# Table of Contents

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schedule-at-a-Glance</td>
<td>2</td>
</tr>
<tr>
<td>Sunday Plenary Video, and Quick Shot Session Abstracts</td>
<td>4</td>
</tr>
<tr>
<td>Monday Plenary, Video, and Quick Shot Session Abstracts</td>
<td>17</td>
</tr>
<tr>
<td>Tuesday Plenary, Video, and Quick Shot Session Abstracts</td>
<td>38</td>
</tr>
<tr>
<td>Sunday Poster Session Abstracts</td>
<td>55</td>
</tr>
<tr>
<td>Monday Poster Session Abstracts</td>
<td>95</td>
</tr>
<tr>
<td>Tuesday Poster Session Abstracts</td>
<td>138</td>
</tr>
</tbody>
</table>

*PLEASE BRING THIS PROGRAM BOOK ABSTRACT SUPPLEMENT WITH YOU TO THE ANNUAL MEETING.*
<table>
<thead>
<tr>
<th>Time</th>
<th>Saturday, May 7, 2011</th>
<th>Sunday, May 8, 2011</th>
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**Schedule-at-a-Glance**

**Saturday, May 7, 2011**
- **7:30 AM - 7:45 AM**: Opening Session
- **8:00 AM - 8:00 AM**: President's Address: Happy Mother's Day
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**Sunday, May 8, 2011**
- **7:30 AM - 7:45 AM**: Opening Session
- **8:00 AM - 8:00 AM**: President's Address: Happy Mother's Day
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**Wednesday, May 11, 2011**
- **7:30 AM - 7:45 AM**: Opening Session
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- **5:45 PM - 6:00 PM**: President's Address: Happy Mother's Day
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Disparities in the Use of Minimally-Invasive Surgery for Colorectal Disease
Celina N. Rembio1, Shubhada Sansgiry2, Courtney J. Balentine3, David H. Berger3
1Michael E. DeBakey Department of Surgery, Baylor College of Medicine, Houston, TX; 2Operative Care Line, Michael E. DeBakey Veterans Affairs Medical Center, Houston, TX; 3Houston VA Health Services Research and Development Center of Excellence, Michael E. DeBakey Veterans Affairs Medical Center, Houston, TX

BACKGROUND: Mortality and morbidity rates for major surgical procedures are improved in high volume hospitals. Although high volume centers often serve diverse patient populations, it is unknown if there are disparities in the application of new surgical technologies within these hospitals. We sought to determine if ethnic and socioeconomic disparities in the use of MIS for colorectal disease exist at high volume centers.

METHODS: Using the 2008 National Inpatient Sample database, a retrospective review of laparoscopic colectomies performed at high volume centers (case volume >200 year) was conducted. IC3-9 codes were used to identify minimally invasive (MIS) colorectal resections. Multivariate logistic regression including ethnic and socioeconomic variables was used to identify independent predictive factors for undergoing MIS.

RESULTS: A total of 98,047 colorectal resections were performed at high volume centers in 2008. Overall, only 7950 (8.1%) colorectal resections were performed using a minimally invasive approach. Patients with malignant neoplasms were three times more likely to undergo MIS, and those receiving elective resections were twice as likely (Table1). When evaluating racial and socioeconomic factors, patients within the highest income quartile were more likely to undergo minimally invasive surgery than those in the lowest income groups. In addition, Medicaid and Medicare patients were significantly less likely to undergo MIS. Lastly, race was not a significant predictive factor for undergoing MIS for colorectal disease at a high volume center.

CONCLUSION: There are significant socioeconomic disparities in the use of minimally invasive surgery for colorectal disease at high volume centers. Future studies should be aimed at identifying access barriers to MIS in the treatment of colorectal disease.

306
Laparoscopic Pancreaticoduodenectomy for Cancer: Margin Status, Adequacy of Resection and 90 Day Outcomes
Craig F. Fischer1, Bridget N. Fahy2, Brian J. Dunkin1,2,3
1Pancreatic Oncology, Michael E. DeBakey VA Medical Center, Houston, TX; 2Division of Minimal Invasive and Robotic Surgery, The Methodist Hospital, Houston, TX; 3Division of Minimal Invasive and Robotic Surgery, The Methodist Hospital, Houston, TX

INTRODUCTION: Laparoscopic pancreaticoduodenectomy (Lap PD) has been shown to have similar outcomes to the conventional open approach (Open PD), in selected patients. The cancer-specific outcomes in patients with periampullary malignancy have not been reported in sufficient numbers to allow conclusions. We report an unselected series of 53 patients who underwent Lap PD for periampullary malignancy and compare these to matched patients who underwent Open PD at our institution.

METHODS: From February 2009 to October 2010, 109 pancreaticoduodenectomies were performed for periampullary malignancy. With approval from the institutional IRB, 53 patients underwent a total laparoscopic approach, without the use of hand-in-hand traction, using an endoscopic retroperitoneal approach. Exclusion criteria Lap PD included tumors >3 cm or vascular invasion determined by preoperative three phase CT scan. During the study period, 6 patients did not meet criteria established for Lap PD and were excluded from the analysis. Propensity score matching was used to examine the institutional database, and select patients for the control group based on Age, Sex, Ca 19-9 and key preoperative covariables. The institution practices a uniform approach to adjuvant chemotherapy for patients treated with intent to cure, with a goal benchmark of beginning of therapy 6 weeks following surgery. Perioperative outcomes were tracked in 90 days following surgery.

RESULTS: Laparoscopic Pancreaticoduodenectomy (Lap PD) has been shown to have similar outcomes as the conventional open approach (Open PD). This study was associated with less operative time, shorter operative time, equal rates of complications, and improved likelihood receiving adjuvant therapy in a timely manner. The benefits of minimal access surgery regarding faster recovery may allow patients with periampullary malignancy to receive timely adjuvant chemotherapy.

RESULTS: Rates of pancreatic fistula, delayed gastric emptying and mortality were not different between patients who underwent Lap or Open PD. Estimated blood loss was less in the Lap PD group, and operative time was longer in the Lap PD group. Percentage of patients undergoing a margin negative resection was equivalent amongst the groups, although a trend was seen for higher lymph node and lymph node metastasis were also not different. Significant differences were noted regarding the likelihood of beginning adjuvant therapy at 6 weeks. 87% of patients in the Lap PD group achieved this benchmark, and only 53% in the Open PD group. Lastly, patients undergoing open PD were more likely to be debilitated after surgery than those who underwent the minimally invasive approach.

CONCLUSIONS: This study is the first to compare a contemporary cohort of patients undergoing Lap PD and Open PD for cancer. Lap PD in this study was associated with less blood loss during operative time, equal rates of complications, and improved likelihood receiving adjuvant therapy in a timely manner. The benefits of minimal access surgery regarding faster recovery may allow patients with periampullary malignancy to receive timely adjuvant chemotherapy.

307
Wei Lee1, Kyung Yul Hur2, Muffazal Lakdawala3, Kazunori Kasama4, Simon K. Wong5
1Surgery, Min Shung General Hospital, Taoyuan, Taiwan; Surgery, Soochunhyang University Hospital, Seoul, Korea; 2Surgery, Saitama Medical College, Japan; Surgery, Prince of Wales Hospital, Hong Kong, Hong Kong

BACKGROUND: Gastro-intestinal metabolic surgery has been proposed for the treatment of not well controlled type 2 Diabetes Mellitus (T2DM) patients with a BMI < 35 Kg/m2. This study aims to describe recent experience with surgical treatment of T2DM in Asian centers.

METHODS: This study was performed at high volume centers in 2008. Overall, only 7950 (8.1%) colorectal resections were performed using a minimally invasive approach. Patients with malignant neoplasms were three times more likely to undergo MIS, and those receiving elective resections were twice as likely (Table1). When evaluating racial and socioeconomic factors, patients within the highest income quartile were more likely to undergo minimally invasive surgery than those in the lowest income groups. In addition, Medicaid and Medicare patients were significantly less likely to undergo MIS. Lastly, race was not a significant predictive factor for undergoing MIS for colorectal disease at a high volume center.

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CONCLUSION: There are significant socioeconomic disparities in the use of minimally invasive surgery for colorectal disease at high volume centers. Future studies should be aimed at identifying access barriers to MIS in the treatment of colorectal disease.

