,5,6,7,8,9, Christian 3,4,5,6,7,8,9, Masaaki 3,4,5,6,7,8,9, Martin E. 3,4,5,6,7,8,9, Bernhard W. 3,4,5,6,7,8,9, Li Y. 10,11,12,13
1Department of Surgery, Ludwig-Maximilians University, Munich-Grosshadern, Germany; 2Department of Surgery, Essen-Karls University, Turin, Germany; 3Walter-Breden Center (WBe), Ludwig-Maximilians University, Munich-Grosshadern, Germany; 4Department of Pathophysiology, Tsingi University, Medical School, Shanghai, China; 5Department of Gastroenterology (Med. R), Ludwig-Maximilians University, Munich-Grosshadern, Germany;

INTRODUCTION: Postoperative ileus is characterized by early reflex inhibition of intestinal motility within hours and followed by an intestinal inflammatory response that involves efferent vagal modulation via the 5-HT3 receptor on intestinal macrophages. The role of the vagus nerve during early hours of postoperative ileus is unknown. We hypothesized that vagal innervation is irrelevant during early postoperative ileus.

METHODS: Postoperative ileus was induced by standardized small bowel manipulation in C57BL6 mice following laparotomy. Subgroups were vagotomized 3–4 days prior to experiments or received pharmacological inhibition of the acetylcholine 7 subunit with the inhibitor o-bungarotoxin (1 µg/kg, i.p. 1, 3, 5, 9 h prior to ileus induction each n = 6), while control animals were sham operated and remained otherwise untreated. Three hours after small bowel manipulation a 2 cm jejunal segment was harvested with the mesentry attached. Mesenteric afferent nerve fibers were stained in vivo generating a single-unit signal with subsequent computerized analysis including recording of intestinal motility. Afferent nerve discharge at baseline, in response to mechanical stimulation with bradykinin (0.5 µM), 5-HT (500 µM) and mechanical stimulation by continuous ramp distension to 60 mmHg were studied. Data are mean ± SEM.

RESULTS: Peak amplitudes of intestinal motor events were 0.39 ± 0.04, 0.67 ± 0.03 mmHg and after ileus nerve discharge was 12 ± 2, 11 ± 1, 14 ± 1 imp/sec 1 following vagotomy, o-bungarotoxin, or sham operation, respectively, with no difference between groups (all n = 5). Increase of afterdischarge to 5-HT was 6 ± 1 imp/sec 1 above baseline following o-bungarotoxin which was similar compared to 8 ± 1 imp/sec 1 in sham controls, while the response was reduced to 0.7 ± 1.6 imp/sec 1 in chronically vagotomized animals (p < 0.05). Bradykinin was followed by 20 ± 2, 19 ± 1 and 22 ± 1 imp/sec 1 after vagotomy, o-bungarotoxin or sham operation respectively, while peak firing rate was 85 ± 5, 95 ± 2 and 80 ± 8 imp/sec 1 during intrathalamic ramp distension at 60 mmHg (all n = 5). At luminal distension from 80 to 300 mmHg, afferent discharge was lower in vagotomized animals compared to sham controls (p = 0.05), but unchanged after o-bungarotoxin.

CONCLUSIONS: Sensitivity to 5-HT and low-threshold distension is mediated via vagal afferents during postoperative ileus, while sensitivity to 5-HT and cholinergic modulation to bradykinin is independent of vagal afferents. Inhibition of afferent nerve discharge early, i.e., 3 hours after induction of postoperative ileus, does not appear to depend on vagal innervation.

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Eating Behavior in Rats Subject to Vagotomy. Sleeve Gastroctomy and Duodenal Switch
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BACKGROUND/AIM: Obesity is a multifactorial disease and the treatments include diet, exercise, drugs and various surgical procedures. Recently, we reported that gastric bypass surgery caused body weight loss without consuming food intake and that high-fat-induced obesity was associated with increased calories per meal but not per day in rats. In the present study, we examined the food intake, eating behavior and metabolic parameters in rats under-went bilateral truncal vagotomy, sleeve gastroctomy and duodenal switch procedures.

METHODS: Body weight (BW) was recorded weekly throughout the period of the study. The food intake, eating behavior and metabolic parameters were measured pre- and 2 or 9 weeks post-operatively by a comprehensive laboratory animal monitoring system (the so-called CLAMS). Adult rats were subjected to bilateral truncal vagotomy plus pyloroplasty to prevent gastroesophageal reflux, sleeve gastroctomy (SG) or duodenal switch (DS)(without SG) was performed in sham- or PP-operated rats, respectively, and the same CLAMS measurements were reported as before. Afterwards, the SG rats were subjected to DS and the VTP rats were subjected to both SG and DS simultaneously.

RESULTS: Survival rates were 100% for sham- (7/7), PP- (7/7) and VTP-operations (7/7), 86% for SG (6/7), 71-83% for DS alone (7/7) or DS with SG (6/7) that was performed early, and 14% for SG+IP (1/7) that were performed at the same time. VTP reduced BW (10%) consistently (1 week post-operatively), while PP- or sham-operation was without the effect (EF) caused BW (10%) for 6 weeks, while DS alone or SG followed by DS led to a continuous BW loss from 15% at 1 week to 30% at 9 weeks postoperatively. Food intake was higher and satiety ratio was lower during nighttime than daytime in all groups of surgeries. VTP was without any measurable effects on food intake, eating behavior and metabolic parameters. SG increased daily activity and energy expenditure but was without the effect on food intake and eating behavior. DS regardless of accompanying with SG reduced food intake by about 60% during nighttime but not daytime, and did not affect energy expenditure.

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CONCLUSIONS: Weight loss after VTP, SG, or DS differed in terms of degree, duration and underlying mechanisms. DS without SG was most effective in long-term, at least partly due to the reduced food intake. In addition to food intake and eating behavior, multiple involvements of absorption, gut hormones and the brain-gut axis need to be further studied.

Perioperative Anti-Tumor Necrosis Factor Alpha Agents Do Not Increase the Rate of Early Postoperative Complications in Crohn’s Disease

1Department of Surgery, Mayo Clinic, Rochester, MN; 2Department of Gastroenterology, Mayo Clinic, Rochester, MN
3BACKGROUND: There have been numerous studies with conflicting results regarding the use of anti-tumor necrosis factor (TNF) alpha and its relationship to postoperative outcome. The aim of our study was to examine the rate of postoperative morbidity in patients receiving anti-TNF alpha in the perioperative period.

METHODS: All patients undergoing surgery for Crohn’s disease from 2005 until 2008 were abstracted from a prospective database. Patients who underwent surgery which included a nodule or staple line at risk for leakage were selected for the study. A retrospective review of medical records was performed. The study group comprised patients treated with anti-TNF alpha preparation preoperatively or up to 30 days postoperatively. The remainder of the patients did not receive the drug in that time period. Patient characteristics, disease severity, medication use, operative intervention and 30-day complication were compared between the two groups.

RESULTS: Three hundred and seventy patients were selected for this study. Of these, 119 received the drug within the allotted time period and 251 did not. The groups were similar in baseline characteristics, perioperative factors and procedures. The study had more severe disease overall as measured by the American College of Gastroenterology (ACG) categories of disease (50% severe full/maintain disease in the study group versus 18% in the unexposed group, p < 0.001). There was no significant association of anti-TNF alpha therapy and any postoperative complications (27.9% in study group versus 30.1% in unexposed group, p = 0.61) nor intra-abdominal infection complications (5.0% in study group versus 7.2% in unexposed group, p = 0.44). Univariate analysis showed that the only factors associated with an increase in postoperative intra-abdominal infections were age and penetrating disease.

CONCLUSIONS: The use of anti-TNF alpha in the perioperative period does not seem to be associated with an increase in overall or infectious complications for patients with Crohn’s disease undergoing surgery.

The Relationship Between Pre-Operative Comorbidity, the Systemic Inflammatory Response and Survival in Patients Undergoing Surgery for Colorectal Cancer

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2INTRODUCTION: Besides tumor characteristics, colorectal cancer progression and survival is also determined by host factors, in particular a systemic inflammatory response (Glasgow Prognostic Score/GPS). The basis of this stage independent relationship with survival is unclear, however pre-op systemic inflammation may reflect comorbidity. Indeed, validated scores such as elevated Chordant comorbidity index (CCI), National Institute on Aging/ National Cancer Institute (NIA/NCI) Index and Adult Comorbidity Evaluation-27 (ACE-27) are related to poor colorectal cancer survival. This study examines the relationships between pre-op comorbidity, systemic inflammation (GPS) and survival in colorectal cancer.

METHODS: Patients having elective curative resection were studied (n = 302, 1997–2005). A pre-op C-reactive protein > 10 mg/L and albumin < 35 g/dl each score 1 and the GPS is constructed (0, 1, or 2). Comorbidity data was abstracted from casesheet review. Patients were classified by 4 separate scores, the CCI, NIA/NCI index, ACE-27 and Lee Cardiac Risk Index (LCRI). Depuration category, smoking status and body mass index (BMI) was collected.

RESULTS: Most were > 65 yrs (66%), Stage I/II disease (60%), a normal GPS (62%) and had a low comorbidity burden. Median follow-up was 74 months during which 118 died (85 from cancer). On multivariable analysis for cancer survival, age (HR 1.30, P < 0.005), TNM stage (HR 2.73, P < 0.001), LCRI (HR 1.38, P < 0.005) and GPS (HR 1.5, P < 0.005) were independently related. Results were similar in node positive disease (n = 180). Old age was related to increasing comorbidity (ACE-27, CCI, LCRI all p < 0.005) and elevated GPS (HR 1.53, P < 0.005). High BMI was related to higher comorbidity assessed with CCI, ACE-27 and NIA/NCI index scores. Smoking and alcohol use were related to increased comorbidity (all P < 0.05). GPS had a weak association with comorbidity burden assessed with the CCI (HR 1.14, P = 0.06), LCRI (HR 1.0, P = 0.06). There was a relationship between GPS and the NIA/NCI index (P = 0.084).

DISCUSSION: Pre-op comorbidity measures, particularly Lee cardiac risk index are important indicators of cancer survival. Generalised comorbidity does not explain the relationship between the systemic inflammatory response and survival. The most important factor to the current mainstay of current cancer treatment, however it is increasingly considered a novel ‘host-related’ factor important. These include attenuation of the host inflammatory response and optimisation of host physiology.

The Relationship of EMAT and Microsatellite Instability Among Patients with Rectal Cancer

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INTRODUCTION: Based on the presence of microsatellite instability-high (MSI-H) in colorectal cancer, patients with MSI-H colorectal cancer may benefit from adjuvant chemotherapy.

METHODS: We studied 147 sporadic cases of colorectal cancer using 5 tetranucleotide microsatellite markers and NCI recommended MSI (microsatellite instability) classification in patients with advanced stage (18/29, 62% vs local disease 11/29, 38%, P = 0.06). There was no association between EMAT and gender (female 19/53, 36% vs male 28/88, 32% P = 0.65). In the subset of tumors analyzed for lymphomies histologically, EMAT was more prevalent in rectal tumors that showed peri- or intra-tumoral infiltration compared to those without.

Table 1. Frequency of EMAT Marker Mutations

<table>
<thead>
<tr>
<th>Marker</th>
<th>n (n%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>n = 147</td>
<td></td>
</tr>
<tr>
<td>n = 147</td>
<td></td>
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</table>

DISCUSSION: EMAT is associated with MSI-H and may be more commonly seen with metastatic disease. The etiology and consequences of EMAT are under investigation, but its association with immune cell infiltration suggests inflammation may play a role in its development.

Laparoscopic Management of Epiploic Epithelial Phlegmon with Intraoperative Endoscopy

Eugenie J. Harvey, Kervin Arroyo, Peter Ruben, Lester R. Katz, Anthony J. Yune

DISCUSSION: A case of epiploic phlegmon with resection of the involved mesentery and endoscopic intervention is presented.

Laparoscopic Assisted Total Gastrectomy with D2 Dissection and Roux-en-Y Pouch

Alexander J. Greenstein1, James P. Dolan, Vincent L. Harrison, Tha H. Pham, John G. Hunter

DISCUSSION: The extent of dissection and best reconstruction methods with total gastrectomy for gastric cancer are controversial. Laparoscopic assisted gastrectomy is popular in Japan, but less commonly used in the United States. In this video, we present a laparoscopic assisted total gastrectomy with D2 dissection and Roux-en-Y pouch reconstruction on a 49 year old female with stage IB (T2N0) gastric cancer who had undergone neoadjuvant chemotherapy.
Standard Distal Gastrrectomy with D2 Nodal Dissection
Hsinam Ho1, S. J. Verstraete2, A. L. Van Melle1, B. Goebel1, P. Van Cutsem1
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Gastric cancer is the second most frequent neoplasm worldwide, however, the incidence of this neoplasm is decreasing in the US and general surgeons rarely perform gastric resection regularly. Current NCCN guideline recommends minimum of D1 nodal dissection for curative resection and randomized D1 vs. D2 dissection trial suggests disease control benefit of the D2 nodal dissection in certain subgroups of the patients. The D2 nodal dissection is technically challenging if it is not done routinely. This video demonstrates technical aspects of the standard D2 nodal dissection for stomach cancer and discusses pitfalls of the procedure.

Management of the Large Inflammatory Pancreatic Head Tumor: Advantages of the Beger Operation
Tobias Keck1, Ulrich Adam2, Ulrich T. Hopf1
1Department for General and Visceral Surgery, University of Freiburg, Freiburg, Germany; 2Department of Surgery, Tübingen Klinikum, Tübingen, Germany.

The large inflammatory head mass in chronic pancreatitis is sometimes difficult to treat in the context of venous hypertension, biliary obstruction and advanced local and perivascular infiltration. The video demonstrates our experience in treating advanced chronic pancreatitis and large inflammatory pancreatic head tumors with the Beger operation. We demonstrate the technical details and pitfalls of this operation and the potential modifications including an internal bilateral gastrojejunostomy. We also demonstrate our experience with this surgical procedure in over 80 patients.

Laparoscopic Spleen Preserving Distal Pancreatectomy for Large Pancreatic Tumors
Leaque Ahmad1, Jorge Zeleda Getty2, Alexius Ramcharan2, John A. Chabot3
1Surgery, Columbia University Medical Center, New York, NY; 2Surgery, Columbia University at Harlem Hospital Center, New York, NY.

Tumors of the pancreas are investigated with imaging studies and endoscopic ultrasound guided biopsy to confirm its benign or malignant nature. Benign or malignant tumors confined to the pancreas can be approached laparoscopically. Even though large pancreatic lesions are usually managed by traditional methods we believe low grade lesions can be approached laparoscopically. This video describes laparoscopic spleen preserving distal pancreatectomy for a large pancreatic tumor.

Robotic Assisted Laparoscopic Lateral Pancreatectojejunostomy for Chronic Pancreatitis
Neal Agee1,2,1Kwan N. Lee2,3, David A. Lanza2, John B. Martin1
1Department of GI and Minimally Invasive Surgery, Carolinas Medical Center, Charlotte, NC; 2Surgical Oncology/Biliary Department, Carolinas Medical Center, Charlotte, NC.

Chronic pancreatitis is without definitive treatment. Non-surgical modalities include behavioral modifications, pharmacologic interventions and endoscopic procedures to palliate symptoms. These are often ineffective when the disease progresses at which point surgery has been proven to be the modality of choice. We present a biliary bypass after a Puestow procedure performed using robotic-assisted laparoscopy. A laparoscopic approach affords the patient the potential for decreased morbidity. The surgical robot allows procedures, which are often too challenging for a HPB surgeon using traditional laparoscopic techniques. Our case demonstrates the feasibility and safety of this procedure.

Laparoscopic Pancreatic Necrosectomy and Cyst-jejunostomy
Sahab Kahn1, Michael L. Kendrick Mayo Clinic, Rochester, MN.

Delayed treatment of pancreatic necrosis with pseudocyst has been described using endoscopic, “open” and laparoscopic approaches. Surgical management allows a definitive debridement with a single procedure. In this video, we present an 80 year old male with a symptomatic pancreatic necrosis with pseudocyst, 5 months after his initial attack of acute necrotizing pancreatitis. Patient selection, procedure options, and the technical aspects of a laparoscopic trans-mesocolonic necrosectomy with loop cyst-jejunostomy drainage is demonstrated.

A Pilot Trial of Endoscopic Radiofrequency Ablation for the Eradication of Esophageal Squamous Intraepithelial Neoplasia and Early Squamous Cell Carcinoma Limited to the Mucosa
Frederic G. Van Vliet1, Lennruza Alvarez Herman2,3, Roos E. Poort1, Carine Sondermeijer1, Rebo J. Ten Kne1, Mark J. Van Berge Henegouwen1, Bas L. Wester1,2, Jacques Bergman3,4
1Gastroenterology and Hepatology, Amsterdam Medical Center, Amsterdam, Netherlands; 2Gastroenterology and Hepatology, Sint Antonius Hospital, Nieuwegein, Netherlands; 3Pathology, Amsterdam Medical Center, Amsterdam, Netherlands; 4Surgery, Amsterdam Medical Center, Amsterdam, Netherlands.

BACKGROUND: Esophagectomy is indicated for esophageal squamous cell cancer (ESCC) involving the mucosal mucosa (T1m1) or deeper, due the elevated risk for lymphatic invasion associated with this and later stages. For the earlier lesions of high-grade intraepithelial neoplasia (HGIN) and ESCC (T1m2), however, endoscopic therapy may be a preferred approach due to a lower morbidity and mortality risk compared to surgery. Endoscopic resection (ER) and radiofrequency ablation (RFA) are safe and highly effective for dysplasia and early cancer in Barrett's esophagus, but less is known about their utility in squamous HGIN and early ESCC. AIMs: Evaluate the feasibility, safety, and efficacy of RFA for esophageal squamous HGIN and early ESCC (T1m2).

METHODS: Patients were enrolled in this prospective, ethics committee approved trial and all signed informed consent. High-resolution chromoendoscopy ( Lugol's) of the esophagus demonstrated ≥1 unstained lesions (UL) with HGIN or ESCC (T1m2) on biopsy or ER. Tumors were placed 1 cm proximal and distal to the UL-bearing portion of the esophagus, defined as the treatment area (TA). Focal ER was used to remove visible lesions (type 0-IIa or 0-IIc) for staging and to render the mucosa flat prior to RFA. EUS/CT ruled out metastatic disease. Primary or herniated RFA was applied if TA ≤24 mm, while focal RFA was applied if TA >4 cm. Chromoendoscopy was repeated every 3 months with biopsy and focal RFA of residual ULs until all biopsies were negative for squamous neoplasia (CR-Neo). After CR-Neo, chromoendoscopy was repeated at 2 and 6 months and then annually with biopsy of TA (2 specimens/cm).

RESULTS: Twelve patients (6 male, median age 67 (IQR 58–73), 9 HGIN (3 ESCC (T1m2) on biopsy or ER. Tumors were placed 1 cm proximal and distal to the UL-bearing portion of the esophagus, defined as the treatment area (TA). Focal ER was used to remove visible lesions (type 0-IIa or 0-IIc) for staging and to render the mucosa flat prior to RFA. EUS/CT ruled out metastatic disease. Primary or herniated RFA was applied if TA ≤24 mm, while focal RFA was applied if TA >4 cm. Chromoendoscopy was repeated every 3 months with biopsy and focal RFA of residual ULs until all biopsies were negative for squamous neoplasia (CR-Neo). After CR-Neo, chromoendoscopy was repeated at 2 and 6 months and then annually with biopsy of TA (2 specimens/cm).

CONCLUSIONS: In this single center, pilot trial of ER and RFA for esophageal squamous HGIN and ESCC (T1m2), we achieved a CR-Neo in all patients after 1 or 2 ablations. No recurrences have occurred 19 months after achieving CR-Neo. While these results are encouraging, larger studies in homogeneous patient populations are needed to address the role of endoscopic therapy for HGIN and early ESCC.

Spontaneous Reflux During Videoscopy: Its Clinical Significance and Correlation with pH Monitoring
Shahin Ayaz1, Steven B. Demeter2, James M. Halli3, Homan Augustin2,3, Jorge Zehetner1, Helen J. Sohn1, John C. Lipham1, Jeffrey A. Hager1, Tom B. Demeter1,2
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INTRODUCTION: The significance of provoked reflux during a barium swallow is unclear, but spontaneous reflux is thought to be more reliably linked to gastroesophageal reflux disease (GERD). The aim of this study was to determine the relationship between spontaneous reflux events during a videoscopy and gastroesophageal reflux disease.

MATERIAL AND METHODS: Records were reviewed of all patients with GERD symptoms who underwent videoscopy within 2 weeks of 24 hour esophageal pH monitoring between January and July 2008. Patients with previous foregut surgery and those that had their pH monitoring on acid-suppression medication were excluded. The videoscopic recordings were reviewed by an experienced radiologist. Spontaneous reflux was defined as the reflux of barium from the fundus into the esophagus through the gastroesophageal junction (GEJ). The occurrence and characteristics of the spontaneous reflux episodes were compared to the findings from ambulatory esophageal pH monitoring.

RESULTS: The study population consisted of 92 patients (49 males and 43 females). Seventy percent (64/92) had a radiologic hiatal hernia. The median number of spontaneous reflux was 3 (IQR 2–3). At least one reflux event occurred in 41 patients (45%). In 95% of the patients with spontaneous reflux the reflux episodes occurred in the upright position and in 80% of these patients it was confmed to the distal third of the esophagus. In 8 patients the
refused barium went up to the mid esophagus or higher. Ninety five percent of spontaneous reflux episodes occurred in patients with hiatal hernia and only 2 patients without a hiatal hernia had spontaneous reflux episodes. Patients seeking treatment for reflux were more likely to have an abnormal composite pH score (78% vs. 53%, p = 0.016).

All of the 8 patients with spontaneous reflux to or above the mid esophagus had an abnormal composite pH score. The finding of spontaneous reflux during a videoesophageogram had a 78% positive predictive value and a 73% negative predictive value for an abnormal composite pH score on ambulatory monitoring. The number of spontaneous reflux events did not improve the predictive value for an abnormal composite score.

CONCLUSION: Seventy eight percent of patients with spontaneous reflux on videoesophageogram have an abnormal composite pH score on ambulatory pH monitoring. Reflux to the level of the mid or proximal esophagus was always associated with an abnormal composite pH score.

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Radiofrequency Versus Milligan Morgan Herniorrhaphy: A Prospective, Randomized Study

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In the past decade, several new surgical tools have revived the hope for an improved technique to treat radically haemorrhoids with less postoperative pain. Among these radiofrequency (RF) excisional surgery seems to be safe, fast and an effective measure of the postoperative pain. The aim of this study was to evaluate and compare RF to Milligan Morgan herniorrhaphy.

PATIENTS AND METHODS: Between 01/03 and 07/09, 210 symptomatic patients were randomized to RF (118 patients) or MM hernorhaphy (92 patients). Mean follow-up was 39 ± 16 months. Patients were seen after 1 week and postoperative pain assessed using a 10 cm visual analogue scale (VAS). Further controls were at 1, 3, 5, and 12 months. Patients were contacted annually thereafter. Clinical outcome was assessed by validated questionnaire on postoperative symptoms and satisfaction. Primary endpoints were pain and wound healing. Secondary endpoints were operative time, morbidity (early and late complications), and patients satisfaction. Data was analysed using chi-squared test and Fisher’s exact test. Overall results are summarised in Tables 1 and 2. Despite postoperative pain was less after RF this difference was significant only for severe pain (VAS > 7). Significant differences were observed in terms of wound healing. The two techniques were similar in terms of early and late complications.

CONCLUSIONS: RF herniorrhaphy is followed by reduced severe pain, better wound healing, despite this, in our experience, is not followed by an earlier return daily activities.

Table 1. Pain, Healing and Return to work after MM and RF Herniorrhaphy

<table>
<thead>
<tr>
<th>Parameter</th>
<th>RF (n = 92)</th>
<th>MM (n = 118)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Postoperative pain VAS</td>
<td>4.6 ± 2.4</td>
<td>5.2 ± 1.9</td>
<td>NS</td>
</tr>
<tr>
<td>Pain duration (days)</td>
<td>17 ± 4.4</td>
<td>25 ± 6.8</td>
<td>P = 0.04</td>
</tr>
<tr>
<td>Pain intensity (VAS)</td>
<td>17 ± 12.3</td>
<td>16 ± 11.6</td>
<td>NS</td>
</tr>
<tr>
<td>Bleeding duration (days)</td>
<td>8.6 ± 1.9</td>
<td>16 ± 1.1</td>
<td>P = 0.05</td>
</tr>
<tr>
<td>Risk of return to work (days)</td>
<td>18 ± 1.0</td>
<td>17 ± 1.1</td>
<td>NS</td>
</tr>
<tr>
<td>Hospitalisations</td>
<td>0.0%</td>
<td>0.0%</td>
<td>NS</td>
</tr>
<tr>
<td>Fistulas</td>
<td>4.2%</td>
<td>11.1%</td>
<td>NS</td>
</tr>
<tr>
<td>Haemorrhages</td>
<td>4.2%</td>
<td>11.1%</td>
<td>NS</td>
</tr>
<tr>
<td>RF associated</td>
<td>4.2%</td>
<td>11.1%</td>
<td>NS</td>
</tr>
</tbody>
</table>

Table 2. Early and Late Complications Resume

<table>
<thead>
<tr>
<th>Parameter</th>
<th>RF (n = 92)</th>
<th>MM (n = 118)</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Urinary retention</td>
<td>2.1%</td>
<td>2.1%</td>
<td>NS</td>
</tr>
<tr>
<td>Faecal retention</td>
<td>0.0%</td>
<td>0.0%</td>
<td>NS</td>
</tr>
<tr>
<td>Hernia recurrence</td>
<td>5.4%</td>
<td>0</td>
<td>P = 0.04</td>
</tr>
<tr>
<td>Skin tags</td>
<td>15 ± 7.5%</td>
<td>16 ± 17.4%</td>
<td>NS</td>
</tr>
<tr>
<td>Anal fissure</td>
<td>4.2%</td>
<td>11.1%</td>
<td>NS</td>
</tr>
<tr>
<td>Anal ulcer</td>
<td>4.2%</td>
<td>11.1%</td>
<td>NS</td>
</tr>
<tr>
<td>Abscess/infalut</td>
<td>0.0%</td>
<td>0</td>
<td>NS</td>
</tr>
<tr>
<td>Resurrection</td>
<td>0.0%</td>
<td>2.2%</td>
<td>NS</td>
</tr>
</tbody>
</table>

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ERCP and Splincterotomy (ES): A Safe and Effective Definitive Management of Gallstone Pancreatitis with the Gallbladder Left in Situ?

Mark Bignell1, Matthew P. Deating, Andrew Hindmarsh, Michael Rhodes

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INTRODUCTION: UK guidelines recommend that patients with gallstone pancreatitis have cholecystectomy within 8 weeks of their pancreatitis. A proportion of these patients are elderly with significant co morbidities rendering them high risk for general anaesthesia and surgery. ERCP and ES followed by a low fat diet may offer a safe alternative to cholecystectomy as definitive treatment in these patients.

METHOD: We performed a retrospective review of all cases of pancreatitis presenting to a single institution between 1999 and 2009. RESULTS: 1094 patients were admitted to the single institution with pancreatitis during the study period of which 526 cases were secondary to gallstones. There were 23 deaths as a result of the acute episode of gallstone pancreatitis and five patients have been lost to follow up leaving 498 patients available for analysis. The median age at presentation was 66 years (range 16–96 years), with a female to male ratio of 2.1:324 patients (65%) underwent early cholecystectomy. Of the remaining 174 patients, 44 (25%) underwent ERCP and cholecystectomy; 86 (50%) were managed with ERCP and ES. The remaining 44 (25%) were managed with a “wait and watch” policy. The 86 patients who were undergoing ERCP and ES as a definitive treatment for gallstone pancreatitis had a median age of 76 years (range 41–91 years) and a median ASA of 2. Four of the 86 (4%) patients had a failed ERCP for technical reasons. Two patients were managed with a laparoscopic cholecystectomy and the remaining two, who were deemed unfit for surgery, were managed expectantly with no recurrence of pancreatitis. Of the successful ERCPs, six required two attempts to cannulate the ducts and this was due to oedema surrounding the ampulla at the initial ERCP. 76 patients (9%) had no recurrence of pancreatitis with a mean follow-up of 36 months (range 1–118 months). The total patient follow-up was 5257 months. 27 patients (35%) died within the follow-up period of unrelated causes, explaining the lower than expected median follow-up. Five patients had a recurrence of pancreatitis during follow-up (7%). The length of their follow-up ranged from 4–89 months (median 35 months). Three of these patients were treated with cholecystectomy, one was managed expectantly and the other refused surgery.

CONCLUSION: ERCP with ES, combined with a low fat diet is a safe alternative to laparoscopic cholecystectomy and on table cholangiogram to prevent further attacks of gallstone pancreatitis in patients who are unfit for surgery.

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Emergency Portacaval Shunt Versus Rescue Portacaval Stenting in a Randomized Controlled Trial of Emergency Treatment of Bleeding Esophageal Varices in Cirrhosis

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1 Surgery, University of California, San Diego, San Diego, CA; 2 Medicine/Gastroenterology, University of California, San Diego, San Diego, CA; 1Family and Preventive Medicine/Biostatistics, University of California, San Diego, San Diego, CA

BACKGROUND: Emergency treatment of bleeding esophageal varices (BLEED) in cirrhosis is of singular importance because of its high mortality rate. Emergency portacaval shunt (EPCS) is rarely used today because of the belief, unsubstantiated by long-term randomized trials, that EPCS causes frequent portal-systemic encephalopathy (PSE) and liver failure. Consequently, portacaval shunt (PCS) has been relegated solely to salvage therapy when endoscopic and pharmacologic therapy have failed. Question: Is the reduction of endoscopic sclerotherapy (EST) with rescue PCS for failure to control BEV superior to EPCS? A unique opportunity to answer this question was provided by a randomized controlled trial of endoscopic sclerotherapy (EST) versus EPCS conducted from 1988 to 2005.

METHODS: Unselected, consecutive cirrhotic patients with acute BEV were randomized to EST (n = 106) or EPCS (n = 105). Diagnostic workup was completed and treatment was initiated within 8 hours. Failure of EST was defined by strict criteria and treated by rescue PCS (n = 30) whenever possible. 64% of patients had more than 10 year follow-up or until death.

RESULTS: See Table:

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CONCLUSIONS: EPCS was strikingly superior to EST as well as the combination of EST and rescue PCS in regard to all outcome measures, specifically bleeding control, survival, incidence of PSE, improvement in liver function, quality of life, and cost of care. These results strongly support the use of EPCS as the first line of emergency treatment of BEV in cirrhosis. (clinicaltrials.gov NCT00690027)

986

Computed Tomography Features Associated with Operative Management for Nonstrangulating Small Bowel Obstruction

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PURPOSE: There is limited data regarding the usefulness of computed tomography (CT) to predict operative management for patients with nonstrangulating small bowel obstruction (SOB). This study aims to determine whether specific features on CT scans in patients with nonstrangulating SOB are associated with the need for surgical intervention.

METHODS: We performed a retrospective review of all patients with SOB admitted to a tertiary care centre within a two year period (2004–2006). We excluded patients with a history of intra-abdominal cancer, inflammatory bowel disease, abdominal or pelvic radiation, recent surgery, those with a clinical indication for immediate surgery or conditions precluding preoperative care from all patients. All patients
had CT scans performed within 48 hours of admission. All scans were independently reviewed by two staff gas-
troenterologists. The scans were evaluated for clinical outcomes. Concordance between CT observers was calculated by the kappa statistic, which was evaluated to determine whether the SBO required surgical intervention or resolved with non-
operative management. The results were examined by unvari-
ate analysis using the chi-square or Fisher's exact test.

RESULTS: A total of 229 patients were identified of whom 125 met inclusion criteria, CT scans were available for 61 patients. Of these, 27 patients (43%) underwent surgical intervention and 36 patients (57%) were managed non-
operatively. There were five CT features frequently associated with surgery on univariate analysis; of these, transition point, complete bowel obstruction, and small bowel dilat-
ation greater than 4 cm had good concordance between radiologists. Only transition point remained significant (OR = 19, 95% CI [1.8–201], p = 0.014) on multivariable logistic regression analysis.

CONCLUSION: The presence of a transition point on CT scan in patients with a clinical diagnosis of nonstangulating SBO was significantly associated with the need for sur-

cical intervention.

987 Is Bile Reflux-Induced Esophageal Dysmotility Mediated by Mucosal Stimulation? An experimental Study

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BACKGROUND AND AIMs: Esophageal motor abnormalities are frequently found in patients with gastroesop-
gagal reflux disease. The role of bile in reflux-induced dysmotility is still elusive. Furthermore, it is questionable whether mucosal or muscular stimulation leads to moti-

to modification. The aims of this study were: (a) analyze the effect of exposure to bile on the motility of the esophageal con-

tractions and (b) analyze the effect of mucosal vs muscular stimulation.

METHODS: 18 guinea-pig esophagus were isolated and its contractility assessed with force transducers. Three groups were formed. In group A (n = 6) the entire esophagus was used and incubated in 100 mL ursodeoxycholic acid for 2 hours. In group B (n = 6) the muscular layer was removed and the muscular layer incubated in 100 mL ursodeoxy-

cholic acid for 1 hour. In group C (n = 6) (control group) the entire esophagus was used and incubated in saline solution. In all groups, five sequential contractions spaced by 1 minute were measured before and after incubation. Contractions were recorded after KCl 40 mM stimulation.

RESULTS: Contraction before incubation did not differ among groups (p = 0.086) and averaged 1,319 (A), 936 (B) and 1,795 (C). After incubation amplitude of contrac-
tion was 0,709 (2,278) and 1,355 for groups A, B, and C, respectively. Before incubation there are no differences between groups A and C (p = 0.635) and there are differences between groups A and B (p = 0.039) and B and C (p = 0.048). After incubation there are no differences between groups A and B (p = 0.134) there is difference between groups A and C (p = 0.022) and B and C (p = 0.000). When the two-groups compare average contraction is silenced and after there is difference only in group A (p = 0.030).

CONCLUSION: Our results show that bile exposure may induce ineffective esophageal motility and the mucosa seems to take an important role in esophageal motility.

988 The Effects of Cannabinoids on the CaCo-2 Cell Model

Test of Intestinal Permeability

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The endocannabinoid system is expressed in the gastro-

intestinal system, and activation of cannabinoid receptors in the gut decrease emesis, gastric secretion and intesti-

nal motility. However, as yet, the effects of cannabinoids on intestinal permeability have not been established. The aim of the present study was to examine the effects of can-

nabinoids on intestinal permeability using the CaCo-2 cell model. CaCo-2 cells were grown until confluent on inserts in 12-well plates. Transepithelial electrical resis-
tance (TEER) measurements were measured as an index of permeability. 50 µM EDTA was applied to inserts to cause a fall in TEER (an increase in permeability) and TEER was measured for the following 4 h (until TEER had recovered to baseline). The effects of cannabino-

doids on TEER in combination with EDTA, or alone, were assessed. Potential tar-

gets of action were investigated using the following: (all 1 µM): AM251 (CB1 receptor antagonist), AM630 (CB2 receptor antagonist), capsazepine (TRPV1 antagonist), GY6662 (FPAR antagonist), GW40464 (FPAR antagonist) and O-1918 (proposed endothelial cannabinoid receptor antagonist). Data were analyzed by one-way ANOVAs and Dunnett’s post hoc test, and are reported as mean ± S.E.M.

90 µM EDTA caused a drop of TEER of about 20% (indicat-
ing an increase in cell permeability). Application of phyt-

cannabinoids caused a more rapid recovery of TEER than observed in the control group in a concentration depen-
dent manner (area under the curve (AUC), vehicle 3728 ± 234, 10 µM delta-9 tetrahydrocannabinol (THC) 2148 ± 475, P < 0.05, 10 µM cannabidiol (CBD) 1201 ± 53, P = 0.01). By contrast, application of endocannabinoids caused a fur-

ther and sustained drop in TEER in addition to the effects of EDTA (AUC, vehicle 3533 ± 211, 10 µM amandamide 4983 ± 409, P < 0.05, 10 µM arachidonylethanolamide (2-AG) 5173 ± 271, P < 0.05). Only CB1 receptor antagonist inhibited the actions of cannabinoids in CaCo-2 cells (THC P < 0.001, CBD P < 0.001, amandamide P < 0.001; 2-AG P < 0.001). These findings suggest cannabinoids may play a role in modulating intestinal permeability and that phytocannabinoids may have therapeutic potential in the reversal of the abnormally permeable intestine in shock and sepsis.

989 Pre-Operative Nomogram to Predict Risk of Peri-Operative Mortality Following Hepatic Resection

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INTRODUCTION: The majority of hepatic resections for malignancy are performed in older patients with major co-
morbidities. There is currently no pre-operative, patient-specific method to determine the likely peri-operative mortality for each individual patient. The aim of this study was to develop a pre-operative nomogram based on the presence of co-morbidities to predict risk of peri-opera-
tive mortality following hepatic resection for malignancy.

METHODS: The National Inpatient Sample database was queried to identify adult patients that underwent hepatic resection for malignancy. The pre-operative co-morbidities, identified as predictors were used and a nomogram was created with multivariate regression using the Taylor expan-

sion method in SAS Software, SURVEYLOGISTIC Procedure Sample A (2000–2004) was utilized to develop the model and Sample B (2005) was utilized to validate this model.

RESULTS: A total of 4405 and 1072 patients were included in Samples A and B. The overall actual observed peri-opera-
tive mortality rate for Samples A and B was 4.2% and 3.5% respectively. The decile-based calibration plot for Sample A revealed excellent agreement between the observed proba-
bilities and nomogram predicted probabilities. Similarly, the quartile-based calibration plot for Sample B revealed good agreement between the observed and predicted probabilities. The accuracy of the nomogram was further reinforced by a good concordance index of 0.80 with a 95% confidence interval of 0.73 to 0.86.

CONCLUSION: This pre-operative nomogram has been shown to accurately predict the risk of peri-operative mor-
tality following hepatic resection for malignancy.

990 Intestine-Specific Deletion of p38 MAPK Perturbs Enterocyte Kinetics Following Massive Small Bowel Resection

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INTRODUCTION: Intestinal adaptation after massive small bowel resection (SBR) is characterized by enhanced crypt cell proliferation and apoptosis. Both of these responses are modulated by epidermal growth factor receptor (EGFR) signaling. We have demonstrated in vitro that p38 MAPK is required for apoptosis mediated by EGFR inhibition. The purpose of this study was to determine the effect of in vivo deletions of p38 expression on intestinal adaptation after SBR. Specifically, we tested the hypothesis that resection-

induced enterocyte apoptosis would be altered by p38 MAPK deletion.

METHODS: Inducible, intestine-specific p38 MAPK-null mice were created by crossing mice with a tamoxifen-inducible-Cre-fusion protein under control of the villin promoter with mice in which the floxed p38 MAPK gene had been tagged for recombination. Tamox-

ifin was injected intraperitoneally at a dose of 0.5 mg/day for 2 days. Seven days after mice were comparable to mice injected with tamoxifen and subjected to 50% SBR. Mice were sacrificed after 3 days and the remnant bowel was harvested for analysis. Crypt depth, villus length, crypt cell prolife-

rative and apoptotic rates were measured.

RESULTS: It was shown that p38-null mice had a >90% reduction in p38a MAPK protein level. After 50% SBR lp38-null mice exhibited significant adapt-
ation in crypt depth, villus length, proliferation, and apoptosis relative to shams. After SBR the crypt and villus elongation in the lp38-null mice was comparable to the wild-type controls. However, after SBR the lp38-null mice had lower apoptosis in the intestinal compartment compared to wild-type controls after SBR (6.85 ± 0.6 vs. 10.9 ± 0.8 apoptotic bodies/100 crypts, p < 0.05). CONCLUSIONS: Deletions p38 MAPK in an inducible, intestine-specific manner does not impair intestinal adap-
tation in mice. However, loss of p38 MAPK does partially block the increase in crypt apoptosis normally seen after SBR. These findings support an important role for p38 MAPK in the kinetics of enterocyte turnover after small bowel resection.
Background: Pouchnitis can be classified as occasional or recurring and about 40% of patients develops a chronic inflammatory condition. Chronic pouchnitis can lead to the pouch failure. Aims of our study were to identify possible relationship between chronic relapsing pouchinits and mucosa-associated microbiota, systemic and local inflammation, local cytokines network and toll like receptor expression.

Patients and Methods: In this prospective study 32 consecutive patients who underwent restorative proctocolectomy, coming for follow up endoscopy in our outpatient department were recruited in 2007. Chronic disease activity was classified using Pouchnitis Disease Activity Index. During pouch endoscopy biopsies from the ileal pouch were obtained to culture bacteria adherent to the mucosa and perform routine histology. Systemic inflammatory status was graded according to blood cell count, ESR, CRP and albuminemia. Local inflammatory status was assessed with local lactic acidosis analyzed by quantitative IL6. Serum and mucosal levels of IL-1, IL-6 and TNF-α were measured with immunoassays. The mucosal expression of toll-like receptors for bacterial lipopolysaccharide (TLR4) and peptidoglycan (TLR2) were measured by quantitative Real Time RT-PCR. After a median follow up of 23 months patients were concomitantly treated with disease activity monitoring, non-parametric statistics and survival analysis.

Results: Clinical diagnosis of pouchitis (PDA > 7) had been made in 10 patients in 2007. During the follow up of these patients failed to recover and thus had chronic pouchitis while other 3 of them had relapsing episodes of pouchitis. In patients with chronic relapsing pouchitis mucosal TLR2 and TLR4 were more expressed than in those with no or only one episode of pouchitis (p = 0.036 and p = 0.045 respectively). The number of CFU of mucosa-associated Clostridiae spp was higher in patients with chronic pouchitis than in those with no or only one episode of pouchitis (p = 0.031). The presence of Clostridiae spp adherent to the ileal mucosa was associated to a significant risk of chronic relapsing pouchitis (OR 14.95 CI 0.887-224.021, p = 0.045). Survival analysis showed that the presence of Clostridiae spp was associated to an increased risk of mucosal TLR2 and TLR4. The populations of mucosa-associated Clostridiae spp seemed to play a role in the pathogenesis of chronic relapsing pouchitis.

Conclusion: Chronic relapsing pouchitis is associated to increased expression of mucosal TLR2 and TLR4. The populations of mucosa-associated Clostridiae spp seemed to play a role in the pathogenesis of chronic relapsing pouchitis.

1040 127 Recisions for Pancreatic Neuroendocrine Tumor: Evaluating the Impact of Miamaly Invasive and Parenchymal-Sparing Surgical Techniques

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Background: Pancreatic neuroendocrine tumors (PNET) are rare lesions that, when treated with curative resection, are associated with prolonged survival. Increasingly, surgeons apply minimally invasive and parenchyma-sparing technique in the surgical management of PNET.

Objective: To evaluate the impact of minimally invasive and parenchyma-sparing approaches on PNET patient morbidity and survival.

Methods: We retrospectively collected demographic and perioperative data on PNET patients who underwent pancreatectomy between October 1994 and June 2009. For comparison, patients were divided into early and recent patient groups: 63 from 1994 to 2006 and 64 from 2006 to present. Variables were compared using t-test, Wilcoxon rank-sum, or Fisher's exact test. Survival was compared using Kaplan-Meier and log-rank test. A Cox proportional-hazards regression analysis evaluated pathological factors influencing survival.

Results: With a mean age of 60.8 years, 127 patients underwent resection for PNET. Formal resections included 61 distal pancreatectomy (23 laparoscopic), 44 pancreaticoduodenectomy, and 3 total pancreatectomy. Parenchymal-sparing resection included 11 celiac ganglionectomy, 5 partial pancreatectomy, 3 pancreaticoduodenectomy, and 3 partial pancreatectomy. One hundred six patients (85.5%) had nonfunctional tumors, of which 61 (57.5%) were benign and 45 (42.5%) were malignant carcinoma. Twenty-one patients (16.5%) had functional tumors, of which 16 (76.2%) were benign and 5 (23.8%) were malignant carcinoma. A median follow-up of 40 months (range 9.2-156 months) for 5-year survival for patients with malignant carcinoma was 66.66%. By univariate analysis of patients with malignant carcinoma, liver metastases and positive resection margins correlated with poor survival (p = 0.006). Lymphovascular invasion, perineural invasion, tumor size, and positive lymph nodes were not significantly associated with differences in survival. In the recent group, there was a significant increase in laparoscopic and parenchyma-sparing resections compared to the early group (31.49% vs. 12.19%, p = 0.05). There were no differences in morbidity (47.6% vs. 42.4%, p = 0.59), mortality (0% vs. 6.3%, p = 0.12), or median survival (p = 0.72) between early and recent groups. Compared to patients who had formal resections, the laparoscopic and parenchyma-sparing patients had shorter postoperative hospital stays (p = 0.005).