RESULTS: Rates of pancreatic fistula, delayed gastric emptying and mortality were not different between patients who underwent Lap or Open PD. Estimated blood loss was less in the Lap PD group, and operative time was longer in the Lap PD group. Percentage of patients undergoing a margin negative resection was equivalent amongst the groups, although a trend was seen for higher lymph node and lymph node metastasis were also not different. Significant differences were noted regarding the likelihood of beginning adjuvant therapy at 6 weeks. 87% of patients in the Lap PD group achieved this benchmark, and only 53% in the Open PD group. Lastly, patients undergoing open PD were more likely to be debilitated after surgery than those who underwent the minimally invasive approach.

CONCLUSIONS: This study is the first to compare a contemporary cohort of patients undergoing Lap PD and Open PD for cancer. Lap PD in this study was associated with less blood loss during operative time, equal rates of complications, and improved likelihood receiving adjuvant therapy in a timely manner. The benefits of minimal access surgery regarding faster recovery may allow patients with periampullary malignancy to receive timely adjuvant chemotherapy.
**METHODS:** Between August 2008 and August 2010, 42 patients with acute appendicitis were offered a pure TVA. Patients who did not wish to undergo a TVA underwent a LA and were served as controls. Both groups were provided with a FSH before surgery and at regular intervals for up to 1 year. Pre- and post-operative FSH results were compared between cohorts using unpaired t-tests, and between individuals within each cohort pre and post operatively using paired t-tests.

**RESULTS:** Patients underwent a pure TVA, 22 underwent LA, and 2 refused participation in this study. Pre-operative and 60 day post-operative FSH data was available for 21 patients (11 TVA, 10 LA). Baseline FSH scores were not significantly different between groups (TVA: 18.0 ± 1.46, LA: 15.0 ± 2.1, p = 0.92). FSH scores at greater than 60 days post-operatively did not differ significantly from pre-operatively in either group (TVA: 18.0 ± 1.46 to 16.7 ± 2.4, p = 0.49, LA:15.0 ± 2.3 to 16.4 ± 2.1, p = 0.49). No FSH decline in either cohort was significantly changed post-operatively.

**CONCLUSIONS:** Neither TVA nor LA affected female sexual function scores. This suggests that TVA does not have negative effects on female sexual function. The results of this study may prove beneficial in consultations with patients concerning the sexual sequelae of transvaginal surgery.

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**LAPAROSCOPIC PARAESOPHAGEAL HERNIA REPAIR: DEFINING LONG-TERM CLINICAL AND ANATOMIC OUTCOMES**

**METHODS:** This is an IRB approved prospective trial. Participants were contacted through community advertising. Patients with past or current history of GERD, LPR or antiresecretory medication use were excluded. Absence of symptoms was confirmed using the reflux symptom index and GERD-HRQOL questionnaires. Subjects underwent unrelated transanal endoscopy; patients with esophageal findings of reflux were excluded. 24-hour HMII was then performed before and after a 2-week course of proton pump inhibitors (PPI). All subjects with a positive DeMeester Score were excluded from the final analysis. Cather configuration consisted of pHi probes located in the hypopharynx and 3 cm proximal to the esophagogastric junction; impedance electrode pairs were located in the hypopharynx and proximal and distal esophagus. LPR events were considered present with retrograde bolus transit across all ring sets and ultimately reaching the hypopharynx. Assuming a Poisson distribution, 95% percentiles for proximal reflux and LPR events were calculated and used as cut-offs for normal vs. pathologic LPR. Subsequently, a cohort of 15 LPR patients who had a complete response to medical or surgical therapy was used for comparison with the normative data, all patients had pre-treatment LPR events recorded using the same catheter configuration. We defined this patient set as “true LPR.”

**RESULTS:** Forty (18 male, 22 female, mean age 33 years) subjects were enrolled. Six subjects were excluded because of a positive DeMeester score or sensor noise. Thirty-four subjects completed one, and 26 completed both HMII testing periods off and on PPI. There was no difference in the total number of total reflux events between off and on PPI (Median, 22 and 24, respectively, p = 0.89). One subject had 1 LPR event off PPI. On PPI, two subjects had 1 and 3 LPR events, respectively. The 95th percentile occurrence of LPR off and on PPI were 0 and 1, respectively; 95% percentile for proximal reflux was 4 for both off and on PPI. Patients with treatment responsive LPR had pre-treatment HMII values greater than the 95th percentile of normal patients in all criteria except total number of reflux events (Table).

**CONCLUSIONS:** This study establishes the normative data for LPR. LPR events are extremely rare in patients without GERD or LPR symptoms as measured with HMII. One or more LPR events should be considered abnormal in patients with LPR symptoms regardless of whether there is a positive DeMeester score.

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**CONCLUSIONS:** Despite an overall high rate of radiologic recurrence following LPEHR, patient satisfaction remains high, radiologic recurrences are well tolerated, and the need for reoperation is very low.

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**BACKGROUND:** Laparoscopic paraesophageal reflux (LPR) with or without aspiration can cause atypical symptoms, asthma and pulmonary fibrosis. No method has been accurate or effective for the diagnosis of LPR. The aim of this study was to establish the normative data for LPR and proximal reflux events in an asymptomatic cohort using hypopharyngeal multichannel intraluminal impedance-pH (HMII).

**METHODS:** We recently determined in a multi-institutional, prospective, randomized study of laparoscopic paraesophageal hernia repair (LPEHR) that the 5-year anatomic and effectively eliminated T2DM in patients with a BMI < 35 Kg/m2. Larger and longer study is needed for this trial to confirm the benefit.

**RESULTS:** We recently determined in a multi-institutional, prospective, randomized study of laparoscopic para-esophageal hernia repair (LPEHR) that the 5-year anatomic and effectively eliminated T2DM in patients with a BMI < 35 Kg/m2. Larger and longer study is needed for this trial to confirm the benefit.
Minimally Invasive Esohpagomyotomy for Carcinoma of Esohpagus After Neoadjuvant Chemoradiation
Daniel K. Yong, Simon Law, Fion S. Chan, Kam H. Wong
Surgery, The University of Hong Kong, Hong Kong, Hong Kong
Minimally invasive esophagectomy in patients with esophageal cancer and prior chemoradiation is challenging because of post-radiation fibrosis. We present such a patient who was operated via combined thoracoscopy and laparoscopy.

In the thoracic phase, the esophagus was mobilized together with mediastinal lymphadenectomy. In the abdominal phase, the stomach was mobilized with preservation of the vascular arcades. The cervical esophagus was divided and pulled down into the peritoneal cavity. Gastric transection was performed extracorporeally via a 5-cm mini-laparotomy. A narrowed gastric tube was created and railroaded via the orthotopic route to the neck for esophagogastric anastomosis.

Minimally Invasive Esohpagomyotomy After Nissen Fundoplication
Roger King, Nish T. Nguyen, Kevin M. Reavis
Surgery, University of California, Irvine, Orange, CA
Nissen fundoplication is a common operation reserved for gastroesophageal reflux refractory to medical management. Despite surgical management, patients are still at risk for developing esophageal cancer. This is a video presentation which demonstrates that minimally invasive Ivor-Lewis esophagectomy can be safely performed after prior Nissen fundoplication.

Laparoscopic Transgastric Resection of a Large Intussuscepted Gastric Polyp
Etienne Auger-Dufresne,1 Liane S. Feldman,1 Gerald M. Fred,1 Lauren F. Fein
Surgery, McGill University Health Centre, Montreal, QC, Canada
An 89-year-old female patient presented with melena, intermittent vomiting and anemia. A large pedunculated hyperplastic polyp is found in the proximal part of the stomach body. Its long stalk containing gastric wall extends across the pylorus into the duodenum. Preoperative studies are shown. It was decided to approach this patient surgically as snare polypectomy was felt unsafe. Laparoscopy: the polyp is located under intraoperative endoscopic guidance. An anterior longitudinal gastrotomy is made. The polyp is exteriorized on its stalk into the peritoneal cavity and resected with a linear stapler. The stomach closure is performed. Postop evolution is described.

Laparoscopic Re-Do Myotomy for Recurrent Achalasia After Heller-Dor Procedure
Mario Costanzini, Renato Salvador, Lisa Zanatta, Cristina Longo, Elena Finotti, Turania Morfin, Giovanni Zaninotto, Emanuele Anzona
Clinica Chirurgica I, University of Padua, Padova, Italy
Failures of laparoscopic myotomy are usually managed with complimentary dilations. Sometimes, however, a new operation is necessary: as in the case we present. At laparoscopy, the myotomy was clearly short on the gastric side. A new myotomy on the right side of the bulb, prolonged for 2 cm on the lesser curvature, was then performed. A partial anti-reflux wrap completed the operation. With this technique we operated 11 patients (7 were referrals): all were cured from their residual dysphagia, even if GERD symptoms developed in 2. Laparoscopic revision of unsuccessful myotomy is feasible, and should be considered an option in recurrent patients who do not respond to pneumatic dilations.

Laparoscopic Truncal Vagotomy and Antrectomy for Treatment of Pain in Chronic Pancreatitis
Tobias Keck, Simon Künters, Ulrich F. Wellner, Frank Makowiec, Ulrich T. Hopt
Department of General and visceral Surgery, University of Freiburg, Freiburg, Germany
Since 2010, we performed 11 laparoscopic pylorusr preserving pancreatic head resections. The operation is performed as hybrid operation with complete laparoscopic resection and reconstruction via a small retrieval incision of 5–7 cm. The video demonstrates the surgical technique and possible pitfalls. The complication rate was not increased in comparison to open surgery. The average operation time was not significantly increased in comparison to open surgery (528 vs 540 min).

We demonstrate that pancreatic head resections can be safely performed via laparoscopy. The combination with an open reconstruction allows a standardized reconstruction with no concessions to safety and operation time.

Laparoscopic pancreatic head resection with hybrid reconstruction via pancreaticogastrostomy
Maria de Andrade, Simon Wurzer, Jean-Philippe Calais, Ulrich T. Hopt
Surgery, The University of Hong Kong, Hong Kong, Hong Kong

Esophagectomy can be safely performed after prior Nissen fundoplication. Which demonstrates that minimally invasive Ivor-Lewis esophagectomy can be safely performed after prior Nissen fundoplication.

Laparoscopic-Assisted Frey Procedure: A New Option for Treatment of Pain in Chronic Pancreatitis
Sajit Kulkarni, Dilin Parakh, Rick Selby, Kaylene Beraza
Surgery, University of Southern California, Los Angeles, CA
The Frey procedure is an established procedure for treatment of pain in chronic pancreatitis. A laparoscopic technique for this procedure has not been described previously. In this video we describe a laparoscopic-assisted redo Frey procedure with a peustow-type pancreaticojejunostomy, performed with the Da Vinci robot in a 46 y old female with familial pancreatitis who previously underwent a peustow procedure to the body and tail of the pancreas. The patient remains asymptomatic 2 y after surgery. Laparoscopic Frey procedure may provide a new treatment option for intractable pain from chronic pancreatitis.

Laparoscopic Pancreatic Head Resection with Hybrid Reconstruction via Pancreatogastrostomy
Tobias Keck, Simon Künters, Ulrich F. Wellner, Frank Makowiec, Ulrich T. Hopt, Wojciech E. Kacz
Department of General and Visceral Surgery, University of Freiburg, Freiburg, Germany
Since 2010, we performed 11 laparoscopic pylorusr preserving pancreatic head resections. The operation is performed as hybrid operation with complete laparoscopic resection and reconstruction via a small retrieval incision of 5–7 cm. The video demonstrates the surgical technique and possible pitfalls. The complication rate was not increased in comparison to open surgery. The average operation time was not significantly increased in comparison to open surgery (528 vs 540 min).

We demonstrate that pancreatic head resections can be safely performed via laparoscopy. The combination with an open reconstruction allows a standardized reconstruction with no concessions to safety and operation time.

Laparo-Endoscopic Single Site (LESS) Morgagni Hernia Repair and Toupet Fundoplication
Shanika R. R. Papi,1 Harold Faul2, Kenneth Lubetzki3,4,5,6
1Surgery, University of South Florida, Tampa, FL; 2Tampa General Hospital, Tampa, FL
In this video we have expanded the applications of LESS surgery to treat an uncommon condition. The operation was undertaken through a 12mm incision at the umbilicus using a multi-trocar port and a 5mm deflectable tip laparo-scope. Loops of intrathoracic small bowel and colon were reduced. The diaphragmatic defect was repaired using non-absorbable mesh and a laparoscopic tacking device. The distal esophagus was circumferentially dissected and the gastric fundus was mobilized by dividing the short gastric vessels. After reconstructing the esophageal hiatus, a 270° fundoplication was constructed over a bougie. The umbilical defect was closed and the skin approximated with excellent cosmesis.

Laparoscopic Fundoplication for Treatment of Pain in Chronic Pancreatitis
Sujit Kulkarni, Dilin Parakh, Harris Selby, Kaylene Beraza
Surgery, University of Southern California, Los Angeles, CA
The Frey procedure is an established procedure for treatment of pain in chronic pancreatitis. A laparoscopic technique for this procedure has not been described previously. In this video we describe a laparoscopic-assisted redo Frey procedure with a peustow-type pancreaticojejunostomy, performed with the Da Vinci robot in a 46 y old female with familial pancreatitis who previously underwent a peustow procedure to the body and tail of the pancreas. The patient remains asymptomatic 2 y after surgery. Laparoscopic Frey procedure may provide a new treatment option for intractable pain from chronic pancreatitis.

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Laparoscopic-Truncal Vagotomy and Antrectomy for Treatment of Pain in Chronic Pancreatitis
Tobias Keck, Simon Künters, Ulrich F. Wellner, Frank Makowiec, Ulrich T. Hopt
Department of General and Visceral Surgery, University of Freiburg, Freiburg, Germany
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We demonstrate that pancreatic head resections can be safely performed via laparoscopy. The combination with an open reconstruction allows a standardized reconstruction with no concessions to safety and operation time.

Robotic-Assisted Laparoscopic Biliopancreatic Diversion with Duodenal Switch
Suman S. Desai, Ranjan Sudin
General Surgery, Duke University Medical Center, Durham, NC
Our patient is a 53-year-old female with a BMI of 42 and an excess body weight of 110 pounds who underwent a robot-assisted laparoscopic biliopancreatic diversion with duode-nal switch (R-IPBS/DSS). This procedure begins with an approach to the right lateral abdominal wall and laparoscopic-assisted fundoplication. The stomach is then transected with a linear stapler and a duodenal-jejunal anastomosis is made in the retrocolic Roux limb via a robotic-assisted hand-sewn anastomosis. Metzenbaum defects are closed to prevent internal hernias. A methylene blue leak test ensures the anastomosis is patent and secure. Our patient has lost 30% of her excess weight in one month.
Surgery, Guthrie-Robert Packer Hospital, Sayre, PA

BACKGROUND: Detection of persistent common bile duct (CBD) stones in patients presenting with acute biliary pancreatitis (ABP) remains challenging, resulting in high rates of negative endoscopic retrograde cholangiopancreatography (ERCP) and magnetic resonance cholangiopancreatography (MRCP). In a study previously conducted by our institution, an algorithm for selective management of patients with ABP was developed. In this study, multivariate analysis identified 5 clinical variables which significantly correlated with persistent stone. Optimal values were: CBD size on ultrasound ≥9 mm, alkaline phosphatase ≥250 U/L, gamma-glutamyl transferase ≥250 U/L, total bilirubin ≥3 mg/dL, and direct bilirubin ≥22 mg/dL. We hypothesized that grouping variables would increase reliability of detection. Receiver operator curve (ROC) curve analysis and linear regression were applied to obtain optimal and equitable predictive values, and variables combined. Based on results, a 5-point scoring system was devised and recommendations for biliary evaluation suggested. Table 1 demonstrates algorithm according to probability of CBD stone as assessed by score.