Conclusion: In this series, there has been a significant increase in minimally invasive and parenchyma-sparing techniques for PNET patients. This shift is associated with a reduced postoperative length of stay and does not increase patient morbidity or compromise patient survival.
METHODS: All diagnoses of gastric cancer were identified using the SEER database (1998–2005). Analyses were limited to 1,296 patients, defined by AJCC staging. Further analysis examined subgroups based on whether surgery was performed or not. Kaplan-Meier survival analyses were one-year and overall survival. Univariate analyses included chi-squares and Kaplan-Meier (KM) survival analysis. Cox proportional hazards modeling was performed to assess independent determinants of survival.

RESULTS: Of 66751 identified gastric cancer patients, 24688 had stage IV disease. One-year survival for stage IV patients was 20%. Age, race, marital status, tumor grade, and procedure type were significantly associated with one-year survival on both univariate and multivariate analyses. Three of stage IV gastric cancer patients were compared, excluding patients with unknown surgery status (N = 526). (1) Surgery performed (N = 4899), (2) surgery recommended, not performed (N = 2426), and (3) surgery not recommended (N = 12927). KM survival analysis showed resected patients had a significant survival advantage and that the survival outcomes for patients who had been recommended for, but had not undergone surgery was identical to that for patients who had not been recommended for surgery. Median survival of group 1 was 8 months compared to 3 months in both groups 2 and 3 (p = 0.0001; Figure).

CONCLUSIONS: Patients with stage IV gastric cancer who undergo resection have significantly greater survival than unresected patients, including those who were recommended for resection but did not receive it. These data suggest that stage IV gastric cancer patients who are resectable operative candidates should be offered resection.

METHODS: Using the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) data, we performed Cox proportional hazard analyses to define significant predictors of early (90 days) and late (>90 days) mortality in stage IV (N = 10,145) gastric cancer patients. Patient characteristics, co-morbidities, surgery types, and oncologic or cardia complications were analyzed.
**SSAT POSTER ABSTRACTS**

**Printed as submitted by the authors.  < indicates a Poster of Distinction.**

**Monday, May 3, 2010**

**Authors available at their posters to answer questions 12:00 PM – 2:00 PM; posters on display 8:00 AM – 5:00 PM.**

**HALL F  SSAT POSTER SESSION 1**

**Basic: Colon-Rectal**

**M1875a**

Mucosal 5-SHT4 Receptor Expression Is Altered Following Parasympathetic Denervation of the Rat Colon

Susan J. Keel, Surgery, University of Pennsylvania (Philadelphia, PA)

**BACKGROUND:** The autonomic nervous system plays an important role in regulating colorectal motility. Surgical and obstetrical trauma has long been cited as a cause for abnormal colorectal motility in humans. Using a rat model, we have recently shown that parasympathetic nerve damage immediately impairs colonic transit and that over time colonic transit is restored, consistent with previous studies when denervation was performed at 15-21 days of age. In this study we explored the mechanisms by which denervation causes abnormal motility and by which this adaptation process takes place remains unclear. Since the peristaltic reflex is mediated by excitatory and inhibitory intrinsic neural reflexes via mucosal serotonin (5-HT) and 5-HT4 receptors within the lamina propria of the rat colon, we hypothesized that restoration of normal colonic motility occurs after parasympathetic denervation is mediated by up-regulation of 5-HT4 receptors within the intrinsic nerve. We hypothesized that the measured changes in 5-HT4 gene expression could be detected using real time PCR.

**METHODS:** 30 SD rats underwent placement of a tunneled catheter into the proximal colon. 22 underwent parasympathetic denervation (partial vagotomy and transection of pelvic nerve) while the others underwent sham operation. To measure colonic transit, 51 Cr was injected into the proximal colon at post op day 1, 3, 5 and 7 and the geometric center (GC) of distribution of Cr2O3 was calculated. 10 SD rats were divided into 2 groups, sham operation and parasympathetic denervation. At post op day 3, mucosal submucosal layers of the proximal, middle and distal colon were harvested. 5-HT4 receptor expression was evaluated by Western blot and real time PCR.

**RESULTS:** At post op day 1, colonic parasympathetic denervation caused a significant decrease in GC (4.4, p < 0.01, n = 6), compared to sham operation (6.1, n = 8). Between post op days 3 and 7, there was a significant trend of increasing GC [5.2 at day 3, (n = 8) and 6.0, p < 0.05 (n = 8)] in the denervation group. 5-HT4 receptor protein expression was significantly increased in the distal colon in the denervation group (n = 5, P < 0.01), compared to sham operation group (n = 5). A trend toward significance was seen in S-HT4 receptor mRNA expression in the denervation group (n = 5, P = 0.06), compared to sham operation group (n = 5).

**CONCLUSIONS:** Mucosal colonic 5-HT4 receptors are upregulated following parasympathetic denervation of the distal colon in rats. Upregulation of 5-HT4 receptors of intrinsic origin may be a contributing factor in the mechanism involved in restoring normal colorectal motility after parasympathetic denervation.

**M187b**

Do Mesenchymal Stem Cells Affect EMG Potentials After Anal Sphinther Injury in an Animal Model?

Leviethar Salcedo, Colorectal Surgery, Cleveland Clinic Foundation, Cleveland, OH

**BACKGROUND:** We have previously demonstrated increased pressures after MSC treatment after anal sphincter injury. This study aims to evaluate homeostasis after intravenous MSC injection and document quantitatively the EMG activity of the anal sphincter after injury and after treatment with MSC.

**METHODS:** 70 virgin female Sprague Dawley rats were randomly grouped into 2 treatment with sham groups direct injection to the anal sphincter (n = 35) and intravenous (IV) tail vein injection (n=35). These were further divided in equal numbers of injury groups (pseudocarcinoma SP and pudendal nerve transection PNT). EMG testing was done before treatment. 24 hours after injury, each animal was injected with ether saline (PBS) or 2 ml labelled green fluorescent protein (GFPI) MSC, 10 days post injury. EMG was repeated. Stains used were alpha-actin for smooth muscles, GFP for MSC and DAPI for nuclear stain. Quantitative and EMG for amplitude and frequency was analyzed in all groups. The data was analyzed using repeated measures mixed models. The model examined the effects of population ( sham, SP, PNT), treatment condition (MSC, PBS), route (direct, IV), EMG read time (0, 10), on frequency and amplitude. Population was significant for both measures. Pairwise comparisons for each measure were made for the various population groups. Bonferroni correction was applied to the P-value to adjust for multiple comparisons.

**RESULTS:** No statistically significant differences were noted on EMG amplitude and frequency after MSC treatment compared to the PBS (sham) injection in the direct and IV groups among both sphincterectomy and pudendal nerve injury groups. Green GFP fluorescent cells were found bordering the external anal sphincter after direct and IV TX after in the sphincterectomy group and red fluorescing cells which are endothelial vascular structures were seen independent of the GFP(+) cells indicating that the GFP(+) MSC had traversed the blood vessels to lie in the connective tissue.

**CONCLUSION:** MSC home to the injured anal sphincter after IV MSC treatment. MSC treatment did not affect EMG potentials after anal sphincterotomy and pudendal nerve crush. Pressure increases seen after MSC injection cannot be attributed to EMG activity.

**RESULTS:**

<table>
<thead>
<tr>
<th>Variable</th>
<th>Route</th>
<th>Treatment</th>
<th>Pre Treatment</th>
<th>Post Treatment</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amplitude</td>
<td>Direct</td>
<td>PBS</td>
<td>1.87 ± 0.21</td>
<td>3.93 ± 2.22</td>
<td>0.04</td>
</tr>
<tr>
<td>Amplitude</td>
<td>IV</td>
<td>PBS</td>
<td>1.91 ± 0.21</td>
<td>3.93 ± 0.30</td>
<td>0.005*</td>
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<tr>
<td>Amplitude</td>
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<td>MSC</td>
<td>1.53 ± 0.16</td>
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<td>0.02*</td>
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<tr>
<td>Amplitude</td>
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<td>MSC</td>
<td>1.86 ± 0.27</td>
<td>1.68 ± 0.30</td>
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<tr>
<td>Frequency</td>
<td>Direct</td>
<td>PBS</td>
<td>47.66 ± 8.80</td>
<td>26.53 ± 4.72</td>
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</tr>
<tr>
<td>Frequency</td>
<td>IV</td>
<td>PBS</td>
<td>41.69 ± 19.46</td>
<td>10.36 ± 3.91</td>
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<td>Frequency</td>
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<td>MSC</td>
<td>62.38 ± 6.47</td>
<td>47 ± 5.70</td>
<td>0.05</td>
</tr>
<tr>
<td>Frequency</td>
<td>IV</td>
<td>MSC</td>
<td>61.86 ± 12.66</td>
<td>18.50 ± 10.25</td>
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</tbody>
</table>

**M1875c**

JC Virus and Anal Cancer

Sonia Ramasamy, Surgery, UC San Diego Medical Center, La Jolla, CA

**BACKGROUND:** Anal carcinoma is often associated with human papilloma virus (HPV) which is thought to drive its pathogenesis by interrupting the function of several cell cycle regulatory proteins such as TP53 and RB. JC virus (JCV) expresses a T-antigen (T-Ag) that plays a critical role in malignant transformation through the development of aneuploidy and by interacting with some of the same cell regulatory proteins as HPV. JCV T-Ag expression has been reported in a variety of human malignancies, including brain tumors, colon cancer, and gastric cancers, but has not been evaluated in anal cancers. We examined a cohort of anal cancer cases for JCV T-Ag expression and correlated this with clinicopathologic data.

**METHODS:** Twenty-one parasite-embedded, formalin-fixed anal carcinoma specimens with associated clinical data (histology, stage, gender, and cancer stage) were obtained under IRB approval. Anal cancer specimens were subject to immunohistochemistry (IHC) staining for JCV T-Ag. Extracted DNA from the tumor and normal tissue was then sequenced, and determination of the number of JCV copies/µg DNA was made by semi-quantitative PCR and Southern Blots using a cell line standard.

**RESULTS:** Of the 21 cases of anal cancer, 12 (57%) were in HIV positive individuals. The average age of our cohort was 54 years, 70% were male. All 21 cases stained positive for JCV T-Ag by IHC. There was a statistically significant higher number of JCV viral DNA copies/µg DNA in HIV anal cancer tissue when compared with surrounding normal tissue (mean 49.12 copies/µg DNA vs. 2.15 copies/µg DNA, p = 0.014). There was no correlation found between disease stage and the number of JCV viral copies (Table 1).

**CONCLUSIONS:** Anal carcinomas show 100% expression of JCV T-Ag and correlates with an increased number of copies of JCV in cancer DNA compared to surrounding normal tissues. HIV infected anal cancer patients had higher JCV viral copies over HIV negative patients. JCV, presumably through its interruption of cell regulatory proteins, might play a role in anal cancer pathogenesis.

**Table 1. Anal Cancer Stage and JCV copies/ug DNA**

<table>
<thead>
<tr>
<th>Stage</th>
<th>N (%)</th>
<th>Average JCV Copies/ ug DNA</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>2 (9%)</td>
<td>14.18</td>
</tr>
<tr>
<td>B</td>
<td>3 (14%)</td>
<td>295.5</td>
</tr>
<tr>
<td>C</td>
<td>4 (19%)</td>
<td>70</td>
</tr>
</tbody>
</table>

**Basic: Esophageal**

**M1876**

The Micro-RNA Profile of Responder and Non-Responder in the Neoadjuvant Therapy of Esophageal Cancer

Daniel Vallbohmer, Department of General, Visceral and Cancer Surgery, University of Cologne, Cologne, Germany

**BACKGROUND:** Neoadjuvant multidi modality treatment is frequently applied to improve the poor prognostic associ ated with locally advanced esophageal cancer. However, only patients with a major histopathologic response to neoadjuvant therapy seem to have a significant survival benefit. Predictive markers to allow individualization of multidi modality treatment are highly needed. The aim of this pilot study was to characterize the micro-RNA profile of responder and non-responder in the neoadjuvant therapy of esophageal cancer in order to identify possible predictive markers.

**PATIENTS AND METHODS:** Eight patients with locally advanced esophageal cancer (CT2-4, N3, M0) were included in the study. All patients received neoadjuvant chemoradiation (cisplatin, 5-FU, 40 Gy) and subsequently underwent transthoracic en bloc esophagectomy. Histopathologic regression was defined as major histopathologic response when resected specimens contained less than 10% viable residual tumor cells (major response: 4 patients; minor response: 4 patients). Intratumoral microRNA was isolated from peritumoral tissue biopsy and corresponding s pectral signatures of 384 microRNAs was analyzed in the 16 specimens by using a TaqMan Human MicroRNA
RESULTS: In the pretherapeutic biopsies a differential microRNA profile was detected depending on the histopathology of tumors. Several microRNAs were significantly different between patients with our without response. Similar results were detected in the surgical samples. The expression of 9 microRNAs was significantly different relative to response finally, a total of 12 microRNAs from which 2 were correlated with histopathologic response.

CONCLUSION: This pilot study was able to demonstrate a differential expression profile of microRNAs depending on histopathologic response in patients with locally advanced esophageal cancer undergoing multimodality treatment. The identified single microRNAs have to be validated by prospective PCR in a larger prospective trial.

Basic: Hepatic

M1879
Identification of Chromosomal Regions That Harbor Novel Genes Important for Pancreatic Cancer Pathogenesis by Genome-Wide Screening Methods
Sabrina Thielges, Department of General, Visceral, and Thoracic Surgery, University Hospital Hamburg-Eppendorf, Hamburg, Germany

BACKGROUND: Pancreatic adenocarcinoma is a genetically highly complex and heterogeneous tumor type with strong genetic instability which makes it resistant to therapy. Known amplifications of oncogenes such as KRAS or MYC and deletions of tumor suppressor genes such as CDKN2A and SMAD4 have demonstrated the importance of genetic alteration in this tumor type.

METHODS: We report the use of an Affymetrix Genome-Wide Human single nucleotide polymorphism (SNP) Array 6.0 (906,600 SNPs) to screen for gene copy number changes and allele imbalances in 8 misscheduled primary pancreatic tumors and 7 established pancreatic cancer cell lines. The Gene Chip Human Genome U133 2.0 Array served for RNA expression profiling. Mutation analysis of KRAS and MSH3 analysis of cell lines was performed.

RESULTS: SNP arrays confirmed the presence of previously reported cytogenetic abnormalities in the cell lines and primary tumor genomes, including MYC amplification at 8q24, gain of 17q12 (ERBB2/HER2), 7q12 (ERBB3) and 3p12 (KRAS). KRAS mutation was found in 5 out of 7 cell lines. All patients exhibited several alterations in signaling pathways such as Wnt/Notch Signaling and KRAS signaling. Approximately half of the cell line samples (7/15) showed an amplification at 1q13.1-1.3.2 in which the sestrine/thioredoxin kinase Mrk/Dyrk1B is localized, a downstream effector of oncogenic KRAS. There was also strong concordance between primary tumors and cell lines with respect to gains on 8q, 12p and 18q. Analysis of gene expression was used to localize potential target genes. M-FISH analysis showed chromosome rearrangements such as 9p- and 18q-deletions during olive oil based nutrition and the number of apoptotic hepatic cells during sepins was significantly lower in the group receiving enteral immunonutrition (TUNEL-pos. vs. control: 25 ± 5 vs. 9 ± 5 fatty acids: 9 4 p 0.05).

CONCLUSIONS: A 6-fatty acid based enteral nutrition reduces the inflammation in the gut and has a hepatoprotective effect allowing sepins. The basic finding is prognostically significant to the individual patient. IL20 release is likely to be reactive to inflammation and its expression is probably secondary to inflammation.

Basic: Pancreas

M1880
Perostilbine and Gembicinabe Have Additive Effects Against Pancreatic Cancer in vitro
Patrick Manual, Department of Surgery, University of Vermont/ Fletcher Allen Health Care, Burlington, VT

BACKGROUND: Resveratrol, a naturally occurring pheron is a potent antioxidant as well as having pro-apoptotic properties. Perostilbine is an analogue of resveratrol with greater oral bioavailability. Our previous studies have shown Perostilbine to be an effective growth inhibitor against multiple cancer cell lines. To further evaluate Perostilbine’s potential role as an agent against pancreatic cancer, we hypothesized that there would be additive effects when Gembicinabe and Perostilbine were combined.

METHODS: Two pancreatic cancer cell lines (MIA-PACA and PAC-1) were cultured using standard techniques. Cells were pretreated with 1 μM Gembicinabe for 18 hours followed by graduated doses of Perostilbine (10–30 μM). In addition, cells were pretreated with Perostilbine (10–30 μM) for 18 hours followed by 1 μM Gembicinabe. Lastly, the same pancreatic cell lines were treated simulta-
neously with Perostilbine and Gembicinabe (doses identi-
cal to those above) after which cell viability was assessed in all three groups by MTT assay at 24, 48, and 72 hours.

RESULTS: Gembicinabe and Perostilbine show an addi-
tive effect on pancreatic cancer cell viability in a time and dose dependent manner. The best results were seen when pancreatic cancer cells were pre-treated with Perostilbine followed by Gembicinabe treatment. With Perostilbine pre-treatment, the greatest effects were seen at 48 and 72 hours for MIA cells, where cell viability was reduced to 23% and 21% of control, respectively (P < 0.001). The Perostilbine pre-treated PAN-C cells reached maximum inhibition of cell viability at 72 hours with a reduction to 34% of control (P < 0.001). Simultaneous use of Gembicinabe and Perostilbine in PAN-C cells reduced cell viability at 72 hours to 62% and 58% of control with Perostilbine concentrations of 10 μM and 20 μM, respectively (P < 0.001). Both cancer cell lines exhibited similar sensitivity to Perostilbine and Gembicinabe also showed reduction to 62% and 58% of control at 48 hours and 37% and 35% of control at 72 hours with Perostilbine concentrations of 10 μM and 20 μM (P < 0.01).

CONCLUSION: Perostilbine, a well tolerated natural compound found in blueberries, may have clinical utility in the treatment of pancreatic cancer. Combination treatment of Perostilbine with Gembicinabe leads to an addi-
tive cytotoxic effect on pancreatic cancer cells in vitro. These findings suggest that perostilbine in combination with gembicinabe is a treatment option worth further investigation.

Basic: Small Bowel

M1881
Regulation of Contractile Activity in Longitudinal Muscle of Rat Ileum by Hydrogen Sulfide
Maeven Nagan, Department of Surgery and Gastroenterology Research Unit, Mayo Clinic, Rochester, MN

BACKGROUND: Endogenous hydrogen sulfide (H2S) is a critical presynaptic modulator of GI motility, however, the mechanisms of action of H2S are not well understood.

AIM: To determine effects and mechanisms of action of H2S on contractile activity in longitudinal muscle of rat ileum.

METHODS: Ileal longitudinal muscle strips from 12 Lewis rats were prepared to measure contractile activity in a temper-
ature controlled tissue chamber. Sodium hydrosulfide (NaHS, 10–10 10–3 M) was used as an exogenous donor of H2S yielding bath solution levels of H2S of approximately 1 to 180 μM. Physiologically endogenous levels of H2S are thought to be 50–200 μM. Effects of NaHS were evaluated on spontaneous contractile activity and after pre-concra-
tion with benesem (10–5 M). L-cysteine (10–5, 10–4, and 10–3 M), the substrate for production of H2S was used as an endogenous donor of H2S. We evaluated involve-
ent of A) Extrinsinc nerves with atropine (10–5 M), phentolamine (10–5 M), and propanolol (5 × 10–5 M); B) Enteric nervous system with tetrodotoxin (10–5 M); C) Nitric oxide with L-NG-nitro arginine (L-NNa, 10–4 M and 10–3 M). D) Calcium entry blockers such as verapamil (10–5 M) and nifedipine (10–5 M). E) K+ channels with glibenclamide (10–5 M) and F) K+ channels with amapin (10–5 M). Under the contractile curve was used to compare the effects.

RESULTS: NaHS exhibited a prominent dose-dependent effect on ileal longitudinal muscle. H2S may act on endogenous stimula-
ted contractile activity (P < 0.01) with effects starting at 10–5 M and also decreased baseline tone. L-cysteine showed no inhibitory effect. Establishing non-adrenergic and non-cholinergic conditions, blockades of all neural activity by tetrodotoxin, blocking NO production by L-NNa, blocking visceral primary afferents by capsaicin, blocking K+ channels by glibenclamide, or blocking K+ channels by amapin, had no effect on the inhibitory effect of H2S on contractile activity.

CONCLUSION: H2S at physiologic levels inhibits contrac-
tile activity of ileal smooth muscle. The inhibitory effect of region is best to be with intrinsic or extrinsic neuroral pathways, nitric oxide, or activity of visceral afferent nerve fibers, K+ channels, or K+ channels in ileal longitudinal muscle suggesting that the mechanisms of action of H2S proposed in other tissues do not appear to be operative in rat ileal longitudinal muscle.

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57
Basic: Stomach

M1882

In-Vivo Assessment of a Biologic Occluder for NOTES Gastrectomy Closure

Alejandro Napolioni, Surgery, University of Pittsburgh, University of Favalou, Pittsburgh, PA

INTRODUCTION: NOTES has emerged as a conceptual framework that may change the paradigm of current surgical practice. Perhaps one of the biggest hurdles to overcome is to provide a “leak-proof” closure of the visceras being transgressed. Failure to achieve this aim would unequivocally result in the failure of NOTES altogether. The limitations of current approaches include technical challenges or the use of inert materials that leave a permanent foreign body within or around the port of entry. Although currently used within the field of surgery, biologic scaffolds for NOTES closure have not been attempted and may overcome several of the current limitations. The current study aimed to evaluate the closure of a transgastric NOTES access using a multi-layer extracellular matrix (ECM) occluder in a survival study with a canine model.

METHODS: Four adult female mongrel dogs were subjected to transgastric NOTES peritonoceotomy. At procedure completion, the gastrectomy was closed by deploying a 4-sided ECM occluder. The construct of the occluder was such that there was ECM coverage on both sides and within the gastrectomy. Animals were survived for 7 days (n = 2) and 8 weeks (n = 2). Endoscopic follow-up was performed at 48 hs post-op and immediately before sacrifice. Endpoints included clinical outcome, presence of leak, peritoneal sway for culture and histology.

RESULTS: All procedures were completed uneventfully. Deployment of the device was possible in all animals and air tightness could be observed immediately after placement under laparoscopic visualization with endoscopic insufflation. All animals had an uneventful recovery with no clinical signs of abdominal discomfort or sepsis. Endoscopy showed no air leak at 48 hs. Abdominal cultures were sterile and no signs of leak were detected at 7-day or 8-week necropsy. Histology demonstrated remodeling of the scaffold with a complete gastric mucosal lining and organized loose collagen bundles. No foreign body reaction was observed at the site of injury.

DISCUSSION: The ECM occluder has been demonstrated to be safe and effective in this preclinical model. Biologic scaffolds may represent a useful application for human NOTES procedures.

Clinical: Biliary

M1615

Impact of Biliary Stenting in Patients with Pancreatic Cancer Undergoing Whipple’s Procedure: A Surgical Perspective

Shunsuke Yasui, Gastroenterology, University of Alabama in Birmingham, Birmingham, AL

BACKGROUND: Self explantable metal stents (SEMS) are usually reserved for patients with inoperable malignant biliary obstruction. Aim: Compare the clinical outcomes of patients with pancreatic cancer who underwent plastic or self explantable metal stents (SEMS) placement and subsequently underwent a Whipple’s procedure.

METHODS: This is a retrospective single center study of all patients with pancreaticobiliary malignancy who underwent Whipple’s procedure by one surgeon over a 4 year period. Patients who underwent preoperative endoscopic biliary decompression at the same institution were identified. All ERCP’s were performed by two endoscopists and the type of stent (metal vs. plastic) deployed was based on the discretion of the endoscopist. Plastic stents were 10Fr in diameter and varied between 7–9 cm in length; SEMS were 10Fr in diameter, 6 cm in length, and were placed below the line of any potential surgical transection. The clinical course of these patients following stent placement and until surgery were reviewed.

RESULTS: 30 of 271 (11%) patients who underwent Whipple’s procedure had a preoperative ERCP with biliary stent placement. Twenty patients had plastic and 10 had SEMS placements. The mean duration to surgery following SEMS and plastic stent placements were 71 and 90 days (p = NS), respectively. While none of the 10 patients who underwent SEMS placement required a repeat intervention, 8 of 20 patients with plastic stents required 10 endoscopic interventions prior to surgery (p = 0.04). Of the 8 patients who required a repeat intervention, 3 required hospitalization for cholangitis (mean length of stay 4 days, range 3–5). Three patients with SEMS and 2 with plastic stent placements underwent preoperative chemoradiation and EUS-guided FNA that yielded a positive tissue diagnosis in all cases. SEMS did not impair visualization of the tumor mass at EUS. A Whipple’s resection was undertaken successfully in all 30 patients and the presence of a SEMS caused no interference with biliary anastomosis.

CONCLUSIONS: In this study, there was less need for repeat endoscopic interventions prior to a Whipple’s procedure when a SEMS was placed initially for biliary decompression. Also, the presence of a SEMS did not preclude preoperative chemoradiation, EUS-guided FNA, or pose technical challenges at surgery.

M1616

Role of Extended Right Hepatectomy for Gallbladder Carcinoma Involving the Hepatic Hilus

Kazuki Shimada, Hepatobiliary and Pancreatic Surgery Division, National Cancer Center Hospital, Tokyo, Japan

BACKGROUND: The efficacy of major hemihepatectomy for advanced gallbladder carcinoma is still controversial, because of a high risk of postoperative serious complications and a poor prognosis. On the other hand, extended major hepatectomy has been frequently applied for hilar bile duct cancer or cholangiocarcinoma involving the hepatic hilus.

METHODS: Between 1999 and 2009, thirty-five patients underwent extended right hepatectomy for gallbladder carcinoma involving the right Glisson’s sheath or the hepatic hilus and/or with direct invasion of the liver parenchyma. Extended right hepatectomy included wedge resection of inferior part of Couinaud’s segment IV and entire caudate lobe with extra-biliary duct resection and lymph node dissection with connective tissue in the hepaticoduodenal ligament. The clinicopathological data of all the patients were analyzed retrospectively. Two patients with apparent residual cancer were excluded from the recurrent and survival analysis. Gallbladder cancer originating from cystic duct was defined as cystic duct carcinoma when the center of the tumor mass was located in the cystic duct by the final pathological examination.

RESULTS: Twenty-five patients (74%; 28/35) presented with jaundice. There was no mortality, but morbidity occurred in 16 patients (46%). Operative time and bleeding was 564 ± 206 minutes and 1472 ± 1268 mL, respectively. There was noredo cell blood transfusion in 28 patients (80%; 28/35). The distribution of the tumor stages according to the TNM classification (UICC, 6th) was: stage IIA (n = 4, 12%), IIB (n = 4, 12%), III (n = 14, 42%), IV (n = 11, 31%). The overall 5-year survival rate and mean survival was 19.9% and 3.4±0.7 years, respectively. Three patients (9%) survived more than five years. On multivariate analysis, presence of hepatic metastases and gallbladder cancer originating from cystic duct were a significant indicator of a poor prognosis.

CONCLUSIONS: This procedure contributed long-term survival in the selected patients with safe Hepatic metastases seem to be a contraindicator for surgery, because no patients survived more than 2.2 years.

M1617

Cosmetic Outcome Following Laparoscopic Cholecystectomy: Is There a Problem?

Mark Billing, Upper Gastrointestinal Surgery, Norfolk and Norwich University Hospital, Norwich, United Kingdom

INTRODUCTION: Advocates of Single Incision Laparoscopic Surgery (SILS) claim that improved cosmesis is one of the main benefits over conventional laparoscopic cholecystectomy (LC). However, there is little published data quantifying the cosmetic outcome following LC. The aim of this study was to determine the cosmetic outcome after conventional LC using a validated scar assessment tool.

METHOD: The “Patient Scar Assessment Questionnaire” (PSAQ) was sent to all female patients aged between 20 and 50 years who had undergone LC at two institutions in 2005 (n = 279). In all cases the operation was performed using a 4 port technique. Patients were asked to give scores that related to the appearance and symptoms associated with the scars at the time of completing the questionnaire.

RESULTS: 120 patients responded to the questionnaire with a response rate of 43%. The median age of responders was 29 years (range 20–50) and 42 (35%) had had previous surgery. Results are shown in the Table below. The table shows that the mean score for each section was low indicating a favourable cosmetic outcome. This correlates with the global question for each category which is scored out of five where a score of one is “excellent” and five is “very poor.” Four patients highlighted dissatisfaction with the umbilical incision.

<table>
<thead>
<tr>
<th>Section (Score range)</th>
<th>Total Score</th>
<th>Overall Question Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance (0–5)</td>
<td>Mean (Range)</td>
<td>1.65 (1.0–2.0)</td>
</tr>
<tr>
<td>Symptoms (0–4)</td>
<td>Mean (Range)</td>
<td>0.4 (0.0–1.0)</td>
</tr>
<tr>
<td>Scar Consciousness (0–4)</td>
<td>Mean (Range)</td>
<td>4.1 (3.0–5.0)</td>
</tr>
<tr>
<td>Satisfaction with Appearance (0–4)</td>
<td>Mean (Range)</td>
<td>4.6 (4.0–5.0)</td>
</tr>
<tr>
<td>Satisfaction with Symptoms (0–2)</td>
<td>Mean (Range)</td>
<td>1.0 (0.0–2.0)</td>
</tr>
</tbody>
</table>

Legend: Patient scores for scars after LC in 119 women aged 20–50. Overall question score is 1 in all but one domain indicating excellent cosmetic results.

CONCLUSION: Patients perceive the cosmetic results following LC as excellent. SILS would therefore seem to have a limited role in terms of improving cosmesis for patients undergoing cholecystectomy. Ancodal evidence from the questionnaire suggests the umbilical port may remain in a poorer cosmetic outcome. Further investigation is needed to determine if this is significant, especially as this may be exaggerated following SILS.
M1618

Gallbladder Mass Identified on Ultrasound: Lessons from the Last Nine Years

Elif Cetin, MD, Boston University School of Medicine, Boston, MA

BACKGROUND: Gallbladder lesions identified on ultrasound often prompt surgical interventions due to risk of malignancy. Patients are often subjected to an open cholecystectomy rather than a laparoscopic cholecystectomy. Our aim is to describe a large contemporary series of patients who underwent cholecystectomy for gallbladder masses identified on “modern” ultrasound imaging.

METHODS: Retrospective review of patients who underwent a gallbladder ultrasound and were diagnosed with a polyp or mass between 2000-2012. Available ultrasound images were reviewed.

RESULTS: Overall 201 patients were explored for a pre-operative diagnosis of a gallbladder mass or polyp identified on ultrasound. On final pathology 117 patients (56%) had a polyp, 22 patients (11%) had a benign adenoma, 21 patients had a polyp of various types (11%, 3 of whom were malignant) and 11 patients (7%) had an invasive adenocarcinoma. Patients with adenocarcinoma had a median US size of 34 mm (9.8-59). On univariate analysis predictors of malignancy were a size ≥ 10 mm (p < 0.001), irregular gallbladder margin on ultrasound (p < 0.001), presence of invasion at the liver interface (p < 0.001) and wall thickening (p < 0.001) whereas factors such as shape (round or pedunculated), echogenicity (hyperechoic or hyperechoic) or presence of flow on Doppler did not differ significantly between malignant and benign cases. Among the patients who were resected 124 patients had no mass identified on final pathology. For these patients 26% had a presurgical size > 10 mm and 21% had a mass > 30 mm, 11% had a thickened wall, 1.6% had irregular margins but none had evidence of invasion. Among the 52 patients with a presurgical lesion of less than 5 mm 42 (81%) patients had no mass, 6 (11%) patients had a polyp, and 4 (8%) patients had an adenoma.

CONCLUSIONS: Mass lesions in the gallbladder identified on ultrasound continue to present a clinical dilemma. The development of a risk score for malignancy based on suspicious characteristics such as size > 10 mm, irregular GB margin, presence of invasion and wall thickening will allow patients to undergo further diagnostic studies.

M1619

Evolutionary Patterns and Immunoregulation of Leucocytes in the Gut

Vincent Harrison, Oregon Health & Science University, Portland, OR

BACKGROUND: Historically, uncomplicated gallbladder diseases have been studied as the introduction of a laparoscopic cholecystectomy (LC) and its increasing availability have changed how patients with gallbladder disease are approached. Our purpose is to evaluate national practice trends with (LC) for gallbladder disease.

M1620

Increased Rate of Sphincter Preservation Following Rectal Cancer Resection in High Volume Hospitals

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BACKGROUND: The purpose of this study was to determine whether sphincter preservation in patients undergoing elective resection for rectal cancer was associated with surgeon or hospital volume. We also sought to determine whether morbidity and mortality are affected by case-volume.

METHODS: Using the U.S. Nationwide Inpatient Sample database, we identified all adult patients who underwent elective colorectal surgery for their primary procedure between 2003 and 2007. Cases were divided into three groups according to the average number of resections performed annually by each surgeon: low-volume (≤ 5 cases/year), intermediate-volume (5-9 cases/year), or high-volume (≥ 10 cases/year). The hospital case-load was also categorized as low-volume (≤ 50 cases/year), intermediate-volume (51-100 cases/year) and high-volume (> 100 cases/year). Multiple logistic regression models were used to identify differences in morbidity and mortality according to hospital volume while controlling for patient and tumor-related factors, including comorbidities according to the Elixhauser algorithm.

RESULTS: A total of 54,000 patients underwent resection of colon cancer by 7,313 surgeons in 1398 hospitals. In univariate analysis, a reduction in mortality rate was observed among patients operated on by high-volume surgeons (2.6 vs. 3.9% p < 0.0001) or in high-volume hospitals (2.6 vs. 3.6% p < 0.0001) compared to the corresponding low-volume groups. After adjusting for important covariates including hospital volume, colon cancer resection by high-volume surgeons was an independent predictor of decreased morbidity (odds ratio [OR] 0.91; 95% CI 0.85-0.97) and mortality (OR: 0.75; 95% CI 0.65-0.86). Morbidity was lowest among patients operated on by high-volume surgeons in high-volume hospitals (2.6 vs. 3.9%; p = 0.05, 95% CI 0.46-0.68). Resection by high-volume surgeons was associated with a decreased length of stay and reduced hospital charges.

CONCLUSIONS: In patients undergoing elective resection of colon cancer, procedures done by high-volume surgeons are associated with decreased morbidity and mortality.

M1622

Real Time PCR Based Approach for Rapid and Specific Diagnosis of Culture Negative Gastrointestinal Tuberculosis and Characterization of Its Host Immunological Features

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BACKGROUND: The gastrointestinal (GI) tract is the sixth commonest extra-pulmonary site to be affected by Mycobacterium tuberculosis complex (MTBC) infections, yet it is often underdetected. This form of TB has an insidious course like any other chronic infectious disease without any specific laboratory, radiological or clinical signs and symptoms. Any kind of delay in prompt initiation, leads to progression of MTBC into disseminated infection. Due to this non-specificity and difficulties associated with its diagnosis, development of a rapid and more specific investigatory method is an urgent need of hour.

OBJECTIVE: To identify the culture negative MTBC infections in endoscopic biopsies and formalin-fixed, paraffin-embedded tissues of gastrointestinal tract using a fluorescence resonance energy transfer (FRET) hybridization probe and real-time polymerase chain reaction (PCR) approach and characterization of its host immunological features.

MATERIALS AND METHODS: The present study included three groups (A) control (n = 24) with no previous signs of Mycobacterium tuberculosis complex (B) patients (n = 28) with known TB origin (C) patients (n = 50) with clinical and histo-pathological signs of TB but was culture and AFB negative. Real time PCR assay using Roche Light Cycler (LC) 2.0 with FRET probes was performed for the specific amplification of 159 bp region of mycobacterium genome. Later host immune characterization of the PCR positive samples was performed through immunohistochemistry and Th1/Th2 cytokine profiling using flow cytometry. Students’ t-test was employed for statistical analysis using SPSS software and p value of ≤ 0.05 was considered to be significant.

RESULTS: All the samples (n = 24) of group A were found to be negative while in group B 27 out of 28 reported positive (96.4%) for MTBC, and 1/28 (4%) were found to be positive showing a positivity of 36%. The sensitivity and specificity of the test was 97.87% and 100% respectively with positive predictive value of 99% and negative predictive value of 98%. On immune characterisation of the LC PCR positive group C cases a depleted CD4+ count and increased levels of IFN-γ and TNF-a were observed.
CONCLUSION: Application of FRET probe based real-time PCR based diagnosis offers a better approach for rapid and specific diagnosis of negative tuberculous infections in the gastrointestinal tract. In addition, understanding host immunological response against such infections might provide specific therapeutic strategies for prevention and treatment of the infection in future.

**M1623**

Portal Venous Thrombus (PVT) Following Restorative Proctocolectomy and Ileal Pouch-Anal Anastomosis (IPAA) for Ulcerative Colitis (UC): Does the Laparoscopic Approach Increase the Risk of PVT

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**INTRODUCTION:** Restorative proctocolectomy (RPC) with IPAA has become the procedure of choice for surgical management of UC. Although patients with UC have a three times greater risk of venous thrombotic events than the general population, those patients who have undergone RPC and IPAA are at an even higher risk for life-threatening venous prothrombotic events. PVT has been increasingly observed after IPAA and can be one of the more serious post-operative complications. PVT usually presents with a spectrum of clinical symptoms including abdominal pain, fever, and/or leukocytosis. The aim of this study was to determine the incidence of confirmed portal and mesenteric venous thrombosis in UC patients following either laparoscopic (LAP-RPC) or open-RPC and IPAA and to characterize their clinical presentation.

**METHODS:** Between 6/2003 and 1/2008, 85 consecutive UC patients who underwent laparoscopic or open RPC-IPAA via a single surgeon were retrospectively evaluated. Any patient who received an abdominal/pelvic contrast enhanced computed tomography (CT) scan postoperatively was included. The symptoms necessitating radiologic evaluation were recorded. CT images were reviewed by two radiologists for the presence of PVT using a 5-point scale system and the location, if present, in one or more of the portal vessels (main portal vein, intraportal portal vein branches, superior mesenteric vein and inferior mesenteric vein) was recorded.

**RESULTS:** Eighty-five patients (ages 14-72, 52% male) underwent RPC-IPAA for UC of which 15 were LAP-RPC (18%). Twenty-seven patients that underwent open RPC-IPAA (32%) and six that underwent LAP-RPC (7%) subquently underwent a contrast enhanced CT scan of the abdomen/pelvis for various presentations: abdominal pain (38%), fever (21%), follow up (15%), rectal pain (6%), nausea/vomiting (6%), and other (18%). In the cohort of 15 patients who underwent LAP-RPC, all 6 patients (40%) who went on to have a CT scan were diagnosed with PVT. Of the 20 patients (24%) identified with PVT, 15 were discovered within 6 weeks of surgery (18%) including all 6 patients who underwent LAP-RPC.

**CONCLUSION:** Portal Venous Thrombus appears to be a more frequent finding following LAP-RPC than open RPC for UC. Patients undergoing elective surgery should be considered at high risk for this potential risk and for those still interested in LAP-RPC, a pre-operative hypercoagulable work-up should be considered. Post-operatively, early screening with a coagulation panel and abdominal imaging and six weeks is recommended for either surgical approach.

**M1624**

Electroacupuncture for Postoperative Ileus After Laparoscopic Colorectal Surgery: An Interim Analysis of a Randomized Sham-Controlled Study

Simon L.M. Ng, Surgery, The Chinese University of Hong Kong, Hong Kong, China

**BACKGROUND:** Postoperative ileus remains a significant medical problem after colorectal surgery that adversely influences patients’ recovery and prolongs hospital stay. Acupuncture is widely accepted as an effective treatment option for postoperative nausea and vomiting, but its role in treating postoperative ileus is unclear. We report interim analysis of a randomized sham-controlled study that aimed to investigate the efficacy of electroacupuncture in reducing the duration of postoperative ileus and hospital stay after laparoscopic colorectal surgery.

**METHODS:** Consecutive patients undergoing elective laparoscopic resection of colon and upper rectal cancer without the need of stoma creation or conversion were randomly allocated to one of the three groups receiving either electroacupuncture (EA), sham acupuncture (SA), or no acupuncture (control). The acupuncture points Zusanli, Sanyinjiao, Hegu, and Zhigou were used. Patients randomized to the EA and SA groups underwent one session of acupuncture daily (15 minutes each) from postoperative day 1 till day 4. The primary outcome was time to defecation. Secondary outcomes included time to resume diet and hospital stay.

**RESULTS:** Between October 2008 and October 2009, 108 patients were randomized. At EA, 38 SA, 35 control) were recruited. The demographic data were similar between groups. Comparing with the control group, the EA group had significantly shorter time to defecation (94.7 hours vs. 118 hours, P = 0.042), time to resume normal diet (4.1 days vs. 5.1 days, P = 0.086), and duration of hospital stay (7.1 days vs. 9.1 days, P = 0.041). The time to defecation of the EA group was also shorter than that of the SA group (94.7 hours vs. 108.6 hours), but the difference did not reach statistical significance (P = 0.210). The time to resume normal diet and the duration of hospital stay did not differ significantly between the EA and SA groups. No adverse event related to acupuncture was noted.

**CONCLUSION:** This interim analysis suggests that EA is more effective than no acupuncture in reducing the duration of postoperative ileus and hospital stay after laparoscopic colorectal surgery, whereas there are no significant differences between EA and SA. A larger trial is required. This study is supported by the Health and Health Services Research Fund, Food and Health Bureau, The Government of the Hong Kong SAR (Reference Number 10070171).

**M1625**

Transanal Versus CT-Guided Drainage for Pelvic Abscess Following Anastomotic Leak in Patients with Ileal Pouch-Anal Anastomosis

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**PURPOSE:** Evidence is lacking whether an abscess associated with anastomotic leak after ileal pouch-anal anastomosis should be drained by transanal or CT guided drainage. In order to clarify their relative potential implications on subsequent anastomotic healing, development of extraspincteric fistula and long term pouch retention, we compare outcomes after the two techniques for drainage.

**METHODS:** Patients who underwent IPAA from 1984-2009 and diagnosed with a pelvic abscess associated with an anastomotic leak on imaging studies were identified. Choice of operative or non-operative drainage was based on surgeon preference. Differences between patients undergoing transanal (Group A) and CT-guided drainage (Group B), for demographic, preoperative, and operative details, functional outcomes, and quality of life were determined.

**RESULTS:** Group A (n = 56) and Group B (n = 19) had similar age (52.1 ± 11.9 vs. 29.6 ± 12.2 years, p = 0.63), gender (male: 75% vs. 70%, p = 0.67), BMI (27.4 ± 6.6 vs. 27.5 ± 4.5 kg/m², p = 0.31), diagnosis (ulcerative colitis, 64.7% vs. 63.2%, p = 0.15), steroid use (51% vs. 37.9%, p = 0.61), albumin level (4.1 ± 0.6 vs. 4.5 ± 0.2 g/dL, p = 0.28), defunctioning ileostomy (92.3% vs. 85%, p = 0.39), length of hospital stay (days, 9.4 ± 5.3 vs. 13.9 ± 12.1) and follow up (18.5 ± 14.6 vs. 4.3 ± 4.8 years, p = 0.48). Size of abscess was greater in Group B (5.3 ± 2.6 vs. 8.5 ± 3.4 cm, p = 0.007). Site of CT-guided drainage was mainly gluteal (n = 12). Two patients (10.5%) developed fistula at CT-guided drainage site. Both healed after conservative treatment and drainage of associated gluteal abscess, respectively. Seven patients (12.5%) in Group A and 4 patients (21%) in Group B (p = 0.4) had pouch failure and underwent redo pouch surgery, pouch excision or permanent diversion despite drainage of the abscess. At most recent follow-up, Groups A and B had similar bowel frequency (p = 0.57), incontinence rate (p = 0.46), urgency (7.9% vs. 15.4%, p = 0.46), sepsis (p = 0.39) and pad usage (p = 0.92). Quality of life (p = 0.6), happiness with surgery (p = 0.34) and satisfaction (p = 0.57) were similar. The overall 3-year recurrence and Klüver score of IPAA was similar between the groups (p = 0.57). Sensitivity analysis was based on local surgeon's preference.