Table 1: Positive Predictive Value (PPV), Associated Odds Ratio (OR) with 95% Confidence Interval (CI) and Recommendations for Biliary Evaluation Based on Score

<table>
<thead>
<tr>
<th>Score</th>
<th>PPV (%)</th>
<th>OR with 95% CI</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>0.01</td>
<td>1</td>
<td>IOC</td>
</tr>
<tr>
<td>1</td>
<td>0.33</td>
<td>0.08-1.8</td>
<td>IOC</td>
</tr>
<tr>
<td>2</td>
<td>1.09</td>
<td>0.30-3.6</td>
<td>IOC</td>
</tr>
<tr>
<td>3</td>
<td>2.90</td>
<td>0.64-12.5</td>
<td>IOC</td>
</tr>
<tr>
<td>4</td>
<td>5.00</td>
<td>3.60-13.1</td>
<td>IOC</td>
</tr>
<tr>
<td>5</td>
<td>52.3</td>
<td>18.8-143.2</td>
<td>IOC</td>
</tr>
</tbody>
</table>

IOC = Intraoperative cholangiogram

PURPOSE: To prospectively study an algorithm developed for evaluation for CBD stones in patients presenting with ABP.

METHOD: Following institutional board approval, all patients presenting with a diagnosis of ABP were offered enrollment into a prospective study. Informed consent was obtained for all enrolled patients. Patients not enrolled were considered controls. Enrollment was at the discretion of the patient and attending physician. To date, 45 patients have been captured of which data collection is complete for 34. Figure 1 demonstrates study design.

RESULTS: Of the 34 patients, 17 were in-protocol and 17 were controls. Twenty patients were low probability (0–2), 10 patients intermediate (3–4) and 4 patients high probability (5). CBD stones were present in 15% of low probability, 40% intermediate and 100% of high probability patients (p < 0.01). A total of 13 MRCP and 6 ERCP were performed. Overall, 69% of MRCP performed were negative for CBD stone and 33% of ERCP were negative. Comparison of patients demonstrated decreased performance of MRCP (25% vs. 55%) and rate of negative MRCP (50% vs. 78%) as well as decreased performance of ERCP (12% vs. 22%) and decreased rate of negative study (0% vs. 50%) for protocol versus control patients. For the low probability protocol patients with CBD stone, all stones were detected at time of cholangiogram and extracted via ERCP. No post-operative complications ensued.

CONCLUSION: Preliminary results demonstrate that the algorithm correlates with probability of CBD stone. This algorithm may be utilized to stratify patients to appropriate initial testing, decreasing the amount of unnecessary studies and interventions.

Surgery, The Mount Sinai Hospital, New York, NY

BACKGROUND: Cholecystectomy for biliary dyskinesia is performed with and without resolution of symptoms. For those who did not benefit from cholecystectomy, the justification of surgery is often based on personal experience of the patient and lack of objective evidence. We aimed to describe the frequency of cholecystectomy in a large prospective study of patients with biliary dyskinesia and to determine whether the pathology was normal or abnormal at the time of surgery.

METHOD: Retrospective analysis of medical records of patients who underwent cholecystectomy for biliary dyskinesia from February 2001 to January 2010 with minimum postoperative follow-up of 6 months.

RESULTS AND DISCUSSION: After an initial analysis of 274 patients only 141 patients were included in the study based upon our inclusion and exclusion criteria. Of the 141 patients 117 (83%) were female and 24 (17%) male. Symptoms for which patient underwent cholecystectomy were persistent or recur in 61 of 141 (43.3%) patients postoperatively. Although most patients on initial surgical follow-up had symptoms improved however 58/141 patients were seen by the GI service with persistent symptoms over a time range of 1-63 months (median at 5 months, mean 9 months). An upper GI endoscopy was performed in 40 of 141 (28.4%) patients for persistent symptoms.

Operative pathology

<table>
<thead>
<tr>
<th>Score</th>
<th>PPV (%)</th>
<th>OR with 95% CI</th>
<th>Recommendation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Normal</td>
<td>56</td>
<td>38.3%</td>
<td>IOC</td>
</tr>
<tr>
<td>Mild chronic inflammation</td>
<td>70</td>
<td>45.6%</td>
<td>IOC</td>
</tr>
<tr>
<td>Cholecystolithiasis</td>
<td>12</td>
<td>8.5%</td>
<td>IOC</td>
</tr>
<tr>
<td>Chronic inflammation</td>
<td>6</td>
<td>3.8%</td>
<td>IOC</td>
</tr>
<tr>
<td>Total</td>
<td>141</td>
<td>100%</td>
<td>IOC</td>
</tr>
</tbody>
</table>

IOC = Intraoperative cholangiogram

The mean ejection fraction (EF) on radionuclide imaging in patients with persistent symptoms was 18.0% (95% CI range 13.8–22.2) compared to almost similar mean EF 18.04% (95% CI range 15.0-21.0) in patients who had resolution of symptoms. In the group of patients who had reproduction of symptoms with cholecystokinin, 49 of 82 (59.8%) had resolution of symptoms.

Surgery, Mayo Clinic Florida, Jacksonville, FL

BACKGROUND: The recently published 7th edition criteria of the American Joint Committee on Cancer (AJCC) TNM staging criteria for gastric adenocarcinoma contains some important changes including a re-classification of tumor depth (T) and lymph node (N) status; it also marks the introduction of new stages IA, IB and IIC as well as reclassification of stage IV as patients with distant metastases only. The goal of this study was to validate these new staging criteria in a non-institutional and non-referral registry and compare it to the prior staging in terms of survival discrimination.

METHODS: A retrospective review of all gastric cancer patients from Surveillance, Epidemiology and End Results (SEER) registry data from 2004 to 2007 was conducted. The same dataset was used to stage patients according to both 6th and 7th edition criteria. Three-year disease-specific survival was compared using Cox proportional regression.

RESULTS: A total of 13,547 patients with gastric adenocarcinoma were identified; 8193 patients (60%) underwent surgery, and 3486 (26%) received radiation therapy. The mean patient age was 66 years. There was a marked increase in the number of patients classified as stage III using the updated criteria (23% vs. 13%), coupled with a decrease in the number of patients classified as stage IV (47% vs. 53%). Re-staging the same patient population according to the 7th edition criteria improved survival discrimination from the 6th edition staging (Figures 1 and 2). On Cox regression multivariate analysis, significant variables predicting poor survival included high tumor grade (HR 1.17, CI 1.07-1.27, p < 0.001) and distal location of primary tumor vs. proximal location (HR 1.78, CI 1.64-1.95, p < 0.001). Hazard ratios by stage (vs. stage IIA) showed linear progression and a statistically significant survival difference from the prior stage: Stage IB, 2.16 (CI: 1.56-2.98); IIA, 3.25 (CI: 2.38-4.28); IIB, 6.14 (CI: 4.70-8.11); IIIB, 11.8 (CI: 9.20-15.2); IIC, 16.7 (CI: 13.0-21.5); and stage IV, 20.2 (CI: 15.9-25.8) (all p < 0.001).

Surgery, Mayo Clinic Arizona, Scottsdale, AZ; General Surgery, Mayo Clinic Florida, Jacksonville, FL

INTRODUCTION: The recently published 7th edition of the American Joint Committee on Cancer (AJCC) TNM staging criteria for gastric adenocarcinoma contains some important changes including a re-classification of tumor depth (T) and lymph node (N) status; it also marks the introduction of new stages IA, IB and IIC as well as reclassification of stage IV as patients with distant metastases only. The goal of this study was to validate these new staging criteria in a non-institutional and non-referral registry and compare it to the prior staging in terms of survival discrimination.

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Acquisition of Metastatic Potential in Colonic Adenocarcinoma Is Associated with Downregulation of Complementary Strand MicroRNAs  
Leathan M. Hernandez*, Dong-Ya Chen, Susan McCarthy*, Leigh Ann Humphries†, Domenico Coppola, Timothy J. Yuami†, David Shin†∗

†Surgery, University of South Florida, Tampa, FL; ‡Gastrointestinal Oncology, Moffitt Cancer Center, Tampa, FL; *Bioinformatics, Moffitt Cancer Center, Tampa, FL

BACKGROUND: Altered expression of certain microRNAs is known to occur during colorectal carcinogenesis, and they have been demonstrated to result in the acquisition of more aggressive phenotypes. However, little is known about the genome-wide alterations in microRNAs during the neoplastic progression of colorectal cancers.