**CONCLUSIONS:** The results of the present study demonstrate that the modified Glasgow Prognostic Score is independently associated with the pattern of recurrence, to the liver in particular, in patients undergoing potentially curative resection for colorectal cancer. In contrast, the Klüver score was not associated with any specific pattern of recurrence.

**M1626**

The Relationship Between Inflammation Based Pathologic and Biochemical Prognostic Criteria and Site of Recurrence Following Curative Resection for Colorectal Cancer

Jonathan J. Platt, Glasgow University Department of Surgery, Glasgow Royal Infirmary, Glasgow, United Kingdom

**OBJECTIVE:** To examine the relationship between the pre-operative systemic inflammatory response (modified Glasgow Prognostic Score, mGPS), the peritumoral inflammatory response (Klüver score) and site of recurrence in patients undergoing curative resection for colorectal cancer.

**BACKGROUND:** Although known to have prognostic value, the pattern of disease recurrence associated with the mGPS and Klüver score has not been examined.

**METHODS:** 291 patients between 1997 and 2007 were studied. mGPS was derived from routine preoperative blood tests. Routine pathology specimens were scored according to Klüver criteria. Recurrence was defined as liver alone (intrahepatic), other sites (extrahepatic) and combined (intra- and extrahepatic).

**RESULTS:** Both the mGPS (HR 1.53, 1.19-1.97, p = 0.001) and Klüver score (HR 2.11, 1.23-3.65, p = 0.007) were independently associated with 3 year recurrence free survival. However, only the mGPS was significantly associated with an intrahepatic site of recurrence (p < 0.01). Of those patients with an intrahepatic recurrence, 66% had an elevated mGPS of 1 or 2. In contrast, 44% patients with extrahepatic recurrence had an elevated mGPS of 1 or 2 and 10% of patients with intra-and extrahepatic recurrence had an elevated mGPS of 1 or 2 (p = 0.01).

**CONCLUSIONS:** The results of the present study demonstrate that the modified Glasgow Prognostic Score is independently associated with the pattern of recurrence, to the liver in particular, in patients undergoing potentially curative resection for colorectal cancer. In contrast, the Klüver score was not associated with any specific pattern of recurrence.
METHODS: A historical cohort of 245 patients from the Pouchitis Clinic were included. The clinical variables evaluated included: age, sex, age at onset of disease, year of IPAA, reason for the operation, comorbidities such as diabetes, steroid use, smoking, NSAID use, pre-referral diagnosis, pre-referral treatment regimen, endoscopic findings, pathological results, post-referral diagnosis and post-referral treatment regimen.

RESULTS: Of the 245 patients (51% were females, median age 50 years, 87% with a preoperative diagnosis of ulcerative colitis, 3% CD, 4% IBDN 0.5% (indeterminate, 5% other) with presumed pouchitis and other pouch disorders, 117 (48%) had the diagnosis revised to most commonly irritable bowel syndrome (IBS) or Crohn's disease (CD) of the pouch. Of the 101 patients referred from outside hospitals, 57 (56%) had a revision diagnosis. 136 patients had diagnosis of pouchitis before referral, and 69 patients had diagnosis of pouchitis post-referral. IBS was diagnosed in 52 patients pre-referral, and 123 post-referral.

CONCLUSION: Our findings suggest that it is important to use clinical, endoscopic and histological assessment to establish accurate diagnosis. The subspecialty care would optimize patients' care.

FUTURE TOPICS: Recognition of IBD, accurate diagnostic and treatment algorithm for pouchitis, benefit analysis of management of pouch related disorders in a tertiary center.

Table 1. Preoperative Diagnosis

<table>
<thead>
<tr>
<th>Procedure/Condition</th>
<th>Pre-referral (%)</th>
<th>Post-referral (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crohn's disease</td>
<td>10 (4%)</td>
<td>13 (5%)</td>
</tr>
<tr>
<td>IBDN</td>
<td>9 (4%)</td>
<td>13 (5%)</td>
</tr>
<tr>
<td>Others</td>
<td>11 (5%)</td>
<td>12 (5%)</td>
</tr>
<tr>
<td>CD</td>
<td>9 (4%)</td>
<td>13 (5%)</td>
</tr>
<tr>
<td>Pouchitis</td>
<td>12 (5%)</td>
<td>13 (5%)</td>
</tr>
<tr>
<td>Small Bowel Infection</td>
<td>2 (1%)</td>
<td>13 (5%)</td>
</tr>
<tr>
<td>Overgrowth</td>
<td>2 (1%)</td>
<td>13 (5%)</td>
</tr>
</tbody>
</table>

Table 2. Revision Diagnosis

<table>
<thead>
<tr>
<th>Procedure/Condition</th>
<th>Pre-Renal (%)</th>
<th>Post-Renal (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pouchitis</td>
<td>138 (56%)</td>
<td>138 (56%)</td>
</tr>
<tr>
<td>Fistula/Stricture</td>
<td>24 (9%)</td>
<td>24 (9%)</td>
</tr>
<tr>
<td>CD</td>
<td>10 (4%)</td>
<td>11 (4%)</td>
</tr>
<tr>
<td>Pouchitis</td>
<td>54 (22%)</td>
<td>54 (22%)</td>
</tr>
<tr>
<td>IPS</td>
<td>22 (9%)</td>
<td>23 (9%)</td>
</tr>
<tr>
<td>Small Bowel Infection</td>
<td>2 (1%)</td>
<td>2 (1%)</td>
</tr>
<tr>
<td>Overgrowth</td>
<td>2 (1%)</td>
<td>2 (1%)</td>
</tr>
</tbody>
</table>

M1629 Preoperative Biopsy Findings Correlate Poorly with Postoperative Findings in IBD-Associated Neoplasia

Angelina Postoev, General Surgery, Cleveland Clinic, Cleveland, OH

Preoperative biopsy findings of neoplasia in inflammatory bowel disease (IBD) do not always correlate with postoperative pathology. The aim of this study was to determine the pathologic correlation rate between preoperative biopsies and postoperative pathology. From 2002-2009, patients presenting for colectomy for IBD-associated neoplasia underwent review of preoperative biopsies and colectomy specimens by pathologist specializing in gastrointestinal disease at our institution. All specimens underwent standardized examination at 5 micron intervals in areas of interest. 35 patients with IBD-associated neoplasia were identified. 6 patients had a biopsy proven mass consistent with invasive cancer and were excluded. Of the remaining 29 patients, 22 (76%) were male, mean age was 50 yrs, mean time with IBD was 16 yrs, 23 underwent restorative proctocolectomy (RP). The average histology sections examined per patient following RP was 36.4 range (22–66).

3 patients had invasive cancer on routine surveillance biopsy. High grade dysplasia (HGD) was identified in 8 patients and low grade dysplasia (LGD) with or without a dysplastic associated benign mass (DALM) was identified in 17 patients. 1 patient was indefinite for dysplasia. Overall, the rate of cancer in final pathology specimen was 14%, the rate of no neoplasia was 24%, and correlation with preoperative biopsy was 41%. In patients with an initial biopsy demonstrating cancer, one patient had no identifiable cancer in the colectomy specimen. Among patients with HGD, unknown cancers were found in 12.5% of patients and preoperative biopsies correlated with the final postoperative pathology in 56% of patients. Among patients with LGD, unknown cancers were identified in 5.9% of patients and preoperative biopsies correlated with the final postoperative pathology in 56% of patients. Among patients with LGD, unknown cancers were identified in 5.9% of patients and preoperative biopsies correlated with the final postoperative pathology in 56% of patients. With no associated lesion (DALM and LGD), the correlation rate was 57% (see Table). Correlation between preoperative biopsies and final pathology among patients with IBD-associated neoplasia, especially if a DALM is present, remains low even among pathologist specializing in inflammatory bowel disease. The cancer risk remains elevated, which suggests that surgery remains indicated for both HGD and LGD.
Clinical: Esophageal

M1631
Long Term Conditional Survival in Esophageal Cancer: A SEER Database Analysis
Attila Dubecz, Surgery, Klinikum Nürnberg, Nürnberg, Germany

BACKGROUND: For esophageal cancer patients 5-years survival rates are generally reported in the literature. It is not clear however, that in patients who already survived a certain period of time what probabilities of surviving an additional 5 years apply.

METHODS: Clinical stage, surgical and non-surgical treatments, age, and race of patients with cancer of the esophagus were identified from the Surveillance, Epidemiology and End Results (SEER) registry (1988–2004). SEER identified a total of 25,306 patients with esophageal cancer (average age: 65.0 years, male-to-female ratio: 3.1). Overall five and ten-year survival of patients through all stages and the relative conditional survival (CS) of patients surviving an additional 5 years after already surviving 0–5 years was calculated using the Kaplan-Meier method. CS was defined as: CS (x) is the probability of surviving an additional 2 years, given that the person already survived for x years. Multivariate analysis was used to examine determinants of 10 year survival; variables tested included age, gender, race, marital status, histology and surgical therapy.

RESULTS: Five and ten-year overall survival of the study population was 13.2/7.6 percent, respectively. Relative conditional 5-year survival of patients surviving 0–5 years by SEER stage is reported in Table 1. Patients with distant metastasis have more than 23 times higher chance of surviving the second than the first five years after diagnosis.

Table 1.

<table>
<thead>
<tr>
<th>Stage</th>
<th>5-Year Survival (%)</th>
<th>10-Year Survival (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Situ</td>
<td>99.1</td>
<td>99.1</td>
</tr>
<tr>
<td>Localized</td>
<td>25.4</td>
<td>14.9</td>
</tr>
<tr>
<td>Regional</td>
<td>12.8</td>
<td>5.7</td>
</tr>
<tr>
<td>Distant</td>
<td>2.8</td>
<td>6.0</td>
</tr>
</tbody>
</table>

CONCLUSION: Overall long-term survival with esophageal cancer is poor, but patients surviving 5 years after diagnosed with esophageal cancer have more than fifty percent chance of surviving until 10 years. The largest gain in conditional survival are seen in patients with advanced disease.

M1632
Evaluation of Preoperative Risk Factors for Postoperative Heartburn After Reoperative Anti-Reflux Surgery
Ashraf Leguey, Surgery, Creighton University Medical Center, Omaha, NE.

BACKGROUND: Results after reoperative anti-reflux surgery (Re-ARS) are known to be inferior to primary intervention but little is known about predictors for poor outcome. The aim of this study was to understand the potential preoperative risk factors that lead to persistent postoperative heartburn (HB) along with patient satisfaction.

METHODS: After IRB approval, a prospectively maintained database was retrospectively reviewed to identify patients with >1 year of follow-up after Re-ARS. HB severity was graded 0–3 before and after Re-ARS based on responses to a standardized questionnaire. Patients reporting symptoms of grade 2 or 3 were considered to have significant HB. Satisfaction with Re-ARS outcome was graded using a 10 point analog scale.

RESULTS: Between December 2003, and September 2008, 110 patients underwent Re-ARS by a single surgeon (EM). Significant pre-operative HB was reported by 52 (47.3%) patients and impaired esophageal motility was noted in 31 (28.2%). Remedial surgery included redo-fundoplication (n = 90, 81.8%), Collis gastroplasty with redo-fundoplication (n = 16, 14.6%), take down of the fundoplication only (n = 5, 2.7%), and hiatal closure after lysis of dense adhesions (n = 1, 0.9%). At least one year of follow-up (mean 21.8 months) was available for 94 (85.5%) patients. In patients with significant pre-operative HB (n = 46 the mean symptom score declined from 2.21 to 0.6 (p < 0.0001) Fourier (14.9%) patients reported significant postoperative HB. Of these, 10 patients reported persistent HB and four had new-onset appearance of the symptom. Univariate logistic analysis indicated that postoperative HB is significantly associated with preoperative esophageal dysmotility (OR: 6.9 CI 1.8–26.4). Multivariate logistic regression identified the esophageal dysmotility (OR: 7.83 CI 1.5–16.8) and the preexisting HB (OR: 3.86 CI 1.005–14.48) as a risk factors for significant postoperative HB. The overall satisfaction score was 8.3 and 91% of patients would recommend the procedure to a friend. Patients with good esophageal motility and without preoperative HB were significantly more satisfied with the results (8.7) than those with impaired esophageal motility and significant preoperative HB (6.9, p = 0.007).

CONCLUSION: Although HB is a common symptom among patients requiring Re-ARS, the reoperative intervention provides significant benefit. Patients with impaired esophageal motility—especially those with significant preoperative HB—are at increased risk for poorer outcomes and decreased satisfaction following Re-ARS.

M1633
Vagal-Preserving Esophageal Resection with Jejunal or Colon Interposition: Long-Term Outcome
Jarro J. Salo, Division of General Thoracic and Esophageal Surgery, Department of Cardiothoracic Surgery, Helsinki University Central Hospital, Helsinki, Finland

BACKGROUND: Vagal-preserving esophageal resection (VPR) is mostly performed because of high grade dysplasia or intramural carcinoma in Barretts esophagus, or in benign end stage complications such as stricture, sigmoid achalasia, epiphrenic diverticulum, perforation, and tumor. Awkward side effects like dumping, diarrhea, and gastritis caused by vagal denervation can usually be avoided by VPR. Although early results of VPR are promising, there are very few studies concerning its long term results.

MATERIAL AND METHODS: VPR with jejunal or colon interposition with intracorachic anastomosis was performed in 47 patients between 1994 and 2009. 16 patients (34%) had had 1–2 previous esophageal operations. Follow-up of all patients included periodically endoscopies, barium swallow, esophageal radionuclide transit, scintigraphic measurement of duodeno-gastro-jejunal reflux, pH-monitoring, and manometry.

RESULTS: One patient died because of lung embolism (mortality 2%). 12 patients (26%) had postoperative complications: 3 anastomotic leak (all after >10 days), 3 postoperative bleeding with mediastinal hematoma, 2 pneumonia, 1 patchy pulmonary necrosis, 1 stroke and 1 gynecologic candida-sepsis. Radio nuclide transit in the colon interposition was significantly slower than in the jejunal interposition, which on the other hand was significantly slower than in 10 normal volunteers. 1 patient presented with scintigrphic duodeno-gastric reflux, but no one had scintigraphic reflux into the interponate. 97% of patients operated on, because of complicated GERD, had normal postoperative pH-monitoring. During the follow-up of 1–15 yrs (mean 8 yrs) it was generally asymptomatic with good quality of life and normal postoperative endoscopy. 2 patients were treated conservatively because of gastrointestinal hemorrhage (normal interponate). 4 patients had to be reoperated after 4–10 years. 3 resection of the jejunal interponate because of elongation and intussusception causing dysphagia and 1 because of high grade dysplasia in the proximal stomach appearing 6 years after VPR because of earlier esophageal dysplasia.

CONCLUSION: The good objective and subjective short term results of VPR stand the test of time in most patients. In the long term dysphagia may arise due to elongation and intussusception of jejunal interponate. Therefore, the jejunal interponate should be straight, fixed in the mediastinum, and covered with mediastinal pleura.

M1634
Evaluation of POSSUM and Its Related Models as an Audit Tool in Patients Undergoing Gastro-oesophageal Cancer Resection
Sumanta Dutta, Department of Surgery, University of Glasgow, Glasgow, United Kingdom

BACKGROUND: The aim of the study was to evaluate the use of the Physiological and Operative Severity Score for the enUmeration of Mortality and morbidity (POSSUM), Portsmouth (P) POSSUM and upper gastrointestinal (CS) POSSUM models in patients undergoing elective resection for gastro-oesophageal cancer.

PATIENTS AND METHODS: Elective gastro-oesophageal cancer resections in Glasgow Royal Infirmary from January 2005 to May 2009 were scored by POSSUM, P-POSSUM and O-POSSUM models. Observed mortality rates were compared to predicted mortality rates in three risk groups for each model using the Hosmer-Lemeshow goodness-of-fit test. The power to discriminate between patients who died and those who survived was assessed using the area under the receiver-operator characteristic (ROC) curve.

RESULTS: The observed mortality rate was 4.1 per cent, whereas rates predicted by POSSUM, P-POSSUM and O-POSSUM were 6.5, 5.8 and 9.9 per cent respectively. POSSUM over-predicted mortality in all risk groups, whereas O-POSSUM and P-POSSUM over-predicted mortality in low risk groups. The area under ROC curve for P-POSSUM (0.808) showed good discriminatory power than POSSUM (0.759), and O-POSSUM (0.715). The observed mortality was 48.8 per cent, whereas POSSUM predicted post-operative complication in 59.5 per cent. POSSUM morbidity equation showed poor discriminatory power (AUC 0.639).

CONCLUSION: All the POSSUM models over-predicted post-operative mortality accurately. P-POSSUM least over predicted the mortality with better discriminatory power in patients undergoing gastro-oesophageal cancer resection.
M1635
Parasophageal Hernia Repair with Biomech Does Not Increase Post-Operative Dysphagia
Thade A. Goer, Minimally Invasive Surgery, Legacy Health, Portland, OR

BACKGROUND: The transition from open to laparoscopic repair of parasophageal hernia (PEH) has allowed for significant reduction in morbidity and mortality but higher recurrence rates were reported. While the addition of synthetic mesh at the hiatus can decrease the recurrence rate, it also can be associated with complications such as stricture formation, erosion and perforation. When biomech is placed at the hiatus, the anticipated result is less local inflammation and tissue reaction than that observed with synthetic mesh while still establishing a more durable PEH repair. However, it is possible that the addition of any material at the hiatus may result in decreased pliability and increased patient complaint. Therefore, our hypothesis in this study was that patients who had a PEH repaired with biomech would have increased dysphagia in the post-PEH repair period.

METHODS: A retrospective review of prospectively collected data on patients who underwent PEH repairs using a standardized biomech placement technique. A comparable cohort of patients who had PEH repairs performed using a standardized technique without mesh was also reviewed. Patient demographics, details of hernia repair, postoperative esophageal manometry and patient symptomatology and results of a validated subjective questionnaire (dysphagia, gas bloat, heartburn, chest pain, abdominal pain, inability to belch) were recorded.

RESULTS: One hundred and sixty-two patients were reviewed. Ninety patients completed 6 month follow-up (57 mesh, 33 primary). At the 2 week evaluation, mesh patients had significantly more gas bloat (15.3% vs 0%, p = 0.012) nearly significant less dysphagia (10.5% vs 24.2%, p = 0.08). By 6 months, despite mesh patients having a higher median lower esophageal sphincter residual pressure (18.5 vs 12 mmHg, p = 0.0001) there was no significant difference between the 2 groups' symptoms or need for dilatation.

CONCLUSION: Patients who underwent PEH repair with biomech did not have higher rates of dysphagia compared to primary repairs after 6 month observation. This information is important in publications regarding lower recurrence rates when mesh is placed advocates for the use of mesh is all patients who have a large hiatal defects.

M1636
Impact of Race, Age and Gender on Outcomes of Laparoscopic Reflux Surgery
Manish M. Tosei, Department of Surgery, University of Nebraska Medical Center, Omaha, NE

INTRODUCTION: Disparities in outcomes of surgical procedures are well-recognized and extremely important. This study examined the impact of race, age, and gender on outcomes of adult laparoscopic reflux surgery (LRS).

METHODS: University HealthSystem Consortium (UHC) is an alliance of over 100 academic medical centers and affiliate hospitals. UHC’s Clinical Database/Resource Manager (CD/RM) allows comparison of patient-level risk-adjusted outcomes for performance improvement. A retrospective analysis of discharge data (2006-09) of adult LRS for esophagitis and esophageal reflux was performed using UHC database CD/RM. Discharge data from the UHC database was accessed using International Classification of Diseases (ICD-9) codes. Principal outcome measures analyzed were mortality, morbidity, 30-day readmission, intensive care unit (ICU) admission, length of ICU stay, length of stay (LOS) and costs.

RESULTS: A total of 8,941 patients were included in the study. Race and age-related differences in LRS outcomes were noted: 81% of patients were Caucasian, Hispanics had equivalent LOS and African-Americans showed significantly higher LOS (2.9 ± 4.7 days for Caucasians vs. 4.1 ± 10.7 days for African-Americans vs. 3.06 ± 4.13 days for Hispanics; p<0.05). In addition, African-Americans showed significantly higher overall morbidity (12.66% for Caucasians vs 15.83% for African-Americans; p<0.05) and hospital costs ($122,131 ± 17,341 for Caucasians vs $16,165 ± 35,420 for African-Americans; p<0.05). Overall morbidity due to LRS progressively increased with age from 9.62% in 18-30 years group to 17.53% in the ≥65 years group. No significant gender differences were observed in overall morbidity (12.72% for males vs 12.66% for females; p<0.05), length of stay (2.87 ± 5.74 days for male vs 3.04 ± 5.23 days for female; p>0.05) or costs (12,389 ± 20,692 for male vs. 12,136 ± 17,004 for female; p<0.05) for LRS were observed.

CONCLUSIONS: This study showed race and age-related differences in outcomes of LRS. African-American patients showed relatively poor surgical outcomes and a more complicated post-operative course. With increasing age, a trend towards increased overall morbidity was observed. Thus, patient race and age appear to have an impact on outcomes of laparoscopic reflux surgery.

M1637
Endoscopic Management of Early Esophageal Neoplasia: An Emerging Standard
Catherine Leigh Whitby, Thoracic Surgery, University of Rochester Medical Center, Rochester, NY

INTRODUCTION: The introduction of endoscopic mucosal resection (EMR) and mucosal ablation technologies has markedly changed the treatment options for early esophageal neoplasia. Assessment of success is largely from 3-5 uniquely high volume centers. Our aim was to evaluate the treatment outcome of a cohort of patients undergoing multimodal endoscopic treatment of early esophageal neoplasia.

METHODS: The study population included 29 patients treated between 1/07 and 9/09. The degree of neoplasia was low grade dysplasia in 2, high grade dysplasia (HGD) in 21 and adenocarcinoma in 6 (4 intramucosal and 2 invasive). Average length of the Barrett’s segment was 4.2 cm (range 1–13 cm). 103 procedures were performed in 29 patients (28 EMR, 72 radiofrequency ablations, and 3 cryoablations). Average number of procedures per patient was 3.6 (range 1–31). Median follow up was 15 months (range 3.9–33.9 months) from the time of first intervention. Endoscopic assessment of residual/recurrent disease was performed every 3 months following completion of active therapy. A complete response (CR) was defined as two consecutive biopsies without dysplasia. Complete response Disease was defined as metachronous if biopsy demonstrated HGD or adenocarcinoma after CR was achieved.

RESULTS: Eighty-nine percent (17/19) of patients achieved CR. Median time to CR was 7.1 months. Three patients (15%) developed metachronous HGD: 2 patients achieved secondary CR and the third is continuing endoscopic therapy. 2 patients (1%) with intramucosal carcinoma had EMR specimens with tumor involvement of the deep margin. One underwent esophagectomy for a T4aN0M0 tumor, and the second chose to continue endoscopic therapy. Two patients (7%) with HGD had disease progression: one moderate surgical risk patient who developed invasive adenocarcinoma and chose to continue with endoscopic therapy and the other a high risk surgical candidate who developed intramucosal carcinoma. Both have since had CR. Four patients (4%) developed complications: chest pain requiring admission (2), stricture requiring dilation (1), and nausea/vomiting requiring admission (1). No patient had poor patient follow up.

CONCLUSIONS: Endoscopic treatment of early esophageal neoplasia is safe and effective in the vast majority of patients in the short term. Complications are uncommon and relatively minor. A small proportion will develop recurrent neoplasia which is usually amenable to retreat endoscopic therapy. Endoscopic therapy for early esophageal neoplasia is indeed an emerging standard of care.

Clinical: Hepatic

M1638
Open Versus Laparoscopic Liver Resection: Looking Beyond the Immediate Post-Operative Period
Judith P. Fox, Department of Surgery, Wayne State University, Detroit, MI

INTRODUCTION: Laparoscopic liver resection for malignant disease is becoming more frequent due to less blood loss, shorter hospital stay, better pain control, and faster recovery. The purpose of this study was to compare in-house, 30-day, and 1-year morbidity between laparoscopic and open liver resection.

METHODS: A chart review was conducted to identify all patients who underwent liver resection for malignant disease between April 2006 and October 2009. Patient, operative, and outcomes data at 30-days and 1-year were collected. Statistical analysis was conducted to compare groups.

RESULTS: Seventy-six patients underwent liver resection with or without ablation: 49 open and 27 laparoscopic. The open and laparoscopic groups were similar in regards to age, gender, BMI, extent of liver resection, use of ablation therapy, and tumor pathology (all p values >0.05). The laparoscopic group had significantly less blood loss (p=0.004) and shorter hospital stay (p=0.002). During hospitalization, patients treated laparoscopically had fewer complications related to surgery or hospitalization (p= NS). Home disposition was similar in the laparoscopic group (96% vs 90%). More patients were readmitted at 30-days in the open group (2 vs 9, p=0.31). Based on readmissions, the procedure was considered to be a more durable PEH repair. However, this benefit was not observed at hospital stay.

CONCLUSION: Laparoscopic liver resection has been shown to improve operative and immediate post-operative outcomes. When looking beyond the initial hospital stay, those benefits appear to continue at 30-days and 1-year with fewer hospital readmissions and shorter hospital stays. This may also suggest lower long-term hospital costs for patients and healthcare systems. (See Table below)

Table 1. Comparison of Laparoscopic and Open Liver Resection Morbidity

<table>
<thead>
<tr>
<th>In-House Morbidity</th>
<th>30-Day Readmission</th>
<th>1-Year Readmission</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lap</td>
<td>Open</td>
<td>Lap</td>
</tr>
<tr>
<td>Patients (Complications/Readmission)*</td>
<td>8/10</td>
<td>20/41</td>
</tr>
<tr>
<td>Surgery-related</td>
<td>5</td>
<td>21</td>
</tr>
<tr>
<td>Hospitalization-related</td>
<td>3</td>
<td>15</td>
</tr>
<tr>
<td>Disease process-related</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

*Conversion to open included in laparoscopic group. Some patients had more than one complication or were admitted more than once.
M1639  
Surgery for Non-Cirrhotic Portal Hypertension in a Developing Country  
Sakala Punta, Surgical Gastroenterology, Apollo Hospitals, Chennai, India

INTRODUCTION: The role of elective or emergency surgery in portal hypertension is coming down worldwide due to the availability of excellent endotherapeutic facilities. In India, these facilities are confined to some major centers only in big cities. Hence surgical treatment had to be undertaken both for elective and emergency situations with excellent results in non-cirrhotic patients who are seen in large numbers in India with absolutely normal livers.

AIM: We prospectively evaluated the results of surgical treatment in patients with extra-hepatic portal venous obstruction and non-cirrhotic portal fibrosis.

MATERIALS AND METHODS: Over a two-year period we performed surgery in 64 patients with non-cirrhotic portal hypertension. Age ranged from 8 years to 57 years. 53 patients had proven extra-hepatic portal venous obstruction and 31 had non-cirrhotic portal fibrosis. 47 patients underwent proximal spleno-renal shunt procedure with a splenectomy and 17 patients underwent splenectomy with devascularisation. Majority of patients had evidence of hypersplenism.

RESULTS: Surgery was successful in all patients. Mean blood requirement was less than one unit. Pancytopenia improved in all the patients. With a follow-up of 12 years, 8 patients presented with upper GI bleeding and all of them settled with endotherapy. None developed encephalopathy or liver failure.

CONCLUSION: In the Indian subcontinent, where non-cirrhotic portal hypertension with normal livers is seen quite often and where uniform availability of good endotherapeutic facilities are not available, surgical treatment is an excellent one-time option with good results.

M1640  
Impact of Targeted Therapy on Complications After Resection of Colorectal Liver Metastases  
Paul Johnston, Department of Surgery, Memorial Sloan Kettering Cancer Center, University of Freiburg, University of Freiburg, Freiburg, Germany

The impact of chemotherapy (oxaliplatin, irinotecan) on liver parenchyma and mortality after liver resection for colorectal metastases (CRC-LM) has been increasingly investigated during the recent years. Antibodies (AB) like bevacizumab (BEV) or cetuximab (CET) are now frequently administered in CRC-LM settings. Some initial series could show a safety of those antibodies regarding liver resection but data are still rare. In this study we evaluated the impact of chemotherapy on liver resection and postoperative morbidity after liver resection.

METHODS: Since 1999 246 liver resections were performed for CRC-LM in our institute. In order to avoid any form of chemotherapy before surgery (prospective database). 200 patients (81%) had various preoperative CTX-regimens without AB (most fluorouracil, oxaliplatin- or irinotecan-based; include adjuvant and/or neoadjuvant) and 46 (7%) had BEV (34 BEV, 9 CET, 3 CET/BEV). Liver failure was defined as postoperative bilirubin >2 mg/dl, bile leak or symptomatic biliaryoma, mortality as in-hospital death. After intensive preoperative CTX a time interval of at least 4 weeks before surgery and a residual liver volume of at least 35% (compared to 25% in patients without CTX) was required. The CTX-groups with and without ABs were compared regarding perioperative outcomes.

RESULTS: A hemipatectomy was performed in 50% (no difference between both groups). The median volume of intraoperatively transfused blood was 0 ml in both groups (p = 0.51). Overall mortality was 10% non-significantly elevated in patients with CTX/AB (4.3% vs. 1% in CTX/noAB, p = 0.11). Any complication occurred in (AB vs. no AB) 56% and 46%, respectively (p = 0.20). The rates of liver failure (11% vs 9%), bilary complications (23% vs 15%), infectious complications (50% vs 20%) and relaparatomy (13% vs 8%) also showed no significant differences.

CONCLUSIONS: Our data confirm the relative safety of antibodies in CTXs before liver resection for CRC-LM. This effect may in part be due to our treatment policy (time interval and residual liver volume) after intensive preoperative CTX.

M1641  
Liver Transsection with Microwave Technology: A Novel Technique  
Derek Christian, Methodist Dallas Medical Center, Dallas, TX

Introduction. Hepatic surgery has evolved significantly in the past decade. In an attempt to decrease intraoperative complications i.e. bleeding and postoperative complications, various techniques have been applied. These have been decreasing intraoperative central venous pressure to utilizing staplers and other energy devices such as Radio frequency. Although MW use has been reported for hepatic cancer ablation, it remains unknown if it is efficacious for precouagulation prior to transsection. We report a novel approach, at a single institution, for liver precouagulation with MW technology.

METHODS: Peritoneal cavity was accessed and inflow and outflow control was secured. Glushkov’s capsule was then incised using electrocautery. Two antennae, 2 cm apart, were connected to 915 MHz generator at 10 W and were inserted 3 cm deep into liver parenchyma. The antennae were advanced into the liver parenchyma at a 130 degree angle, 2 cm apart. Once the liver parenchyma was firm and had changed its color to grey, the antennae were procured. For conventional method, transsection was performed at approximately 20 second intervals. The liver parenchyma was divided with electrocautery following precouagulation of the liver parenchyma using MW antennae. First order divisions (left, right or extended hepatectomy) were used as major resections. All other resections were grouped as minor resections.

RESULTS: Thirty five patients (24 men) with a median age of 60 yrs underwent liver resections. Diseases treated were colorectal metastases (19), hepatocellular carcinoma (6), pancreatic cancer (5), lung cancer (4), renal cancer and prostate cancer (1 each). 15/35 patients (43%) underwent an hepatectomy (n = 19), segmental resection (n = 5), hemangima (n = 2), focal nodular hyperplasia (n = 2), metastatic GIST (n = 1), hydatid cyst (n = 1), hepatoid carcinoma (n = 1) and hepatolithiasis (n = 1) suspected metastatic breast cancer (n = 1). Resections done were right hepatectomy (n = 19), segmental resection (n = 5), left hepatectomy (n = 4), extended right hepatectomy (n = 4), segment IV and segment V resections during radical cholecystectomy (n = 2), left lateral sectionectomy (n = 1). Median operative time for major resection was 188 and 251 mins for minor. There was one postoperative mortality due to respiratory failure. Bile leak needing stenting occurred in 1 patient. Median blood loss for major resection was 500 ml and 265 ml for minor. Intraoperative transfusion was required in 9 major and 1 minor resections. Other complications were ileus in 4, DVT in 2, intraabdominal abscess in 1 and cardiac events in 2 patients.

CONCLUSION: Liver precouagulation with MW technology is a novel and efficient technique with minimal morbidity and mortality for liver transsection.

M1642  
Outcome After Resection of Colorectal Liver Metastases: Analysis of 264 Patients  
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Because mortality and encouraging survival data resection of liver metastases (LM) of colorectal cancer (CRC) is increasingly performed in the multimodal management of these patients. The knowledge of prognostic factors is crucial in the planning of different treatments. In this study we updated our outcome results in 264 patients after first resection of liver metastases. The role of electrophysiology and Combined Chemotherapy for Recurrence

METHODS: Long-term survival was evaluated in 264 patients after first resection of CRC-LM between 1998 and 2008. Survival analysis was performed by Kaplan-Meier methods. Independent risk factor analyses for survival were done using Cox proportional hazard model.

RESULTS: 54% of the 264 patients lived at least on a hemipatectomy. Free hepatic resection margins were achieved in 86%. Five-year survival (S-5yr) was 44% in the entire study group. By univariate analysis an positive resection margin (S-5yr: 34% vs. 4%, p = 0.001), size of metastases $\leq$ 3 cm (S-5yr: 39% vs. 52%, p = 0.0041), number of CRC-LM > one (S-5yr: 39% vs 50%, p = 0.009) and increased tumor marker levels (CEA > 200 and/or CA 19-9 > 100; S-5yr: 30% vs 47%) were risk factors for a poorer outcome. Node positive primary CRC, and female gender showed a non-significant trend towards worse survival. In multivariate analysis the resection margin (p = 0.05), number of metastases (p = 0.001), number of liver metastases (p = 0.006) and increased tumor markers (p = 0.01) indepen-dently influenced survival. Neoadjuvant chemother-apy (performed in 16%) for CRC-LM did not influence survival but these patients had more and larger primary tumors than the other patients.

CONCLUSION: In our series, patients with favourable prognostic factors the complete resection of colorectal liver metastases is associated with good long term outcome. Established prognostic factors may be used in the multimodal setting to plan individual therapy. Further advances in adjuventaive chemotherapy may still increase resection rates or long term outcomes in patients with metastatized CRC.

M1643  
Surgical Treatment for the Patients of Intrahepatic Cholangiocarcinoma with Lymph Node Metastases: Repeat surgery and Combined Chemotherapy for Recurrence  
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BACKGROUND AND AIM: Intrahepatic cholangiocarcinoma (ICC) is increasing worldwide and still remains a major challenge for surgeons with around 30% of 5-year survival rate after curative resection. The results of surgical resection for ICC patients with lymph node metastases are especially poor. We investigated our results of surgical resection for the patients with ICC.

PATIENTS AND METHODS: 44 patients with ICC underwent hepatectomy in our institute until 2006. They are including 13 patients with lymph node metastases. Survival rates after first hepatectomy for the patients were calculated and cases of long-term survival were examined.

RESULTS: Survival rates after first hepatectomy are 51, 29, 22% for 5, 10, 15 years respectively. Survival rates of the patients with and without lymph node metastases are 42 and 51% for 3 years, and 28 and 29% for 5 years respectively. There is no significant difference between the survival curves from the groups. 11 out of 13 patients with hepatocellular carcinoma who underwent first hepatectomy (7 in residual liver, 2 in lung, lymph node, each, 1 in bone, another one in brain) got no additional surgery. 5 patients with lymph node metastases and 11 patients without actually survived more than 3 years. 4 out of those 5 patients with lymph node metastases underwent repeat surgery for recurrence in the residual liver or the lung and 3 of them underwent adjuvant and/or neo-adjuvant chemotherapy. There is one patient who underwent 4 hepatectomy and 1 pulmonary resection, combined with chemotherapy, and survived 6 years and 9 months.

CONCLUSION: In our series, the outcome of hepatectomy for ICC patients with lymph node metastases is compara-ble to that for patients without. Although recurrence rate after hepatectomy is high for the patients, the residual liver and the lung are the main sites of recurrence and repeat surgery, combined with chemotherapy, is thought to benefit their survival.
M1644
Oncologic Outcome After Laparoscopic Resection of Malignant Liver Tumors
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INTRODUCTION: Although the technique and safety of laparoscopic liver resection have been well described in the literature, there is a paucity of reports regarding oncologic results. The aim of this study is to assess the oncologic outcome following laparoscopic resection of malignant liver tumors.

METHODS AND PROCEDURES: Forty-one patients underwent laparoscopic resection of malignant liver tumor between April 2006 and September 2009. Data were collected prospectively with IRB approval. Pre-operative parameters, as well as overall and disease-free survival were analyzed. The patients were followed quarterly with tumor markers and chest-abdomen-pelvis CT scans for the first 2 years and then biannually. Statistical analysis was performed using Kaplan-Meier survival tests. All data are expressed as mean ± SD.

RESULTS: There were 24 males and 17 women. Mean age was 64.1 ± 7.3 years. Pathology included colorectal liver metastasis (n = 24), hepatocellular cancer (n = 12), and sarcoma, GIST, renal cell cancer, breast cancer and neuro-endocrine cancer metastasis in 1 patient each. Twenty-two patients underwent wedge resection or segmentectomy, 15 patients bi-segmentectomy, 2 patients left hepatectomy, 1 patient right hepatectomy + segment 4B resection, and 1 patient right hepatectomy. There was one conversion to open due to bleeding (2.5%). Mean tumor size was 3.2 ± 0.3 cm. Mean operative time was 254.6 ± 86.3 minutes. Mean estimated blood loss and length of hospital stay was 210.7 ± 80.2 ml and 3.6 ± 1.2 days respectively. The average surgical margin was 10.8 ± 3.1 mm. There was no mortality. Complications were seen in 16% of the cases. The patients were followed a mean of 17.2 ± 1.6 months. No post-op mortality or local recurrence detected during the follow-up. Three-year Kaplan-Meyer estimated overall and disease-free survival rates were 72% and 55%, respectively. In follow up, 4 patients developed new liver and 3 patients extrahepatic recurrence. The latter 3 patients died due to extrahepatic disease progression.

CONCLUSION: The absence of local and port-site metastases in our study proves that the laparoscopic approach follows surgical oncologic principles. The short-term overall and disease-free survival are favorable. Due to better patient recovery, we believe that it should be the procedure of choice in selected patients.

Clinical: Pancreas

M1645
Atrial Fibrillation and Delayed Gastric Emptying After Pancreaticoduodenectomy: Coincidence or Shared Mechanism?
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BACKGROUND: Atrial fibrillation is one of the most common postoperative arrhythmias in noncardiac surgery. Postoperative atrial fibrillation is associated with increased morbidity and mortality, as well as prolonged hospital stays and subsequent drain on staff and resources.

OBJECTIVES: We aimed to investigate preoperative and postoperative variables that are associated with atrial fibrillation after pancreaticoduodenectomy (PD).

METHODS: We performed a retrospective chart review of 523 patients who underwent pancreaticoduodenectomy at our institution between 2000 and 2009. 344 resections were performed since 2005. We collected: patient demographics, history of cardiac disease, hypertension, hyperthyroidism or COPD, preoperative chemoradiotherapy, type of resection performed (pylorus-preserving pancreaticoduodenectomy or standard pancreaticoduodenectomy, with or without vascular resection) operative time, estimated blood loss and transfusions, tumor size and histology, lymph node status, postoperative hematocrit and leukocyte count and postoperative NSAI use. Data was analyzed with alpha = 0.05 using Fisher exact test for categorical variables and Mann Whitney U or unplanned t test for continuous variables.

RESULTS: Approximately 5% of the 248 patients included in the analysis experienced at least one episode of post-operative atrial fibrillation. Median age of patients with atrial fibrillation was 74 years, compared with 66 years in patients without atrial fibrillation (p = 0.0005). Patients with atrial fibrillation were more likely to have a history of cardiac disease (p = 0.0347) and to require treatment for an infection over the course of their hospitalization (p = 0.0199). Of note, 92% of the patients with atrial fibrillation suffered from delayed gastric emptying (DGEm), defined as failure to tolerate a regular diet by the seventh postoperative day, compared to 46% of patients without atrial fibrillation (p = 0.0008). This association held true when analyzing age (p = 0.0005). A possible explanation linking postoperative atrial fibrillation and delayed emptying could be intraoperative injury to a shared pathway of vagal innervation, others have noted a similar phenomenon, non, also attributed to vagal injury, of delayed gastric emptying after radiofrequency ablation of atrial fibrillation. Another possible explanation would be perioperative changes in fluid balance which could result in both bowel edema and volume overload.

CONCLUSIONS: Age and a prior history of cardiac disease are risk factors for postoperative atrial fibrillation. Patients with postoperative atrial fibrillation are more likely to experience delayed gastric emptying.

M1646
Association of Pretreatment Quality of Life to Pancreatic Malignancy and Survival: An Analysis of 323 Patients
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BACKGROUND: In common to use quality of life (QoL) measures to assess treatment outcomes for pancreatic disease. However, in other disease processes, it has been suggested that pretreatment QoL scores can predict the outcome of treatment, specifically in some malignant diseases, QoL can predict survival. This study assessed whether pretreatment QoL scores could predict malignancy in patients with pancreatic cancers and survival in those with malignancies.

METHODS: Patients with surgery for pancreatic lesions completed the SF-36, which contains 8 domains measuring QoL: physical functioning (PF), role-physical (RP), role-emotional (RE), bodily pain (BP), vitality (VT), mental health (MH), social functioning (SF), and general health (GH). Best possible score is 100, worst possible score is 0.

Patients with pain related to known chronic pancreatitis were excluded from the study, however, undiagnosed solid or cystic lesions were included. Data obtained included age, gender, resectability, additional antineoplastic therapy, stage, pathology, and survival. Patients were categorized by pathology (benign vs. malignant), stage (local, regional or distant), resectability (resected vs. not), survival (c.1 yr vs. > 1 yr) and their pretreatment QoL scores. Data were analyzed by the Mann-Whitney U-test, Cox Proportional Hazards model, and multiple logistic regression analysis.

RESULTS: Of the 323 patients assessed, 210 had malignancies. In 6 of the 8 domains, patients with malignancies had lower median QoL scores compared to patients with benign lesions: PF 60 vs 85 (p = 0.0003), RP 0 vs 75 (p = 0.003), RE 100 vs 100 (p = 0.004), VT 45 vs 55 (p = 0.005), SF 62.5 vs 75.5 (p = 0.0007) and GH 62 vs 72 (p = 0.03). Of the various malignancies, patients surviving c.1 yr had lower pretreatment scores in all domains (PF 30 vs 70, RP 0 vs 75, RE 0 vs 100, SF 41 vs 74, VT 20 vs 50, MH 60 vs 80, SF 50 vs 75, and GH 55 vs 70, all p < 0.0001). Significant correlation was seen with tumor resection, adjuvant therapy, and VT score were independent predictors of survival.

CONCLUSIONS: Patients with pancreatic malignancies had lower QoL scores than patients with benign pancreatic disease. Patients with malignancies survived the c.1 yr had lower scores, even after controlling for stage. These lower scores may reflect more advanced disease or frailties which identify patients with poor prognoses. This suggests that pretreatment QoL scores may be used to predict which patients will have a poor survival and therefore could avoid aggressive, but futile, treatment.

M1647
Laparoscopic Enucleation for Neuroendocrine Pancreatic Tumors: Pancreas Related Complications
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BACKGROUND: In the majority of cases enucleation represents definitive treatment for neuroendocrine pancreatic tumors (NEPT). However, enucleation is not a simple procedure, whether performed open or laparoscopically. It offers clear advantages to patients but pancreas related complications may occur. When NEPT arise in the head of the pancreas can represent a surgical challenge.

AIM: To define the complication rate and incidence of pancreatect fistula (PF) according to DSGF in patients undergoing enucleation for NEPT.

MATERIAL AND METHOD: Between April 1998 and September 2009 52 patients underwent laparoscopic surgery for NEPT, 25 sporadic insulinoma and 27 non-functioning tumors. NEPT were localized in the pancreatic head in 6 patients, in the pancreatic neck in 9 patients, in the body in 28 patients and in the tail of the pancreas in 9 patients. We reviewed the operative results and postoperative courses in these patients. Intraoperative ultrasonography was used in all cases.

RESULTS: Mean diameter of sporadic insulinoma was 14 cm (range 0.6–20 mm) and of non-functioning tumors was 3 cm (range 2.5–3.2 cm). 18 patients (76%) with sporadic insulinoma and 12 patients (44%) of non-functioning tumors underwent successful laparoscopic enucleation. Conversion rate to an open procedure was 6.6%. Overall PF after LapEn was observed in 12 patients (49%), however 50% was biochemical PF (grade A). The frequency of PF was significantly higher (p = 0.01) after LapEn from the head (100%) compared with from the neck (50%) and from the body of the pancreas (29%), DSFG grade B and C. It was also higher after LapEn from the head-neck of the pancreas (41.6%) compared with the body of the pancreas (8%). No patient required reoperation.

CONCLUSION: This study confirmed the technical feasibility and acceptable morbidity associated with LapEn for NEPT. There was no operative mortality. Sixty percent of the patients who had LapEn had no complications. A major concern with LapEn from the head-neck of the pancreas is the possibility of PF however can often be managed with prolonged drainage without bowel rest.
CONCLUSION: Management and Outcomes of Patients with Acute Pancreatitis: Differences According to Admitting Service

Elderly patients with acute pancreatitis (AP) vary depending on the different etiologies. Differences in management and outcomes based on whether a patient is admitted to a medical or surgical service may exist, but few studies have addressed this issue. Our aim was to analyze the effect of medical or surgical admission on management and outcomes of AP.

METHODS: We conducted a retrospective review of all patients admitted to a single institution with a diagnosis of acute pancreatitis during January 2007 and June 2008. Clinical, biochemical, demographic, management and outcome variables were obtained. Descriptive statistics were used according to the type of variable measured. The statistical significance of the associations was evaluated by the χ2 test and Fisher's exact test where appropriate. For continuous variables, Student's t-test was performed.

RESULTS: Eighty-one consecutive patients were included and analyzed. Patients (65%) were female. Forty-seven (58%) were admitted to a surgical service (SS) and 34 (42%) to a medical service (MS). Mean age of patients admitted to a SS was 73.7 ± 14.9 vs. 39.2 ± 17.48 (P = 0.5). Etiologies were as follow: 48 (59%) biliary, 9 (11%) alcoholic, 11 (14%) hypertriglyceridemia and 13 (16%) idiopathic. Most cases of biliary pancreatitis (94%, P = 0.008) were managed conservatively. Six (78%) patients were classified as mild pancreatitis and 18 (22%) as severe (8 [17%] in SS vs. 10 [29%] in MS (P = 0.2). Patients with a diagnosis of diabetes mellitus (DM) were more frequently admitted to MS (32%) than to SS (4%) (P = 0.001). Seventy-two percent of patients admitted to SS was discharged during hospitalization compared to 53% of those in MS (P = 0.1). Total parenteral nutrition (TPN) was used in 11% of patients in SS and 6% (18%) in MS (P = 0.5). A nasogastric tube (NG) was placed in 17% of patients in SS vs. 15% in MS (P = 1.0). Patients with DM had significantly more severe AP than non-DM patients (P = 0.003), however, mortality was not significantly different among DM and non-DM patients (P = 0.1). Length of stay (LOS) was 7.94 days in SS vs. 8.53 days in MS (P = 0.6). Overall mortality was 9% (7/81), 4/43 in SS vs. 5/38 in MS (P = 0.6).

CONCLUSIONS: Management of acute pancreatitis in elderly patients with acute pancreatitis varied according to the admitting service and different etiologies among surgical and medical services, outcomes are not significantly different.
M1652

Prediction of Mortality After Pancreateoduodenectomy: Impact of Patient or Treatment Related Risk Factors on Complication Rates

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INTRODUCTION: Although mortality after pancreateoduodenectomy (PD) has decreased over the past decades, morbidity remains still high. Therefore we aimed to identify risk factors that might proactively predict postoperative complication rates.

METHODS: From 1994 to 2009 544 consecutive patients underwent PD as pylorus preserving pancreaticoduodenectomy (83%) or the classical Whipple procedure (17%). Indications for surgery were pancreatic (PaCa, 36%) or other periampullary cancers (23%), chronic pancreatitis (CP, 29%) or others (12%). During subgroup analysis patients with remaining "hard" pancreatic gland (PaCa or CP, 60%) were compared with the other pathologies ("soft" pancreas). Evaluation was done by retrospective analysis of our prospective pancreatic database. Multiple demographic and disease-related parameters were analyzed for their influence on various complication types (multivariately by binary logistic regression). For this study pancreatic leak included all 3 BClPS-definition. 15% of the patients had resection of adjacent organs (Orgs), 10% preoperatively elevated creatinine levels (Cr/High).

RESULTS: Overall mortality was 3.2% (no risk factor identified). Overall complication rate was 56% and independent on the type of PD. Surgical complications occurred in 38%, infectious surgical complications in 19% and any pancreatic leak in 18%. Multivariate risk factors for any complication were "soft" pancreatic tumors (no PaCa/CP; p < 0.01, relative risk RR 1.8), Orgs (p = 0.001, RR 2.3), Cr/High (p = 0.04, RR 1.8) and BMI > 25 (vs < 25; p = 0.04, RR 1.6). An elevated BMI > 25 and a "soft" pancreas were independent risk factors for surgical complications (both p < 0.01), infections surgical complications (p = 0.01) and pancreatic leak (both p < 0.01). Elevated BMI was the only risk factor for wound infections (p = 0.03). Further factors like gender, antibiotic treatment, diabetes and preoperative self-sufficiency did not relevantly influence morbidity.

CONCLUSION: In our large series of patients undergoing PD an elevated body mass index and a potentially soft pancreatic remnant (defined by underlying disease/absence of stasis/pancreatitis) were clearly the most relevant factors preoperatively.

M1653

Laparoscopic Distal Pancreatectomy Offers Shorter Hospital Stays with Fewer Complications

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BACKGROUND: Laparoscopic distal pancreatectomy is being performed more frequently for benign and low-grade malignant neoplasms of the body and tail of the pancreas. Data continues to emerge comparing outcomes of laparoscopic and open distal pancreatectomy.

OBJECTIVE: The aim of this study was to investigate short-term outcomes after laparoscopic distal pancreatectomy compared to open distal pancreatectomy at a single, high-volume institution.

METHODS: We reviewed the medical records of all patients who underwent distal pancreatectomy since March 1991. We compared demographic and postoperative data between patients who underwent laparoscopic versus open distal pancreatectomy from January 2001 to June 2009. For the purposes of analysis, the laparoscopic converted to open cases were included in the open group. Continuous variables were compared using Student’s t-test or Wilcoxon rank-sum test. Categorical variables were compared using chi-square or Fisher’s exact tests.

RESULTS: A total of 332 patients underwent distal pancreatectomy over an 18-year period. Beginning in 2001, 86 (29.3%) were attempted and 65 were converted laparoscopically with a conversion rate of 24.4%. Reasons for conversion included hemorrhage (8), inflammatory or invasion lesion (6), difficult dissection (6), and injury to colon (1). Eleven patients (52.4%) in the converted group had adenomas or IPMNs. None of the patients who underwent open distal pancreatectomy performed since 2001 (n = 208), laparoscopic pancreatectomy was statistically similar with respect to patient demographics, operative times, and rates of splenic preservation, positive margins, pancreatic fistula, reoperation, and mortality. The laparoscopic approach was less likely to be used for pancreatic ductal adenocarcinoma (12% vs 28%) and IPMNs (22% vs 48%). Laparoscopic distal pancreatectomy patients had lower median blood loss (350 vs 1000 ml, p < 0.0001), smaller median tumor size (1.2 vs 4 cm, p < 0.0001), and shorter average length of resected tumors (7.6 vs 9.8 cm, p < 0.0001). Those in the laparoscopic group had fewer overall (29% vs 44.2%, p = 0.05) and major (10.8% vs 22.6%, p = 0.05) complication rates as well as shorter postoperative hospital stays (median 5 vs 6 days, p < 0.0001).

CONCLUSIONS: Laparoscopic pancreatic resection can be performed safely and effectively in patients with small, benign or low-grade malignant neoplasms of the body and tail. When feasible in selected patients, the laparoscopic approach offers fewer complications and shorter postoperative hospital stays.

M1654

Survival Expression in Carcinogenesis of Intraductal Papillary Mucinous Neoplasms of the Pancreas

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BACKGROUND: Intraductal papillary mucinous neoplasms (IPMNs) of the pancreas are indicated the possibility to be a model of multistep carcinogenesis of pancreatic cancer, because they include a spectrum of neoplasms like adenoma, borderline lesion, carcinoma in situ ( CIS), and invasive adenocarcinoma ( invasive). Survivin, a member of the apoptosis inhibitor family, shows increased expression in human cancers of various origins. It has been demonstrated that survivin inhibits apoptosis via caspase inhibition and promotes mitosis via aurora-B kinase activation.

OBJECTIVES: To evaluate survival and aurora-B kinase expression in IPMNs, which have potential to clarify the carcinogenesis of the pancreatic neoplasms and to be a biomarker of earlier diagnosis of pancreatic malignancy.

METHODS: Survivin and aurora-B kinase expression were evaluated by immunohistochemistry in a total of 168 lesions from 85 patients who underwent pancreatic resection for IPMNs which included invasive IPMNs (n = 22), CIS IPMNs (n = 32), borderline IPMNs (n = 14), and adenoma IPMNs (n = 17).

RESULTS: The nuclear overexpression of survivin was observed in 15 of 15 (100%) invasive IPMNs, 20 of 43 (47%) CIS IPMNs, 2 of 14 (14%) borderline IPMNs, and 9 of 77 (12%) adenoma IPMNs, respectively. The nuclear overexpression of aurora-B kinase was observed in 6 of 15 (40%) invasive IPMNs, 17 of 43 (40%) CIS IPMNs, non of 14 (0%) borderline IPMNs, and 2 of 62 (3%) adenoma IPMNs, respectively, while no hyperplastic lesion had overexpression of survivin and aurora-B kinase. There were significant differences in the expression of survivin between invasive IPMNs and CIS IPMNs (p < 0.001), and in the expression of survivin and aurora-B kinase between CIS IPMNs and adenoma IPMNs (p < 0.001 for both). There were also significant differences in the expression of survivin and aurora-B kinase between malignant IPMNs and benign IPMNs (p < 0.001 for both).

CONCLUSIONS: These results suggested that survivin may play important roles in the transition from CIS IPMNs to invasive IPMNs of the pancreas. Moreover, survivin and aurora-B kinase overexpression may indicate the carcinogenesis of IPMNs of the pancreas and they may be useful biomarkers for earlier diagnosis of pancreatic malignancy.

M1655

Ampullary Carcinoma: Adjuvant Chemoradiation Improves Survival in Node-Positive Patients

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BACKGROUND: The preferred management for adenocarcinomas of the ampulla of Vater is pancreaticoduodenectomy. Factors most often associated with a poor prognosis include T stage and node status. Currently, many authorities recommend adjuvant therapy for patients with more advanced ampullary carcinomas. However, no randomized data are available, and retrospective analyses have generally failed to demonstrate a survival advantage for patients receiving adjuvant therapy. Therefore, the aim of this analysis was to determine whether adjuvant chemoradiation improved survival in patients with resected Stage IB or III ampullary adenocarcinoma.

METHODS: From 1990 through 2008, 80 patients with adenocarcinoma of the ampulla of Vater underwent pancreateoduodenectomy at our institution. The mean age was 63.2 years, and 43 were male (54%). The T stages were I (16%), II (30%), III (44%), IV (10%). Thirty-five patients (44%) had node-negative disease whereas patients (56%) were node-positive. AJCC stages I was (25%), II (15%), III (36%), IV (13%). Three patients died postoperatively (3.8%). Overall, 38 patients (48%) received adjuvant chemoradiation which generally consisted of 54 Gy external beam radiation with 5-FU as a radiosensitizer as well as 5-FU (37%), gemcitabine (42%), or FOLFOX (21%) chemotherapy usually given both before and after chemoradiation. Survival was determined from the time of surgery until death or November 2009. Kaplan-Meier methodology was used to estimate survival. Cox proportional hazard models were employed to examine the effect of prognostic factors on overall survival.

RESULTS: Overall median and 5-year actuarial survival were 36 months and 45%, respectively. Age, gender, tumor size, tumor differentiation, and use of adjuvant therapy were not significantly associated with improved survival. However, node-positive disease was associated with improved overall survival (81 vs 21 months, p < 0.001). Of 45 patients with stage IB and III disease, 12 (27%) received adjuvant therapy, and 13 patient were not treated. However, survival was significantly prolonged in this high-risk subset of patients receiving adjuvant therapy (31 vs 13 months, p < 0.01).

CONCLUSIONS: Adjuvant chemoradiation following curative resection for stage IB and III ampullary adenocarcinomas provided a statistically significant benefit in overall survival. Until randomized trials have been performed, patients with resected lymph node positive ampullary carcinoma should be strongly considered for adjuvant chemoradiation.
M1657

Does BMI/Morbid Obesity Inﬂuence Outcomes in Patients Who Have Undergone Pancreatoduodenectomy for Pancreatic Adenocarcinoma?

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INTRODUCTION: The obesity epidemic coupled with epidemiologic evidence of a link between pancreatic cancer and obesity has raised the interest in the impact of BMI (body mass index) on outcomes for patients undergoing curative resection for pancreatic ductal adenocarcinoma.

HYPOTHESIS: Obesity increases operative time and blood loss, increases aggressiveness of pancreatic cancer, and decreases overall survival.

AIM: To determine the effect of obesity on outcome of patients undergoing curative resection of pancreatic ductal adenocarcinoma.

METHODS: All consecutive patients undergoing “curative” (R0, R1) pancreateoduodenectomy (PD) for pancreatic adenocarcinoma from 1981 to 2007 were categorized into four groups according to their BMI (<25, 25 to <29.9, 30 to <34.9 and ≥35). Association of BMI groups with perioperative variables (operating time, blood loss, complications, and in-hospital mortality) pathologic characteristics (tumor size, tumor stage, differentiation, lymph nodal status, and TNM status), and long-term overall and disease-free survival were evaluated using Kruskal-Wallis and chi-square tests, logistic regression, and Cox proportional hazards regression. A second set of analyses were performed by dichotomizing patients into morbid obesity (BMI ≥35) in comparison to the rest.

RESULTS: Of the 586 patients studied, there were 232 (40%) with BMI <25, 252 (40%) with BMI 25 to <29.9, 89 (15%) with BMI 30 to <34.9, and 33 (6%) with BMI ≥35. Operating time and intra-operative blood loss increased directly with BMI (P < 0.005 each), although none of the remaining peri-operative features differed among BMI groups. There were no associations between BMI and the pathologic features studied. In particular, BMI was not associated with lymph node status even after adjusting for tumor size and the number of lymph nodes retrieved. Most importantly, Cox regression did not demonstrate any association between BMI and overall or disease-free survival. All the analyses were then repeated for the morbidly obese group and the results were similar.

CONCLUSIONS: BMI (and morbid obesity) does not inﬂuence long-term outcomes for patients undergoing PD for pancreatic adenocarcinoma. Surgeons should however be vigilant of the greater risk of peri-operative blood loss with increasing BMI, which may lead to serious short- and long-term consequences.

M1658

Lack of Beneﬁt to Perioperative Epidural Analgesia Among Patients Undergoing Elective Gastric and Pancreatic Resections

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BACKGROUND: Epidual pain catheters are purported to improve perioperative pain control and decrease rates of ileus, pneumonia, and venous thromboembolism. Since these data are primarily limited to gynecologic and thoracic surgical procedures, we hypothesized that use of epidural pain catheters would demonstrate benefit among patients undergoing gastric and pancreatic resections.

METHODS: From January 2007 to June 2009, 126 patients underwent elective gastric and pancreatic resections for space-occupying lesions at an academic university hospital. Emergency, trauma, and oncologic cases were excluded. Clinicopathologic data were reviewed among epidural (E) and non-epidural (NE) patients for their association with perioperative outcomes. Data were analyzed using parametric and non-parametric methods as appropriate.

RESULTS: 91 patients (72%) received an epidural, and 35 (28%) did not. Pancreateoduodenectomy was performed in 73 patients (54%), distal pancreatectomy in 21 patients (20%), and partial gastrectomy in 24 patients (19%). There were no signiﬁcant differences in mean postoperative pain scores, return of bowel function, or ketorolac use among E and NE patients. 21% of E patients had their catheter removed within 48 hours because of poor pain control or hemodynamic issues. 14% of E patients also received concomitant intravenous narcotic infusion with a functioning E. The prevalence of overall complications (40% E versus 34% NE, P = 0.68), prolonged ileus (13% E versus 11% NE, P = 1.00), pneumonia (12% E versus 6% NE, P = 0.51), venous thromboembolism (8% E versus 6% NE, P = 1.00), and length of stay (median 8 days E versus 7 days NE, P = 0.38) were not signiﬁcantly different between the two groups. Subgroup analysis of patients without complications (97% E versus 78% NE, P = 0.20) demonstrated no signiﬁcant differences in pain scores, return of bowel function, or length of stay between E and NE patients.

CONCLUSIONS: The use of epidural pain catheters does not alter perioperative outcomes among patients undergoing elective gastric and pancreatic resections. Routine use of epidurals in this subgroup of patients may not be indicated.
**Clinical: Small Bowel**

**M1660**

**Management of ERC-Related Duodenal Perforations**

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**BACKGROUND:** Although endoscopic retrograde cholangiopancreatography (ERC) is widely regarded as a safe procedure, it is associated with significant morbidity and mortality. Duodenal perforation is one of the most serious complications of ERC. Its management is still controversial, some authors recommend surgical, others conservative treatment.

**METHODS:** A retrospective chart review was conducted to identify 11 patients (men, n = 6, women, n = 5, mean age 71.3 years) treated at our institution for ERC-related duodenal perforations. Between January 2000 and October 2009, 4,015 ERC procedures were performed (perforation rate: 0.4%), in one patient ERC was performed elsewhere. Study variables included indication of ERC, clinical presentation, diagnostic procedures, time to diagnosis and treatment, location of injury, management, length of hospital stay, and survival.

**RESULTS:** Four of the perforations were discovered during ERC, five requiring radiologic imaging for diagnosis. In one patient diagnosis was made only at autopsy, and in another patient perforation came 3 years after the procedure through a dislocated stent. Four of 11 perforations were stent related, in two patients ERC was performed in a non-anatomical situation (Billroth II gastroenterostomy). Four patients were treated surgically with nil mortality. Five patients were managed conservatively with a successful outcome, and two patients died after conservative treatment (18%). Three of four patients underwent surgery within 24 h after the ERC, with only one patient undergoing endoscopic retrograde treatment included (hepaticejunoanastomosis and duodenostomy (in one patient), suture of the perforation with T-Drain (in one patient), suicide only (in two patients). Average length of stay was 20.1 days.

**CONCLUSIONS:** Post-ERC duodenal perforations are associated with significant morbidity and mortality. Immediate radiologic evaluation and close surgical monitoring is needed. Management should be individually tailored based on clinical and radiological findings. A treatment algorithm is suggested based on the study result.

**M1661**

**Small Bowel Adenocarcinoma in Crohn’s Disease**

Maria Widmar, Mount Sinai School of Medicine, New York, NY

**BACKGROUND:** An association between small bowel adenocarcinoma and Crohn’s Disease (CD) is well-established. Crohn’s-related small bowel cancers are male predominance, distal, surrounded by dysplasia, and carry a poor prognosis, particularly in the setting of intestinal strictures. As suggested in an earlier published series from our center (1991), clinical indicators of small bowel cancer in CD include recurrent obstrusive symptoms after periods of quiescence and bowel obstruction that is refractory to conservative management. We present our recent experience with this entity in order to further elucidate its clinical, pathological features and clinical indicators.

**METHODS:** A retrospective review was undertaken of all surgical patients with small bowel adenocarcinoma and CD seen at our institution between 1994–2009. The data included demographics, pathology, hospital and post-operative course. Follow-up was assessed until time of death or by interview with survivors. Patients were classified into two groups according to lymph node status (Stages 182 vs. 3&4); survival was calculated for all patients and compared between these groups using Kaplan Meier methods.

**RESULTS:** 28 patients (9F, 19M) were identified and followed for a median of 2 years. The median age at onset of CD symptoms was 25, and the median age at cancer diagnosis was 54.9, for a mean interval of 28.3 years. Twenty-one cancers were ileal and five were jejunal. There were no cancers in excluded intestinal loops. Significant differences in 2-year survival were determined for: node-negative (83.3%, 95% CI: 62.4–100%) versus node-positive cancers (45.5%, 95% CI: 17.7–73.3%) and for localized (90.9%, 95% CI: 73.8–100%) versus metastatic disease (33.3%, 95% CI: 0.6–66%). Overall 36-month survival was 68% (95% CI: 46.9–86%), compared to 40% among those without excluded loops in our series from 1991. Fifteen of 22 patients had long periods of quiescent disease before diagnosis (7–45 years), and 13 of 22 patients required surgery for refractory bowel obstruction. Adequate information was not retrievable for 6 patients.

**CONCLUSIONS:** A comparison to our previous series reveals similar male predominance, long duration to development of cancer, and a high rate of node-positive cancer at diagnosis. Our findings also confirm 2 important clinical indicators of malignancy: recurrent symptoms after long periods of relative quiescence, and persistent small bowel obstruction that is refractory to medical therapy.

**Clinical: Stomach**

**M1662**

**Laparoscopic Repair of Perforated Ulcer in Western Denmark**

Thusten Sommer, Surgery, Randers Regionalhospital, Randers, Denmark

**OBJECTIVE:** To report the distribution and results of laparoscopic repair of perforated ulcer in surgical departments in a major region in Denmark and compare it with the results from the national database regarding morbidity and mortality.

**METHODS:** Case charts from all patients who underwent laparoscopic repair of perforated ulcer in Western Denmark in the period 1 January 2003–1 July 2007 were collected. Demographic data, surgical details, morbidity, 30 day mortality, and length of stay were recorded. For comparison, data from the National Health Registry (NIP) describin all patients who had an operation due to perforated ulcer in this period was obtained.

**RESULTS:** No more than 51 out of 818 patients undergoing operation for perforated ulcer in the region had a laparoscopic operation. Mortality in the laparoscopic group was 4% compared to 26% reported from the national data base (NIP). The laparoscopic group had a higher reperforation rate, but length of stay was equal. No formal criteria concerning surgeon or patients selection for laparoscopic surgery were met.

**CONCLUSION:** Laparoscopic repair of perforated ulcer was done without any selection criteria in few surgical departments in Western Denmark and was associated with a low mortality but a higher risk of reperforation.

<table>
<thead>
<tr>
<th>Table 1. Complications After Surgery</th>
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<tbody>
<tr>
<td>Laparoscopic</td>
</tr>
<tr>
<td>Patients (n)</td>
</tr>
<tr>
<td>30-day Mortality (%)</td>
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<tr>
<td>Reperforation (%)</td>
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<tr>
<td>Other reoperation (%)</td>
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<td>Length of stay (days)</td>
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**Including drainage %/median/average**

**Table 2. Operative data laparoscopic repairs**

<table>
<thead>
<tr>
<th>Laparoscopic</th>
<th>Jyllands</th>
<th>NIP data Jyllands</th>
<th>NIP data Denmark</th>
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<tbody>
<tr>
<td>Perforation</td>
<td>51</td>
<td>35</td>
<td>25</td>
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<tr>
<td>Duodenum</td>
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<td>18</td>
<td>18</td>
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<tr>
<td>Gastric</td>
<td>10</td>
<td>14</td>
<td>14</td>
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<tr>
<td>Suturing alone</td>
<td>10</td>
<td>12</td>
<td>12</td>
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<tr>
<td>Suturing antrum-emperadrus</td>
<td>39</td>
<td>39</td>
<td>39</td>
</tr>
<tr>
<td>Postoperative nasogastric drainage</td>
<td>3 (5–15)</td>
<td>3 (5–15)</td>
<td>3 (5–15)</td>
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<tr>
<td>Oral feeding start day</td>
<td>4 (6–13)</td>
<td>4 (6–13)</td>
<td>4 (6–13)</td>
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<tr>
<td>Ambulatory</td>
<td>3 (5–10)</td>
<td>3 (5–10)</td>
<td>3 (5–10)</td>
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**METHOD:** Duodenal-Jejunum Dynamic Reservoir with Anti-Peristaltic Emptying After Gastric Resection (Safatle’ Technique) Leads to Well Nourished Patients with Good Quality of Life

Ulysses Ribeiro, Jr., Gastroenterology, Surgery, University of Sao Paulo, Hospital Sirio Libanes, Sao Paulo, SP, Brazil

The passage of food through duodenum is relevant for the maintenance of good nutritional status after gastric resection. We have developed a reconstruction technique following gastronomy (Figure 1). AIM: To evaluate the long-term outcome of patients who underwent this type of reconstruction.

**Schematic representation of the Safatle’s technique that incorporates Roux-en-Y, small bowel interposition, and duodenal pouch with anti-peristaltic emptying.**

**METHODS:** 125 consecutive gastric cancer patients were evaluated through clinical, laboratory, radiologic, scintigraphic and endoscopic examination. There were 88 men and 37 women with a mean age at the time of surgical treatment of 60.5 ± 14.74 years. Follow-up varied from 2 to 25 years (mean = 11.4 years). Total gastrectomy was performed in 68 patients, subtotal gastrectomy in 45, pyloric block in 8 and total esophagogastrectomy in 4. RESULTS: Laboratory analysis showed no evidence of iron deficiency (hemoglobin < 12 g/dl, ferritin > 10, serum iron > 60), or low serum albumin. Sixty percent of the patients gained weight, 20% lost and 20% maintained their weight. Radiologic and scintigraphic examinations demonstrated proper drainage of the contrast from the reservoir to the jejunum, without dilatation or stasis. Empting time varied from 60 to 180 minutes (mean = 122.4 minutes). Endoscopic examination revealed absence of alkaline reflux, or fluid stasis in the reservoir and easy visualization of the duodenal papilla.

**CONCLUSIONS:** 1. The presented surgical technique is simple, efficient and safe with low rate of complications. 2. Long term follow-up demonstrated well nourished patients leading to a good quality of life.
Histologic Patterns in Patients Undergoing Permanent Gastric Electrical Stimulation for Gastroesophageal Reflux Disease

INTRODUCTION: The muscular layers of stomach contain interstitial cells of Cajal (ICC) that form a network with nerve fibers that run from stomach to S100 and CD117 staining and quantification of nerve fibers and interstitial cells of Cajal in inner and outer muscle layers of stomach were performed, and S100/CD117 ratios calculated. Ten high-powered fields were examined and averaged for each layer (inner and outer) with each stain. Biopsy results were compared by two-tailed, un-paired t tests to results from 20 autopsy controls, also stained and counted. Means, medians, and ranges were calculated for all GP patients, controls, diabetic only, and idiopathic only.

RESULTS: Mean numbers of nerve fibers were significantly lower in GP patients than controls. Mean numbers of ICC were not reduced in the GP group. Ratios of S100/CD117 cells were decreased in GP patients. (Table 1)

Radial Dilating Trocar System Is Associated with a Low Incidence of Port Site Hernias Among Patients Undergoing Laparoscopic Roux-en-Y Gastric Bypass Surgery

Objective: To assess the incidence of trocar hernias using a radial dilating trocar system.

INTRODUCTION: Obese patients are at increased risk of trocar-related hernias, but port closure in these patients is difficult. A radial dilating trocar system has a theoretical advantage of reducing harm to hernia incidence, but this is unproven. The current study was undertaken to determine the incidence of trocar site herniation using a commercially available radially dilating trocar system without routine closure of fascial defects.

METHODS: We retrospectively evaluated 2,780 laparoscopic BYGB patients enrolled in a prospectively collected database at 3 centers. All patients underwent BYGB using dilating trocars between January 2003 and March 2008. A total of 15,443 dilating trocars were used. Trocar configurations were based upon surgeon preference. In sites where a Hasson port or a 15 mm trocar was used, or an EEA stapler was used transabdominally, the fascial defects were closed. Dilating trocar sites were not routinely closed. Prospectively collected data included demographics, location, type, size, and number of access ports, history of prior hernia, steroid use, diabetes, respiratory disorder, port-site infection, and specimen extraction. All patients were followed at 3 to 12-month intervals postoperatively and for the presence of trocar site hernias. Descriptive statistics, Chi-square and Fisher’s exact tests were used to characterize and compare patients with and without trocar site hernias.

RESULTS: A total of 2,780 patients were followed for a median of 12.6 months. There were 17, 147 trocar sites and 3, 105 Hasson ports. Of these, 1,305 were Hasson and 399 were 15 mm trocars. Dilating ports included 6,658 12 mm and 8,765 5 mm sites. Overall, 46 (0.3%) patients developed a trocar site hernia. The incidence of hernia with each trocar type is: 55/1,305 (4.2%) Hasson, 2/399 (0.5%) 15 mm ports, 5/6658 (0.075%) 12 mm dilating ports, and 2/8765 (0.023%) 5 mm dilating ports. The majority (93%) of port site hernias were localized in the midline position. Specimens were extracted through 6 port sites which went on to herniate (17%). Specimen extraction resulted in a hernia incidence of 2.7% (9/293) compared to a hernia incidence of 1.5% (18/1,248) without extraction for any size port, p = 0.127. Trocar site hernia was not associated with any pre-operative predictors.

CONCLUSION: A low incidence of trocar hernias was found after laparoscopic BYGB surgery using a radially dilating trocar system. Port site hernias are more frequent with larger trocars, but heterogeneous, sites are retrieved at the site, and at trocars positioned in the midline of the abdomen.

Intestinal Bowel Obstruction After Gastric Bypass With Normal Imaging: Endoscopic Diagnosis and Treatment of Small Bowel Food Bolus Entangled in Sutures

Dane E. Azagury, Division of Gastroenterology, Brigham & Women's Hospital, Boston, MA

BACKGROUND: Roux-en-Y gastric bypass (RYGB) is the most common surgical weight loss procedure in the US. Suture material is commonly seen at the gastrojejunal anastomosis and is often considered a normal finding. The presence of suture, however, creates a potential web for entrapment of undigested food. We present a short series of 3 patients who experienced intermittent small bowel obstruction after RYGB due to the presence of a small bowel food bolus.

METHODS: Medical records were retrospectively reviewed for patients with history of RYGB and abdominal pain, and emergent enteroscopy, with foreign body removal.

RESULTS: Three patients with prior history of RYGB (3 months–8 years) presented to the emergency department with acute post-prandial emesis and epigastric pain. Additionally they related a 2–4 week history of intermittent pain, nausea, vomiting and retching, especially after protein meals. One patient also complained of occasional hematemesis. Two of these patients had normal computed tomography of the abdomen. Endoscopic examination showed a normal esophagus and pouch, however in all 3 patients exposed suture was noted at the outlet. The suture extended into the rectum limit under tension. One patient also complained of bloating and rarely related repeated rapid tube passage. In all cases an undigested food bolus was found in the small bowel, entangled in a nest of suture line. The suture was cut at its origin and traction placed on the suture to pull the bolus retrograde into the pouch. The bolus and suture were subsequently removed with a Roth net. In one case the large bolus was difficult to see until suture removal was attempted. Symptoms resolved following bolus removal in all cases.

CONCLUSION: This series highlights a unique cause for common symptoms in the post bypass patient. Food bolus entrapment with partial bowel obstruction should be entertained in RYGB patients complaining of abdominal pain and with visible suture at the gastrojejunal anastomosis. Additionally those who undergo endoscopic evaluation for other indications should be considered for elective suture removal.
Laparoscopic Adjustable Gastric Banding (LAGB) in Super Morbidly Obese Patients (BMI >50) in Ambulatory Surgery Center Is Safe

David Anh Nguyen, Bariatric Surgery, Skylex Advanced Surgical, Inc., Los Angeles, CA

INTRODUCTION: Safety and efficacy of LAGB has been performed in super-morbidly obese patients with great success. We analyzed outcomes and safety in outpatient ambulatory surgery centers (ASC).

METHOD: 525 patients with a BMI greater than 50 under went LAGB in ASC. Electronic medical records were reviewed blindly to assess complications and weight loss.

RESULTS: Graphs below depict great weight loss with reduction of BMI and average weight loss.

CONCLUSION: Out-patient surgery in ASC is a viable option for patients with super-morbid obesity. No deaths or life threatening complications were encountered post-operatively. Furthermore, resolutions of co-morbidity were seen in this sub group of patients.

Combined Science

M2057

Inflammatory-Related Gene Variants as Risk Factors for Pancreatic Cancer: Does NOS Play a Role?

Kaye Reid Lombardi, Department of Surgery, Mayo Clinic, Rochester, MN

BACKGROUND: Recent reports continue to support a link between chronic inflammation and progression to pancreatic cancer (PC). These cite an increased expression of proinflammatory mediators in PC but not in normal adjacent tissue, suggesting a possible mechanism of carcinogenesis.

HYPOTHESIS: The association between inflammation and PC is facilitated by host susceptibility, specifically by genetic polymorphisms in inflammation-related genes.

METHODS: We conducted a case-control, candidate gene association study of C1318T (rs435424) in 216 pancreatic cancer patients with histologically proven primary pancreatic ductal ade- nocarcinoma and 280 age and sex-matched controls evaluated at a single institution from October 1, 2000 to the present. Inflammation-related candidate genes were selected using both literature review and bioinformatics analysis, followed by selection of tagged single nucleotide polymorphisms (SNPs). We used Illumina GoldenGate technology to genotype 768 tag SNPs of 61 candidate genes. The association of each SNP, under a log-additive genetic model, with risk for PC was evaluated using logistic regression, adjusting for known risk factors for PC. Statistical significance was set at p <0.0001.

RESULTS: Our sample was mostly Caucasian (96.8%) and 0.1% of cases and 57.3% of controls were male. When comparing cases and controls, there were statistically sig- nificant differences in sex (p = 0.002), race (p = 0.0002), smoking status (p < 0.0001), BMI (p < 0.0001), and personal his- tory of first-degree relative with PC (p = 0.0053). Restricting genetic analysis to Caucasians and adjusting for age, sex, smoking status, BMI, familial pancreatic can- cer status, and diabetes diagnosed greater than two years prior to diagnosis of PC, single SNP analysis revealed an association between four SNPs in the neuropeptide Y receptor 1 gene (NTRC). The association of the CT (p = 0.00049, OR = 1.29, [95% CI 1.12, 1.49]), rs3728203 (p = 0.00055, OR = 1.27, [95% CI 1.11, 1.46]), and rs9685380 (p = 0.0045, OR = 1.27, [95% CI 1.15, 1.45]) was significant.

In our genotyped data, the linkage disequilibrium (LD) between these SNPs ranged from 0.72 to 0.98. These SNPs have a close physical relationship on the NOS1 gene, within 2 LD Hocks (6 kb) and the other 28.7 kb in a 38 kb region of chromosome 12.

CONCLUSION: Of the 61 genes evaluated, only NOS1 had a significant association with PC and may be associated with risk of PC. NOS1 is not a well studied gene in PC. These preliminary findings warrant further studies to assess the impact of NOS1 on PC risk.

M2058

Prognostic Value of the Heme Oxygenase-1 Transcription Controlling GTn Repeat Promoter Polymorphism in Completely Resected Only Surgically Treated Esophageal Cancer

Yogeek Kumar Vashist, Department of General, Visceral and Thoracic Surgery, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

PURPOSE: The basal transcription of heme oxygenase-1 (HO-1) regulation is dependent upon a GTs repeat poly- morphism (GTn) in the promoter of the heme oxygenase-1 gene (HMOX-1). Here, we evaluate the role of GTn in only surgically resected esophageal cancer (EC) patients without neoadjuvant or adjuvant treatment.

PATIENTS AND METHODS: Genomic DNA was extracted from peripheral blood of 297 patients. To determine the number of the GTs repeats DNA was amplified by PCR and sequenced. The results were correlated with clinicopathological parameters, disseminated tumor cells (DTC) and clinical outcome.

RESULTS: Three genotypes (SS, SL and LL) were defined based on cut-off points for short allele (SGTn) with GTn repeats <15 and >25 as long allele (LGTs). Throughout all analyses a contrary role of GTn was evident in squamous cell carcinoma (SCC) and adenocarcinoma (AC) patients. In SCC patients the SS genotype presented with less aggressive tumors in terms of tumor size, presence of regional and non-regional lymph-node metastasis, DTC and lower relapse rate compared to SL and LL genotype patients. In contrast, in AC patients the SS genotype patients displayed more aggressive tumor biology with bigger tumors, higher rate of lymph-node metastasis and DTC and tumor recurrence rate compared to SL and LL genotype patients. The disease-free (DFS) and overall sur- vival (OS) in SCC patients was markedly reduced in LL genotypes compared to SL and SS genotypes. In parallel, in AC, the SS genotype patients displayed the worst DFS and OS. GTs was identified as an independent prognostic fac- tor with contrary prognostic value for tumor recurrence and death in SCC and AC.

Tuesday, May 4, 2010

Authors available at their posters to answer questions 12:00 PM – 2:00 PM; posters on display 8:00 AM – 5:00 PM.

HALL F

SSAT POSTER SESSION II

Basic: Colon-Rectal

T1945

Accelerated Biological Ageing in Colorectal Cancer: Association Between Telomere Length, F Gutin A and Inflammatory Status

Eiman Monaghan, Department of Surgery, Division of Cancer Sciences and Molecular Pathology, University of Glasgow, Glasgow, United Kingdom

INTRODUCTION: Accelerated biological ageing is a fea- ture of a diverse range of pathologies, including cancer. Typically this is manifest as telomere attrition, which reflects increasing “miles on the clock” and predisposes to surgically resected esophageal cancer (EC) patients without neoadjuvant or adjuvant treatment.

METHODS: Telomere lengths were determined by Q-PCR (ref2) from peripheral blood leukocytes (PBL) derived from CRC patients. F Gutin A levels in plasma were measured by ELISA and correlated with common clinico-pathological
The degree to which each of these components contributes to restoration of the LES is unknown. We have demonstrated that each of these components is equally important in establishing both increased LES length as well as increased LES pressure.

### Basic: Pancreas

**T1948**

**Further Insights on the Mechanisms of the Beneficial Effect of Hypertonic Saline Solution in Acute Pancreatitis**

Ana Maria M. Collo, Gastroenterology, University of São Paulo, São Paulo, Brazil

**BACKGROUND/AIM:** In previous studies, we investigated the effect of hypertonic saline (HS) vs. water infusion on the local inflammatory response reduction due to the alteration of the density of the inflammatory compartment in acute pancreatitis. The present study was designed to evaluate whether the mortality reduction associated with the use of HS on the local inflammatory response reduction is a consequence of systemic inflammation reduction.

**METHODS:** AP was induced in male Wistar rats by intraductal 2.5% taurocholic acid injection. Animals were divided in groups: C (without AP), NT (not treated AP), NS (AP treated with NaCl 0.9%), and HS (AP treated with NaCl 7.5%). Acute fluid volume, trypsinogen activation peptide (TAP) and amylase levels in ascitic fluid and serum were determined. Pancreatic cyclooxygenase 2 (COX-2) and inducible nitric oxide synthase (iNOS) expression were assessed by Western blot analysis. Pancreatic MPO, MDA, and histological alterations were analyzed. Inflammatory cytokines (TNF-α, IL-6, and IL-10) levels in ascitic fluid, serum, and in pancreatic tissue were determined by ELISA.

**RESULTS:** There were no significant differences in serum and ascitic fluid TAF and amylase levels, and in pancreatic MPO, MDA and histological score in groups NT, NS and HS. A significant decrease in pancreatic COX-2 and iNOS expressions were significantly decreased in the HS group, as well as ascitic fluid volume and inflammatory cytokines levels in ascitic fluid, serum, and pancreatic tissue when compared to NT and NS groups.

**CONCLUSIONS:** These findings suggest that hypertonic saline solution decreases local and systemic inflammatory response in acute pancreatitis without changing the intensity of the pancreatic lesions. Supported by FAPESP 2007/03990-5

**T1949**

**Lactate Sensitizes to Pancreatitis Responses in Rats**

Joan A. Alkhatlow, Department of Surgery, Department of Surgery, Yale University, Veterans Administration Connecticut Healthcare, New Haven, CT

The use of intravenous fluids is important for the therapy of acute pancreatitis. Normal saline (NS) and lactated Ringer (LR) are commonly used. Lactate can have physiological effects acting as a buffer, metabolic intermediate, and receptor ligand. A G-protein-coupled receptor (GPCR) activated by lactate has recently been described. We examined the hypothesis that lactate might have distinct effects in disease models of acute pancreatitis.

**METHODS:** Using cerulein-hyperstimulation models, trypsinogen activation was assayed in vitro in isolated pancreatic acinar cells and in vivo.

**RESULTS:** In acinar cells, lactate (1–20 mM) sensitized cerulein-induced trypsinogen and chymotrypsinogen activation. The effects of lactate were concentration-dependent and saturable. Amylase secretion was not affected. GPBR1 lactate receptor is expressed in rat pancreatic acinar cells, as determined by PCR. In vivo studies showed that pretreatment of rats with LR enhanced cerulein (50 μg/kg) induced trypsinogen activation compared to normal saline infusion. LR contains 2.7 mM calcium, lactate containing buffer without calcium caused similar sensitization as LR.

**CONCLUSIONS:** These findings demonstrate that lactate sensitizes the rat pancreas to cerulein responses, possibly through a novel G-protein-coupled receptor. These studies suggest that the effect of LR should be studied in conditions with an increased risk of pancreatitis such as pancreatic trauma and EIRC.
Clinical: Biliary

T1622

Early Phase Systemic Cytokine Profile of Natural Orifice Transluminal Endoscopic Surgery (NOTES©)
Cholecystectomy: Comparison with Laparoscopic Cholecystectomy and Roux-en-Y Gastric Bypass
Byron F. Santos, Department of Surgery, Northwestern University, Chicago, IL

INTRODUCTION: Although NOTES may offer decreased postoperative pain, wound complications, and improved cosmesis compared to standard laparoscopic surgery, its immunologic impact is unknown. NOTES requires the creation and closure of a viscopouch, potentially contaminating the normally sterile peritoneal cavity. We hypothesize that NOTES cholecystectomy is associated with increased systemic cytokine activation compared to laparoscopic cholecystectomy (LAP).

METHODS: Patients requiring cholecystectomy were recruited. Exclusion criteria were age >65 yrs, body mass index (BMI) >40 kg/m², cholecystolithiasis, acute cholecystitis,prior pelvic or gastric surgery, endometriosis, stressed use, and immunosuppression. NOTES patients underwent hybrid transgastric or transgastric cholecystectomy. LAP patients underwent standard laparoscopic cholecystectomy. Laparoscopic roux-en-y gastric bypass (RYGB) patients were enrolled as a positive control group. Peripheral venous blood was collected preoperatively (Baseline) and 30 minutes postoperatively (Postop). Plasma cytokine analysis was done using multiplex ELISA arrays for IL-1α, IL-1β, IL-2, IL-4, IL-5, IL-6, IL-8, IL-10, IL-12p70, IL-13, IL-17, IL-1α, IL-1β, IP-10, MCP-1, MIP-1β, TNF-α, and TNF-β. IL-6 and IL-10 were chosen as primary end-points based on a priori power analysis using preliminary data, with additional cytokines treated as secondary end-points. Cytokine levels were analyzed using a mixed-effects model.