METHODS: Using an ABI microRNA array platform, we simultaneously evaluated the expression of 668 microRNAs in fresh frozen primary colon adenocarcinomas across the spectrum of AJCC stages (I–IV). Prediction analysis for microarrays (PAM) was used to compare microRNA expression across AJCC stages and build a microRNA stage classifier. Cross-validation was used to evaluate performance of prediction error rate. False discovery rate (FDR) was controlled at 1%. Biological functions of selected microRNAs of interest were evaluated by overexpressing transfections and subsequent in vitro invasion assays.

RESULTS: Primary fresh frozen tissues from 65 patients (40 male and 25 female) with a mean age 65 ± 13 years and with AJCC Stage I (n = 7), Stage II (n = 22), Stage III (n = 18) and Stage IV (n = 18) colon cancers, underwent RNA extraction and microRNA array analysis. We identified a seven-microRNA expression signature to differentiate early cancers (Stage I) from those associated with metastatic disease (Stage IV). Table: We then demonstrated that this signature was able to allow discrimination between Stage II and III primary colon cancers (Table). Interestingly 6 of the 7 differentially expressed microRNAs were downregulated with tumor progression, suggesting tumor suppressive functions. Moreover, all 7 microRNAs were noted to be complementary strand microRNAs (designated by ∗) which, until only recently, were thought to be non-functional byproducts of microRNA metabolism. In order to evaluate the biologic function of the downregulated microRNAs of our signature, we separately transfected HCT-116, a highly invasive colon cancer cell line, with corresponding precursor microRNAs and confirmed overexpression by quantitative RT-PCR. We demonstrated that overexpressing transfections of 3 of the microRNAs (miR-200c, miR-143∗, and miR-2427) significantly abrogated invasive potential in vitro.

CONCLUSION: With broad high-throughput evaluation of microRNA expression across the spectrum of colon cancer stages, we have identified a seven-microRNA signature that is associated with more aggressive disease. In addition, forced overexpression of 3 of the microRNAs resulted in an attenuation of in vitro invasion, suggesting direct tumor suppressive function and further supporting the biologic importance of complementary strand microRNAs.
The Fate of Barrett's Epithelium Under Acid Suppression Obtained by Medical or Surgical Therapy

Proceedings of the 9th World Congress of Gastroenterology

S. Schwaiger, P. Parente, N. F. carniello, F. Cavallini, F. Carini, E. Ancona, M. Rugge, G. Zaninotto

Department of Surgical and Gastroenterological Sciences, Clinic Chirurgica I, University of Padova, Padua, Italy; Department of General Surgery, S. Giovanni e Paolo Hospital, ULS 12, Venice, Italy; Department of Medical Diagnostic Sciences & Special Therapies, Pathology Unit, University of Padova, Padua, Italy; Surgical Oncology, Istituto Oncologico Veneto, IRCCS, Padova, Italy

BACKGROUND: Barrett’s epithelium (BE) is the most serious complication of GERD and it is associated with an increased risk to develop adenocarcinoma. Anecdotal BE regression after profound acid suppression have been reported. The aim of the study was to evaluate the modifications induced by surgical and medical therapy on clinical findings, phenotype of BE and expression of the CDX2 protein, as a gene involved in the metaplastic differentiation.

METHODS: 89 Barrett’s patients with at least 12 months after surgery or medical therapy were enrolled. Group A (n = 45) received antireflux surgery Group B (n = 44) medical therapy. Patient symptoms were evaluated using a detailed questionnaire, endoscopy with biopsy was performed according to Seattle, histologic assessment. BE phenotype modifications induced by therapy (presence of I.M., type of I.M., expression of CDX2) were quantified by means of histology (H&E), histochemistry (HID) and immunohistochemistry. Barium swallow, manometry and 24-h pH were performed pre and 6 months after surgery. Surgical failures were defined as: (1) abnormal 24-h pH monitoring; (2) recurrence of endoscopic esophagitis; (3) recurrence of hiatal hernia/slipped fundoplication at endoscopy/barium swallow.

RESULTS: The median of follow up was 34 months (IQR 23–48). The symptom score decreased after both therapies: 14.5 (10–21) pre vs 0 (0–6) post (p < 0.0001). The decrease of endoscopic length of BE was more significant in group A than in group B (p = 0.006), and generally BE length decreased more in patients with short segment BE (SSBE, < 3 cm BE), than in those with long segment BE (LSBE, ≥ 3 cm BE), (p = 0.02). Regression of I.M. was observed in 12 of 89 patients after therapy: all cases occurred in SSBE patients. In patients in which I.M. was no longer evident after therapy, CDX2 expression was also absent. Two SSBE patients had recurrence of reflux after surgery: in the 13 SSBE patients in whom surgery was effective BE regression was observed in 7, significantly different from the medical group. (p = 0.002).

CONCLUSIONS: Medical and Surgical therapies are both effective in controlling GERD symptoms. Patients with SSBE (but not LSBE) may regress with adequate acid suppression. Surgery—when effective—leads to regression more frequently than medical treatment.

Budd-Chiari Syndrome Revisited: Thirty-Eight Years’ Experience with Surgical Portal Decompression


Surgery, University of California, San Diego, San Diego, CA

OBJECTIVE: To assess the validity of our observations regarding Budd-Chiari syndrome (BCS) reported 10 years ago by expansion of our series and close follow-up for an additional decade.

BACKGROUND: Ten years ago we reported our results with what remains the largest clinical experience in Western countries with surgical portal decompression for BCS. Since then our series has expanded to 77 patients and there has been a worldwide explosion of interest in and publications about BCS.

METHODS: 77 BCS patients were allocated to 3 groups: 1–39 had hepatic vein occlusion alone, treated by side-to-side portocaval shunt (SPS); ≥ 39 had inferior vena cava occlusion treated by mesoaortal shunt in 8 and combined SPS/cavoportal (CAS) shunts in 18. BCS recurrence or portal decompression showed the need for liver transplantation (LT). An extensive diagnostic work up included angiography with pressure and liver biopsy. Follow-up was 100%, lasting 5–39 years.

RESULTS: Group I, long-term survival is 95% with 36 free of ascites, leading lives of good quality 5 to 38 years post-SPS. Group II, mesoaortal shunt was discontinued because of a high failure rate, but combined SPS/CAS-CV-LPR had a survival for 5–25 years. Group III, 6 patients (50%) are alive and well for over 5 years post-LT. Serial liver biopsies showed long-term reversal of BCS lesions.

CONCLUSIONS: Long-term survival following surgical portal decompression of BCS has not been equaled by other forms of therapy, medical or surgical. It is imperative to perform surgical portal decompression early in the course of BCS to avoid irreversible liver damage.
**557**

**Pure Laparoscopic Hepatectomy for HCC Patients with Severe Liver Cirrhosis**

Zenichi Monti

Department of Surgery, Fujita Health University, Toyoake, Japan

The patients with severe liver cirrhosis who undergo hepatectomy often develop post-operative liver failure, even if the hepatectomy is very limited.

For the patients, pure laparoscopic hepatectomy (PLH) minimize destruction of the collateral blood and lymphatic flow caused by laparotomy and mobilization of the liver and, also, mesenchymal injury caused by compression of the liver. It restraints the complications, which lead to the postoperative serious liver failure, such as massive ascites. Severe cirrhotic patients with tumors on the surface of the liver, in case of difficult adaptation of RFA and/or local recurrence after repeat treatments, are the good candidates for PLH.

**558**

**Prevalence of Defaecatory Disorders in Morbid Obese Patients Before and After Bariatric Surgery**

Elisabetta De Luca, Domenico Benavoli, Luana Franceschilli, Giulio P. Angelucci, Sara Lazzaro, Achille Gaspari

Surgery, University of Rome Tor Vergata, Rome, Italy

**BACKGROUND:** Morbid obesity is associated with defaecatory disorders (DDs) such as faecal incontinence and constipation. However data on their prevalence as well as their impact on the quality of life are very limited.