RESULTS: 21 subjects underwent LAP (n = 8), NOTES (n = 5), or RYGB (n = 8). Mean age ± SD (37 ± 12 v. 42 ± 11 yrs), BMI (29 ± 5 v. 30 ± 4 kg/m²), and male sex (n = 2 v. n = 2) were similar between LAP and NOTES groups, respectively. Postop IL-6 was higher for NOTES versus LAP (69 ± 35 vs. 22 ± 24 pg/ml, p < 0.05). IL-10 was higher for RYGB versus LAP (56 ± 36 v. 14 ± 14 pg/ml, p < 0.05). No significant differences were seen in levels of the secondary end-points.

CONCLUSION: NOTES cholecystectomy is associated with increased early postoperative activation of IL-6, and possibly IL-10 compared to LAP. NOTES may cause a greater physiologic insult compared to laparoscopic surgery.

T1623

Microlaparoscopic Cholecystectomy: An Alternative to Single Port Surgery
Keith A. Zuckala, Surgery, Danbury Hospital, Danbury, CT

INTRODUCTION: Recent advances in minimally invasive surgery aiming at diminishing incision have led to the development of single port surgery (SPS). SPS has an increased level of complexity and require a higher level of surgical skills as compared to traditional laparoscopy. We have explored microlaparoscopy as a simpler alternative for routine laparoscopic cholecystectomy.

METHODS: Retrospective review of consecutive elective laparoscopic cholecystectomies performed by a single surgeon at a teaching university hospital over a 24 months period. All surgeries were performed using a 5 mm trocar for the umbilical port and 3 mm trocars for the other ports in standard configuration. Intraoperative cholangiography was performed routinely if technically feasible.

RESULTS: 79 elective cholecystectomies were performed by microlaparoscopy during the 24 months period. Indications for surgery are listed in Table 1. 3 cases required an upgrade to 3 Trocars size for technical reasons resulting in a microlaparoscopic completion rate of 96%. Intraoperative cholangiography was completed in 70 cases (89%). There were no conversions to open surgery. There were no intra- or postoperative complications and all patients were discharged on the day of surgery.

Table 1. Indication for Cholecystectomy

| Cystic Duct | Gallstone Size | Periampullary | Duodenal Dive
|-------------|---------------|---------------|----------------
| n = 10 | n = 7 | n = 2 | n = 2 |
| Stones > 1 cm | 3% | 2% | 2% |

CONCLUSION: Microlaparoscopic cholecystectomy is safe and feasible and represents a simple alternative to other techniques that aim at minimizing incisions. Future development in visualization and instrumentation will allow using even smaller instruments and diminishing the surgical “footprint” even further.
T1625

Is Pain Provocation with Cholecystokinin Administration on Cholecystokinin Predictive of Relief of Symptoms for Biliary Dyskinesia Following Cholecystectomy?

Angela L. Gucwa, Surgery, Section of Gastrointestinal Surgery, Medical College of Georgia, Augusta, GA

INTRODUCTION: Biliary dyskinesia, also referred to as chronic acalculous gallbladder disease (CAGD), falls within the spectrum of diseases associated with gallbladder dysmotility. Cholecystokinin cholecystokinin (CCK-CS) has been used to evaluate for CAGD, with a gallbladder ejection fraction (GEE) of < 35% being indicative of gallbladder dysfunction. The reproduction of biliary colic upon administration of CCK has been cited as indicative of CAGD. Our purpose was to determine if reproduction of pain during CCK-CS is a predictor of surgical outcomes of as a correlate to pathology.

METHODS: A retrospective review of patients was performed to evaluate adults with a diagnosis of CAGD who underwent CCK-CS prior to surgical intervention. CPT and ICD-9 coding queries were used to identify the patient population. Patients with cholecithiasis were excluded. This study was approved by the institutional Human Assurances Committee.

RESULTS: 64 patients met inclusion criteria. Two patients were lost to follow up and were excluded. During CCK administration. 41 patients (66.1%) reported symptoms similar to their presenting complaint. 21 patients reported no symptoms with CCK administration. Pathology review demonstrated either normal histology (n = 4), cholecystitis (c = 4), chronic cholecystitis (n = 47), both cholelithiasis and cholecystitis (n = 6), or autoysis (n = 1). There was no significant relationship between pathology and either CCK or reproduction of symptoms with CCK administration. 81% of patients (n = 50) had relief of symptoms following cholecystectomy (mean EF of 19.5% ± 12.16%). 31 of these patients (66.6%) had reproduction of symptoms with CCK-CS. Twelve patients had recurrence of symptoms (mean EF of 17.18% ± 7.58%) despite surgery. Eight of these patients (66.67%) had symptom reproduction with CCK administration. There was no significant correlation with either the EF or reproduction of symptoms following CCK administration as a predictor of postoperative outcome on analysis by unpaired Student’s t-test.

CONCLUSION: Provocation of pain CCK-CS is an unreliable indicator of postoperative relief of symptoms than GBEF.

T1626

Tissue Compression Analysis for Magnetically Anchored Cautery Dissector During Single Site Laparoscopic Cholecystectomy

Lauren Bramall Mashaud, UT Southwestern Medical Center for Minimally Invasive Surgery, UT Southwestern Medical Center, Dallas, TX

INTRODUCTION: Magnetic Anchoring and Guidance System (MAGS) instruments consist of an internal surgical device coupled across the abdominal wall using an external handheld magnet. The purpose of this study was to evaluate the histological effects of abdominal wall compression using the MAGS platform.

METHODS: Cholecystectomy was performed in 4 porcine models (41–53 kg, 2 non-survival, 2 survival (72 hrs & 14 days)) using a single site laparoscopic (SSL) approach with percutaneous gallbladder retraction sutures. Through a 2.5 cm umbilical incision, a MAGS cautery dissector was inserted. A multipurpose access device allowed use of a laparoscope and other instruments. The MAGS cautery instrument was used to perform the entire dissection. The abdominal wall areas corresponding to the region occupied by the MAGS platform were grossly examined internally (laparoscope) and externally (direct visualization) for signs of tissue damage and marked to facilitate accurate specimen harvesting. At necropsy, abdominal wall thickness was measured and the peritoneal cavity was examined. A board-certified pathologist performed histological evaluation of the harvested specimens. NADH stains evaluated cellular viability and H&E sections evaluated necrosis, acute inflammation, ulceration, and vascular congestion. All findings were scored using standardized grading scales.

RESULTS: All procedures were completed using a SSL approach with no complications, gallbladder dissection time was 36 minutes (15-49). The MAGS cautery instrument facilitated excellent triangulation with minimal instrument conflicts when used in conjunction with only one laparoscopic instrument. Uncompressed and compressed abdominal wall thicknesses were 2.1 cm (1.4-2.5) and 1.4 cm (1.1-1.8), respectively. In all 4 animals, very mild erythema was noted immediately post procedure in the areas corresponding to the outer edges of the rectangular external magnet; this erythema was non-visible within 20 minutes. In 2 animals (pigs 3 & 4), mild blanching was noted on the peritoneal surface and 1 animal (pig 3) exhibited a 3 mm area of petechiae. Necrosis demarcated by the peritoneum was not observed. In all animals, a light microscopic view of necrosis, atrophy, or loss of normal NADH staining. No ulceration, acute inflammation, or vascular congestion was detected.

CONCLUSION: This study demonstrated that use of the MAGS cautery dissector for a SSL cholecystectomy was advantageous in providing triangulation; however this did not result in any significant gross or microscopic tissue damage; despite the thin abdominal wall of the porcine model. These data support important safety aspects of the MAGS platform for planned use in humans.

Clinical: Colon-Rectal

T1628

The Role of Glyceryl Trinitrate Ointment After Hemorrhoidectomy: Preliminary Results of a Prospective Randomized Study

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INTRODUCTION: Conventional Hemorrhoidectomy (CH) is well known to cause significant postoperative pain and delayed return to daily activities. Both surgical wounds and sphincter apparatus spasm are likely responsible for the pain. Besides internal sphincter spasm and hypertonia are associated with impaired mucosal blood flow and probably with delayed healing. In this study we evaluated the role of Glyceryl Trinitrate Ointment (GTN) in reducing postoperative pain, ameliorating wound healing and recovery after CH.

PATIENTS AND METHODS: Between 01/08 and 05/09, 54 symptomatic patients were randomly assigned to receive (23 patients) or not (21 patients) 0.4% GTN ointment for 8 weeks after radiofrequency hemorrhoidectomy. Patients with inflammatory bowel disease, coexisting anorectal disease, or previous anal surgery were excluded. Patients were seen 1 week after Day Surgery and, pain assessed using a 10 centimeters linear visual analogue scale (VAS). Further controls were at 1, 3 and 6 months after surgery or if required. Clinical outcome was assessed by a validated questionnaire on postoperative symptoms and satisfaction supplemented with a visual analogue scale (VAS) for confidence score. Data on postoperative pain (including intensity and duration), wound healing, bleeding, return to normal activities and early (<30 days) and late (30 days) complications were recorded and prospectively entered in a data base.

RESULTS: Patients groups were similar in terms of mean age, gender distribution, degree of disease and follow-up. GTN treated group experienced significantly less pain during the first week after surgery (1.9 ± 2.1 vs. 3.3 ± 2.2, p = 0.02, expressed as mean VAS score). This difference was more evident starting postoperative day 4. A significant higher percentage of untreated patients experienced severe pain (mean VAS score > 7) (6.6 ± 4.4 v 12.1 ± 6.5, p = 0.009). Despite no differences were observed in terms of bowel function, soiling and itching duration, patients treated with GTN were able to an early return to daily activities compared to untreated (11.5 ± 4 days v 16: 9.2 ± 0.05). Two GTN treated patients (8.7%) discontinued the application because of local discomfort and headache. The two groups were similar in terms of ER admission, hospital readmissions, and postoperative and late complications. Patients’ satisfaction scores were also similar.

CONCLUSIONS: Topical GTN cream reduces postoperative pain after hemorrhoidectomy and, despite we did not observe a significant effect on wound healing, it allows an early return to daily activities.

T1629

Ethnicity Influences Lymph Node Resection in Colon Cancer

Molly M. Cone, Oregon Health & Science University, Portland, OR

PURPOSE: Adequate resection and evaluation of lymph nodes after colectomy is now used as a quality indicator and is associated with improved survival. The extent that patient factors, including ethnicity, influence the number of nodes harvested is still unknown. The aim of this study is to determine the association between ethnicity and lymph node retrieval after colon cancer resection.

METHODS: This study is a historic cohort using the Surveillance and End Results (SEER)—Medicare database. A total of 32,936 patients were identified who underwent colon cancer resection from 2000-2003. The study period ended in 2003, when the number of lymph nodes was no longer recorded as a data point. Statistical analysis was performed using SAS software (Version 9.3). Since 12 lymph nodes constitutes an adequate number for accurate staging, subjects were classified as having <12 (N = 20,605) or ≥12 (N = 12,338) examined. Next, univariate and multivariate logistic regression models were used to analyze the relationship between lymph nodes resected and independent variables. Independent variables included: ethnicity, age, gender, cancer stage, income, and comorbidities.

RESULTS: Of the 32,936 patients 62.5% had fewer than 12 lymph nodes resected. Multivariate analysis demonstrated that Hispanic ethnicity was associated with a significantly lower rate of having 12 or more lymph nodes evaluated when compared to the Caucasian population (OR = 0.61, 95% CI: 0.50-0.74). Despite this difference in lymph node number, both groups received the same rate of direct care surgery and survival between the two ethnicities was equivalent. Furthermore, their staging was comparable: the proportion of stage II and III diagnoses was the same for both groups (40% vs. 40% for stage II and 28.8% vs. 28.8% for stage III).

CONCLUSION: Overall, most colorectal resections are performed on patients age 70 and older. Hispanic patients are even less likely to have an adequate lymph node resection when compared to the Caucasian population. However, they have equal rates of cancer directed surgery, stage II and III diagnoses, and equal postoperative complications. These findings are an important determinant of quality markers such as lymph node number.
Recurrent Due to Infection After Colectomy for Cancer Is Strongly Associated with One-Year Mortality

Cesare Ruffolo, IV Unit of Surgery, Regional Hospital Cà Foncello, Madison, WI

BACKGROUND AND OBJECTIVES: Early hospital readmission rate was determined, and readmission diagnoses were grouped using Agency for Healthcare Research & Quality Clinical Classifications Software. Multivariate logistic regression identified predictors of one-year mortality. Odd's ratios (ORs) were adjusted for patient sociodemographics, comorbidity, hospital volume, operative factor, in-hospital complications, length of stay, discharge destination, and receipt of chemotherapy.

RESULTS: Of 42,348 discharged patients, 4,462 (11%) were readmitted within 30 days. The most common causes of rehospitalization were ileus/obstruction, pneumonia, bleeding, surgical site infection, and sepsis. The one-year mortality rate in readmitted patients was 26.2%, compared to 10.5% in nonreadmitted patients (p < 0.001). Of the 1,027 patients readmitted for an infectious complication, 341 (13%) died within one year. After adjusting for potential confounders, all common causes of rehospitalization were significantly associated with one-year mortality. The strongest predictors of mortality were pneumonia and sepsis (adjusted ORs 4.03 and 3.97, respectively).

Table 1. Frequency of the Five Most Common Readmission Diagnoses in 42,348 Patients Collected for Cancer, and Adjusted Odds Ratios (ORs) for One-Year Mortality

Rehospitalization Diagnosis Frequency (％ of Readmitted) OR (95% CI) for Mortality

1. Severe Infection
2. Cancer
3. Bleeding
4. Surgical Site Infection
5. Other

T1631

The Value of Ki-67 as a Prognostic Indicator in Patients with Appendiceal Carcinoid Tumor

Carcinoid, Department of Surgery, University of Wisconsin, Madison, WI

PURPOSE: To examine the value of the growth fraction marker of cell proliferation, Ki-67, as a prognostic indicator in patients with appendiceal carcinoid tumor.

METHODS: A retrospective chart review was conducted on 51 patients with appendiceal carcinoid tumors who underwent surgical intervention from 1991–2008. MB-1, a monoclonal antibody of Ki-67 measuring its expression, was used to determine cell proliferation and correlated with clinical and histological parameters. MB-1 index was categorized according to the WHO (World Health Organization) classification.

RESULTS: Of the 51 patients, 41 had MB index <2%, 6 MB index between 2–15% and 4 had MB index >15%. Assessment by tumor size demonstrated, 32 patients had tumors <2 cm, 3 >2 cm, and 16 tumors were of unspecified size. Patients with tumors <2 cm, were significantly more likely to have MB index <2% vs. MB index >15% (p < 0.001, OR 3.59). The median follow-up rate was 5 years (range 10.5–18 months) with a 51% follow-up rate. Of the 26 patients with follow up, there were 7 mortalities and 3 recurrences. Assessment of survival demonstrated significantly decreased survival by increasing MB index. Survival rate by MB index was as follows: <2% was 97%, 2–15% was 85% and >15% was 67% (p = 0.02).

CONCLUSION: This study demonstrated significantly decreased survival by increasing MB index. Ki-67 may be a useful prognostic indicator for survival in patients with appendiceal carcinoid tumors. No correlation between MB index and tumor size presentation with metastatic disease was demonstrated.

Clinical Presentation and Diagnosis of Intestinal Adenocarcinoma in Crohn’s Disease

Cesare Ruffolo, IV Unit of Surgery, Regional Hospital Cà Foncello, Madison, WI

BACKGROUND: Crohn’s disease (CD) is a well known pre-cancerous condition. Late presentation of CD occurs in 30% of patients and the diagnosis of appendiceal adenocarcinoma in CD and 79 consecutive CD patients undergoing bowel surgery from 2004 till 2008 were reviewed. Gender, age, disease duration, phenotype and localization, familiarity for colorectal cancer, synchronous colorectal cancer, perforation, obstruction, vomiting, obstruction, fever, abdominal mass at palpation, abdominal pain, and appetite/weight loss. The 14 morphological symptoms were analyzed as possible predictors. Univariate and multivariate logistic regression analyses were performed.

RESULTS: Ten men and 2 women underwent surgery for intestinal cancer in CD with a median age of 50 years (31–68). Carcinomas were localized in the terminal ileum in 4 cases, right colon in 3, transverse colon in 1, sigmoid colon in 1, rectum in 2 and an anorectal fistula in 1. Only 3 patients were pre-operatively diagnosed with cancer while the others had a post-operative diagnosis. At diagnosis only 3 (23%) patients presented with AJCC stage II cancer while 4 (33%) presented with stage III and 5 (42%) with stage IV. Rectal bleeding (OR 0.385 [95% CI 0.077– 1.926), p = 0.20) and weight loss (OR 0.667 [95% CI 0.313– 1.418), p = 0.17) were unrelated to cancer diagnosis. At univariate analysis age, fever, obstruction, diarrhea and vomiting resulted to be significantly associated to cancer diagnosis. At multivariate analysis only age (OR 1.057 [95% CI 0.999–1.107, p = 0.05) and obstruction (OR 6.530 [95% CI 1.512–26.806], p = 0.01) significantly predicted cancer diagnosis.

DISCUSSION: In CD, rectal bleeding, the most common alarm symptom for intestinal cancer, is not useful for an early diagnosis. CD patients presenting with an older age and obstruction should be thoroughly investigated to rule out neoplastic lesions. Early diagnosis of intestinal cancer remains a clinical challenge in CD.

Perioperative Management of Oral Anticoagulation for Elective Colon and Rectal Abdominal Procedures

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PURPOSE: Management of perioperative anticoagulation for patients on chronic anticoagulation is a poorly studied problem in colorectal surgery.

METHODS: Review of patients on warfarin anticoagulation undergoing elective colon and rectal operations at a single center from January 2006 to June 2006. Primary outcomes were thromboembolic and bleeding complications.

RESULTS: 146 patients underwent 165 abdominal procedures, median age was 67 yrs, 59% were men, the most frequent indications for anticoagulation were deep venous thrombosis (DVT), atrial fibrillation (35%), pulmonary embolism (25%), mechanical heart valve (16%), treatment of peripheral or cerebral vasculopathy (10%), and other (9%). 22 patients had >1 indication for anticoagulation. 11 had a documented hypercoagulable state. 51 patients had history of warfarin use median 8 ± 0.4 days preoperatively. 50 patients (30%) were bridged with intravenous heparin (LMWH). The remaining 10 were kept on warfarin use median 0.5 ± 0.3 days preoperatively. 20 (12%) were managed with intravenous, unfractionated heparin (UFH) a mean ± 0.6 days preoperatively. The most frequent indications for surgery were malignant neoplasm (59%), stoma reversal (16%), inflammatory bowel disease (16%), and diverticular disease (15%). 38% of cases were performed laparoscopically. Median estimated blood loss (EBL) was 200 ml and 19% received intraoperative blood products. 19% of patients received prophylactic transfusion. The median length of stay for patients on anticoagulation was 5 ± 0.3 days. 22% of patients were managed with LMWH starting a mean 4 ± 0.7 days postoperatively. 32% received therapeutic UFH starting a mean 2 ± 0.7 days postoperatively and 37% received subcutaneous UFH starting a mean 2 ± 0.6 days postoperatively. 10% experienced bleeding complications (3 of which required reoperation). By multivariate analysis, extended cessation of anticoagulation for preoperative colonoscopy or gastrointestinal bleeding and XBL 5000 ml were risk factors for postoperative bleeding (p = 0.04). 5 patients (3%) suffered from a postoperative thromboembolic event. Anticoagulation for cerebrovascular disease was a risk factor for thromboembolism by multivariate analysis (p = 0.03). Overall operative mortality was 30% and there were no deaths 30 days post-operatively.

CONCLUSIONS: Postoperative bleeding and thromboembolism in patients on chronic anticoagulation are not insignificant (10 and 3%, respectively). EBL 500 ml and prolonged cessation of anticoagulation prior to surgery predispose patients to postoperative bleeding. Patients with cerebrovascular disease are at increased risk for thromboembolic complications postoperatively and should be aggressively monitored and treated.

The Prognostic Factors in Predicting Recurrence of Acute Appendicitis After Conservative Therapy

Carcinoid, Department of Surgery, University of Wisconsin, Madison, WI

The purpose of the present study was to determine the prognostic factors in predicting recurrence of acute appendicitis. The present study was a prospective study carried out in the period from January 2006 to June 2006. Since August 2006, 353 patients were admitted to our hospital for acute appendicitis. In these cases, 218 patients underwent operation during admission, and we followed up remaining 135 patients who underwent conservative therapy. For these patients the available data was age, gender, laboratory data, and CT findings at their initial admission were compared with non-recurrent patients.

RESULTS: Recurrent right lower quadrant pain developed 33 of 101 patients (32.7%), who were able to be followed up more than 12 months after discharge. 30 patients were diagnosed as relapsing acute appendicitis by our hospital or other medical institutions, and 18 of 30 patients (60%) underwent operation. There was no significant difference in gender, body temperature, or CRP between recurrent and non-recurrent patients. Mean age of recurrent patients versus non-recurrent patients was 16.0 versus 30.0 (p < 0.001). The most frequent complications during the follow-up period was 1160 (p < 0.05) at the onset of appendicitis. Acute, within inflammation around the appendix, and enlarged diameter of appendix (over 9.0 mm in diameter determined by
Expression of the Cancer Tissue Antigen IGF2BP3 (IMP3) in Colorectal Cancer: IMP3 Holds Promise as a Specific Immunotherapy Target

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INTRODUCTION: IGF2BP3 (IMP3) is a member of the insulin-like growth factor mRNA binding protein (IMP) family that plays a role in RNA trafficking and stabilization as well as cell growth and migration early in embryogenesis. IMP3 is undetectable in adult human tissues yet is found in the testes, thus, it is considered a cancer testis (CT) protein. Several other CT proteins have proven to be reasonable vaccine targets. Although, increased IMP3 expression has been noted in cancers of the pancreas, kidney, ovary, and liver, expression in colorectal cancer (CRC) has not been studied. Thus, the aim was to assess IMP3 expression in CRC and, thus, determine if IMP3 has potential to be a vaccine target.

METHOD: CRC patients for whom adequate tumor and normal tissue samples were available from an IRB approved tissue data bank were included. Demographic, clinical, pathologic and short term outcome data were collected prospectively. Tumor samples were OCT embedded and stored at −80°C until analysis. Total RNA was isolated and purified from tissue samples and cDNA synthesized. IMP3 expression was analyzed by quantitative PCR (qPCR) using the SYBR Green platform. Comparative quantitative analysis was performed using the delta-delta Ct method with GAPDH as an internal control. Tumor and tumors IMP3 expression levels were determined and compared. Tumors with levels 0.5x or more than the mean were considered positive.

RESULTS: A total of 78 paired CRC and normal tissue specimens (36 M/42 F, age 67 ± 14.5) were assessed (88% colon, 12% rectal, pathologic stage 2, 44, stage 3, 34). In 65% of tumors the IMP3 expression levels were at least 0.1% of the testes level and, also, the tumor to normal tissue IMP3 expression ratio was greater than 1.00. In 2% of tumors the IMP3 expression levels were noted in the Stage 3 and node positive tumors. The median tumor expression level was higher in women (p = 0.036).

DISCUSSION: The majority of CRC tumors expressed IMP3 as judged by RT-PCR and IHC. This is in distinction to the low CRC expression levels noted for other CT proteins in previous studies. A larger and more diverse group of tumors should be assessed to better determine if IMP3 expression correlates with TN, or final tumor stage. Assessment of blood or advanced CT antibodies and IMP3 protein is also needed. IMP3 holds some promise as a vaccine target.

T1636 Predicting Post-Operative Mortality for Clotludrum Difficult-Associated Colitis

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PURPOSE: Clotludrum Difficult-associated colitis (CDMC) is the most common cause of nosocomial infectious diarrhea in adults, with frequently lethal outcomes. We sought to develop and validate a prediction rule to identify risk factors for in-hospital mortality of patients undergoing bowel resection for CDMC.

METHODS: Patients undergoing bowel resection for CDMC were identified from the American College of Surgeons National Surgical Quality Improvement Project (NSQIP) 2005–2008. Demographics, comorbidities, and preoperative variables were collected. Univariate and multivariate analyses were conducted to identify predictors of death from surgery for CDMC. Model fit was assessed by internal validation.

RESULTS: 611, 265 patients were identified with 211 undergoing colectomy for CDMC. Of the operative patients, eighty-eight (41.7%) were male and the overall in-hospital mortality was 29.9%. The median time to death was 7 days. One hundred and forty seven patients underwent at least one transfusion and total ileostomy (95% CI, 1.15–5.90). The median hospital length of stay was 16.8 days (95% CI, 0.23–25.9) for all patients and 11.8 days (95% CI, -0.23–30.0) for survivors.

Table 1. Comparison of Derivation and Validation Sets

<table>
<thead>
<tr>
<th>Parameter</th>
<th>NSQL</th>
<th>VALDS</th>
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<tr>
<td>Mean OR (95% CI)</td>
<td>1.21 (0.78–1.82)</td>
<td>0.70 (0.42–1.18)</td>
</tr>
<tr>
<td>Median LOS (days)</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Number of Patients</td>
<td>92</td>
<td>32</td>
</tr>
<tr>
<td>Number of Deaths</td>
<td>5</td>
<td>11</td>
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</table>

Conclusion: Single-incision laparoscopic surgery is a safe and feasible approach for colorectal resections. When compared to HALS, SILS results in a smaller incision size and reduced length of stay at the expense of longer operative times.

T1638 Cost Considerations of Laparoscopic Restorative Proctocolectomy: Do the Recovery Benefits of a Minimally Invasive Approach Even Out the Balance Sheet?

Kelly A. Garrett, Colorectal Surgery, Cleveland Clinic, Cleveland, OH

BACKGROUND: Although restorative proctocolectomy (RP) is increasingly being performed via a laparoscopic approach for the treatment of ulcerative colitis and familial adenomatous polyposis, data on costs associated with the technique are lacking. We analyzed the impact of laparoscopic RP (LRP) compared to a matched group of patients undergoing open RP (ORP) and determined whether the increased operative costs are offset by a decreased length of stay (LOS) for the primary procedure and hospitalization within ninety days.

MATERIALS AND METHODS: Patients undergoing LRP were identified from a prospective pelvic pouch database maintained within LRP. Data were collected from the Colorectal Surgery Outcomes Reporting (CSOR) database. Preoperative, perioperative, and postoperative ASA, major medical, and other comorbidities were analyzed. Patients undergoing ileostomy (69%) and ileal pouch-anal anastomosis (IPA) were excluded. Costs were compared.

RESULTS: 103 patients who underwent LRP from 2003–2009 were identified and matched to patients who underwent ORP. The two groups had similar age, gender, preoperative diagnostic and ASA score. In group 1, 37 (52%) patients had completion proctocolectomy and ileo-anal pouch and 70 (68%) patients had total proctocolectomy and ileo-anal pouch. LRP had significantly shorter LOS when compared to ORP (median = 4 days, IQR 3–7, p < 0.001). Although operating room costs (p < 0.001), anesthesiologist (p < 0.001), professional costs (p = 0.004) and global hospital costs (p < 0.001) were significantly higher in the laparoscopic group for the primary procedure; nursing, ICU, pharmacy and radiology costs were similar. For hospitalizations within ninety days, there was no difference in the rate of admissions (p = 0.86) or hospital costs
between the two groups. Analysis of surgical cost for the primary procedure combined with cost for hospitalizations as well as ventilators for the two groups revealed operating room costs (p = 0.001), anesthesia costs (p < 0.001), professional costs (p = 0.012) and global costs (p < 0.001) were significantly higher for the LRP group.

CONCLUSIONS: LRP is significantly more costly when compared to ORP. The shorter LOS for LRP did not offset the global cost for the primary procedure and hospitalizations within ninety days. Identification of specific scenarios where the clinical benefits of LRP are unequivocal may help improve utilization of resources in the current era of cost constraints.

Clinical: Esophageal

§ T1639

Long-Term Outcome of Patients with Spontaneous Esophageal Rupture (Boerhaave’s Syndrome) Undergoing Esophagectomy as the Definitive Treatment Strategy

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BACKGROUND: Long-term outcome of patients treated for a spontaneous esophageal rupture (Boerhaave’s syndrome) is seldom reported, especially in patients undergoing esophagectomy. This surgical option is mainly reserved for patients with severe wall necrosis or large esophageal perforation in which a primary repair appears unsatisfactory. As little data are available about this group of patients, this study was conducted to evaluate the long-term outcome of patients with Boerhaave’s syndrome undergoing esophagectomy.

PATIENTS AND METHODS: The study population included 43 patients (33 male, 10 female; median age: 63 years) with Boerhaave’s syndrome who underwent esophagectomy at specialized centers of 2 European countries from 1983 to 2009. All study patients had severe wall necrosis or large perforation of the distal esophagus unsuitable for primary repair.

RESULTS: Twenty patients had esophagectomy with thoracotomy and 23 through a transthoracic. In most patients (n = 38) an intrathoracic esophagostomia was performed. Five patients underwent a direct reconstruction with a gastric conduit. The median length of hospital stay was 45 days with a hospital mortality rate of 30% (13/43 patients). Mortality among those 8 patients with a failed attempt of primary closure of the perforation was 63% (n = 5). Twenty six patients were discharged with cervical stoma. Of them, 22 (85%) underwent a delayed reconstruction after a median time of 6 months using either a gastric conduit (n = 1) or colon conduit (n = 21). In 4 (9%) patients the cervical stoma remained because of poor cardiopulmonary conditions (n = 1), late death (n = 1) or reconstruction is under planning (n = 2). With a median follow up of 42 months, 22 (51%) patients are alive with 20 patients on full oral diet.

CONCLUSION: Surgical therapy with esophagectomy achieves in up to 50% a remarkable long term outcome in the group of Boerhaave’s syndrome patients known to have the worst prognostic disease status.

T1640

The Safety of Laparoscopic Antireflux Surgery in the Lung Transplant Population: A Case-Control Study

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BACKGROUND: Gastroesophageal reflux disease (GERD) has been associated with bronchiolitis obliterans syndrome (BOS), a form of rejection after lung transplantation. Recent evidence suggests that laparoscopic antireflux surgery (LARS) may control the decline in lung function characteristic of BOS. However, the safety of LARS in lung transplant patients is unknown, as no reports have been published to address this issue objectively. The aim of this study is to determine the safety of LARS in the lung transplant population. Our hypothesis is that LARS is as safe in the lung transplant population as it is in patients who have not undergone lung transplantation.

MATERIALS AND METHODS: We retrospectively compared the outcomes of LARS of 18 consecutive patients who have undergone lung transplantation to those of 21 consecutive patients (control group) with neither lung disease or lung transplantation who had LARS between November 2008 and October 2009.

RESULTS: There was no statistically significant difference in complication rates after LARS between the lung transplant population and the control group (p = 0.88). The study population faced significantly higher surgical risk than the control group (mean ASA class: 3 vs. 1.7). However, patients in the control group had significantly higher prevalence of bariatric and hypothyroid and diabetes than the lung transplant population (p = 0.004 and 0.0000, respectively). The average length of stay was similar in both the lung transplant population and the control group (1.7 vs. 1.8 days; p = 1.0) regardless of complications. Time since lung transplant had no effect on complication rate (p = 0.92). There was no in-hospital or 30-day mortality for any patient.

CONCLUSIONS: Previous reports indicate acceptable safety of LARS in the lung transplant population, though this has not yet been assessed against a control group. We demonstrated that LARS is equally as safe in lung transplant patients as it is in the general population with GERD. Therefore, LARS is a safe and acceptable procedure to address GERD after lung transplantation.

T1641

The Influence of Incidental Gastrointestinal Stromal Tumors on the Treatment of Patients Undergoing Resection of Upper Gastrointestinal Malignancies

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BACKGROUND: There are emerging data to suggest that asymptomatic gastrointestinal stromal tumors (GIST) of the stomach are not uncommon. We sought to determine the incidence of these tumors in patients undergoing resection for epithelial tumors of the foregut as well as the impact on surgical and adjuvant treatment.

METHODS: A prospectively entered database chronicling all patients undergoing resection of non-GIST malignancies of the stomach and esophagus at a single university center over a 4-year period was accessed, and pathology reports were reviewed for the presence of synchronous GISTs. Patient demographics, tumor characteristics, operative procedures, and post-operative outcomes were reviewed for patients in whom a synchronous GIST was identified. Data presented as median (range).

RESULTS: From July 2005 to November 2009, 186 patients underwent gastrectomy (n = 62) or esophagectomy (n = 124) for a non-GIST malignancy (142 adenocarcinoma, 29 squamous cell carcinoma, 7 other). Of these, synchronous GISTs were identified in 6 (3.3%) (n = 1), pre-operatively (n = 1), intra-operatively (n = 4), and upon final pathology (N = 5). Median age of patients was 70 years (30-84) and most were male (6/8). Operative therapy was altered in 4 of 5 patients identified pre- or intra-operatively. In these patients, a wedge resection of the stomach was performed in the eventual gastric conduit following esophagectomy. Final pathology revealed completely resected tumors of 0.65 cm (0.2-5 cm) with low or very low malignant potential. None of the patients received adjuvant therapy for the GIST in addition to that for the epithelial tumour. At last follow up (16–25 months), 3 patients have died from disease (epithelial cancer), 2 are alive with disease (epithelial cancer), and 3 are alive without disease. In no patient has GIST recurred.

CONCLUSION: Synchronous GIST is not an uncommon incidental finding during resection of foregut malignancies that may alter surgical treatment but is unlikely to impact long term survival.

T1642

Diagnosis of Type-I Hiatal Hernia: A Comparison of High Resolution Manometry and Endoscopy

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OBJECTIVE: Sliding type I hiatal hernia (HH) is commonly diagnosed using upper endoscopy, barium swallow (BS) or esophageal manometry (EM). Current data suggests that endoscopy is superior to EM or BS. Recently, high resolution manometry (HRM) has become available for the assessment of esophageal motility. The unique ability of this technique to display spatial and topographic pressure profiles of gastroesophageal junction (GEJ) and crural diaphragm (CD) in real time suggests that it may be a better means for the assessment of an overt type-I HH.

The objective of the current study was to compare EM with endoscopy for diagnosis of sliding HH.

METHODS: Data was analyzed retrospectively for 83 consecutive patients (61% females, mean age 52 ± 13.2 yrs.) with objective gastroesophageal reflux disease (GERD) who were considered for laparoscopic antireflux surgery between 2006 and 2008 and had preoperative HRM and endoscopy. HH was defined as GEJ ≥2.5 cm above the CD. Intraoperative diagnosis of HH was used as the gold standard. Sensitivity, specificity and likelihood ratios of a positive and negative test were used to compare the performance of the two diagnostic modalities.

RESULTS: Forty two patients were found to have a type-I HH during surgery. Twenty four patients had manometric criteria for a HH by HRM and 36 patients were described as having a HH by endoscopy. False negative rates were found to significantly lower (p = 0.003) with HRM (2/41) as compared to 12/41 (p < 0.001). There were no significant differences in the false negative rates between the two modalities (2/42 vs 13/36; p = 0.36). Sensitivity, specificity and likelihood ratios for HRM and endoscopy are shown in Table 1.

Table 1. Sensitivity, Specificity and Likelihood Ratios for HRM and Endoscopy

<table>
<thead>
<tr>
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<th>High Resolution Manometry (HRM)</th>
<th>Endoscopy</th>
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<tbody>
<tr>
<td>Sensitivity</td>
<td>94.38%</td>
<td>66.67%</td>
</tr>
<tr>
<td>Specificity</td>
<td>75.12%</td>
<td>80.00%</td>
</tr>
<tr>
<td>Likelihood ratio of a positive test</td>
<td>10.72</td>
<td>2.01</td>
</tr>
<tr>
<td>Likelihood ratio of a negative test</td>
<td>0.60</td>
<td>0.52</td>
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CONCLUSIONS: HRM has better specificity and ability to rule-in an overt type-I HH (greater likelihood ratio of a positive test). However, relatively higher false negative results with HRM as compared to endoscopy (47.68% vs 36.12%) counteract this benefit. Both HRM and endoscopy are unreliable for ruling-out type-I HHs. Negative result for a HH by either modality mandates additional testing.
Elevated Preoperative Neutrophil/Lymphocyte Ratio as a Predictor of Post-Operative Disease Recurrence in Esophageal Cancer

Keen M. Shariat, Medicine, Columbia University Medical Center, New York, NY

BACKGROUND: The prognosis for patients with esophageal cancer is poor, even among those who undergo potentially curative esophagectomy. There are few predictors of disease recurrence after surgery for esophageal cancer. Neutrophil/lymphocyte ratio (NLR) is hypothesized to reflect the extent of systemic inflammatory response created by a tumor, and possibly provides an indication of tumor aggressiveness and propensity for metastasis. Elevated NLR has been associated with disease recurrence after resection for colorectal cancer metastases, cholangiocarcinoma, and hepatocellular carcinoma. We aim to evaluate the potential utility of NLR as a predictor of outcomes in esophageal cancer.

METHODS: We performed a single-center retrospective analysis of esophageal cancer patients who underwent esophagectomy at a single institution between 1989–2009. Data were collected on patient demographics and clinical characteristics, receipt of neoadjuvant treatment and tumor characteristics, preoperative white blood cell counts, and differential were used to calculate NLR. Elevated NLR was defined as a neutrophil:lymphocyte ratio $>5$. Logistic regression modeling was performed to analyze characteristics associated with elevated NLR. Kaplan-Meier analyses and Cox regression modeling were performed for disease-free and overall survival.

RESULTS: A total of 212 patients underwent esophagectomy and had available preoperative lab values to calculate NLR. The median duration of follow-up was 32 months (IQR: 13–56). Forty patients (19.8%) had elevated NLR preoperatively. No patient who was not neoadjuvantly treated had significantly associated with elevated NLR. In Kaplan-Meier analyses, elevated NLR was associated with significantly worse disease-free ($p=0.03$) and overall survival ($p=0.03$); however, these associations were not significant after adjustment for potential confounders. Multivariable stratified analysis, elevated NLR was associated with significantly increased risk of disease recurrence among patients who received neoadjuvant treatment (HR 2.13, 95% CI 1.09–4.17).

CONCLUSIONS: Preoperative neutrophil/lymphocyte ratio is a potential prognostic marker for tumor recurrence after esophagectomy, particularly in patients who receive neoadjuvant treatment. It is unclear whether NLR reflects the degree of inflammatory response to the primary tumor or perhaps other patient-specific characteristics that predispose to recurrence. Further investigations are warranted to clarify the mechanisms that explain the observed associations between elevated NLR and poor outcomes in esophageal cancer.

EUS Staging Accuracy in Oesophageal Cancer After CRT

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BACKGROUND: Endoscopic ultrasonography (EUS) is considered the best method for locoregional staging of oesophageal cancer (EC). Surgery with or without neoadjuvant or adjuvant chemo-radiotherapy is the treatment of choice for most patients with EC. After preoperative chemo-radiotherapy (CRT), EUS accuracy is claimed to be poor, although considered helpful in guiding the management of these patients. Aim: To assess EUS staging accuracy after CRT and to identify EUS role in the patients' prognosis.

METHODS: From January 2000 to April 2009, a total of 474 patients with oesophageal carcinoma who underwent oesophagectomy were examined using preoperative EUS and CT. Of these patients, 267 underwent preoperative chemo-radiotherapy (CRT). Both EUS and CT scans were used to determine the depth of tumor penetration (T-stage) and the presence of lymph node metastases (N-stage) in accordance with AJCC TSMN. EUS was performed using blind oesophagoscope-probe (MEI 9081) at 7.5 MHz (30%), because of stenosis, the other were performed with the mechanical radial UM GINQ 130, 7.5 and 20 MHz (28%) or the electronic CF UE 160 12/20 MHz mini-probes (22%). EUS and CT staging after CRT were compared with surgical pathology stage.

RESULTS: Accuracy of EUS after CRT was 44.7% in detecting the depth of esophageal involvement, with better results for the T1 group (70%), and 60.6% in detecting lymph node metastases. In these cases CT accuracy is comparable with 43.2% in T stage and 57% in N stage. Compared with EUS, CT tends to over-stage T stage and to underestimate N stage. The other side the most common EUS errors post-CRT were over-staging if compared to resected surgical specimen. The multivariate analysis showed that survival rate in patients who underwent CRT is not related to EUS stage post CRT but only to surgical pathology stage.

CONCLUSIONS: EUS staging accuracy of esophageal cancer after chemo-radiotherapy using the conventional TN system, is lower than reported for pre-treatment staging (44.7% vs 80%). Over-staging is the most common error in EUS staging after CRT, apparently because fibrosis and inflammations, associated with chemo-radiotherapy, are indistinguishable from residual tumor on EUS imaging. In a select group (i.e., complete response or progression of the disease) EUS could be usefulness for the choice of the treatment (definitive vs surgery).
CONCLUSION: Surgery for peri-ampullary liver metastasis is associated with low morbidity and mortality. While survival is possible in select pts, outcome following surgery of peri-ampullary metastasis remains controversial. We assess safety and efficacy of curative intent surgery for peri-ampullary liver metastasis.

METHODS: Between 1993–2009, 40 pts underwent resection and/or radiofrequency ablation (RFA) for peri-ampullary liver metastasis. Clinicopathologic and outcome data were collected and analyzed.

RESULTS: Location of primary tumor was pancreatic head (n = 20), ampullary (n = 10), distal bile duct (n = 3) or duodenum (n = 5). Most pts (n = 27) presented with synchronous disease. Of pts with metachronous disease (n = 13), median time to liver metastasis was 22 mo. The majority of pts had solitary lesions (n = 34); median lesion size was 2.7 cm. Pts with simultaneous disease had smaller lesions (median, 0.9 cm) vs pts with metachronous disease (median, 3.0 cm) (p = 0.01). At surgery, pts underwent resection alone (n = 21), RFA alone (n = 8), or resection-RFA (n = 1); RFA alone (n = 7, p = 0.001) and resection (n = 5, p = 0.009) were performed more often in pts with metachronous disease. Post-operative morbidity and mortality were 30% and 5%, respectively. Most pts (55%) required with a median recurrence-free survival of 10 mo. Intra-hepatic recurrence was the predominant pattern of initial recurrence (86%). Overall 1- and 3-year survival was 55% and 18%. Survival was not associated with synchronous vs metachronous presentation (p = 0.05). Pts with pancreatic or distal bile duct tumors had a worse survival (median, 13 mo) vs pts with ampullary or duodenal tumors (median, 23 mo).
We in the US

in on surgery for treatment of HCC was

geneal and had a history of hormo-

onal contraceptive use, which was discontinued at the
time of diagnosis. Nine patients (53\%) had multiple HA,
with a median number of 2 lesions (range 1–10) per
patient. Median size of the largest HA at the time of diag-
nosis was 4.3 cm (range 2.3–14.4) and median size of
the largest HA at the time of RFA was 3.9 cm (range 1.5–6.7). A
total of 39 lesions were ablated in 25 sessions (open n = 5, percutaneous n = 20). RFA was successful at the first
attempt in 4 patients (28\%). Seven patients underwent additional sessions of RFA resulting in adequate treatment
in 4 patients (24\%). Five patients (29\%) had radiological
evidence of small residual HA tissue (≤1.5 mm) bordering
the thermal lesion, but due to low clinical importance no
further treatment was administered. All of these lesions
have remained stable or regressed during follow-up. Four
patients are currently awaiting further therapy or follow-
up. Post-operatively, one patient developed a liver abscess
requiring re-intervention and one patient suffered from a
major but reversible complication related to concomitant
hepatic resection. Median hospital stay was 7 days in the
open group and 2 days in the percutaneous group.

CONCLUSION: HA can be safely treated using both open
and percutaneous RFA. However, multiple sessions are
often required and signs of residual adenoma might persist
in some patients despite repetitive treatment. RFA might be
especially beneficial for patients not amenable for sur-
gery or those that would require major hepatic resection
otherwise.

RESULTS: Of 61 patients undergoing treatment for HA, 17
patients (28\%) underwent RFA for HA. Mean age was 29
years. All patients were female and had a history of hor-
omonal contraceptive use, which was discontinued at the
time of diagnosis. Nine patients (53\%) had multiple HA,
with a median number of 2 lesions (range 1–10) per
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otherwise.

DIFFERENCES BETWEEN BIPOLAR-COMPRESSION AND ULTRASONIC DEVICES FOR PARENCHYMAL TRANSCUTANEOUS LIVER RESSECTION

Kim E. Brown, Department of Surgery, University of Louisville, Louisville, KY

BACKGROUND: Bipolar-compression liver resection has become
a safe and essential technique in the management of hepatic tumors. Multiple options for parenchymal transec-
tion techniques exist; however, none has emerged as superior. We aimed to compare operative characteristics
among and outcomes between bipolar-compression and ultra-
sonic devices used for parenchymal transection during laparoscopic liver resection.

METHODS: Review of a prospective hepatopancreato-
biliary database from December 2002 to August 2009
identified 54 patients who underwent laparoscopic liver
resection with parenchymal division using either a bipolar-
compression (n = 35) or an ultrasonic (n = 19) device, at the
operating surgeon’s discretion. Major vascular/biliary
structures were divided by endoscopic stapling in both
groups. Operative data, histology and 90-day complication
rates were compared to investigate differences between
different transection devices. ANOVA and the Pearson
chi-squared test were used to compare the two groups.

RESULTS: The two groups were not significantly different
with regard to age, body mass index, parenchymal steatosis/
inflammation, and number of Couinaud segments resected.
A shorter median time of parenchymal transection was
noted for the bipolar-compression (55 min; range: 20–65) vs.
the ultrasonic device (55 min; range: 29–73; p < 0.001).
Shorter median total operative times (130 [70–180] vs. 180
[80–240] min; p = 0.049) were also noted for the bipolar-
compression device. When examining post-operative out-
comes, no significant differences between device groups
were noted for estimated blood loss, complications of any
type, or for liver-specific complications (post-operative
hemor-
rage or bile leak). See Table.

CONCLUSIONS: Bipolar-compression devices may offer
an advantage of decreased transection time and total oper-
ative time over ultrasonic devices without a difference in
post-operative complications during laparoscopic liver
resection.

T1655

DIFFERENCES BETWEEN BIPOLAR-COMPRESSION AND ULTRASONIC DEVICES FOR PARENCHYMAL TRANSECTION DURING LAPAROSCOPIC LIVER RESSECTION

T1656

DIFFERENCES BETWEEN BIPOLAR-COMPRESSION AND ULTRASONIC DEVICES FOR PARENCHYMAL TRANSECTION DURING LAPAROSCOPIC LIVER RESSECTION

Raul E. Brown, Department of Surgery, University of Louisville, Louisville, KY

BACKGROUND: Bipolar-compression liver resection has become
a safe and essential technique in the management of hepatic tumors. Multiple options for parenchymal transec-
tion techniques exist; however, none has emerged as superior. We aimed to compare operative characteristics
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type, or for liver-specific complications (post-operative
hemor-
rage or bile leak). See Table.

CONCLUSIONS: Bipolar-compression devices may offer
an advantage of decreased transection time and total oper-
ative time over ultrasonic devices without a difference in
post-operative complications during laparoscopic liver
resection.
Clinical Pancreas

T1656 Surgical Resection Is the Only Effective Therapy for Primary and Metastatic Pancreatic Inlet Cell Carcinoma

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BACKGROUND: Multidisciplinary management of patients with pancreatic inlet cell carcinoma (ICC) remains poorly defined. Our objective was to determine the role of multidisciplinary therapy of pancreatic ICC.

METHODS: The Los Angeles County Cancer Surveillance Program (CSP) was queried to identify all patients diagnosed with ICC during the study period of 1982–2006. Patients receiving pancreatic resection, chemotherapy (CT), radiation therapy (RT) either alone or in combination were tabulated. Univariate and multivariate analyses were compared. Multivariate Cox-regression analysis was performed to identify predictors of survival.

RESULTS: Two hundred thirty-six patients were diagnosed with ICC during the study period. The majority of patients (75%) initially presented with regional (n=82) or distant (n=95) disease. Treatment of the cohort consisted of pancreatic resection (n=82, 35%), chemotherapy (n=5, 21%) or radiation therapy (n=9, 4%). Select patients (n=14, 17%) underwent multimodal adjuvant therapy. Median survival (MS) for the entire cohort was 3.2 years. Stratified by therapy, surgical resection was associated with highest survival rates (n=22, 71%, 5-year). Surgical survival was associated with improved survival when compared to medical management (chemotherapy and/or radiation therapy) (17.3 vs 5.8 years, p = 0.002, 12 vs 1.1 years, p = 0.002, and 4 vs 1.8 years, p = 0.011, respectively). By multivariate analysis, survival independent of predictors improved survival (HR 0.35, CI 0.19-0.66, p = 0.011). In contrast, chemoradiation was associated with decreased survival.

CONCLUSION: In this large series evaluating the multidisciplinary management of pancreatic ICC, surgical resection remains the only treatment modality associated with improved survival. Chemotherapy or radiotherapy as primary therapy or as an adjunct to surgery did not provide a survival benefit in these patients.

T1657 Surveillance and Recurrence After Resection of Non-Invasive Intraductal Papillary Mucinous Neoplasms

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BACKGROUND: Pancreatic intraductal papillary mucinous neoplasm (IPMN) is a precursor to invasive pancreatic adenocarcinoma. IPMN follows a relatively indolent course in the absence of malignancy and is often amenable to surgery. Numerous studies have explored preoperative parameters that predict malignant or invasive disease and the need for resection. The risk of recurrence in patients with invasive or metastatic disease is known to be high. This study aims to identify factors that predict pancreatic IPMN recurrence and the need for post-operative surveillance in patients with IPMN.

OBJECTIVE: We aimed to investigate the patterns of recurrent IPMN among patients with non-invasive disease.

METHODS: We performed a retrospective chart review of 91 patients who underwent pancreatic resection for non-invasive (benign or carcinoma-in-situ) IPMN between 1997 and 2009. Patients undergoing total pancreatectomy or those with invasive carcinoma were excluded, as were patients lost to follow-up before 6 weeks had elapsed since their surgery. Data collected included: type of resection, histology, margin status, postoperative follow-up time, additional pancreatic resections and histology of any recurrent disease.

RESULTS: Mean follow-up time for all 68 patients included in the analysis was 25 months (median = 14 months, range = 1.3–128 months). Thirty patients (4%) had recurrent disease requiring a second surgery. Two of these patients had carcinoma-in-situ in the primary resection specimen, while one patient had positive margins. Mean time to the second surgery was 20 months (median = 18 months, range = 14–27 months). An additional seven patients who have not undergone a second resection had lesions suspicious for recurrent IPMN observed by endoscopy. Two patients in the endoscopy group had positive margins, none had malignant disease in the primary resection specimen. Mean time until the first endoscopic observation of potentially recurrent disease was 12 months, (median = 15 months, range = 3–128 months). One additional patient with IPMN in which recurrence was documented, had IPMN in an inner duct that was hyperplastic and X-rayed 19 months later with inoperable pancreatic adenocarcinoma. Mean follow-up for all recurrent disease (both surgical and endoscopic follow-up) was 28 months.

CONCLUSIONS: Recurrent IPMN remains a concern, even in the setting of a non-invasive disease. However, the majority of recurrences present within a few years of the primary resection. Surveillance protocols for patients who have undergone IPMN resection would likely provide the greatest benefit within this time period.

T1658 Hepato, Pancreatic and Biliary (HPB) Surgery Can Be Safely Performed in a Community Teaching Hospital

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INTRODUCTION: There is an ongoing debate about the feasibility of performing HPB cases in low-volume, community hospitals. We decided to analyze outcomes of HPB surgical cases done in our community teaching hospital and compare them with published data from academic centers and national data.

MATERIALS AND METHODS: We reviewed all HPB cases (liver, pancreas, bile duct cases) performed in an eight year period (2001–2009) by an HPB-fellowship trained surgeon (PEX) at our hospital. All patients who underwent HPB surgery were reviewed and all pertinent clinical information was retrieved. 30 days morbidity and mortality were analyzed. All complications were graded according to the Clavien grading system (grades I–VI). Complications-pancreatic fistula/leak and delayed gastric emptying were analyzed using International Study Group definitions (ISGPF) and International Study Group of Pancreatic Surgery (ISGPS) definitions.

RESULTS: There were 140 HPB cases performed. These included 33 pancreatoduodenectomies, 29 distal pancreatectomies, 52 hepatic cases and 26 cases of other lesions involving the pancreas and biliary tract. Overall complication rate was 36%, 4%. Using Clavien classifications, there were 26 Grade 1 complications (60%), 13 Grade 2 complications (30%), 2 Grade 3 complications (9%), 2 patients underwent reoperation for postoperative complications. Overall mortality was 0.7% (1 patient). Pancreas-specific complications included 6% pancreatic leak rate after pancreatectoduodenectomy and 24.1% leak rate for distal pancreatectomy.

CONCLUSION: HPB surgery can be safely performed in a community setting, with morbidity and mortality comparable to high-volume centers. Appropriate surgical expertise and clinical resources are necessary to provide satisfactory outcomes.

Clinical Outcome in Low Socioeconomic Patients with Severe Acute Pancreatitis Treated Either with Early Nasogastric Feeding or Total Parenteral Nutrition: A Comparative Study

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BACKGROUND: Severe Acute Pancreatitis (SAP) is common in the north-east part of India and accounts for around 3, 17% hospital deaths. Pancreatic ductal pathology is one of the most affecting causes of high socioeconomic population. In SAP severity of inflammatory response together with increased intestinal permeability directly affects the clinical outcome. Enteral feeding has been suggested efficacious and safe to parenteral nutrition because of proposed beneficial effect on gut barrier. Our study was to compare early enteral feeding with Total parenteral nutrition (TPN) in view of clinical outcome.

MATERIALS AND METHODS: 50 patients who meet the inclusion criteria were randomized either to TPN or Early enteral nutrition (EN) group. The nutritional regimen was started 24 hours from admission. The nutritional regime aimed to be isocaloric between 2 groups with the energy target of 25 kcal/kg/day based on admission weight. The initial rate of enteral feed was 25 kcal/hr and gradually increased daily up to 100 kcal/hr.

RESULTS: The incidence of infectious complications (IF vs EN, p=0.002) and gastrointestinal complications-pancreatic fistula & pancreatic abscess (IF vs EN, p=0.007) were significantly lower in enteral fed group. The most significant infectious complication was pancreatic infection (pancreatic necrosis & pancreatic abscess) (IF vs EN, p=0.007) and central venous catheter infection (0.8 vs 8, p=0.004). Systemic complication including multiorgan failure was also significantly lower in EN group (5 vs 12, p=0.037). In enterally fed group only 1 patient expired compared to 4 in TPN patients. Incidence of delayed gastric emptying (9 vs 17) with decreasing trend in the TPN group (3 vs 14, p=0.002). The mean hospital stay in EN group was 76.5 days compared to TPN 104.4 days. The mean cost of feeding in TPN was approximately 11 times more than Enteral fed patients.

CONCLUSION: The enteral feed was well tolerated, cheaper and effective. It significantly reduces the incidence of infective complications and good control of blood glucose. EN is the better option in management of SAP among low socioeconomic population.

Pancreatoduodenectomy for Ductal Adenocarcinoma in the Very Elderly: Is it Safe and Justified?

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BACKGROUND: The outcomes of complex major surgery in the elderly are being scrutinized because of the demands on surgical services, by an aging population, and the concern whether such endeavors are justified. Pancreatectoduodenectomy (PD) for pancreatic adenocarcinoma presents special challenges because of the high morbidity of the procedure, dismal prognosis of the disease, and the increasing incidence of pancreatic cancer with age.

METHODS: All patients who underwent PD for pancreatic adenocarcinoma from 1981 to 2007 were analyzed for peri-operative outcomes, tumor-related parameters, use of adjuvant therapy, and long-term survival. Specifically those aged ≥80 years were compared with a control group aged ≥80 years. Continuous variables are displayed as median and range (90th percentiles) and median. Cox’s proportional hazards were used to determine survival and effects of age as an independent marker against other variables.

RESULTS: Fifty three patients aged ≥80 years underwent PD. Twenty six (51%) developed complications, including delayed gastric emptying (9,17%), pancreatic leak (6,13%) and post-operative bleeding (5,9%). There was one in hospital death (2%). Five patients (9.5%) were readmitted with a control group aged ≥80 years. Forty one (79%) patients were discharged home, and of those (12,22%) patients were discharged to an outside health care facility (pancreatic leak/drains and feeding issues--5, delayed gastric emptying/ nutrition--4, no home support—1), one died in a nursing home at 5 months while the other 10 patients returned to their previous abode (median 4 weeks). The median survival was 15.3 months (95%
BACKGROUND: Endoscopic transpapillary drainage is usually not advocated for large pseudocysts especially at tail end of pancreas for fear of infection. We attempted transpapillary drainage with nasopancreatic drain (NPD) or stent alone in large pseudocysts (>6 cm) located at tail end of pancreas.

METHODS: Over a period of three years, 11 patients (9 male) with large pseudocysts located at tail end of pancreas were treated with transpapillary drainage. An informed consent was obtained, intravenous midazolam and hyoscine butyl bromide were administered and endoscopic retrograde pancreatography (ERP) was performed. Initially, an attempt was made for a contrast free deep pancreatic duct cannulation. When it was not possible minimal nasal cannulation was injected. On endoscopic retrograde pancreatography (ERP), a 5 or 7 Fr stent was inserted. In nasopancreatic drain (NPD) was placed across/near the site duct disruption. The end points of treatment were resolution of pseudocyst or need for surgery.

RESULTS: Nine patients had an underlying chronic pancreatitis (alcohol 1 and idiopathic 8) and two patients had pseudocyst as sequelae of acute pancreatitis (drug induced 1 and idiopathic 1). The size of pseudocysts ranged 7 to 18 cm (8 ± 3.1 cmms). Nine patients had partial duct disruption and 2 patients had complete disruption. An attempt to place NPD was made in 5 patients and a stent in 6 patients in the NPD group, deep cannulation could not be achieved in 1 patient with complete disruption, he was treated successfully with antibiotics and percutaneous drainage. In other 4 patients with partial duct disruption, NPD was successfully placed bridging the disruption and all these patients had resolution of pseudocyst of 2.8 ± 0.7 cmms. The NPD group got blocked in one patient at day 14 and was successfully opened by flushing. In the stent group 1 patient had partial and 1 had complete duct disruption. The patient with complete disruption and non-bridging stent had successful outcome at 8 weeks. Out of 5 patients with partial disruption, one recovered uneventfully in 6 weeks with a stent bridging the disruption. The other 4 patients (bridging stent in 3 developed febrile illness and infection of the pseudocyst. The other 4 patients (bridging stent in 3) were treated with antibiotics for successful resolution. There was no recurrence of the pseudocyst in a mean follow up of 16.4 months.

CONCLUSION: Endoscopic transpapillary drainage with a NPD bridging the disruption is associated with good outcome even in patients with large pseudocysts at the tail end of pancreas. However, there was increased frequency of infection when a stent was used for drainage.

T1662
Preservation of Replaced or Accessory Right Hepatic Artery During Pancreaticoduodenectomy for Pancreatic Adenocarcinoma: Impact on Margin Status and Survival
Olivier Turet, Surgical Oncology, Institut Paul Calmettes, Marseille, France

INTRODUCTION: Replaced or accessory right hepatic artery (RARHA) is common and may complicate pancreaticoduodenectomy.

AIM: We sought to determine the impact of RARHA on postoperative morbidity, margin status, and overall survival in patients undergoing pancreaticoduodenectomy (PD) for pancreatic adenocarcinoma (PA).

METHODS: From 2000 to 2007, 471 consecutive patients underwent pancreaticoduodenectomy (PD) for resectable PA at 2 institutions. Of these, 47 patients (10%) had documented RARHA. Of these, 16 patients received neoadjuvant chemoradiation (neoadjuvant RARHA group) due to institutional preference and 31 patients did not receive preoperative radiation (RARHA group). Matched patients without RARHA comprised our Control group.

RESULTS: RARHA was identified by radiologists in 14 patients (29%). Conversely, surgeons identified RARHA by review of the CT scan by the operating surgeon in 24 (51%) patients preoperatively and 23 (49%) patients intraoperatively. RARHA was preserved during PD in 44 patients. Three patients with RARHA involved by PA had reconstruction (2) or ligation (1). Morbidity and mortality of the RARHA group were 36% and 2%, respectively. No short term or long term RARHA-related morbidity was noted. Comparison of RARHA group vs Control group revealed no significant differences in length of operation, blood loss, lymph node retrieval, positive lymph nodes, and involved margins. Furthermore, the neoadjuvant RARHA group had lower margin positivity rate when compared to the in RARHA group, but this was not statistically significant (10% vs. 19.3%, p = 0.6). All patients with R1 resection (n = 8) had tumor size ≥3 cm. No difference was noted in median ≤3-yr mean overall survival times between RARHA group and Control group. Two patients in the RARHA group with involved RARHA died of disease progression after 6 and 12 months of follow up. One patient in the RARHA group with involved RARHA was still alive without recurrence after 28 month follow-up.

CONCLUSIONS: PD for PA in the presence of RARHA resulted in comparable outcomes to patients without RARHA. Margin positivity was not affected by presence of RARHA, however, patients with frank RARHA involvement tended to have poorer survival. Neoadjuvant and anti-biotics for successful resolution. There was no recurrence of the pseudocyst in a mean follow up of 16.4 months.

T1663
Subjective Evaluation of the Pancreatic Texture by the Surgeon Is Objective and the Most Important Predictor of Postoperative Pancreatic Fistula
Yahia Keck, Department for General and Visceral Surgery, University of Freiburg, Freiburg, Germany

This study aims to prospectively evaluate the accuracy of subjective judgement of pancreatic texture and durability in comparison of objective histologic parameters of fibrosis.

MATERIALS AND METHODS: Using a prospective database various risk factors for pancreatic fistula were examined. For 62 consecutive patients with pancreatic head resection, pancreatic texture was subjectively graded by the experienced pancreatic surgeon to “hard” or “soft.” Independent histological evaluation for fibrosis was performed. POPF was defined according to the BSGS definition. For statistical analysis, Spearman rank correlation and binary logistic regression were used.

RESULTS: In univariate analysis weight loss, hard pancreatic texture, large pancreatic duct diameter as well as diagnosis of the disease were determined as independent risk factors for POPF with reduced POPF rate. Hard pancreatic texture correlated positively with the diagnosis of a pancreatic head resection. A large duct diameter was associated with a high risk of severe POPF. A high risk of severe POPF was observed in the BSGS-3 group独立诊断, and a low risk of severe POPF was observed in the BSGS-1 group. Multivariate analysis showed that hard pancreatic texture (OR 0.12, p = 0.02) and history of weight loss (OR 0.84 per kg, p = 0.04) were the only independent risk factors.

CONCLUSION: Pancreatic texture, as subjectively evaluated by the experienced surgeon, is the strongest and most easily evaluated factor predicting POPF. Further studies on POPF should stratify patients according to pancreatic texture. Anatomometric techniques may then be chosen depending on pancreatic texture.

T1664
Factors Associated with Failure of Conservative Management in Severe Acute Pancreatitis
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BACKGROUND: The initial treatment of Severe Acute Pancreatitis (SAP) is conservative. The standard management was operative intervention in patients with (suspected) infected necrotizing pancreatitis. Mode of intervention depends on various factors. The aim of the present study was to evaluate the effectiveness of non-operative management in patients with SAP.

METHODS: Ongoing prospective study carried out from April 2008 onwards. All consecutive patients (64) with SAP were recruited in the study. Patients were initially managed conservatively and as per the indication underwent intervention. The outcome in patients managed with different modalities was compared.

RESULTS: Of the 64 consecutive patients with SAP, 41 patients were managed non-operatively. Out of which 14 patients were managed conservatively, 27 patients underwent PCDo and the remaining 23 patients underwent initial PDs. There was one mortality in patients managed conservatively and three mortalities in those managed by PCDo alone. Mortality was 11/23 (47.8%) in patients requiring surgery. Overall mortality in the whole group was 15/64 (23.4%). Significant factors leading to 14/64 deaths were POPF (p = 0.003), APACHE > 9 (p = 0.001), pancreatic respiratory failure (p = 0.001), ICU admission > 5 days (p = 0.000), and infected necrosis (p = 0.000).

CONCLUSIONS: Overall mortality in this group of SAP was 23.4%. Patients with non-operative management had 9.7% mortality. Surgery was required in 35.9% patients in this series. Mortality in patients with surgical management was 47.8%, of which the disease specific mortality was 39.1%.
T665
Cholecodochoduodenostomy: Is It Really So Bad?
William McHer Lepard, Surgery, Medical University of South Carolina, Charleston, SC

BACKGROUND: Choledochoduodenostomy (CDD) has been shunned by some surgeons for the management of the benign distal common bile duct stricture due to the potential complication of “sump syndrome.” The feared sump syndrome is theorized to occur from bile stasis and reflux of duodenal contents into the terminal common bile duct with bacterial overgrowth, resulting in cholangitis or hepatic abscess. The true incidence and resultant morbidity of sump syndrome, however, is not well defined.

METHODS: With the approval of the Institutional Review Board, a retrospective chart review of all patients undergoing cholecodochoduodenostomy for benign disease at a single institution between 1994 and 2008 was undertaken. Data were collected with particular attention to operative indications, perioperative course, and long term results. Long term outcomes were assessed through clinical reports at outpatient follow up, emergency room visits, and hospital readmissions.

RESULTS: Seventy-nine patients underwent side-to-side CDD for benign disease during the 15 year period (51 (65%) men; mean age 52 years (STD 12)). Indications for surgery included chronic pancreatitis (80%), choledocholithiasis (11%) and cholangitis (4%). Patients presented with abdominal pain (80%), nausea/vomiting (30%) and jaundice (13%). Sixty-one patients (77%) underwent an addition procedure at the time of the CDD, including lateral pancreaticojunostomy (26%). There was no perioperative mortality. Postoperative complications occurred in 15 (19%) patients, including intraabdominal abscesses (26%), wound infection (20%) and biliary leak (13%). The mean hospital stay was 9.7 days (STD 6.9). There was no occurrence of cholangitis. Two patients (2.5%) developed a hepatic abscess, managed by antibiotics and imaging guided percutaneous drainage.

CONCLUSIONS: CDD is a safe and effective method of decompressing the distal common bile duct in benign pancreaticobiliary disease. Long term results are acceptable with sump syndrome a rare outcome.

T666
Percutaneous Transhepatic Ileal Segment Autotransplantation After Pancreatectomy for Chronic Pancreatitis: A Novel Approach
Kathleen M. Morgan, Surgery, Medical University of South Carolina, Charleston, SC

BACKGROUND: In selected patients with chronic pancreatitis, total pancreatectomy with ileal autotransplantation can be effective for the treatment of intractable pain and avoidance of diabetes. Conventionally, ileal infusion occurs intraoperatively after islet processing. A percutaneous transhepatic route in the immediate postoperative period is an alternate approach.

METHODS: A prospectively collected database of all patients undergoing extensive pancreatectomy with islet autotransplantation for pancreatic cancer at a single institution was reviewed with attention to preoperative, intraoperative, and postoperative complications (CR 287 vs. 257). Intraoperative ileal infusion was noted. Approval from the Institutional Review Board for the evaluation of human subjects was obtained.

RESULTS: Over an 8 month period, 22 patients (14 women; median age 40.5) underwent extensive pancreatectomy with islet autotransplantation for pancreatic cancer. Twenty-one patients underwent total or completion pancreatectomy for pain secondary to pancreatitis, one patient underwent extended distal pancreatectomy for a disconnected duct after acute pancreatitis. Median operative time was 255 minutes (range 144 to 395), with median EBL 400 cc (range 100 to 3000). Median elapsed time from pancreatic resection to ileal transplantation transhepatically was 265 minutes (range 145 to 363). A median of 236,496 IgE were harvested (range 6341 to 1,168,725), or 3.15 IgE per kg, with a viability of 97.5%. Peak portal venous pressure during ileal infusion was a median 13.5 mmHg (7 to 31 mmHg). Postoperative complications occurred in 8 patients (36%), including those related to pancreaticojejunostomy (wound infection, abdominal abscess, deep vein thrombosis, acute renal failure, pneumonia, Clostridium difficile colitis, urination tract infection, and deep vein thrombosis) as well as those related specifically to ileal transplantation (hepatic artery pseudoaneurysm, portal vein thrombosis). With median follow up of only 3.8 months, 21 patients (95%) demonstrated improvement in pain with decreased narcotic requirement, 3 (14%) are narcotic independent, and 5 (23%) are insulin free.

CONCLUSIONS: Percutaneous transhepatic ileal segment autotransplantation is feasible and safe. Given ileal processing times, percutaneous infusion in the immediate postoperative period may be a viable option for the early postoperative surgical further follow-up is needed to assess the effectiveness of total pancreatectomy with percutaneous transhepatic ileal autotransplantation in terms of long term ileal function and pain relief.

T667
Laparoscopic Distal Pancreatectomy: Is There Benefit in Slow Preservation?
Sanjeev Suresh Vijayan, Mayo Clinic, Rochester, MN

AIM: Spleen preservation in patients with benign disease undergoing laparoscopic distal pancreatectomy is described; however, debate continues as to the potential advantages and disadvantages of splenic preservation. The aim of this study was to analyze the impact of splenic preservation on perioperative outcomes.

METHODS: A single-institution, retrospective review of patients undergoing laparoscopic distal pancreatectomy between January 2004 and July 2009 was performed. Twenty-five patients who underwent laparoscopic spleen-preserving distal pancreatectomy (LSPDP) were compared to 73 patients undergoing a laparoscopic distal pancreatectomy with splenectomy (LDP). Univariate and multivariate analysis was performed using logistic or linear regression as appropriate.

RESULTS: When comparing LSPDP to standard LDP, the patients did not differ in mean age (61 vs. 55, p = 0.13), sex (68% vs. 57% female; p = 0.35), or BMI (28.2 vs. 25.0); however, patients in the LDP group were more likely to have an ASA of 3 (24% vs. 61%, p = 0.01). The mean tumor size was 3.0 cm vs. 4.4 cm, p = 0.51 and pancreatic specimen length was 8.5 cm vs. 9.6 cm, p = 0.20 were similar between groups. When analyzing perioperative outcomes, we found no significant differences in mean operating time (218 minutes vs. 202 minutes, p = 0.30), blood loss >150 mL (82% vs. 9%, p = 0.70), or pancreatic leak rate (20% vs. 16%, p = 0.65). The LSPDP group had a higher mean platelet count at dismissal (405 vs. 245 × 10^9, p = 0.013); however they were no less likely to experience infectious morbidity (14% vs. 10%, OR 0.35, 95% CI 0.15–2.94, p = 0.35), thrombotic morbidity (4% vs. 9%, OR 0.41, CI 0.05–4.36, p = 0.41) or have a length of hospital stay >5 days (28% vs. 50%, OR 0.4, CI 0.1–1.0, p = 0.053) when compared to the LDP group.

CONCLUSIONS: Laparoscopic distal pancreatectomy with splenic preservation is a safe and feasible operation; however, contrary to results published in smaller series or open approaches, we found no apparent advantages of splenic preservation with regard to perioperative outcomes. Extended follow-up is necessary to determine whether differences exist in the incidence of delayed complications.

Clinical: Small Bowel

T668
Occult Retropertitoneal Lymphadenopathy from Metastatic Bladder Carcinoma Resulting in Duodenal Obstruction: Report of Two Cases
Brian Jang, Department of Surgery, CMDN-Abbot Wood Johnson Medical School, New Brunswick, NJ

BACKGROUND: Duodenal obstruction has been reported to develop from direct extension of upper gastrointestinal malignancies, most commonly pancreatic, biliary, duodenal, and gastric cancers. Retropertitoneal lymphadenopathy is a rare cause of duodenal obstruction and typically occurs in the setting of lymphoma. Conventional cross-sectional and endoscopic interrogation are able to provide a diagnosis in the majority of cases.

FINDINGS: To our knowledge, this is the first report of two cases of duodenal obstruction resulting from confluent retropertitoneal lymphadenopathy at the level of the fourth portion of the duodenum from metastatic transitional cell carcinoma of the bladder. In both cases, there was confluent and firm retropertitoneal lymphadenopathy involving superior mesenteric artery lymph nodes causing extrinsic compression at the level of the fourth portion of the duodenum. CT scanning and upper endoscopy failed to recognize this pattern of confluent retropertitoneal lymphadenopathy from bladder carcinoma. Both patients underwent an exploratory laparotomy, requiring a surgical bypass for palliation.

T669
A Thin Walled Naso-Enteric Feeding-Decompression Catheter That Can Be Delivered Over a Nasal Gastrostomy
Gerald Moss, Biomedical Engineering Department, Rensselaer Polytechnic Institute, White Plains, NY

A polyurethane nasso-enteric feeding-decompression catheter was developed whose size is less than 20 French (0.0667 mm), yet has an ID of only 6 mm. Flexibility with out kinking was maintained by stenting with a “double helix” of ultra-thin stainless steel spring band. Its total wall thickness is approximately one-fifth that of conventional construction. This catheter can be inserted over a currently available 5 mm nasal gastrostomy for safe and rapid placement. The larger channel can aspirate both the stomach and duodenum. A second fine bore-feeding tube can be inserted co-axially, to extend 5 cm beyond the larger channel (e.g., into the more distal duodenum), resulting in a two lumen feeding-decompression catheter. The lubricated 20 French re-enforced catheter is slid over the 5 mm nasal gastrostomy. The pair is guided into the distal duodenum under direct vision, and the gastrostomy withdrawn. A 6 French feeding catheter is inserted co-axially 5 cm beyond the outer channel. For safety, this final 5 cm will be accomplished by retracting the outer aspiration tube over the feeding tube.

Histopathology revealing poorly differentiated metastatic bladder carcinoma.
Catheter Inserted Over Nasal Gastroscope

Clinical: Stomach

T1671
Helicobacter Pylori Has No Influence in Distal Gastric Cancer Survival

Amado A.M. Herbella, Federal University of São Paulo, São Paulo, Brazil

INTRODUCTION: There is evidence that H. pylori is correlated with distal gastric cancer genesis. However, few studies analyzed the survival related to H. pylori infection.

OBJECTIVE: This study aims to correlate gastric cancer survival and Helicobacter pylori infection.

MATERIALS AND METHODS: All histopathological reports of stomach biopsies (endoscopic and surgical) received at the institution’s Pathology Service between January 1, 1995 and April 30, 2002 were included in the study. Age, gender, H. pylori infection detected by Hematoxylin-eosin (HE), Giemsa, and Warthin-Starry stains, and type and location of the gastric malignancy were the variables analyzed. We calculated the frequency, prevalence, percentage, and odds ratio to establish the relationship between H. pylori infection and gastric adenocarcinoma (GA).

RESULTS: A total of 8,040 gastric biopsies were studied; of these, 3,934 were positive for H. pylori and 529 were diagnosed with GA. Only 70 GA biopsies were positive for H. pylori infection (13%). Mean age of patients was 57.3 years and male-female ratio was 1:1. There were no statistical differences between intestinal and diffuse subtypes.

CONCLUSIONS: We found a relation of 13% between CG and H. pylori infection in an open Mexican population at the institution, a finding that is similar to those reported in series from China, Japan, Costa Rica, and other countries.

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T1672
Relation Between Helicobacter Pylori Infection and Gastric Cancer in a Single Institution

Eduardo E. Montalvo-Jave, Department of Surgery, Department of Surgery, Hospital General de Mexico, Facultad de Medicina, UNAM, Mexico City, Tlalpan, Mexico

INTRODUCTION: Gastric cancer (GC) is the 14th cause of death in Mexico; alcohol, tobacco, diet, and, lately, infection by Helicobacter pylori (Hp) include some of the associated risk factors. We studied the prevalence of Hp infection and gastric cancer at a single institution.

OBJECTIVE: To study the association between Hp infection and gastric cancer.

MATERIALS AND METHODS: All histopathological reports of stomach biopsies (endoscopic and surgical) received at the institution’s Pathology Service between January 1, 1995 and April 30, 2002 were included in the study. Age, gender, Hp infection detected by Hematoxylin-eosin (HE), Giemsa, and Warthin-Starry stains, and type and location of the gastric malignancy were the variables analyzed. We calculated the frequency, prevalence, percentage, and odds ratio to establish the relationship between Hp infection and gastric adenocarcinoma (GA).

RESULTS: A total of 8,040 gastric biopsies were studied; of these, 3,934 were positive for Hp infection and 529 were diagnosed with GA. Only 70 GA biopsies were positive for Hp infection (13%). Mean age of patients was 57.3 years and male-female ratio was 1:1. There were no statistical differences between intestinal and diffuse subtypes.

CONCLUSIONS: We found a relation of 13% between CG and Hp infection in an open Mexican population at the institution, a finding that is similar to those reported in series from China, Japan, Costa Rica, and other countries.
T1675
Three Unusual Presentations of Gastrointestinal Stromal Tumors (GIST): Literature Review and Treatment
Elizabeth Revesz, Surgery, St. Joseph Hospital, Champaign, IL
Gastrointestinal stromal tumor (GIST) is rare malignancies that originate from the cells of Cajal, the pacemaker cells of the intestine. GISTs represent 0.2% of all gastrointestinal tumors with an annual incidence of 14.5 per million persons in the US. GIST arises from the stomach in 51% of the time, followed by the small intestine in 36% of cases, 12% from the colon and rectum, and 1% from the esophagus. After a thorough literature review using the search terms “GIST case reports” and “GIST presentation” in PubMed, we found that the majority of published case reports presented with gastrointestinal hemangioma. Upper GI bleed is more frequent given the predominance of tumors originating from the stomach. Hemoperitoneum is also reported as an initial presentation of GIST, especially in larger tumors. A rarely reported occurrence is intramedullary hemangioma. Furthermore, published case reports have described GIST misdiagnosed as another disease process. GISTS have masqueraded as gastric carcinoma or adenocarcinoma, squamous cell carcinoma, lung cancer, pancreatic cancer, hepatoblastoma, ovarian, uterine or vaginal tumors, testicular masses and prostate cancer. We report one case of a GIST masquerading as appendicitis, only one other such case was found in the literature. Nevertheless, these tumors also can present synchronously with other malignancies. Since a not so specific clinical picture and rare overall prevalence make diagnosing GIST difficult, a higher clinical suspicion should be utilized early in the patient’s disease course, gauging respectability, and surgical planning. Given that most GISTS are vascular tumors, prior endovascular embolization can also facilitate resection by controlling hemorrhage during resection. A diagnosis and treatment algorithm of GIST is presented based on our institution’s experiences and on the National Comprehensive Cancer Network (NCCN) recommendations.

METHODS: Laparoscopic sleeve gastrectomy and two jejunojejunostomies were performed in 8 dogs (47-47 kg) survived for 3, 7, 14, and 28 days. Boutress material consisted of a bioabsorbable, synthetic polymer (glycolide, dioxane, dimethyl acetamide and trimethylolpropane triol), whose mechanism as antibacterial is attributed to its high zeta potential. We have demonstrated that this solution causes no damage to peritoneal mesothelial cells.

T1676
Pre-Loaded Buttressed Versus Non-Buttressed Linear Staple Lines: A Randomized, Blinded-In-Vivo Comparison
Lauren Brandon Mashall, Department of Surgery, UT Southwestern Medical Center, Dallas, TX
INTRODUCTION: Prior studies have documented increased burst strength of buttressed vs. non-buttressed linear staple lines. However, available tissue reinforcement systems require manual loading and can be time-consuming, require additional training or dissemble during staple usage. The purpose of this study was to perform an in-vivo comparison of buttressed versus non-buttressed linear staple lines using a novel pre-loaded tissue reinforcement system; specific outcomes were intraoperative problems, bleeding, adhesion formation, and histologic tissue analysis.

METHODS: Laparoscopic sleeve gastrectomy and two jejunojejunostomies were performed in 8 dogs (47-47 kg) survived for 3, 7, 14, and 28 days. Boutress material consisted of a bioabsorbable, synthetic polymer (glycolide, dioxane, dimethyl acetamide and trimethylolpropane triol), and was fixed to the staple cartridges during manufacturing. Buttressed and non-buttressed loads were used to create the gastric sleeve and to close the jejunal entenotomies; both types were used in each animal in an alternating fashion according to a randomized, matched pair design. Intraoperative outcomes included instrument malfunctions and bleeding. At necropsy, adhesions were scored and staple lines were harvested with histological analysis performed by a board-certified pathologist in a blinded fashion. Standardized grading scales were used for all comparisons. Statistical analysis included Mann Whitney and Fisher Exact tests; data are reported as mean ± SD.

RESULTS: A total of 40 staple lines were analyzed. No instrumentation malfunctions occurred and all buttressing materials remaining intact during stapling. Incidence of grossly visible bleeding was 5% for buttressed vs. 30% for non-buttressed (p = 0.09). Bleeding was rated as mild (two intervention) for buttressed and mild (n = 5) and moderate (required intervention, n = 1) for non-buttressed, with one non-buttressed staple line having staple malformation that required oversewing. At autopsy, no leaks were identified (n = 8); all staple lines had shown a standardized strength of S-severe) were similar for buttressed (1.6 ± 0.8) and non-buttressed (1.9 ± 1.0) loads (n.s.). Histological analysis identified no significant differences according to hemorrhage, inflammation, fibrosis, connective tissue, necrosis, and neovascularization scores.

CONCLUSIONS: Although not statistically significant, a trend towards less gross bleeding and less staple malformation was observed for the buttressed compared to the non-buttressed staple lines. The novel pre-loaded bioabsorbable buttress system resulted in uncomplicated usage and no detrimental adhesion formation or histologic outcomes. The use of this buttressing system may be beneficial.

Combined Science

T2086
Transperitoneal Lavage with an Electrolyzed Solution by Ionic Selectivity Considerably Decreases the Bacterial Load and the Inflammatory Response in a Murine Model of Sepsis
Francisco Nachon Garcia, Instituto de Ciencias de La Salud, Programa de Doctores en Ciencias Biomédicas, Cirugía General, Universidad Veracruzana, Centro de Especialidades Médicas del Estado de Veracruz, Xalapa Ver, Veracruz, Mexico
INTRODUCTION: Peritoneal sepsis is the prototype of a severe inflammatory response. The sustained immune, hemodynamic and metabolic support, antimicrobial treatment, and control of the source of infection are required. Transperitoneal peritoneal lavage (TLP) with 0.9% saline solution (SS) has been the standard method to eliminate the bacterial load and biological debris from the abdominal cavity. The addition of antibiotics or antineoptics to the SS used for TLP has proved variable efficacy. In this study we tested Electrolyzed Solution by Ionic Selectivity (ELOIS) and its bioelectronic nature and to compare TOPL, whose mechanism as antibacterial is attributed to its high zeta potential. We have demonstrated that this solution causes no damage to peritoneal mesothelial cells.

MATERIALS AND METHODS: We conducted a randomized, double-blind experimental study on a murine model of peritoneal sepsis by cecal ligation and puncture. The care and use of animals was according with APS guiding principles. We compared the effectiveness of SS and ELOIS for TOPL by evaluating the systemic inflammatory response (SIR), including cardiac rate (CR), respiratory rate (RR), core temperature (T), white blood cells count, plasma levels of IL-6 and IL-10, histopathological changes in the peritoneum, antibiotic activity, IL-6 and IL-10 mRNA expression in peritoneal mesothelial cells, and animals survival rate.

RESULTS: Clinical parameters of SIR showed significant differences in ELOIS group compared to SS group. CR 270 ± 24 vs 299 ± 15, RR 89 ± 5 vs 87 ± 5, T 32.7 ± 0.7 vs 32.7 ± 0.7, WBC 5.2 with 2.3% band cell vs 5.6 with 4.9% band cell (p < 0.001). Plasma levels of IL-10 were higher in ELOIS group, 1.5 fold above the control, and 0.5 above to that on sepsis stage (p < 0.001). Peritoneal inflammation was reduced by 6% in the ELOIS group compared to the sepsis stage and SS group (p = 0.01, p < 0.05 respectively). Bacterial load was reduced from more than 300,000 CFU in the sepsis stage, to less than 50,000 CFU (p = 0.001) after ELOIS treatment. Compared to the sepsis stage or SS-treated animals, IL-4, IL-10 and IL-12 mRNA expression decreased after ELOIS treatment (p < 0.001). Finally, Kaplan-Meier analysis showed 90% higher cumulative survival rate in the ELOIS group compared to the SS group (p = 0.05).

CONCLUSION: This study demonstrates that TOPL with ELOIS cause a significant reduction of the bacterial load, resulting in a better control of the local and systemic inflammatory response, which allows longer survival of the animals.

Methods: CHAMPS is a 41-item questionnaire where patients report weekly physical activity over a range of activities; responses are converted into metabolic equivalent (kcal/kg/wk). A 3 kcal/kg/wk difference is equivalent to 1 hour of moderate intensity activity. Patients scheduled for abdominal surgery were evaluated preoperatively, 3 weeks and 2 months postoperatively. As recovery is affected by age, magnitude and type of surgery and presence of complications, known-groups construct validity was assessed by comparing postop weekly energy expenditure of patients in these subgroups. CHAMPS was also compared to other measures of surgical recovery including health-related quality of life (SF-36) and pain and fatigue (visual analog scale). p < 0.05.

RESULTS: 204 patients, 68% male with a mean (SD) age of 55 (15) years, participated. Of patients approached, 94% agreed to participate with complete follow up data in 89% of patients at 3 weeks and 90% at 2 months. CHAMPS estimated energy expenditure decreased from a median of 29 prep to 26 at 3 weeks postop and increased above baseline levels to 36 at 2 months. Older patients (age ≥65) had lower physical activity at 3 weeks (23 vs 29), 41% of procedures were laparoscopic and 60% were ambulatory. Patients undergoing laparoscopic procedures were more physically active at 5 weeks (35 vs 24) compared to open procedures. Compared to patients undergoing higher intensity procedures requiring admission, ambulatory patients reported higher energy expenditure at 3 weeks (30 vs 22) and 2 months (43 vs 28) postop. 27% of patients had one or more postop complication. Compared to those without complications, patients with complications reported less physical activity at 3 weeks (15 vs 39) and 2 months (23 vs 43). At all time points, there were low to moderate but significant correlations between CHAMPS and the SF-36 physical function, vitality and general health subscales and with fatigue (r = 0.14-0.41).

CONCLUSION: This study contributes evidence for construct, longitudinal and cross-sectional validity for the CHAMPS physical activity questionnaire as a practical, easily administered, quantitative measure of recovery after scheduled abdominal surgery.

Methods: CHAMPS is a 41-item questionnaire where patients report weekly physical activity over a range of activities; responses are converted into metabolic equivalent (kcal/kg/wk). A 3 kcal/kg/wk difference is equivalent to 1 hour of moderate intensity activity. Patients scheduled for abdominal surgery were evaluated preoperatively, 3 weeks and 2 months postoperatively. As recovery is affected by age, magnitude and type of surgery and presence of complications, known-groups construct validity was assessed by comparing postop weekly energy expendi-
Wednesday, May 5, 2010

Authors available at their posters to answer questions 12:00 PM – 2:00 PM; posters on display 8:00 AM – 5:00 PM.

HALL F

SAT POSTER SESSION III

Basic: Colon-Rectal

W1866

Local Peritoneal Irrigation with Intestinal Alkaline Phosphatase Is Protective Against Peritonitis in Mice

Farzad Davoudi, Department of Surgery, Massachusetts General Hospital/Harvard Medical School, Boston, MA

BACKGROUND AND AIMS: Despite the use of specific antibiotics, aggressive operative intervention, and nutritional support, peritoneal sepis continues to be a major cause of morbidity and mortality. Local irrigation of the peritoneal cavity with a variety of agents has proven to be of no benefit. The brush border enzyme intestinal alkaline phosphatase (iAP) can detoxify gram-negative bacterial endotoxin lipopolysaccharides and systemic administration of sepsis has been shown to be of benefit in several animal models of sepsis. The present study was designed to investigate the therapeutic effects of locally administered iAP and to determine whether or not endotoxin (EAP) in a cecal ligation and puncture (CLP)-animal model of polymicrobial sepsis.

METHOD: Forty week old C57BL/6 mice were randomized to undergo CLP with an 18 gauge needle, followed by instillation of iAP into the peritoneal cavity at a variety of dosages and time schedules. Fecal output was evaluated by measurement of lung myeloperoxidase activity and blood levels of AST and ALT (liver enzymes). In addition, blood leukocyte counts and cytokine levels were assessed. Finally, peritoneal lavage fluid (PLF) was aspirated 24 h after CLP and neutrophil infiltration as well as bacterial counts in both aerobic and anaerobic conditions were determined.