**AIM:** To assess the prevalence of DDs and compare it using a questionnaire-based study in morbid obese patients attending bariatric surgery. Data included demographics, past medical, surgical and obstetric histories, as well as obesity related co-morbidities. The Wexner Constipation Score (WCS) and the Faecal Incontinence Severity Index (FISI) questionnaires were used to evaluate constipation and continence. For the purpose of this study we considered abnormal a WSS ≥5 and a FSI score ≥10. Same questionnaires were completed after bariatric surgery at 3 and 6 months follow-up.

**RESULTS:** A total of 114 patients accepted the study since March 2010, 72 F, 42 M, mean age of 43 years (range 17–73). Mean BMI before surgery was 46 ± 8 kg/h2 (range 35–67 kg/h2). Mean WSS was 4.2 ± 2 (range 1–7) while mean FSI score was 9.0 ± 8 (range 0–38). Overall 67% of the patients reported DDs according to our scores. Twenty-six patients (23%) had WSS ≥5, 27 patients (24%) a FSI ≥10, while 17 patients (15%) reported combined abnormal scores. These percentages correlates with BMI ranging from 47% with BMI ≤40 kg/h2 to 62% with BMI ≥50 kg/h2.

Forty-four patients underwent surgery with a minimum follow-up of 3 months. Mean BMI decreased significantly from 46 kg/h2 to 38 ± 8.5 kg/h2 and to 35 ± 9 kg/h2 respectively at 3 and 6 months after surgery. Accordingly to the BMI decrease, WSS improved, but significantly, from 4.2 to 3.9 ± 5.2 (NS) at 3 months and to 3.1 ± 4.1 (NS) at 6 months after surgery. The FSI score improved from 9.0 ± 6.5 to 2.7 ± 5.5 after 3 months (NS) and to 0.3 ± 1.1 after 6 months (p = .006).

**CONCLUSIONS:** defaecatory disorders are more frequent in morbidly obese patients compared to the general population. The risk of DDs increases with BMI. Bariatric surgery reduces DDs, mainly faecal incontinence, and these findings correlated with BMI reduction.

**561**

**Complete Traumatic Rupture of the Pancreas—Pancreas Preserving Reconstruction: A Non-Resectional Procedure Using Pancreatogastrostomy and a Modified “Blumgart” Anastomosis**

Hannes P. Neeff, Frank Makowiec, Tobias Kock, Ulrich T. Hopt

Department of Surgery, University of Freiburg, Freiburg, Germany

We present a case of a 23 yo female with an isolated central pancreatic rupture. Since diagnosis was made early, a non-resectional procedure could be performed. The remnant of the pancreatic tail was managed using pancreateogastrostomy for exocrine drainage. The central surface of the pancreatic head was treated using a serosal patch of jejunum in order to prevent leakage. The anastomosis was carried out in a modified “Blumgart” fashion. Recovery was uneventful and exocrine and endocrine function could be completely preserved in this young female adult.

The video was recorded from the surgeon’s point of view with an overhead camera.

**AIM:** This video demonstrates the feasibility of the laparoscopic approach for the Frey procedure has not been previously reported.

**BACKGROUND:** The laparoscopic approach for the Frey procedure was not previously reported.

**RESULTS:** The procedure was completed in 308 minutes and with an estimated blood loss of 50 ml. The patient postoperative course was uncomplicated and she was discharged on postoperative day 4.

**CONCLUSIONS:** The laparoscopic Frey procedure is feasible and can be performed with the same surgical steps as for the open approach.

**564**

**Adrenocortical Carcinoma with Intracaval Extension to the Right Atrium: Resection on Cardiopulmonary Bypass**

Fuan Z. Zouan, Kwan N. Lau, David S. Iannitti, Daniel K. Tong, Simon Law, Fion S. Chan, Kam H. Wong

Mayo Clinic, Rochester, MN

**BACKGROUND:** Severe liver cirrhosis who undergo hepatectomy often develop post-operative liver failure, even if the hepatectomy is very limited.

For the patients, pure laparoscopic hepatectomy (PLH) minimize destruction of the collateral blood and lymphatic flow caused by laparotomy and mobilization of the liver and, also, mesenchymal injury caused by compression of the liver. It restraints the complications, which lead to the postoperative serious liver failure, such as massive ascites. Severe cirrhotic patients with tumors on the surface of the liver, in case of difficult adaptation of RFA and/or local recurrence after repeat treatments, are the good candidates for PLH.

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**CONCLUSIONS:** defaecatory disorders are more frequent in morbidly obese patients compared to the general population. The risk of DDs increases with BMI. Bariatric surgery reduces DDs, mainly faecal incontinence, and these findings correlated with BMI reduction.
samples were collected prospectively from 156 patients from 2/2007 to 4/2009, peritoneal lavage

METHODS: The same prognosis as stage IV disease in gastric cancer. Conventional cytology, however, has low sensitivity. We propose that RT-PCR may have increased sensitivity and provide more accurate staging information.

Positive peritoneal cytology confers worse survival of patients with advanced stage disease, poor pathologic features such as vascular or perineural invasion, or who recurred after resection were PCR+ as compared to CYT+. An R0 resection was performed in 85 (87%) patients: only one (1%) was CYT+ while 13 (15%) were PCR+. Of this group, PCR+ demonstrated a worse survival than PCR- patients (p = .02). (Figure 1A). Further analysis showed that the stage III/IV, CYT– subgroup, PCR+ had a trend towards worse survival (p = .09) than PCR– patients (Figure 1B).

CONCLUSION: RT-PCR for CEA increases detection of submicroscopic peritoneal disease and is more sensitive than cytology. PCR positivity was associated with decreased survival. Further followup is required to determine if PCR can be used as an independent predictor of poor survival in gastric cancer.

Survival distribution curves of R0 resected patients (A) and R0, stage III/IV, cytology negative patients (B) by PCR status. In patients who underwent R0 resection, PCR+ patients had a significantly worse survival than PCR– patients (p = .02). In the R0 resected, stage III/IV, cytology negative patients, PCR+ had a trend towards worse survival than PCR– patients (p = .09).

CONCLUSION: Surgery alone with adequate nodal evaluation may have a role in the treatment of localized gastric cancer. To corroborate these findings, surgery alone with adequate nodal evaluation (as a treatment arm) deserves consideration in the design of future gastric cancer trials to provide patients effective yet resource-conserving, rather than maximally tolerated, treatments.
Laparoscopic and Robotic Distal Gastrectomy with Lymphadenectomy for Gastric Adenocarcinoma in an Obese Patient

Lobos Ilbljona
City of Hope National Medical Center, Duarte, CA

In Asia, laparoscopic assisted gastric resection is commonly performed with open reconstruction. In the United States, minimally invasive techniques have been adapted to enable gastric resection with intracorporeal reconstruction. The aim of this video presentation is to demonstrate an approach to minimally invasive gastric cancer surgery. A hybrid laparoscopic and robotic approach is used to accomplish a radical distal gastrectomy with lymphadenectomy in a typical obese Western habitus patient with a mid antral gastric malignancy. Standard laparoscopy is used for cemen- toectomy, gastric transaction and reconstruction. Lymphad- enectomy is accomplished with the use of a surgical robot.

YKL-40: A Predictive Biomarker for Stage II Colon Cancer

Richard B. Arens1, Hannah Swazy-Quinn2, Christopher N. Chapman1, Fida Rosenblum2, Jane Garb1, Rong Shao3, Richard B. Arens1,3, Hannah Swayze-Quinn1, Christopher

INTRODUCTION: YKL-40, a 40-kDa secreted glycoprotein also known as human cartilage-glycoprotein 39 or Chitin-ase 3-like 1, has recently been shown to promote cancer growth. Furthermore, the uniquely prognostic importance of YKL-40 expression within the stroma may be hypothesis-driven by emphasizing the role of the tumor stroma in cancer progression. The pro-angiogenic mechanism of YKL-40 could provide a more targeted approach towards the use of anti-angiogenic therapy for colon cancer. Our study warrants further validation and supports closer investigation into the tissue-specific mechanism of YKL-40.

RESULTS: YKL-40 is uniquely expressed in both epithelial and stromal cells from colon cancers. With a median follow-up of 48 months, high expression of YKL-40 within the stroma of the tumors correlated with disease-free survival (p = 0.036) while controlling for other known prognostic variables. High expression within the tumor epithelium did not correlate with prognosis (p = 0.241). Our results demonstrated that patients with high stromal expression of YKL-40 in their tumors were more than twice likely to relapse (hazard ratio 2.4 ± 1.0).