RESULTS: We found that phosphatase activity due to iAP in PLF was still present up to 5 h post injection. Compared to the vehicle-treated control, the overall 7-day survival rate was increased by iAP treatment, with maximal effects seen at 25 units (40% vs. 0% survival rate). Compared to single EAP injection (25 U), multiple injections of EAP (25 U) or co-administration did not produce any significant additive effects on survival rate. iAP-treated mice showed less lung neutrophil infiltration and liver damage compared to non-treated mice. iAP treatment had no effects on the neutrophil counts, bacterial counts, or TNF-α levels in PLF, but there were reduced IL-6 levels in iAP-treated animals compared to untreated mice.

CONCLUSIONS: These data demonstrate that local irrigation of the peritoneal cavity with iAP enhances survival in a mouse model of peritonitis, likely through the reduction of local inflammation as well as remote organ damage. These results suggest that iAP irrigation could be a novel therapy to treat intra-peritoneal sepsis.

W1867

Plasma Levels of Soluble Intercellular Adhesion Molecule-1 Are Moderately Increased in Patients with Colorectal Cancer

C.M. Shanthia Kamada D, Colon and Rectal Surgery, Department of Surgery, St. Luke Roosevelt Hospital, New York, NY

INTRODUCTION: Intercellular Adhesion Molecule-1 (ICAM-1) is a transmembrane endothelial (EC) and leukocyte associated glycoprotein that plays a key role in leukocyte migration and activation. ICAM-1 expression is induced by IL-1 and TNF alpha. ICAM-1 participates in immune and inflammatory processes by interacting with leukocyte LFA1 and Mac-1 integrins. Soluble ICAM-1 (sICAM-1) is generated via proteolytic cleavage and is present in the plasma. sICAM-1 delivers chemokinetic signals to lymphocytes and enhances cytokine production and T-cell proliferative responses. sICAM-1 promotes angiogenesis and is upregulated in various tumor types and different tumor stages. We found significantly higher sICAM-1 levels in patients with colorectal cancer (CRC) than in the normal control population.

METHOD: Preoperative blood samples were collected from CRC and benign colon pathology patients undergoing colorectal resection (CR). Clinical, demographic and final pathological data were collected. Plasma sICAM-1 levels were determined via ELISA in duplicate and are reported as mean ± SD. ICAM-1 levels between groups were compared by the t test and the ANOVA test was used to assess the relationship between sICAM-1 levels and T, N or tumor stage in the cancer group. Significance was defined as p < 0.05.

RESULTS: A total of 130 CRC (74% colon, 26% rectal) and 116 benign disease patients (adenoma 39%, diverticulitis 38%, other 3%) were studied. The sex breakdown was similar. The CRC patients were older (mean age 66 ± 60, p = 0.001). The mean preoperative plasma sICAM-1 level was significantly higher in the malignant disease group (20.5 ± 17 µg/mL) than the benign pathology group (13.5 ± 8 µg/mL) (p = 0.001). No significant correlation was found between sICAM-1 levels and T, N or final tumor stage although non-significant elevations were noted with increasing T and final tumor stage and in node positive patients.

CONCLUSION: The mean plasma sICAM-1 level in a group of CRC patients was modestly (15%) but significantly increased when compared to benign pathology patients. ICAM-1 expression is upregulated in cancers due to inflammation-related angiogenesis, tissue remodeling, and leukocyte trafficking. Tumor shedding of ICAM-1 may increase plasma sICAM-1 levels. A larger study is needed to determine the clinical relevance, if any, of this change and to definitively determine if plasma levels correlate with T, N and tumor stage.

Basic: Esophageal

W1868

Is Toupet Fundoplication the Most Physiological Procedure to Treat Gastroesophageal Reflux Disease? Results of a Prospective Randomized Experimental Trial Comparing Three Major Antireflux Operations

Kai Bachmann, General Visacrol and Thoracic Surgery, University Medical Center Hamburg-Eppendorf, Hamburg, Germany

BACKGROUND AND AIMS: Gastroesophageal reflux disease (GERD) is one of the most common dysfunctions of the upper GI. It is interfering with the quality of life and is a risk factor in the development of adenocarcinoma of the lower esophagus. Laparoscopic fundoplication is an effective treatment in GERD but the physiological mechanisms of the different available procedures had yet to be investigated.

METHODS: 28 German Landrace pigs underwent baseline manometry and 24 h pH-monitoring followed by myotomy to induce a refluxophagitis. After proving the new onsets reflux, the pigs were randomized to 4 Groups (total fundoplication, anterior hemifundoplication, posterior hemifundoplication and controls). On day 10 and 60 after the intervention, the effectiveness and the different modifications of fundoplication was compared with the controls by 24 h pH-monitoring and after pharmacological stimulation. Finally the pigs were sacrificed and the Yield Volume and Pressure were recorded.

RESULTS: After myotomy a significant increase of the reflux could be confirmed. After fundoplication we found a significant decrease of the fraction time (pH < 4) and increase of the vector volume compared to measurement after myotomy: Total fundoplication and posterior hemi-fundoplication were highly effective while measurements after anterior fundoplication still revealed increased fraction times. Pharmacological stimulation with pentagastrin showed a significant increase of the Vector Volume due to contraction of the esophageal sphincter.

CONCLUSION: Total fundoplication and posterior hemi- fundoplication are potent operations for GERD. The anterior fundoplication reduces the reflux most well, but the effects were significantly lower compared to total and posterior fundoplication. Pharmacological stimulation revealed excellent results after posterior hemifundoplication and the tendency to overcorrection after total fundoplication.

Basic: Pancreas

W1869

Nitrnic Oxide Synthetase Inhibitor Reduces the Lung Damage Induced by Albumin Administration in Acute Pancreatitis

Emilio Elias Abdo, Gastroenterology, Universidade de São Paulo, São Paulo, Brazil

BACKGROUND/AIMS: Deterioration of hemodynamic conditions is a serious complication of severe acute pancreatitis (AP). Early colloidal resuscitation is a matter of controversy due to the possible deleterious effect on lung function. Previous study demonstrated that inhibition of nitric oxide synthase (iNOS) reverse the effect of albumin on lung damage in burn (Chen LW, J Am Coll Surg, 2005). We hypothesized that this effect could be reproduced in acute pancreatitis (AP).

METHODS: AP was induced in male Wistar rats by intraduodenal 2.5% taurocholate injection. To evaluate the effect of albumin on lung damage in AP, animals received intravenously normal saline (Group II) or human albumin (25% in saline) (Group II) immediately after AP. To evaluate the effect of iNOS inhibition on lung damage in AP, iNOS specific inhibitor S-methylisothiourea (SMT, 7.5 mg/Kg, IP) was given to animals immediately after AP. The animals were divided into two groups: Group II: normal saline was given after AP and SM, and Group IV: albumin was given after AP and SM. After 12 hours all animals were sacrificed and blood was collected for amylase assay. Lung myeloperoxidase (MPO) activity was determined as an index for pulmonary neutrophil sequestration. Pulmonary vascular permeability was quantified by measuring the filtration of Evans blue (EB).

RESULTS: Serum amylase levels, lung MPO activities and vascular permeability of lungs were significantly increased in the AP group. Albumin administration after AP increased lung permeability (70.92 ± 7.0 µg EB/mg tissue) compared with saline administration (47.41 ± 4.62 µg EB/mg tissue) (p < 0.05). However, albumin administration with SM reduced lung permeability (42.77 ± 9.49 µg EB/mg tissue) compared to albumin administration without SMT (70.92 ± 7.0 µg EB/mg tissue) (p > 0.05). There were no significant differences in serum amylase and lung MPO activities among groups.

CONCLUSION: Restoration of extracellular fluid in AP with albumin increased the lung permeability of iNOS before albumin administration reduced this albu- min induced damaging effect in AP.
The Effects of Cannabinoids on Intestinal Permeability in an in Vitro Model of Inflammation

Ahmadin Alhomeri, School of Graduate Entry Medicine and Health, University of Nottingham, Derby, United Kingdom

Pro-inflammatory cytokines cause damage in the gastrointestinal epithelial barrier, leading to increased translocation of luminal antigens and toxins. The ability to modulate the intestinal permeability during the inflammatory process could be important in devising future therapeutic strategies. Cannabinoids have previously been shown to also exert anti-inflammatory actions in the gut, therefore the aim of the present study was to examine whether cannabinoids modulate intestinal permeability during inflammation. Caco-2 cells were grown until fully confluent on inserts in 12-well plates. Cells were treated with 10 ng/ml TNF-alpha for a further 16 hours. Transepithelial electrical resistance (TEER) measurements were done with a measure of permeability for the following 72 hours (while TEER had recovered to baseline). The effects of cannabinoids on TEER during inflammation were assessed at a potential target sites of action were investigated using the following (all µM): AM251 (CB1 receptor antagonist), AM630 (CB2 receptor antagonist), capsaicin (TBPVI1 antagonist), GW9662 (PPARα antagonist), GW6471 (PPARα antagonist), and O-1918 (proposed endothelial cannabinoid receptor antagonist). Data were analysed by one-way ANOVA and Dunnett’s post hoc test, and are reported as mean ± S.E.M. Cytokine treatment caused a fall in TEER (indicating an increase in cell permeability) of approx 20% after 24 h. Phytocannabinoids significantly enhanced the recovery of cytokines-induced reduced TEER in a concentration-dependent manner (area under the curve (AUC) vehicle 1062 ± 151, 10 μM delta-9-tetrahydrocannabinol (THC) 283 ± 53, P < 0.03; 10 μM cannabidiol (CBD) 309 ± 30, P < 0.01). By contrast, endocannabinoids caused a further fall in TEER during inflammation in a concentration-depen dent manner (AUC, vehicle 910 ± 40, 10 μM anandamide 1522 ± 111, P < 0.05; 10 μM 2-arachidonoylglycerol (2-AG) 1341 ± 79 P < 0.05). Only CB1 receptor antagonist inhibited the actions of cannabinoids during inflammation in Caco-2 cells (THC P < 0.05; CBD P < 0.01; anandamide P < 0.001; 2-AG P < 0.001). These findings suggest that endocannabinoids may play a role in modulating intestinal permeability during the inflammatory process, and that phytocannabinoids may have therapeutic potential in the treatment of gastrointestinal disorders associated with a “leaky” gut.

CONCLUSIONS: Diabetes is prevalent in the U.S. Our results indicated that nearly one-quarter of individuals with diabetes have poorly controlled glucose levels and 25% have a BMI > 35. Since bariatric surgery is an effective therapy for type II diabetes in the severely obese, our data support the concept that alternative treatments, such as bariatric surgery, should be explored for severely obese individuals with diabetes or within a research setting; mild or moderate obese individuals with poorly controlled diabetes.

Clinical: Biliary

W1641 Variable Frequency of p-53, Rad-9, Cyclin E and K-Ras Gene Mutations with Mixed Chimerism of STR LocI and Their Plausible Role in the Gallbladder Carcinogenesis in a Cohort Exposed to Methyl Isocyanate

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BACKGROUND: Gallbladder cancer (CAGB) is a concealed phenomenon and highly malignant with a poor survival rate thought to be driven by the accumulation of genetic alterations and consequent changes in gene expression patterns. Study of cancer pattern amongst victims of Bhopal gas tragedy exposed to methyl isocyanate (MIC) revealed higher incidence of CAGB. This necessitated an objective elucidation of the molecular changes in CAGB. Objectives: To study the expression patterns of p53, Rad50, cyclin-E, K-ras with mixed chimerism of STR locI in a cohort exposed to MIC diagnosed with CAGB.

MATERIALS AND METHODS: Surgical resected specimens of 40 cases of patients, age (males 47; females 37), age range 20–75 years, mean age 55.5 ± 1.89 years with 31 adenocarcinoma (07 well differentiated, 19 moderately differentiated and 05 poorly differentiated), 01 adenomas (a large and 06 gallbladder adenoma were examined for p53, Rad50, cyclin-E, K-ras through immunohistochemistry using spectrophotometric imaging. Microsatellite instability was determined from PCR amplification of six microsatellite markers (D16S539, D13S317, D7S800, F13A01, F16A01, F14A06) (41 cases).

RESULTS: Of the 40 samples, 74%, 15%, 32% and 38% showed positivity for p53, Rad50, cyclin-E and K-ras expression respectively in adenocarcinomas (p = 0.0001) and in adenomas (p = 0.0001). In decentralized cell carcinoma the positivity of mixed chimerism of any four genes, such as 32.2%, 32.3%, 30.0% and 50% respectively (p = 0.0069) suggesting the prevalence and invasiveness of the disease. However, co-expression of K-ras, Rad 50 and cyclin-E with p53 was absent in adenomas with dysplasia implicating their independent role. Microsatellite instability results determined by the multiplex STR PCR also showed statistical significant relationship independent of tumor stage and type.

CONCLUSIONS: These results imply that the expressions of p53, Rad50, cyclin-E and K-Ras are altered along with mixed chimerism of STR locI. The identification of genes and pathways involved in gall bladder carcinogenesis will not only enhance our understanding of the biology of this process but will simultaneously provide new targets for early diagnosis and facilitate novelembtled treatment design for CAGB.
We recommend LESS cholecystectomy.

Patient Interest in Natural Orifice Transluminal Endoscopic Surgery (NOTES) as an Alternative to Laparoscopic Cholecystectomy

Monika Tomoyo Young, Indiana University, Indianapolis, IN

BACKGROUND: With an intentional disruption of a hollow viscus and entry into the peritoneum, natural orifice transluminal endoscopic surgery (NOTES) is one of the most controversial topics in gastrointestinal surgery. Surveys demonstrate mixed opinions of surgeons regarding NOTES. Therefore, it imperative that one examines patient response to this new approach. After all, patient perception will affect clinical implementation, public interest, and willingness to undergo procedure.

METHODS: A total of 108 patients completed a questionnaire including an informational handout with illustrative diagrams and an 11-item survey. Laparoscopic cholecystectomy (LC) and NOTES cholecystectomy via transoral, transrectal, and transluminal routes were described. Patients were asked to select their preferred surgical technique (NOTES vs. LC) assuming comparable risks of complications and cost. Patients were also asked to identify all key reasons for their respective choice. Finally, all participants were asked to select a preferred NOTES orifice.

RESULTS: Out of 108 responses, 61% of patient preferred NOTES over laparoscopy for their cholecystectomy. Female gender was the single characteristic significantly associated with a preference for NOTES, with 70% of the 66 women choosing this approach and only 48% of the 42 men (P = 0.02). Age >50 (P = 0.44), college or graduate level education (P = 0.44), history of a prior cholecystectomy (P = 0.85), and marital status were not found to be significantly correlated with NOTES preference. The most commonly cited reason for choosing NOTES was less post-op pain (73%), followed closely by less family inconvenience (71%) and less risk of infection (71%). The lack of external scarring ranked fourth out of the six reasons, with 44% of patients selecting this as a factor in their decision. Other less commonly cited reasons were earlier return to work/income (59%) or sports (23%). For patients choosing laparoscopy over NOTES, more available data (86%) and surgical experience (83%) were both commonly selected factors. The oral orifice was most popular, with 64% of all participants preferring this approach.

CONCLUSION: Female gender was significantly associated with a preference for NOTES. Other demographic factors did not correlate significantly with selection of either technique. Decreased pain, family inconvenience and risk of infection were found to be more important than scarring, earlier return to work/income or sports. The oral orifice was preferred by a majority of patients. Patients consider NOTES a reasonable alternative to laparoscopy.

W1644

Clinical: Colon-Rectal

W1646

Transvaginal Specimen Extraction for Laparoscopic Colectomy

Jong Kang, Colon & Rectum Surgery, Taich General Hospital, Hualien, Taiwan

PURPOSE: This study was to assess the feasibility and safety of transvaginal specimen extraction for laparoscopic colectomy.

METHODS: Twenty consecutive patients with benign or malignant rectum polyp were included for surgery of laparoscopic colectomy. A full laparoscopic colectomy was successfully performed for all cases. The specimen was extracted via a transvaginal route.

RESULTS: The mean age of the patients was 68 years old and mean body mass index was 25.5 kg/m². The average size of tumor was 4.5 cm. The mean operative time was 165 minutes while the average estimated blood loss was 50 ml. The average hospital stay was 8 days. The mean VAS was 3. Postoperative complications include ileus (n = 1) and urinary tract infection (n = 1). There was no vaginal wound infection nor surgical mortality.

CONCLUSIONS: This technique of transvaginal specimen extraction for laparoscopic colectomy effectively preserved the benefits of laparoscopic surgery without abdominal wound-related complications.
INTRODUCTION: Photodynamic diagnosis (PDD) as a method for differentiating between malignant tumors and normal tissue attracts a lot of attention. The 5-aminolevulinic acid (5-ALA), a naturally occurring amino acid with no fluorescent properties, metabolizes into protoporphyrin IX (PpIX), a fluorescent substance that gives off 630 nm red absorption light when irritated with blue light of 405 nm. PpIX also has the property to accumulate in cancerous cells. PDD using 5-ALA is currently put to practical use in the diagnosis of malignant brain tumors. Although it’s application to colorectal cancer in animal models has been reported, there is little information or pathological evidence regarding the uptake of tumors in humans. We tried applying PDD of 5-ALA using rected specimens from patients with colorectal cancer.

METHODS: 5-ALA (Cosmo bio company) was dissolved in saline with a ratio 20 mg/kg and taken orally one hour before the start of anesthesia. Following the specimen extraction, we conducted our fluorescence observation using a wavelength of 375-440 nm. 630 nm red absorption light was visible with the naked eye through a filter that allowed us to compare and confirm the accuracy of the original diagnosis.

RESULTS: There were a total of 14 ulcerative colitis patients with afferent limb syndrome after IPAA. Nine were female. Median age was 34.5 (range, 16-60) years at the time of IPAA. Eight patients had primary IPAA elsewise 5 patients were referred with intermittent obstructive symptoms including chronic abdominal pain (n = 12), bloating (n = 3), constipation (n = 2) and perianal pain (n = 1). Seven patients had more than one symptom. In all patients, dilatation of the afferent limb is difficult in intubating the afferent limb was detected at proctoscopy. In 8 patients kinking or narrowing of the pouch inlet were identified by using gastrografin enema (n = 6), flexoendoscopy (n = 1) or small bowel series (n = 1). Of 14 patients, 7 had successful balloon dilatation of the afferent limb without the need for surgery. One patient has been scheduled for surgery due to failure after dilatation. Four patients with pouch dilatation had surgery including resection of angulated bowel (n = 2) or pouch excision with end ileostomy (n = 2). In 1 patient, symptoms due to afferent limb syndrome relieved after conservative management. The last patient was lost to follow-up.

CONCLUSION: A combined assessment of endoscopy and abdominal imaging is important to establish the diagnosis of afferent limb syndrome. Endoscopic or surgical intervention is often needed.

INTRODUCTION: Venous invasion is an important high-risk feature in colorectal cancer. However, prevalence of venous invasion in published studies ranges from 10-90%. To resolve disparity amongst reporting pathologists in our institution, methods to improve detection of vascular invasion were sought. Elastica stain highlights elastin fibres present in the adventitia of blood vessels providing a more objective method of detection of venous invasion. As a result elastica stains have been used routinely on colorectal specimens in our institution since 2002. The aim of the present study was to examine the impact of elastica staining on the value of venous invasion as a predictor of cancer specific survival, following curative resection of colorectal cancer.

METHODS: 419 patients underwent curative elective colorectal cancer resection between 1997-2006. Patients were grouped prior to 1997-2001 (cohort 1, n = 194) and following introduction of elastica staining (2003-2006) (cohort 2, n = 225). In 197 of all patients 1997-2000, both H&E alone and elastica H&E techniques were applied allowing a direct comparison within a single cohort.

RESULTS: Clinicopathological characteristics and 3-year survival rates were similar in both groups (cohort 1 vs cohort 2). Rate of detected venous invasion increased from 18% to 58% following introduction of elastica staining (p < 0.001). The 3-year cancer survival rate associated with absence of venous invasion was 84% in cohort 1, compared with 96% in cohort 2 (p = 0.01). Elastica staining improved the prognostic value of venous invasion, the area under the receiver operator curve rising from 0.59 (P = 0.040, 1997-2001) to 0.68 (P < 0.001, 2003-2006) using cancer mortality as an endpoint. Within cohort 2, the absence of venous invasion was associated with a 3 year cancer survival of 96% with both node negative and node positive disease. A direct comparison between H&E alone and elastica H&E was made in 51 patients (cohort 5). The area under the receiver operator curve rose from 0.58, P = 0.293 (H&E alone) to 0.74, P = 0.003 (elastica H&E).

DISCUSSION: Increased detection of venous invasion with elastica staining, compared with H&E alone, provided superior prediction of cancer survival in colorectal cancer. This relationship was seen in the comparison of two consecutive cohorts and in a direct comparison in a single cohort. When stained with elastica, the absence of venous invasion is associated with an excellent 3 year survival whatever the tumor's lymph node status. Based on these results, elastica staining should be incorporated into the routine pathological assessment of venous invasion in colorectal cancer.
A Novel Data-Driven Staging of Colorectal Cancer
Elena Munkelt, The Cleveland Clinic, Cleveland, OH

PURPOSE: We define prognostic model that predicts survival of patients with colorectal cancer after a radical potentially curative resection. This study uses a data-driven approach to identify highly predictive cancer characteristics that involve TNM as well as non-TNM factors. A novel prognostic methodology, random survival forest, accounts for the complex interplay among clinical and histologic features.

METHODS: Survival data of 2,534 colon and 2,380 rectal cancer patients undergoing a radical resection between 1969 and 2003 were analyzed by novel random forest technology. We examined the role of TNM and non-TNM factors such as histologic grade, lymph node ratio, type of surgery, ASA, and age in staging and prognosis. A forest of 1,000 random survival trees was grown using log-rank splitting. Risk-adjusted random survival forest methodology maximized survival prediction and produced variable importance measures.

RESULTS: Risk-adjusted 5-year survival after resection of colon and rectal cancer was dominated by pT and lymph node ratio. Survival of colon cancer was modulated by AJCC grade, whereas type of resection modulated survival of rectal cancer. Risk-adjusted predicted survival of patients ordered by increasing mortality and divided into 10 groups demonstrated decreasing survival. The degree to which lymph node ratio was one of the dominant predictors for colon and rectal cancer relates to proposed stage grouping is shown in the following figure.

CONCLUSIONS: The novel data-driven methodology for survival data was a useful tool for predicting survival for patients with colorectal cancer and identifying patterns of cancer characteristics. Important prognostic values from new model include lymph node ratio, ASA, and type of surgery. Specifically, higher predictive power of lymph node ratio as compared with traditional pTN classification was observed. These observations may lead to stage groupings that redefine a simple, logical arrangement of TNM.

Do Gastroenterologists Find More Adenomas on Colonoscopy Than Colorectal Surgeons?
Kevin Ollinger, Gastroenterology, Cedars-Sinai Medical Center, Los Angeles, CA

BACKGROUND: Adenoma detection is increasingly used as a measure of quality for screening/surveillance colonoscopy. Both gastroenterologists (GEs) and colorectal surgeons (CRS) perform colonoscopy, and studies demonstrate equivalent safety between the two specialties. However, it is unknown whether there is there is variability in adenoma detection rates between GEs and CRS. The objective of this study was to assess differences in adenoma detection between GEs and CRS during screening/surveillance colonoscopy.

METHODS: We performed a retrospective analysis of colonoscopies performed by GEs and CRS over a one month period at an outpatient endoscopy center. Patients with prior colon cancer or resection, familial adenomatous polyposis or inflammatory bowel disease were excluded. Multiple factors were assessed, including patient demographics, procedure indication, family history of colorectal neoplasia, prep quality, colon intubation rate, total procedure time, and procedure start time. Polyps were classified as hyperplastic, adenomatous, or cancer. Comparative statistics included Students' T test, Wilcoxon rank-sum test, and chi-square analysis where appropriate. Poisson regression adjusting for non-independence and multivariable logistic regression were used to adjust for confounders.

RESULTS: Eight GEs and four CRS performed 180 and 119 colonoscopies respectively during the study period. 326 polyps including 157 adenomas and 2 cancers were found in 299 patients with the mean age 62 (range 29–85). The mean number of adenomas per patient was 0.7 (0.01–6.0). The mean polyp size was 8 mm (range 2–76 mm). The mean number of adenomas per patient was 0.7 (0.01–6.0). The mean polyp size was 8 mm (range 2–76 mm). The mean number of adenomas per patient was 0.7 (0.01–6.0). The mean polyp size was 8 mm (range 2–76 mm).

CONCLUSIONS: Gastroenterologists may find more polyps than CRS. The colonoscopic detection rates are similar between GI and CRS. Patients should feel assured that adenoma detection during colonoscopy does not vary between GEs and CRS.
INTRODUCTION: The use of neoadjuvant chemoradiotherapy (NCR) is widely regarded as the standard of care for patients with locally advanced rectal cancer (RC). For colon cancer, the pathologic nodal status is a clear prognostic indicator. For RC treated with NCR, due to accuracy rates of pre-treatment nodal staging and potential downstaging of nodes, the prognostic significance of pathologic nodal status is less clear.

METHODS: From 1998–2008, a total of 174 patients were identified as having undergone NCR and radical resection for RC. Clinicopathologic and survival data were reviewed. Univariate analyses and multivariate analyses were performed. For analyses, patients were grouped into 4 nodal categories (uN0-pN0, uN0-pN1, uN1-pN0 and uN1-pN1).

RESULTS: Our study population consisted of 104 men and 70 women with a median age of 60 years (29–83 yrs) and a median follow up of 31 months (1–116 mo). Following NCR, 140 patients underwent low anterior resection and 34 abdominoperineal resection (APR) with 96% of patients receiving adjuvant chemotherapy. On univariate analysis, nodal category (p = 0.005), RI resection (p = 0.03), and APR (p = 0.04) were found to negatively influence DFS. With respect to nodal category, DFS was significantly impacted by the final pN status but not by pre-operative uN status (Figure 1). Nodal category approach signifi- cantly (p = 0.04) as a predictor of OS. However, patients with nodal downstaging (uN1-pN0) had a significant survival advantage compared to patients with nodal progression (uN0-pN1) (p = 0.03). On multivariate analyses, pathologic nodal positivity (p = 0.03; HR 2.84; CI 1.11–7.24) was an independent predictor for DFS.

CONCLUSIONS: For patients with rectal cancer treated by NCR, pathologic rather than pre-operative nodal status represents an independent predictor of DFS. This may have important potential implications for the application of adjuvant therapy.

Clinical: Esophageal

W1656

Technical Complications After Esophagectomy Did Not Affect the Five Year Survival for Treatment of Squamous Esophageal Carcinoma

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INTRODUCTION: Esophagectomy for treatment of squamous esophageal cancer carries significant morbidity and mortality. Evidence suggested that occurrence of complications correlated with tumor recurrence and survival. Our study aimed to investigate the effect of technical complications on survival after esophagectomy for treatment of squamous esophageal cancer.

METHODS: Patients who had esophagectomy for treatment of squamous esophageal cancer were recruited. Technical complications were defined as: 1. Anastomotic leakage; 2. Conduit ischemia; 3. Vocal cord palsy; 4. Wound infection; 5. Chylothorax and; 6. Postop hemorrhage. The demographic, tumor staging, perioperative outcomes and 5 year survival were compared between patients with and without technical complications.

RESULTS: From 1993 to 2008, 171 patients with squamous esophageal cancers were treated with esophagectomy and 66 survived for 5 year (38.6%). Majority of the patients were stage II and stage III diseases (stage I 4.1%, stage II 41.9%, stage III 39.8%). Postoperative morbidity was 41% (13%), and technical complications occurred in 31 patients (18.1%) including; 11 anastomotic leakage (6.4%), 3 chylothorax (1.7%), 2 postop hemorrhage (1.1%), 9 vocal cord palsy (5.2%) and 6 wound infection (3.5%). Patients with technical complications had a higher 30 days mortality than those without (16.1% vs 5.7%); p = 0.062). The occurrence of technical complication does not affect the 5 year survival (p = 0.67, OR 1.18 [95% CI 0.54–2.62]) (Log rank test p = 0.88). Moreover, there was no difference in tumor recurrence between those with or without technical complications (p = 0.073).

CONCLUSIONS: Though patients with technical complications after esophagectomy had a higher 30 days postoperative mortality, this did not affect the overall 5 year survival and tumor recurrence.
Persistent Elevation of C-Reactive Protein After Gastro-oesophageal Cancer Resection as a Predictor of Postoperative Intra-Abdominal Infection Complications
Santama Dutta, Department of Surgery, University of Glasgow, Glasgow, United Kingdom

BACKGROUND: Intra-abdominal infectious complications in form of anastomotic leaks or clinically apparent complications following gastro-oesophageal cancer resection. Therefore, early detection is of paramount importance. Although markers of the systemic inflammatory response, including C-reactive protein (CRP) and white cell count (WCC), have been used in this regard but their relative predictive value is unclear. The aim of the present study was to examine serial post-operative WCC and CRP and their diagnostic accuracy in case of infective complications.

PATIENTS AND METHODS: CRP and WBC were routinely measured postoperatively in 136 consecutive patients undergoing gastro-oesophageal cancer resection. Postoperative complications were recorded. The diagnostic accuracy of CRP and WBC were analyzed by receiver operating characteristics (ROC) curve analysis with intra and extra-abdominal infectious complications as the outcome.

RESULTS: CRP peaked on postoperative day (POD) 2 with a median serum CRP of 206 mg/L and gradually decreases thereafter in patients with an uncomplicated postoperative course. In intra-abdominal infected patients CRP was significantly greater, peaked on POD 3 (median CRP 237 mg/L), and persisted thereafter, whereas white blood cell count was now significantly lower. The CRP cut-off value was 180 (sensitivity 0.79, specificity 0.59). The area under the ROC curve was 0.74 (p = 0.001). On POD 3, 4, and 5, the diagnostic accuracy of CRP was similar.

CONCLUSION: Serial CRP measurements are helpful for detecting intra-abdominal infections after gastro-oesophageal resection. Persistently elevated CRP values after POD 3 should be investigated for intra-abdominal infection.

Laparoscopic Partial Posterior (Toupet) Fundoplication in GERD Patients with Impaired Esophageal Motility: A 10 Year Follow-Up Study Including Quality of Life
Heinz Wylkepfe, Department of Visceral, Transplant and Thoracic Surgery, Medical University Innsbruck, Innsbruck, Austria

BACKGROUND: Since the 1990 laparoscopic antireflux surgery is a well established treatment option for patients with gastroesophageal reflux disease (GERD). Often, partial posterior fundoplication is preserved for patients with weak esophageal peristalsis in order to lower esophageal outflow resistance. The long term outcome of this type of fundoplication is not known.

PATIENTS AND METHODS: From 1994 until 2001, 101 GERD patients with manometrically defective esophageal peristalsis underwent partial posterior fundoplication. After a mean interval of 11.4 years (range 7-25) patient's symptoms and quality of life were assessed by means of the gastrointestinal quality of life index (GQLQ) and the SF-36.

RESULTS: 71% of the patients replied to the questionnaire. 15% of these patients complained of heartburn, 5% of dysphagia, 11% of regurgitation, 14% of retrosternal pain, 15% of globus sensation, 22% of cough and 14% of hoarseness. The quality of life index measured by the GQLQ-questionnaire was 113.4 ± 21.1, which is almost equal to that of the healthy population. The SF-36 questionnaire demonstrated a complete normalisation in subcategories (general health, mental health, social function, vitality, and pain), the remaining being slightly below normal. This effect was clearly attributed to otherwise various illnesses of some of the patients, diminishing the mean values of the whole group. 90% of the patients were satisfied with the operation even in the long term and 89% would do it again.

CONCLUSIONS: For patients with impaired esophageal peristalsis, laparoscopic partial posterior fundoplication is a good treatment option in the long term. It almost restores quality of life to normal thus providing a high patient satisfaction.

The Effect of an Increasing Body Mass Index on Health Related Quality of Life Following Esophaegogastric Cancer Surgery
Jiten Kaban, General Surgery, Norfolk and Norwich University Hospital NHS Foundation Trust, Norwich, Norfolk, United Kingdom

Obesity is linked to higher incidences of esophageal and esophageo-gastric adenocarcinoma and postoperative complications. Rates of obesity are also on the rise. The aim of this study was to determine whether increasing body mass index has an impact on changes in quality of life after upper GI cancer surgery.

METHODS: We employed The European Organisation for Research and Treatment of cancer (EORTC) health related quality of life questionnaires (QLQ-C30, EORTC QLQ-OES18 and STO22) filled out by patients pre-operatively and at 6 weeks, 6 months, 1 year and 2 years after treatment. The raw scores from the questionnaires were linearly transformed according to the EORTC manual for scoring. Means of the scores were calculated for oesophageal and gastric cancer resections for patients with a BMI ≤ 25 and compared with those >25. Differences between means were calculated using the independent t-test.

OUTCOME: Over a four year period 49 patients underwent oesophageal resections and 73 patients had gastric resections. Median age was 67 (Range 39-85 years). 56% of patients undergoing oesophagectomy were overweight (BMI ≥ 25-30) of which 16% were obese (BMI >30). Being overweight resulted in a greater decrease of physical functioning and worsening insomnia with an increase in difficulty eating compared to controls. 52% of patients undergoing gastroectomies were overweight, 12% of which were obese. For this group, being overweight resulted in worse symptoms of nausea and vomiting at 2 years compared to normal controls.

CONCLUSION: Quality of life in overweight or obese group deteriorates for certain parameters following oesophageal-gastric cancer surgery compared to normal weight. Understanding of these changes in quality of life in the overweight group can improve treatment decisions for this group of cancer patients.

Postoperative Impedance Testing Unreliable in Detecting Nissen Fundoplication Failure
Brittney N. Arnold, Minimally Invasive Surgery, The Oregon Clinic, Portland, OR

BACKGROUND: Objective confirmation of successful anti-reflux surgery currently relies on the gold standard 24-hour pH testing. Multichannel intraluminal impedance and pH monitoring (MII-pH) can provide more information and is being increasingly used in the postoperative setting. Based on available values for impedance testing, we have observed an incidence of false positive and negative impedance events in otherwise successful fundoplications. This study investigates the clinical validity of these impedance events, possible causes, and the utility of MII-pH in the setting of normal pH following Nissen fundoplication.

METHODS: All patients who had normal post-Nissen 24-hour pH using MII-pH (Sierra Scientific Instruments) were retrospectively reviewed from a prospectively collected database. Patient demographics, concurrent paraesophageal hiatal hernia (PEH) repair, postoperative symptomatology, manometry and MII-pH were reviewed. Patients who had esophageal lengthening procedures or other esophageatic surgery were excluded. Normal values: pH ≤ 4.0, DeMeester score <14.76, impedance ≤731 events. Groups were compared using an unpaired t-test in SPSS.

RESULTS: Tables 1 & 2.

CONCLUSION: Up to 50% of patients who have successful Nissen fundoplications may display abnormal impedance. Nissen patients who also undergo PEH repair are more likely to have abnormal impedance, and lower bolus and DEC pressures, than patients who have a Nissen alone. This may be due to anatomic changes that occur during the hernia reduction and repair causing fluid trapping in the distal esophagus. Therefore, MII-pH is not a reliable measure to document Nissen failure.

Table 1. Normal vs. Abnormal Patients (n = 68)

<table>
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<th>Test</th>
<th>Normal (n = 30)</th>
<th>Abnormal (n = 38)</th>
<th>p value</th>
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<tbody>
<tr>
<td>CrP</td>
<td>95 ± 9.5 g/L</td>
<td>123 ± 12.7 g/L</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>BAI</td>
<td>10 ± 1.2</td>
<td>19 ± 1.2</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>BAI</td>
<td>15 ± 4.7</td>
<td>24 ± 4.7</td>
<td>&lt; 0.001</td>
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Table 2. Nissen Fundoplication with and without PEH repair (n = 68)

<table>
<thead>
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W1663

The Role of PET/CT in Identifying Advanced Disease in Patients with Potentially Curable Oesophageal Carcinoma
Victoria Louise Wilson, Upper GI Surgeon, Glasgow Royal Infirmary, Glasgow, United Kingdom

AIM: To evaluate the role of PET/CT as an additional staging modality in oesophageal cancer.

PATIENTS AND METHODS: 46 consecutive patients with potentially curable oesophageal cancer underwent PET/CT as part of primary staging after conventional staging with CT, an endoscopic ultrasound (EUS), and a staging laparotomy and discussion at the regional multidisciplinary team meeting (MDT). Data was collected prospectively between 1st May and 1st November 2009.

RESULTS: Patients included 32 males, 14 females, median age 68 years (range 44–86 years). 29 had adenocarcinoma, 15 squamous carcinoma and 2 undifferentiated carcinoma. All had previous CT and, 32 (68%) had EUS and 19 (41%) staging prior to PET/CT was recorded as: T1/2 N0 = 5; T3 N0 = 7; T1/2 N1 = 19; T3 N1 = 21; T4 N0/1 = 4. Staging following these investigations was recorded and compared to findings at PET/CT. There were 8 (17%) examinations reported positive for metastatic disease. 6 (13%) patients had metastatic disease not identified on previous staging. 2 patients had confirmation of metastatic disease after suspicion was raised on previous investigation. Other previously undiagnosed cancers were seen in 2 cases: 1 confirmed breast cancer and 1 advanced oesophageal cancer. In 13 of 31 (42%) cases, PET/CT understaged nodal disease as reported as N1 on previous staging. 2/4 (48%) with negative PET/CT were later found to have metastatic disease (false negatives). 27 patients post PET-CT proceeded to radical treatment (neo-adjuvant chemotherapy + surgery in 18, radical chemo-radiotherapy in 9). 19 patients proceeded to palliative treatment.

CONCLUSION: We conclude that PET/CT is a highly important staging modality in oesophageal carcinoma. Treatment plans were changed from potentially curable to palliative in 10 (32%), with metastatic disease identified in 8/46 (17%) of patients previously thought possible candidates for radical treatment after conventional imaging with CT or EUS. Laparoscopy, PET/CT showed a relatively poor correlation with conventional staging for nodal disease with 13/31 (42%) of patients with local nodal disease after conventional staging understaged as node negative.

W1664

A Simple Risk Score to Predict Short-Term and Long-Term Outcome in Only Surgically Treated Esophageal Cancer
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PURPOSE: Esophageal resection is still associated with considerable morbidity and mortality. The long-term outcome of esophageal cancer (EC) is poor. We aimed to develop a simple risk score (SRS) for short-term and long-term outcome of EC.

PATIENTS AND METHODS: In total, 498 patients, with or without neoadjuvant and adjuvant treatment, were included in this study. Three SRS risk groups were defined based on preoperative functional evaluation of different organ systems by validated tools (revised cardiac risk index, MELD score and pulmonary function test). Patients with good function all of organ systems were allocated to SRS1 group. SRS2 indicated moderate impairment of one organ system and SRS3 reflected severe impairment of at least two organ systems. Clinico-pathological parameters, morbidity, mortality as well as disease-free (DFS) and overall survival (OS) were correlated to SRS.

RESULTS: SRS significantly correlated with the disease-stage (p = 0.0055) and predicted the short-term outcome. SRS2 and SRS3 patients had at least doubled risk of morbidity and mortality compared to SRS1 patients. Furthermore, increasing SRS score was associated with gradual decrease in DFS (P < 0.001) and OS (P < 0.001). In nodal-stratified subanalyses, SRS identified patients being at higher risk of tumor recurrence and poor survival within the node-negative group. In node-positive patients SRS did not undertake further risk assessment. SRS was identified as an independent prognosticator of tumor recurrence and overall survival.

CONCLUSION: SRS is easy to determine and is based on validated tools. SRS allows preoperative objective allocation of patients to different risk profiles for morbidity, mortality and long-term outcome in EC.

W1665

Treatment of Mid and Distal Esophageal Diverticula: A Single Institution Eleven Year Experience
Neal Agee, Department of GI and Minimally Invasive Surgery, Carolinas Medical Center, Charlotte, NC

INTRODUCTION: Mid and distal esophageal (epiphrenic) diverticula are rare. Historically, treated with resection with thoracotomy surgery management was associated with significant length of stay (LOS), morbidity and mortality. This study documents the diagnosis, minimally invasive treatment, and follow-up of an 11 year experience.

W1666

Age of Transfused Red Blood Cells and Outcomes After Liver Resection of Hepatocellular Carcinoma
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METHODS: Using an IRB-approved database, patients with mid and distal esophageal diverticula that underwent minimally invasive treatment were identified. Data analyzed included demographics, symptoms, diagnosis, diverticular site, disease stage, and postoperative complications. The data was reported as the mean ± standard deviation.

RESULTS: Sixteen patients were identified (10 female, 6 male); mean age was 62 years (range 28–75). The duration of symptoms averaged 101 months (range 2 to 720 months). All patients were symptomatic, including dysphagia (n = 16), regurgitation (n = 11), and reflux (n = 7). All patients had pre-operative esophagogastroduodenoscopy and an EGD-12 of 16 patients had an esophageal motility disorder achalasia being the most common (n = 9). One patient had a failed Nissen fundoplication with the development of a diverticulum. There were 3 mid esophageal and 13 epiphrenic diverticula. Mean size was 7.3 cm. Fifteen underwent laparoscopic and one underwent thoracoscopic diverticulectomy, myotomy and fundoplication. There were no conversions to open. One complication occurred, pneumonia and there were no deaths. Estimated blood loss was 111 cc. Mean LOS was 6.8 days (range 2–33) with no esophageal leaks with a mean follow-up of 13 months (range 2–86 months). One patient reports residual dysphagia, substantially improved from pre-op.

CONCLUSION: Mid and distal esophageal diverticula are most often associated with a motility disorder. Although they are rare, they can be symptomatic in patients. Minimally invasive techniques provide adequate treatment for even large diverticula with limited post-operative complications and excellent symptom resolution.

Clinical: Hepatic

W1667

Preoperative Predictors of Increased Intraoperative Blood Loss During Hepatotomy
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BACKGROUND: Despite recent advanced surgical technique with newly developed hemostatic devices, hepatotomy remains one of the most hemorrhagic procedures in abdominal surgery. To reduce the need for homologous blood transfusion, it is important to clarify the preoperative predictors influencing intraoperative blood loss during hepatotomy and the need for autologous blood storage.

METHODS: From September 2007 to August 2009, 216 consecutive patients underwent elective hepatotomy for tumor. Hepatotomy was performed for hepatocellular carcinomas (n = 87), mass-forming cholangiocarcinoma (n = 19), hepatic metastases (n = 104), and other tumours (n = 6). Hepatotomy was performed under intermittent occlusion of inflow vessels (15 minutes) with clamp crushing method. Minor hepatotomy was defined as limited resection or resection of less than two Couinaud’s segments, and major hepatotomy consisted of

RESULTS: There was no in-hospital mortality, but morbidity occurred in 65 patients (30.1%). The mean and median blood loss was 842 ± 771 ml and 621 ml (range: 10–4443), respectively. Major hepatotomy was performed on 92 patients (42.6%) and minor hepatotomy in 124 patients.
undergoing resection alone (312 ± 48 mL vs. 860 ± 99 mL, p = 0.0060). At a median followup of 54 months, 5-year survival was significantly higher in patients with HCC (86% vs. 71%, p = 0.001). At a median followup of 60 months, 5-year survival was significantly higher in patients who were treated with therapy alone (HR, 0.94; 95% CI, 0.53 - 0.50) vs. 0.98 (p = 0.81).

CONCLUSION: In patients with recurrent colorectal liver metastases, the combination of intraoperative ablation with resection extends the limits of potentially curative treatment to include patients with advanced disease that might otherwise not be amenable to surgical intervention. The combination of resection and ablation yields survival results that are equivalent to that of resection alone but with reduced surgical morbidity.

W1670
Underutilization of Surgical Treatment of Hepatocellular Carcinoma in the Medicare Population
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The incidence of hepatocellular carcinoma (HCC) is increasing in the United States. Due to factors such as portal hypertension, tumor biology and a donor organ shortage the care of these patients remain highly specialized and complex. Multiple treatment options are available for HCC, but their use and utility remains unknown.

METHODS: Using SEER-Medicare linked data, we identified 8570 patients diagnosed with HCC between 1991 and 2012. Only 36 patients received liver transplantation (LT), 2452 patients received liver resection, and 250 patients received chemoembolization (ACB) in the Medicare population. Patients were compared with respect to tumor factors, perioperative factors, operative factors and overall survival. Latent class models were used to examine overall survival while adjusting for confounding factors.

RESULTS: A total of 234 operations were performed on 104 patients. The median number of operations performed per patient was 2 (range 2-4). There was an increase in the proportion of patients treated with resection and ablation per 0% (1991-1994) to 48% (2007-2009). There was also an increase in the proportion of patients undergoing surgery with abnormal liver parenchyma (steatosis, fibrosis, or inflammation) from 37.3% (1992-1994) to 52.2% (2007-2009). Patients undergoing resection and ablation had a greater tumor burden (median 1 metastatic lesion vs. 1, p < 0.001) and higher baseline clinical risk scores (median 5 vs. 2, p = 0.041) than patients undergoing resection alone. Patients undergoing resection and ablation had lower intraoperative blood loss compared to patients undergoing resection alone (312 ± 48 mL vs. 860 ± 99 mL, p = 0.0060). At a median followup of 54 months, 5-year survival was significantly higher in patients with HCC vs. those without HCC (86% vs. 71%, p = 0.001). At a median followup of 60 months, 5-year survival was significantly higher in patients who were treated with therapy alone (HR, 0.94; 95% CI, 0.53 - 0.50) vs. 0.98 (p = 0.81).

CONCLUSION: In patients with recurrent colorectal liver metastases, the combination of intraoperative ablation with resection extends the limits of potentially curative treatment to include patients with advanced disease that might otherwise not be amenable to surgical intervention. The combination of resection and ablation yields survival results that are equivalent to that of resection alone but with reduced surgical morbidity.

W1671
Prognostic Impact of Dihydromyridine Dehydrogenase Expression in Adjuvant Gemcitabine Plus S-1 Chemotherapy After Surgical Resection for Pancreatic Adenocarcinoma
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OBJECTIVE: Although the prognosis in patients with pancreatic adenocarcinoma remains poor, adjuvant gemcitabine plus S-1 chemotherapy (GEM + S-1) after surgical resection for pancreatic adenocarcinoma has been shown to improve survival. S-1 is a novel oral fluoropyrimidine combination including tegafur (a prodrug of 5-fluorouracil), S-5), dihydromyridine dehydrogenase (DDH) inhibitor (5-S-hydroxy-2,4-dihydromyristicin), and ootate phosphatidylinositol 3-kinase (PI3K) inhibitor (potassium oxonate). To clarify the relationship between expression of intratumoral enzymes related to the metabolism of S-5U and its derivatives and response to adjuvant chemotherapy with GEM + S-1 for pancreatic adenocarcinoma, we evaluated thymidine synthase (TS), DDH, and OPRT expression immunohistochemically in resected pancreatic adenocarcinoma tissues.

METHODS: Polyclonal antibodies were used to immunostain sections of 106 formalin-fixed paraffin-embedded specimens of pancreatic adenocarcinoma resected between 1998 and 2003. The relationship between intratumoral TS, DDH, and OPRT expression and prognosis was evaluated statistically.

RESULTS: Out of 106 patients, 75 (70.1%) received adjuvant GEM + S-1 chemotherapy. High intratumoral TS expression was seen in 46 patients (64.1%), 39 (53.3%) patients were underweighted localized therapy that was potentially curable (TX group; resection, ablation, and radiation). In total, 54% of tumors were classified as low TS expression (TX group), and 64% of patients underwent TX. In the NoTx group, 49% were not cirrhotic, 36% had tumors <5 cm and 21% were tumor stage I or II. Median survival for all HCC patients increased over time (2002-2005: 116 months, 1999-2003: 96 months, 1991-1998: 87 months). In multivariate regression analysis, patients who received any modality of treatment achieved some benefit compared to NoTx. Specifically, adjusted overall survival was greatest in the patients in the TX group. (HR 0.33, 95% CI 0.26-0.47), resection (HR 0.33, 95% CI 0.28-0.37) and ablation (HR 0.51, 95% CI 0.42-0.62).

CONCLUSION: The incidence of hepatocellular carcinoma in the Medicare population is increasing in the United States. Due to factors such as portal hypertension, tumor biology and a donor organ shortage, the care of these patients remain highly specialized and complex. Multiple treatment options are available for HCC, but their use and utility remains unknown.

W1672
Interventional Radiology Assisted Endoscopic Transgastric Peripancreatic Fluid Collection Drainage
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BACKGROUND: Many centers advocate the use of EU to perform transgastric drainage of peripancreatic fluid collections (EFTS). However most endoscopists do not perform EU. We report our experience using interventional radiology (IR) placed percutaneous drains as a first stage to a subsequent endoscopic transgastric PFC drainage.

OBJECTIVE: To evaluate the technical and treatment success and safety profile of IR assisted endoscopic transgastric PFC drainage.

PATIENTS: This study involved 11 consecutive patients referred for endoscopic drainage of PFCs over a 2-year period.

INTERVENTIONS: The first stage is performed by IR under CT guidance. A suitable window to the PFC through the stomach is determined. An 18-gauge trocar needle is then advanced through the anterior and posterior wall of the stomach into the PFC. Following removal of the inner trochar, a stilette and Amplatz wire is advanced. The tract is dilated and the wire, an 8.5 F multipurpose catheter is positioned in the PFC. The second stage is performed under endoscopic and fluoroscopy control. The endoscope is removed. The posterior gastrostomy is cannulated using a wire guided sphincterotome. The tract is dilated 15 mm using an endoscopic dilating balloon. Two 10F x 5 cm double pigtail stents are left across the posterior gastrostomy. The anterior gastrostomy is closed with endoscopic clips.

RESULTS: 11 patients (6 males and 5 females) with mean age of 61 (range 38-79) years underwent IR assisted endosonographic guided percutaneous PFC drainage over a 2 year period. The PFCs were gallstone related in 7 patients, post surgical in 2 patients and idiopathic in 2 patients. The mean size of the aspirated fluid was 12 cm (range 6-19 cm) in its largest dimension. The procedures were technically successful in all 11 patients. There were 3 complications (pneumothorax, that was treated with a chest tube, uncomplicated pneumoperitoneum that was confirmed by diagnostic laparoscopy, delayed bleeding from posterior gastrostomy requiring endoscopic hemostasis). All patients had a successful resolution of their PFCs on followup imaging. The median length of hospital stay was 11.5 days (range 5-66 days). At a mean followup period of 14 months (range 2-29 months), all patients were doing well.

CONCLUSION: IR assisted endoscopic transgastric PFC drainage is technically feasible and safe and is associated with favorable clinical outcomes.
Background: Delayed gastric emptying (DGE) is a common cause of morbidity after pancreaticoduodenectomy (PD). DGE can be a source of distress and discomfort to patients, resulting in prolonged hospital stays and subsequent drain on staff and resources. Aim: We aimed to investigate whether any preoperative or intraoperative variables predict risk of DGE. Ability to predict DGE would potentially enable therapeutic interventions such as insertion of a feeding jejunostomy at the time of PD in high-risk patients.

Methods: We performed a retrospective chart review of 523 patients who underwent PD at our institution between 2000 and 2009. 384 resections were performed since 2005. Data collected included: patient demographics, preoperative symptoms, preoperative chemother- apy, type of resection performed (pylorus-preserving PD or standard PD, with or without vascular resection) or time estimated blood loss and transfusions, tumor size and histology, lymph node status, postoperative hematocrit and leukocyte count and postoperative NAAD use. We defined DGE as failure to tolerate a regular diet by postoperative day seven. Data was analyzed with alpha = 0.05 using Fisher exact test for categorical variables and Mann-Whitney U test for continuous variables.

Results: A total of 114 patients with DGE were compared with 134 patients without DGE. Patients who suffered DGE were significantly more likely to have smaller tumors (p = 0.015) and fewer positive lymph nodes (p = 0.009), with patients without DGE were more likely to have received preoperative chemotherapy (p = 0.005) or preoperative radiation (p = 0.010). A possible explanation for these results is that patients with malignant disease have less normal functioning pancreatic parenchyma and are consequently less at risk for digestive symptoms resulting from pancreatic injury and inflammation. In addition, DGE was associated with an infection during hospitalization (p = 0.008). Hematocrit on the third postoperative day was significantly lower (p = 0.019) for patients who suffered DGE, excluding patients who experienced post-operative bleeding. We hypothesize that DGE patients experienced more postoperative third space sequestration and bowel edema, resulting in greater hemodilution when sequestered fluid redistributed back into the vasculature.

Conclusions: Contrary to our expectations, patients with smaller tumors and benign disease were more likely to experience DGE than patients with more advanced, malignant disease. As our ability to diagnose premalignant lesions improves, there will likely be more PD performed for benign disease, with a subsequent increase in the frequency of patients with DGE.

Diagnostic Laparoscopy for Pancreatic Cancer in an MRI Driven Practice: What’s It Worth? Elliot Tapper, Beth Israel Deaconess Medical Center, Boston, MA

Introduction: For many patients with pancreatic cancer, CT is inadequate in determining unresectability. 10-48% of patients deemed resectable receive an unnecessary laparotomy. Accordingly, many groups have studied the role for diagnostic laparoscopy (DL) though none have evaluated it in an MRI driven practice.

Methods: All MRI’s administered for suspected pancreatic cancer between December 2004 and 2008 were evaluated. Radiographic diagnoses were prospective judged resectability based on the presence of metastases and relationship of the tumor with the surrounding vasculature. Unresectable disease received endoscopic biliary and duodenal stenting. Resectable and borderline disease received Whipple operations and double bypasses if unresectable intraoperatively. We performed a decision analysis for the cost-effectiveness of incorporating DL. We queried our billing database to render average costs for all patients with pancreatic cancer who received Whipples, double-bypasses and double-stenting procedures. We did not include professional fees. The maximal cost of DL was derived from the itemized costs of the materials, space and ancillary staff, presuming routine utilization, no missed metastases, and no complications.

Results: Preoperative MRI deemed 94% patients’ tumors resectable; 86% agreed to a laparotomy. Six patients were found to have metastases intraoperatively and 15 patients had un-resectable disease (vascular involvement or benign pancreatitis) and thus received double-bypass procedures which the average total cost of the hospitalization was $23,957.18. Whipples were provided to 65 patients at an average cost of $22,122.43. DL was thus to be offered to 86 patients. For the 6 patients with metastases, it would be the sole operation (E4504.07). This would be added to the cost of endoscopic stenting procedures, which results in an average total cost of hospitalization of $18,451.41. For the patients with metastases, the marginal cost of DL before a laparotomy would be $2651.71, which we added to the total costs above.

Conclusion: For DL to be cost-effective, it would have to increase the rate at which we diverted patients to the GI lab and DGE, excluding patients who experienced post-operative bleeding. We hypothesize that DGE patients experienced more postoperative third space sequestration and bowel edema, resulting in greater hemodilution when sequestered fluid redistributed back into the vasculature.

Conclusions: Contrary to our expectations, patients with smaller tumors and benign disease were more likely to experience DGE than patients with more advanced, malignant disease. As our ability to diagnose premalignant lesions improves, there will likely be more PD performed for benign disease, with a subsequent increase in the frequency of patients with DGE.

The Role of Procalcitonin in the Early Diagnosis of Postoperative Pancreatic Fistula After Pancreatic Resection

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Background: Postoperative pancreatic fistula (PF) are frequent major complications after pancreatic surgery. Detection of amylase in drainage-fluid and serum-CRP are well established diagnostic parameters. The importance of Procalcitonin (PCT) in the diagnosis of PF remains to be elucidated. Aim of the study was therefore, to evaluate if PCT in the diagnosis of PF and major complications following pancreatic surgery.

Methods: All patients with PS were prospectively collected from Jan 2009-Sept. 2009. Serum-CRP, PCT as well as amylase in drainage fluids were measured every second postoperative day. Following parameters were analyzed: diagnosis, age, operation, complications (major, minor, secondary), PF grade, A, B, C and according to the ISGPF-definition.

Results: During the observation period, n = 107 patients received PS and developed n = 15 minor, n = 12 major and n = 3 secondary complications. Among major complications, n = 9 (19%) were due to a drainage-fluid thereof n = 3 grade A, n = 2 grade B and n = 4 grade C. CRP and PCT were significantly increased in pat. with PF and other major complications after the 10th postop. day (p = 0.005; Anova). In the detection of PF, the ROC-Analyis for PCT revealed an AUC of 0.736 with a sensitivity of 83% and a specificity of 72% for the cut-off-value of 17.8 mg/l. For CRP the AUC was 0.855 with a sensitivity of 86% and a specificity of 83% for the cut-off-value of 77.1 mg/l. For the detection of major complications, the ROC-Analyis of PCT resulted in an AUC of 0.977 with a sensitivity of 100% and a specificity of 92% for the cut-off-value of 20.9 mg/l. For CRP the AUC was 0.770 with a sensitivity of 73% and a specificity of 84% for the cut-off-value of 77.1 mg/l.

Conclusion: Our results demonstrate that PCT is equivalent with CRP in the early diagnosis of postoperative pancreatic fistula, however superior in the diagnosis of all major complications following PS. Therefore we advocate the routine use of PCT and CRP following PS.
W1677
Diagnostic of Exocrine Pancreatic Insufficiency: Fecal Elastase-1 Versus Serum-Beta-Carotin

BACKGROUND: Determination of fecal elastase-1 is well established in the diagnosis of exocrine pancreatic insufficiency (EPI). However, accelerated gastro-intestinal passage could result in false negative results. Serum-beta-Carotin is an indirect parameter to measure the malabsorption of lipids, but is not determined in the diagnostic of EPI yet.

METHODS: All patients underwent pancreatic surgery were prospectively collected from Jan. 2009-Sept. 2009. Fecal Elastase-1, serum-beta-carotin and clinical features were analyzed preoperatively and 1 week, 1 and 6 months postoperatively together with surgical procedure and diagnosis.

RESULTS: During the observation period 125 patients underwent pancreatic surgery. The results of preoperative fecal elastase-1 and serum-beta-carotin showed significant lower values in pat. with chronic pancreatitis (CP) in contrast to pat. with benign and malignant tumors (p < 0.005, Anova). One week postoperatively, serum-beta-Carotin was significantly decreased in pat. after pancreatic head resection (PHR) in contrast to pat. after left pancreatic resection (LPR) or bypass-procedures (BP) (p < 0.05, Anova). In contrast, one week postoperatively fecal elastase-1 was decreased in all groups regardless of the surgical procedure without any differences in the clinical features. The follow-up revealed reduced values for both parameters in pat. with PHR compared to pat with LPR or BP. Overall, postoperative serum-beta-Carotin was more frequently in normal range than the values of fecal elastase-1 in patients without clinical signs of exocrine insufficiency.

CONCLUSION: Our data demonstrate that serum-beta-Carotin is equivalent to fecal elastase-1 in the diagnosis of exocrine pancreatic insufficiency following pancreatic surgery. Moreover, the validity of serum-beta-Carotin seems to be superior to fecal Elastase-1.

W1678

Will Ki-67 Predict Lymph Node Status in Pancreatic Endocrine Tumors?

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BACKGROUND: Pancreatic endocrine tumors (PET) are rare and exhibit an uncertain biological behavior. Many studies have suggested that certain tumor markers and factors such as size and mitotic count may predict the behavior of PET. However, the role of ki-67 proliferative index is much debated.

AIMS AND OBJECTIVES: To evaluate the significance of tumor size and Ki-67 proliferative index with lymph node status in PET.

METHODS: Records of patients who underwent surgical resection for PET between September 2005 to September 2009 by a single surgeon were reviewed. Pathologic variables were tumor size, lymph node status and Ki-67 proliferative index.

RESULTS: The study was performed on 24 pancreatic resections for PET. Of these, 18 (75%) underwent distal pancreatectomy and 6 (25%) underwent pancreatecduodenectomy. PET was limited to the pancreas or regional lymph nodes in 23 (96%) patients whereas 1 (4%) patient had distant metastatic disease. Multicentric disease within the pancreas was found in 8 (33%), 23 (96%) patients underwent R0 resection, and 17 (71%) patients had tumor larger than 2 cm. The distribution of patients as per Ki-67 proliferative index is shown in Table 1. The patient with distant metastatic disease had a large tumor (5 cm) and a “high” Ki-67 proliferative index (38%).

CONCLUSION: PET are diagnosed and recognized with greater frequency. Lymph node involvement in PET appear to be associated with larger tumor size. A high Ki-67 proliferative index (>10%) predicts lymph node metastasis in larger tumors (>2 cm). Preoperative Ki-67 should be done to predict LN metastasis in PET so as to evaluate the potential need for preoperative systemic therapy. Additional studies are needed to investigate the exact correlation between Ki-67 proliferative index, size and lymph node metastasis.

W1679
Feeding Tube Placement and Relationship to Pancreaticoduodenectomy Outcome

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BACKGROUND: For patients with diagnoses requiring pancreaticoduodenectomy (PD), feeding tube placement is often a limited potentially requiring feeding tube (FT) placement. We investigated if FT placement before, during or after PD was associated with altered patient outcome compared to no FT.

METHODS: This review included 214 patients undergoing PD for pancreatic, biliary or duodenal lesions. Eight received pre-operative FT (pre-op FT), 9 received intra-operative FT (intra-op FT), 14 received FT during their original admission for surgical resection for early (FT), 17 received FT after being discharged for surgical resection (late FT), and 166 received no FT. Univariate analysis was used to compare each group to no FT controls using the Mann-Whitney U-test.

RESULTS: Mean age was 63 ± 12.5 years (p = NS), 126 males were included (p = NS). There were 197 PD and 21 analogous procedures for 145 malignant and 73 benign lesions. No differences in the type of lesions resected between groups was found. Mean follow-up was 381 ± 58 days and was not different between the 5 groups. Table 1 shows post-op complications experienced by each of the 5 groups compared to no FT controls (n, % affected). Total complications for pre-op FT patients was similar to no FT while intra-op, early and late FT patients experienced more complications (p = 0.0194, 0.010 and 0.0005). At 1, 3- and 6-months no FT patients maintained 92%, 87% and 89% of their pre-op weight while pre-op FT patients maintained 92% (p = 0.0234) and 95% (p = NS) of their pre-op weight.

CONCLUSIONS: Most patients did not require FT post-op. Pre-op FT patients had minimal short-term post-op weight loss. Outcomes were not different between groups. Complications following PD may increase the need for preoperative FT. The placement of pre-op FT demonstrated a complication rate similar to no FT controls. The results do not justly routine intra-op FT placement.

W1680
Serum Blood Urea Nitrogen (BUN) and Albumin on the First Post-Operative Day (POD 1) Predict Pancreatic Fistula and Major Complications After Pancreaticoduodenectomy (PD)

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INTRODUCTION: PD is a surgical procedure with a high morbidity rate. Morbidity stems from pancreatic fistula, albumin on the first post-operative day (POD 1) and severe postoperative infectious complications. Factors associated with this increased morbidity in patients undergoing PD include prooperative albumin, as well as postoperative anemia levels. Previous work has shown hypoalbuminemia on POD 1 to be contributory to post-pancreatectomy complications. We set out to determine the impact of BUN and albumin on POD 1 for patients undergoing PD.

METHODS: We examined our prospective, IRB-approved database of 447 consecutive patients who underwent PD at THU between January 1, 2000 and December 31, 2008. Collected data included serum albumin pre-operatively and on POD 1. We also examined pre-operative and POD 1 BUN and hemoglobin. Morbidity was graded from 1 to 5 based on the previously published scale of Clavien et al.

RESULTS: Data on all variables were available in 362 patients. The median LOS in patients with albumin <2.5 was significantly increased compared to those ≥2.5 (geometric mean 10.1 vs 7.9 days, p < 0.001) and in those with BUN <90 compared to those ≥90 (7.7 vs 9 days, p = 0.003). Patients with a BUN <10 had a significantly decreased risk of any complication (58% vs. 56%, p < 0.001), serious complication (9% vs. 23%, p = 0.001), and pancreatic fistula (6% vs. 14%, p = 0.011). Patients with POD 1 hypoalbuminemia had a significant increased risk of any complication (57% vs. 44%, p = 0.033), and an increased risk of serious complication (25% vs. 14%, p = 0.012), and pancreatic fistula (15% vs. 9%, p = 0.095). On multivariate analysis, BUN >20 was the most significant predictor of grade III or above complication (p = 0.019, HR = 2.7) and pancreatic fistula (p = 0.16, HR = 2.6). POD 1 albumin <2.5 mg/dl was also an independent predictor of serious complication (p = 0.01, HR = 2.3). Patients with both risk factors had a 31% chance of developing serious
comlications and 18.5% risk of developing pancreatic fistula, while those patients with neither risk factor had a 6.5% and 15.6% risk, respectively.

**CONCLUSION:** Serum albumin and BUN on POD 1 are important predictors of POPF. These low-cost and easily accessible tests can be used as a prognostic tool to predict adverse surgical outcomes.

**W1681**

Intra-Abdominal Fat Predicts Survival in Pancreatic Cancer

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**BACKGROUND:** The impact of obesity on survival after pancreatic cancer surgery remains controversial. This may be due to the fact that obesity has been calculated by body mass index (BMI), an indirect measure that does not account for fat distribution. We hypothesized that directly measuring intra-abdominal fat would better predict survival.

**METHODS:** Patients who had a Whipple procedure for pancreatic adenocarcinoma from 2000–2009 were selected from institutional cancer databases at two hospitals. Preoperative CT imaging was used to measure intra-abdominal fat. Cox regression analysis was used to identify independent predictors of survival.

**RESULTS:** Sixty-one patients from 2000–2009 underwent a Whipple procedure for exocrine pancreatic adenocarcinoma. After adjusting for age and periportal invasion status, periportal BMI was not a significant independent predictor of overall survival (p = 0.827). Unlike BMI, quartiles of intra-abdominal fat did influence survival. Relative to patients with the lowest quantity of intra-abdominal fat (low quartile), those with more intra-abdominal fat tended to show worse overall survival but in a non-linear fashion (Figure 1). Individuals in the second quartile showed a 4-fold increase in likelihood of death (HR 4.018, 95% CI 1.099–14.867, p < 0.035) relative to the lowest quartile.

**Patients in the third (HR 2.124, 95% CI 0.278–16.222, p < 0.460) and fourth quartile (HR 1.354, 95% CI 0.296–6.196, p = 0.696) also showed greater risk of death but neither achieved statistical significance.**

**CONCLUSIONS:** Although BMI does not significantly predict survival in pancreatic cancer, increased intra-abdominal fat does identify a subset of patients with worse prognosis. This novel approach to measuring abdominal adiposity deserves further study to understand the relationship between obesity and outcomes in pancreatic cancer.

**W1682**

Tumor Size Correlates with Lymph Node Metastasis in Primary Pancreatic Endocrine Neoplasms

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**INTRODUCTION:** Well-differentiated pancreatic endocrine neoplasms (PEN) is a rare entity in which surgical resection is the only chance for cure. The extent of resection and lymphadenectomy remains controversial with few clinical parameters available to guide surgical planning. We hypothesize that the size of PEN will correlate with lymph node metastasis.

**METHODS:** This study was a retrospective review of our institution’s prospectively collected database on patients who have undergone pancreatic surgery from May 1984 to August 2009. We used the Cochran-Mantel-Haenszel test for nonzero correlation between tumor size and positive lymph node status.

**RESULTS:** We identified 511 patients who had a PEN resected. Of the 511 patients, we found 365 with PEN as their worst diagnosis as well as having at least one lymph node in their pathology specimen. Tumor size correlated with lymph node metastasis in the following manner: <1 cm, 15%; 1 to <2 cm, 14%; 2 to <3 cm, 41%; 3 to <4 cm, 61%; 4 to <5 cm, 75%; 5 cm or more, 54%. There was a statistically significant correlation between tumor size and lymph node metastases (p = 0.0001).

**CONCLUSION:** Size of PEN correlates with lymph node metastasis. Remarkably, even small (<1 cm) PENs can metastasize to lymph nodes. Therefore surgical resection with appropriate lymphadenectomy should be considered for all PENs regardless of their size.

**W1683**

The Prognostic Influence of Lymph Node Ratio Following Pancreatoduodenectomy for Ampullary Adenocarcinoma

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**BACKGROUND:** Survival after surgery for ampullary cancer remains poor. Prognostic factors including tumor stage, lymph node (LN) status, and tumor grade have been identified. Described as the lymph node ratio (LNR), the number of involved LNs compared to the number examined has been prognostic in pancreatic adenocarcinoma. We sought to assess the prognostic value of LNR on a consecutive series of ampullary adenocarcinomas undergoing pancreatoduodenectomy.

**METHODS:** Retrospective review of a prospective database of pancreatoduodenectomies performed between 1997 and 2008 was undertaken. Clinicopathological data was collected and the LNR calculated. Patients with positive LN status were grouped into: (1) LNR = 0.0, (2) LNR 0.01–0.2, (3) LNR 0.2–0.4 and (4) LNR > 0.4. Survival outcome was compared using Kaplan-Meier/Cox proportional hazards analysis.

**RESULTS:** 95 ampullary adenocarcinomas were identified with a median survival for the cohort being 31.2 months (95% CI; 18.2–67.4). The median number of LNs harvested was 20.0 (95% CI: 18.2–22.1). LN involvement was associated with other aggressive tumour characteristics including lymphovascular invasion, tumour stage and notably an elevated pre-operative C-reactive protein concentration (p < 0.05). Overall LN status influenced survival with a median survival for the 38 (44.7%) negative resections being 124 months (95% CI: 96.8–152.8) versus 21.3 months for node-positive disease (95% CI: 18.1–36.3). Increasing LNR was associated with decreased survival: LNR <0.01–0.2; 40.0 months; LNR 0.2–0.4; 18.3 months and LNR >0.4; 10.1 months. On multivariate analysis LN status (Hazard ratio 4.6; 95% CI 2.6–9.6) and perineural invasion (Hazard ratio 3.3; 95% CI 1.5–7.3) maintained significance.

**CONCLUSION:** Positive LN status in ampullary adenocarcinoma is a strongly independent predictor of poor outcome. Pancreatoduodenectomy is curative in 65% of patients with node-negative disease. Amongst the LN positive ampullary adenocarcinoma resections LNR was inversely associated with outcome.

**W1684**

Surgeon and Organ Matter for the Outcome After Distal Pancreatic Resection

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**INTRODUCTION:** Distal pancreatic resection (DPRR) is a less frequently performed operation than pancreaticoduodenectomy with a relatively high perioperative morbidity but low mortality. There is a considerable rate of postoperative pancreatic fistula (POPF). The aim of this study was to evaluate the perioperative outcome in over 100 cases of DPPR, with focus on risk factors for POPF and different anastomotic techniques.

**PATIENTS METHODS:** On the basis of a prospectively maintained database, exploratory data analysis was performed for all patients who received a DPPR from 1994 to 2009. Significance level was set to 5%. SPSS version 17 was used for all statistical analysis. POPF was defined according to the BJSF definition.

**RESULTS:** From 1994 to 2009, 129 DPPR were performed. Indications were adenocarcinoma (29%), chronic pancreatitis (31%), NET (15%), CFP (16%), and others. Median age was 56 years and male: female ratio 40:60. For closure of the pancreatic cut surface, a pancreaticojunostomy (43%), direct closure by stapler (37%) or seromuscular patch (6%) were used. There were 33% multivisceral resections (including portal vein resections). In multivariate analysis, independent risk factors for periprocedural mortality were the type of pancreatic disease and the surgeon, and risk factors for POPF was a high BMI, the type of closure of the pancreatic cut surface and the surgeon.

**CONCLUSION:** The main factors influencing morbidity and POPF rates after DPR are the underlying pancreatic disease and the type of anastomosis. The surgeon plays an important role because he chooses the type of operative technique and extent of resection.
RESULTS: Of 550 pancreatic resections (356 Whipple, 167 Distal, 11 Total, 16 Other), 288 (53%) had some complication, of which 167 (31%) were infectious. Rates of infection differed by procedure (Whipple 34%, Distal 23%, Total 9%; p = 0.029) but did not differ whether performed for malignancy or not. While most infections were of minor severity (n = 105, Clavien 1–2), major infections (n = 62, Clavien 3–5) did occur in 13% of all resections. Patients with infection did significantly worse, with longer LOS and OR time, more transfusions and ICU use, and greater EBL. They required either rehabilitation or home care 2.56x the time of vs 1/3rd for the non-infected) and were readmitted more often (34% vs 12%). The most common organisms were Staphylococcus, Enterococcus and E. coli. By category, wound infection (14% of all cases) was most common, followed by infected suture (9%), UTI (7%), pneumonia (6%) and sepsis (2%). C. difficile colitis (1.6%) and line infections (4%) were infrequent. 48/72 clinically relevant infusions involved polymicrobial infection and occurred equivalently for Whipple and distal duodenal. TPN use (Odd’s Ratio 7.3), cancer status (OR 2.1), and perioperative hypotension (OR 1.0) were predictive of any infection, but specific categories of infection had different predictors. Total costs were $15,000 higher for infection cases and increased grade-for-grade across the Clavien score, with infection accounting for 30% of the cost differential.

CONCLUSION: Nearly one-third of our patients undergoing pancreatic resection developed infectious complications. Depending on severity, clinical outcomes suffered and costs rose significantly. These data are guiding process evaluations and initiatives for infection control in our unit.

Clinical: Small Bowel

W1687
Electrical Stimulation of the Duodenum to Treat Diabetic Pernicious Anemia: Preliminary Results of the First in Men Study
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Diabetes mellitus type 2 is a worldwide dramatic growing problem. The usual treatment is limited in lifelong medication, not in healing. Obesity surgery, especially gastric bypass and bilipancreatic diversion showed us dramatic reduction in cases of diabetes mellitus type 2. The study in animals demonstrated electrical stimulation of the duodenum can mimic the effect of the gastric bypass. Now we want to present preliminary results of the devices effect in the first in men study. The duodenal pacing induces weight loss, decrease of HbA1c, decreases glucose levels in the MIT.

W1688
Idiopathic Gastrointestinal Failure Syndrome in Female Smokers with Peptic Ulcer Disease
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PURPOSE: There is a subset of patients who do not tolerate vagotomy and gastric resection for peptic ulcer surgery. The patterns of failure after peptic ulcer surgery have changed over the past 30 years as the indications for surgery have narrowed. The purpose of this study is to describe a unique syndrome of chronic gastrointestinal failure in female smokers that require surgery for medically refractory peptic ulcer disease (PUD).

METHODS: A retrospective study was performed in a consecutive group of women that required gastric resection and vagotomy for refractory PUD. Medical records were reviewed for common factors and symptoms shared by this select group of patients.

RESULTS: A total of five women (n = 5) are described. All women underwent gastric resection with vagotomy for PUD. All required multiple re-operations for failing to take an oral diet and for failure to tolerate jejunal tube feedings. All patients were white and the mean age was 47 year old. The mean BMI was 15 kg/m². Other factors shared by this group include a significant smoking history, chronic narcotic abuse, constipation, chronic intolerance to oral diet, and failure to tolerate tube feedings at infusion rates that maintain adequate body weight.

CONCLUSION: This study describes a distinctive syndrome of idiopathic gastrointestinal failure in female smokers that require surgery for medically intractable PUD. The syndrome is characterized by chronic intolerance to oral intake, intolerance to high volume enteral feeds, narcotic use, need for multiple gastrointestinal operations, and significant malnutrition manifested by weight loss and low BMI. Early identification of this syndrome may allow patients to avoid unnecessary interventions and allow clinicians to tailor nutritional support to individual patients.

W1689
Risk of Obesity-Related Cancer After Obesity Surgery in a Population-Based Cohort Study
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OBJECTIVE: Obesity increases risk of several cancers, but it is uncertain whether weight reduction is followed by any decreased risk. To address this topic, we selected a group of patients representing a substantial weight loss starting at a defined time, i.e., patients submitted to obesity surgery. We hypothesized that risk of obesity-related cancer decreases with time after obesity surgery.

DESIGN AND SETTING: A nationwide, population-based cohort study of obesity surgery in 1980-2006 registered in the Swedish Patient Register. New cancers were identified through the Swedish Cancer Register. Cohort members observed total number of overweight-related cancers and groups of obesity-related cancer (breast, prostate, colorectal, endometrial, kidney) were divided by the expected numbers, representing the baseline risk, thus calculating standardized incidence ratios (SIRs) with 95% confidence intervals (CI). Time trends of SIR after obesity surgery were the main outcome measure.

RESULTS: Among a total of 13,123 obesity surgery patients, contributing with 125,049 person-years of follow-up, 296 new cases of obesity-related cancer were identified. There was no overall decrease in SIR of obesity-related cancer with increased time after obesity surgery (p for trend 0.40). Similarly, no statistically significant trends with follow-up time were found for cancer of the breast (p = 0.60), prostate (p = 0.54), endometrium (p = 0.81), or kidney (p = 0.42), while the risk of colorectal cancer increased with time (p for trend 0.01) after obesity surgery.

CONCLUSIONS: The weight reduction following obesity surgery might not be enabled by a decreased risk of obesity-related cancer without increasing follow-up time as compared to the baseline risk.
reconstruction using transoral anvil (Orvil, Autosuture, Norwalk, CT). The initial trocars were placed at the periumbili- cum, and four trocars were placed at upper abdominal portions. After completing dissection and transecting the esophagus, the periumbilical incision was extended to 3 cm to remove the stomach. After gastric tube was made extra- corporeally, the handpiece of SILS stapler was inserted in the gastric tube, and the gastric remnant was returned to the abdomen, then anastomosis was completed intraorally.

RESULTS: Neither patient complained of heartburn sug- gesting reflux gastritis. Following endoscopy revealed no reflux esophagitis. In the barium-meal study, reaggregation from the gastric remnant to the esophagus was not shown.

CONCLUSION: The gastric tube reconstruction with the transoral anvil could be technically feasible, simple, and safe for reconstruction after LAGP.

W1693
Gastroscopy Closure in NOTES: Literature Review and Description of the Clinical NOTES Gastroscopy Closure Technique
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OBJECTIVE: A primary challenge that remains in natural orifice transluminal endoscopic surgery (NOTES) is a con- sistent and safe gastric closure. Surgical technique, as well as industry taking an active role to develop an endoscopic system for gastric closure, has made transgastric surgery a clinical reality. We present a thorough literature review of gastroscopy closure technique, description of endoscopic instrumentation currently available for gastroscopy closure, and our clinical experience with transgastric surgery.

METHODS AND PROCEDURES: A literature review was per- formed using PubMed with the search criteria of: NOTES surgery, transgastric surgery, and gastroscopy closure was per- formed. Current products used in preclinical studies and clinical cases were reviewed in a porcine model and those with FDA approval were used in transgastric operations. The endoscopic gastroscopy closure products are described and pictures displayed. In our clinical experience we have performed 3 transgastric operations (2 appendectomies, 3 cholecystectomies) under IIB protocol. Gastroscopy closure was obtained using the USGI Medical g-Prox. Endoscopic bal- loon placement in the gastroscopy was utilized for mainte- nance of pneumogastroon along with laparoscopic view of the closure was obtained. All of the patients were admitted to the hospital for observation per protocol.

RESULTS: Multiple techniques for gastroscopy closure are presented based upon literature review. The majority of closure devices are reported in a porcine model. Six flexible closure products were evaluated, 2/8 have FDA clearance at this time. Successful gastroscopy closure was obtained in all cases. 2 patients were discharged on POD 1 and 1 on POD 2. There was no clinical evidence of a gastric leak in any of the operations. At follow up all patients were pain free.

CONCLUSION: Safe, reliable, and reproducible gastroscopy closure is required for transgastric access. New endo- scopic technology now offers multiple options for closure and has been demonstrated successfully in clinical cases. Further technological developments and a larger clinical study is necessary to elucidate the best closure device.

W1949
Single-Incision Laparoscopic Surgery (SILS) Simulator Training Improves Performance
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INTRODUCTION: SILS has emerged as a promising way to perform laparoscopic surgery. However, it is more techni- cally challenging than standard laparoscopy (LAP), and is not currently part of the Fundamentals of Laparoscopic Surgery (FLS) curriculum. We hypothesize that SILS-spe- cific training is superior to LAP training in improving SILS performance.

METHODS: First and second year medical students with no prior LAP or SILS experience were recruited and base- line tested on tasks from FLS (peg transfer and circle cut- ting) using LAP and SILS techniques. LAP was performed on a standard, three-port, FLS box-trainer with standard LAP instruments. SILS was performed using an FLS box- trainer modified to accept a Coviden SILS Port™ with two ports for Coviden Roticator™ instruments and one port for a 30-degree 5 mm laparoscope. After baseline testing, subjects were randomized to either LAP or SILS training (four practice sessions over a 4-6 week period). After com- pleting the training, subjects were retested on LAP and SILS platforms. Scoring were calculated using standard time and accuracy metrics, normalized to previously published FLS scoring criteria to distinguish competent (>54%) and non-competent surgeons (<54%). Repeated measures analysis of covariance was used to measure the effect of time and training regimen on score improvement, while controlling for differences in baseline score. A p-value <0.05 is used to denote a significant difference.

RESULTS: 14 subjects performed LAP (n = 8) or SILS (n = 6). Baseline scores were similar in both groups, except for SILS circle (p = 0.014) and overall SILS score (p = 0.012) which were higher in the LAP group. All scores improved signifi- cantly over time (p < 0.001). Improvement of LAP scores was similar between groups. However, the SILS group had superior improvement of SILS peg (F[1,11] = 12, p = 0.005) and overall SILS scores (F[1,11] = 23, p < 0.001).

CONCLUSION: SILS-specific training is superior to stan- dard LAP training in improving SILS score. SILS-specific training does not adversely affect acquisition of LAP skill. SILS-specific training should be incorporated into existing LAP training curriculums.

W1950
A Combined Oral Regimen of EGCG and Silibinin Inhibited the Subcutaneous Growth of the CT-26 Colon Cancer Cell Line and May Improve Healing of Gastric Wounds
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INTRODUCTION: There is strong evidence that tumor growth is stimulated after colorectal resection in patients with residual tumor microfoci, thus, there is a need for anti-cancer drugs for the perioperative period. In order for a drug to be used in this time period it is critical that it does not impair wound healing. EGCG (epigallocate- chin-3-gallate) from green tea and Silibinin (Silib) from the milk thistle plant, are pro-apoptotic drugs that also impact cell cycle regulation. Alone, each inhibits cancer growth; the efficacy of the 2 together is unknown. This study assessed the tumor inhibitory effect of EGCG and Silib and also studied the impact of these drugs on wound healing.

METHODS: Tumor Growth Study: CT26 cancer cells were subcutaneously injected into 44 Balb/c 1 mice that were divided into 4 groups 1) Phosphotidylcholine (Silib delivery vehicle alone; 2) EGCG alone; 3) Silib alone; and 4) EGCG + Silib. Daily doses of these agents were given orally starting the day after inoculation for 24 days. On day 25 the tumors were excised and weighed, cell proliferation (Ki67) and apoptosis (Caspase3) were assessed via IHC. Wound Healing Study: 4 groups of Balb/c mice (n = 15/ group) were given the same drugs in a similar manner. Sham laparotomy and gastroscopy were performed 1 week noted later. The abdomen and wall of the stomach were sutured together in 1 layer. On postop day 7 the stomachs and abdominal wall pelvis were collected. Stom- ach bursting pressure and the collagen content of the abdominal wounds were determined. The wounds were also examined histologically.

RESULTS: The mean mass of the subcutaneous tumors in the EGCG- and Silib group was significantly smaller than that of the control group's tumors (p = 0.02). There was no difference noted in tumor mass when EGCG and Silib were given alone. The EGCG + Silib group had significantly lower tumor mass (p = 0.02). Wound area was measured via IHC analysis showed that only the drug combination inhibited tumor cell proliferation (vs. control, p = 0.015) and increased apoptosis (vs control, p = 0.005). Perior EGCG and Silib together had no adverse effect on stomach bursting pressure (vs. control, p = 0.379) or the wounds histologic appearance.

CONCLUSIONS: Whereas, each drug alone was not effec- tive, EGCG and Silib together was found to inhibit tumor growth and proliferation and to encourage apoptosis in this murine model. Importantly, this drug combination did not impair wound healing or gastric wound healing. This drug combination merits further study as a possible perio- operative therapy for cancer patients undergoing curative resection.
Increased Gastric Conduit Ischemia as Measured by Optical Fiber Spectroscopy During Minimally Invasive Esophagectomy Is Associated with Development of Anastomotic Complications

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INTRODUCTION: Anastomotic complication is a major morbidity associated with esophagectomy. Gastric ischemia after conduit creation is believed to contribute to anastomotic complications, but we lack a reliable method to assess gastric conduit perfusion. We hypothesize that fiber optic spectroscopy (FOS) can reliably assess conduit perfusion and that the degree of intraoperative gastric ischemia will correlate with the development of anastomotic complications.

METHODS: FOS utilizes the differential spectral absorbance characteristics of oxy- and deoxy-hemoglobin to determine oxygen saturation (OSat) and blood volume fraction (BVF) within tissues. FOS was used to measure OSat and BVF in the distal tip of the gastric conduit at baseline, after division of the short gastric vessels, left gastric vessels, gastric tube creation, and conduit pull-up. OSat and BVF readings were normalized to baseline and correlated to clinical outcomes.

RESULTS: Between 2008 and 2009, 23 patients underwent minimally invasive esophagectomy. Four patients had ischemic conditioning by short gastric vessel division at a median of 94 days prior to esophagectomy. Seven patients developed an anastomotic leak or stricture. OSat decreased from 47.5% at baseline to 32.3% after conduit creation (p = 0.002) and then to 36.4% after pull-up (p = 0.02). Relative to baseline value, BVF increased by 166% after conduit creation (p = 0.06) and by 256% following pull-up (p = 0.02). Compared to patients without anastomotic complications, those who manifested anastomotic complications had greater intraoperative changes in OSat (18.9% decrease from baseline versus 50.2%, p = 0.02). However, BVF (160.2% vs. 169.2%, p = 0.9) did not differ between patients with and without anastomotic complications. Compared to patients who underwent immediate reconstruction, those who underwent ischemic conditioning had significant differences in BVF relative to baseline (182.5% versus 73.1%, p = 0.02). However, OSat did not decrease significantly (29.3% decrease from baseline vs. 29.8%, p = 0.9) for patients with versus those without prior ischemic conditioning after conduit creation.

CONCLUSION: In this study, the degree of intraoperative gastric ischemia resulting from gastric conduit creation is associated with the development of anastomotic complications. In patients undergoing ischemic conditioning, decreases in BVF suggest less venous congestion in the gastric conduit. Our preliminary data indicate that FOS is useful in assessing the changes in conduit perfusion during esophagectomy. Further studies are needed to evaluate strategies to improve gastric perfusion and venous drainage during esophagectomy.
Difficult to Remove Colonic Polyps: EMR, ESD, or Surgery? (AGA, ASGE, SSAT)

New Hope for Chronic Pancreatitis? (SSAT, AGA, ASGE)

Laparoscopy for Cancer—Are There Limits?

Some of My Best Friends Are Surgeons

Multidisciplinary Management of Rectal Cancer: Update and Current Controversies

Multimodality Management of Rectal Cancer: Update and Current Controversies

Cancer of the Gastrointestinal Tract: East Meets West

How to Teach Uncommon and Highly Complex Operations

 zen and the Art of Surgery: How to Make Johnny a Surgeon

A Multidisciplinary Approach to Endoscopic, Percutaneous, and Interstitial (AGA, ASGE, SSAT) Nanotechnology in Biology and Medicine

Multidisciplinary Management of Esophageal Perforation and Leaks

Complications in Colon Disease: A Multidisciplinary Approach to Endoscopic, Percutaneous, and Interstitial (AGA, ASGE, SSAT) Multidisciplinary Management of Esophageal Perforation and Leaks

Debate 2: Traditional Laparotomy or Open Repair?

Debate 1: Traditional Laparotomy or Open Repair?

Endoscopic Management of Esophageal Perforation and Leaks

Debate 2: Traditional Laparotomy or Open Repair?

Debate 1: Traditional Laparotomy or Open Repair?

Debate 2: Traditional Laparotomy or Open Repair?

Debate 1: Traditional Laparotomy or Open Repair?

Debate 2: Traditional Laparotomy or Open Repair?