CONCLUSION: Our results confirm a pattern of expres- sion of YKL-40 in colon cancer that may be a potential pre- dictive biomarker to identify high risk patients with Stage II disease who warrant adjuvant therapy. Furthermore, the uniquely prognostic importance of YKL-40 expression within the stroma may be hypothesis-driven by emphasizing the role of the tumor stroma in cancer progression. The pro-angiogenic mechanism of YKL-40 could provide a more targeted approach towards the use of anti-angiogenic therapy for colon cancer. Our study warrants further validation and supports closer investigation into the tissue-specific mechanism of YKL-40.

High YKL-40 expression predicts worse disease-free survival. Level of expression (Low, Intermediate and High) defined by a scoring method incorporating intensity and percent of cells stained by IHC.

Table: Multivariate Analysis of Surgery Alone with Adequate Nodal Evaluation on OS and CSM

<table>
<thead>
<tr>
<th>Cancer specific Mortality</th>
<th>Overall Mortality</th>
<th>Cancer specific Mortality</th>
<th>Overall Mortality</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surgery alone</td>
<td>0.49 (0.26–0.96)</td>
<td>0.86 (0.28–3.12)</td>
<td>1.25 (0.42–3.93)</td>
</tr>
<tr>
<td>Surgery + Chemoradiation</td>
<td>0.65 (0.27–1.60)</td>
<td>0.56 (0.25–1.26)</td>
<td>1.20 (0.57–2.94)</td>
</tr>
<tr>
<td>Surgery + Chemotherapy</td>
<td>Ref.</td>
<td>Ref.</td>
<td>Ref.</td>
</tr>
</tbody>
</table>

N. Chapman2, Frida Rosenblum2, Jane Garb1, Rong Shao3, Richard B. Arens1,3, Hannah Swayze-Quinn1, Christopher

Figure 1A: Inhibition of in vivo glucose absorption by phloretin (PT) and phlorizin (PZ) at 100 mM glucose (black arrow at 60 min represents administration of inhibitor).

Figure 1B: Inhibition of in vivo glucose absorption by phloretin (PT) and phlorizin (PZ) at 10 mM glucose (black arrow at 60 min represents administration of inhibitor).
Plasma Levels of Prostaglandin E2 (PGE2), a Protein with Proangiogenic Effects, Are Elevated in Colorectal Cancer Patients

M.C. Shantha Kamar H, Hoan H. Jang, Sajith A. Herath, Daniel D. Kirchoff, Xiaohong Yan, Vesna Cekic, Richard L. Whelan
Surgery, St. Luke Roosevelt Hospital, New York, NY

INTRODUCTION: Prostaglandin E2 (PGE2), a major metabolite produced by cyclooxygenase 2 (COX-2), plays a role in tumor development and progression. PGE2 is the ligand for 4 prostaglandin type I (E) receptor subtypes, EP1 to EP4. The expression patterns of these receptors on a variety of cell types accounts for the diverse functions of PGE2. Over-expression of COX2 and PGE2 has been observed in colorectal cancer (CRC) and PGE2 binding to EP2 receptors on endothelial cells in blood vessels of tumors directly impact tumor angiogenesis by enhancing cell survival. Also, COX-2/PGE2 contributes to VEGF and CXCL1 mediated angiogenesis which is necessary for tumor growth. There is also evidence that COX2 derived PGE2 promotes colorectal cancer growth via activation of epidermal growth factor receptor (EGFR) signaling. Elevated levels of EGFr, VEGF, and CXCL1 have been noted in CRC patients; however, plasma PGE2 levels in CRC patients have not been well studied. This study’s purpose was to evaluate preoperative plasma PGE2 levels in populations of CRC and benign colonic disease patients.

METHODS: Patients (pts) undergoing colorectal resection for benign colonic disease or adenocarcinoma were prospectively enrolled in an IRB approved tissue and data bank. Preoperative blood samples, basic demographic data, type of resection performed, other clinical information, and pathology results were prospectively collected. Blood samples were processed in a timely manner and plasma was stored at -80°C until further use. Plasma PGE2 was assayed in duplicate via ELISA, and results are reported as mean ± SD. A t-test was used to compare PGE2 levels between groups. Significance was defined as p < 0.05.

RESULTS: A total of 148 pts were enrolled; 78 CRC (38% colon, 17% rectal) and 70 benign condition pts (51% diverticulitis, 44% adenoma). The mean male to female ratios in the groups were comparable, but the CRC pts were older (p = 0.002). The final cancer staging in the CRC group: stage 1, 24 (31%); stage 2, 28 (36%); stage 3, 18 (23%); stage 4, 8 (10%). The mean PGE2 level was significantly higher in the CRC group than the benign group (676.8 ± 582.5 pg/ml vs. 472.5 ± 424.8 pg/ml, p = 0.002). No significant differences in PGE2 levels were noted between the different stage groups, however, plasma levels were higher in stage-4 pts.

CONCLUSION: Preoperative plasma PGE2 levels were evaluated in CRC pts and compared to those in benign colorectal disease pts. The mean plasma PGE2 level in CRC pts was 43% higher than the mean level in benign pts. The higher levels in CRC pts could be attributed to tumor-related inflammation, progression, and angiogenesis. Further studies with a larger population of cancer-free control and CRC pts, including more stage-4 patients, are necessary to better determine whether PGE2 levels correlate with cancer stage and prognosis.
Our study demonstrates significant differences in both the preop and percent change (from preoperative to 12 month time points) of BCRF between adults and adolescents. Between preop and 12 months post op, adolescents were more likely to experience a greater improvement in HDL, hsCRP, and fasting insulin than adults of similar BMI and comorbidities.

CONCLUSION: Our study demonstrates significant differences in both the preop levels and percent change (from preoperative to 12 month time points) of BCRF between adults and adolescents. Between preop and 12 months post op, adolescents were more likely to experience a greater improvement in HDL, hsCRP, and fasting insulin than adults of similar BMI and comorbidities.

Table 1: Median Survival in Months Based on Treatment

<table>
<thead>
<tr>
<th>Treatment Type</th>
<th>Median Overall Survival</th>
</tr>
</thead>
<tbody>
<tr>
<td>No treatment</td>
<td>1.5</td>
</tr>
<tr>
<td>Surgery only</td>
<td>7.5</td>
</tr>
<tr>
<td>Radiation only</td>
<td>5.5</td>
</tr>
<tr>
<td>Chemotherapy and surgery</td>
<td>7.5</td>
</tr>
<tr>
<td>Entire Cohort</td>
<td>4.6</td>
</tr>
</tbody>
</table>

Impact of Therapeutic Intervention on Survival in Patients with Cholangiocarcinoma

Priscelle Wang, Rebecca Nelson, Brian Mailey, Wendy Lee, Julio Garcia-Aguilar, Gagandeep Singh, Joseph Kim

City of Hope National Medical Center, Duarte, CA

BACKGROUND: Cholangiocarcinoma is a rare cancer with typically poor overall survival. Previous reports of clinical outcomes are limited to single-institution or small cohort studies. Our objective was to examine surgical and medical outcomes for patients with cholangiocarcinoma using a population-based cancer registry.

METHODS: Patients with cholangiocarcinoma treated in Los Angeles County from 1988 to 2006 were identified using the Los Angeles County Cancer Surveillance Program. Patients were evaluated by standard clinical and pathologic factors, including cccRisk, extent of disease, and treatment received (surgery, radiation therapy, chemotherapy, and none). Overall survival differences between treatment arms were assessed by Kaplan-Meier method and significance determined using log-rank test. Cox proportional hazard modeling was used in multivariate analysis.

RESULTS: Of the 1040 patients with cholangiocarcinoma, 48% were male and 52% were female. The median age of patients was 69. The histology of the patients were white (47%), followed by Hispanics (26%), Asians (18%), and Blacks (9%). Most patients had distant disease (27%), whereas lower rates were observed for local (37%) and regional (17%) disease. There was no record of disease stage in 400 patients, but only 23 of these patients underwent surgical resection and 294 patients had no treatment. Curative-intent surgical resection was performed in 126 patients of the overall cohort. Of these, 80 patients had surgery alone, whereas 46 patients had combination therapy (surgery + chemotherapy, n = 21; surgery + radiation, n = 4, and surgery + chemotherapy + radiation, n = 21). When comparing outcomes for treatment, overall survival was highest for the surgical arms (Table 1). On multivariate analysis, younger age, female gender, limited extent of disease, surgery, and chemotherapy were all associated with improved survival (Table 2).

CONCLUSIONS: To our knowledge this is the largest report of clinical outcomes in patients with cholangiocarcinoma. Our results suggest that surgical resection remains the most important variable associated with improved survival. The role of chemotherapy and radiation with surgery is not clear but warrants further examination in the multidisciplinary management of this deadly cancer.
p53 Gene Mutation Predicts Lymph Node Disease Following Neoadjuvant Chemoradiation Therapy in Rectal Cancer Patients
Marion Philip N. Nadeja, Zhenbin Chen, Wenyam Li, Wendy Lee, Joseph Kim, Julio Garcia-Aguilar
General Oncologic Surgery, City of Hope, Duarte, CA

BACKGROUND: The presence of lymph node (LN) metastasis after neoadjuvant chemoradiation therapy (CRT), which does not always correlate with primary tumor response, is the main obstacle to the implementation of CRT followed by local excision or even a watch and wait approach for the treatment of rectal cancer. We investigated whether cancer gene alterations are associated with LN metastasis after CRT in rectal cancer patients.

METHODS: Pre-treatment biopsies were obtained from 127 patients with Stage III/II rectal cancer enrolled in a multi-center prospective Phase II clinical trial. All patients received neoadjuvant CRT followed by total mesorectal excision. Pathologic staging was determined according to AJCC criteria and patients were grouped according to pathologic LN status. Tumor DNA was extracted from pre-treatment biopsies and analyzed by PCR and sequencing for p53 and p53 gene mutations. Fisher's Exact Test was performed to assess the association of gene mutation status with LN metastasis after CRT.

RESULTS: Overall, 31 (24%) patients had LN metastasis after CRT. p53 and K-ras mutations were detected in 63 (50%) and 47 (37%) patients, respectively, and 23 patients had both mutations. Patients with p53 mutations had an increased risk of LN metastasis compared to patients who had wild type p53 (33% vs. 11%); p = 0.0135. However, the detection of K-ras mutation alone or combined with p53 mutation was not associated with LN metastasis after CRT.

CONCLUSIONS: Our results suggest that detection of mutant p53 may predict LN metastasis after CRT. Therefore, routine p53 genotyping may help guide appropriate therapy in rectal cancer patients undergoing CRT.

693 Hepatocyte Nuclear Factor (HNF) 4a Expression Distinguishes Ampullary Cancer Subtypes and Prognosis After Resection
Robert Gruenert1, Florian Ehrel1, Petra Ruemmele2, Christian Pilarsky1
1Department of Pathology, University Hospital Regensburg, Regensburg, Germany; 2Department of Pathology, University Hospital Dresden, Dresden, Germany

OBJECTIVE: To investigate biological differences and prognostic indicators of different ampullary cancer (AC) subtypes. Likewise, HNF4α protein expression is an independent predictor of favorable prognosis in carcinoma of the papilla of Vater.

CONCLUSIONS: Immunohistochemical determination of HNF4α expression is an effective tool for distinguishing different AC subtypes. Likewise, HNF4α protein expression is an independent predictor of favorable prognosis in carcinoma of the papilla of Vater.
Minimizing MIS Using Magnetically Anchored and Percutaneous Needleless Instruments for Basic and Complex Procedures

Nabeel Arain, Sara Best, Jeffrey A. Cadeddu, Deborah C. Hogg, Richard Bergs, Raul Fernandez, Lauren B. Marshad

1Department of Surgery, University of Texas Southwestern Medical Center, Dallas, TX; 2Department of Urology, University of Texas Southwestern Medical Center, Dallas, TX; 3Texas Manufacturing Assistance Center/Automation and Robotics Research Institute, University of Texas Arlington, Arlington, TX

This video shows techniques for minimizing MIS using magnetically anchored and percutaneous needleless instruments for both basic and complex procedures which included a laparoscopic cholecystectomy (porcine model) and a laparoscopic Roux-en-Y gastric bypass (human cadaver). We combined instrumentation including a magnetically anchored camera, 3mm percutaneous instruments, and a single 12 mm working port. This combination afforded excellent triangulation and minimized the number and size of incisions. Furthermore, this strategy may offer comparable or even better cosmesis compared to single incision laparoscopic procedures without the associated technical difficulties.

Use of a Magnetically Coupled Camera and Novel Mini Laparoscopic Instruments to Perform Minimaly Invasive Sigmoid Colon Resection

Cabin D. Uyning, Rohan A. Joseph, Nilson Salas, Patrick R. Beardon, Barbara L. Bass, Brian J. Dunkin

Department of Surgery, The Methodist Hospital, Houston, TX

Natural orifice transluminal endoscopic surgery (NOTES) and single site laparoscopy (SSL) have led surgeons to seek less invasive methods of performing even standard operations by reducing port number and size. This video demonstrates how novel technology can be used to perform reduced port surgery, even during complex operations, without compromising visualization, triangulation, or instrument function. Use of MACS in combination with percutaneous internally assembled instruments enabled reduced port surgery while maintaining the visualization and function of 4 port laparoscopic surgery. The ergonomic benefit of this technology will aid in the performance both reduced port surgery and SSL.

Laparoscopic Rectosigmoid Resection with Transvaginal Rectopexy and Extraction for Rectal Prolapse

Patrick Suda, Samantha J. Pulliam, May Wakamatsu

1Surgery, Massachusetts General Hospital, Cambridge, MA; 2Obstetrics and Gynecology, Massachusetts General Hospital, Boston, MA

The patient is a 39-year old G4P4 female with full-thickness rectal prolapse, constipation, symptomatic cystocoele, rectocele, and stress urinary incontinence. Laparoscopic rectosigmoid mobilization was performed using 4 abdominal trocars and a 12 mm port was inserted through a posterior colotomy. The rectum was transected transvaginally with a stapler and suture rectopexy was performed through the vaginal trocar. The rectosigmoid was extended transanally, the anvil was placed, and intracorporeal stapled anastomosis was completed. Anterior and posterior colpohysterectomy with tension-free vaginal sling were performed perineally. The patient was discharged on postoperative day 4.

Endoscopic Treatment of Weight Regain in the Post-Bypass Patient

Ephraim H. Watson, David B. Lautz, Christopher C. Thompson

1Division of Gastroenterology, Brigham & Women's Hospital, Boston, MA; 2Surgery, Brigham and Women's Hospital, Boston, MA

Weight regain affects a significant proportion of post-bypass patients. pouch and stoma dilation have been implicated as important factors in this process. The significant risk of morbidity with surgical revision makes endoscopic therapy an attractive treatment modality. This video reviews current endoscopic techniques including sclero-therapy, tissue anchor placement, and endoscopic suturing. Current evidence regarding these techniques is sparse, though compelling data are forthcoming. Given the growing bariatric population, endoscopic treatment of surgical failure will play an important role in the management of these patients.

NOTES Transoral Remnant Extraction (TORE) for Sleeve Gastrectomy

Sheetal Nihalwala, Sanas E. Majid, Tohio Katagiri, Takuya Uotani, Michael Sedrak, Bryan J. Sandler, Gatt R. Jacobsen, Mark A. Talanini, Alan Wittgrove, Santiago Horgan

University of California at San Diego, San Diego, CA

Laparoscopic sleeve gastrectomy has rapidly become the procedure of choice for morbid obesity. we have utilized our considerable experience in natural orifice transluminal endoscopic surgery (NOTES) to develop techniques which will eliminate the potential complications of transabdominal organ extraction. Here we demonstrate the world's first case of the unisex approach to transoral remnant extraction or TORE.

A Standard "Oncologic" Segmental Colorectal Resection Is Indicated for Dysplastic Adenomas That Come to Surgery: ESD and EMR Are Best Avoided in These Patients

Joon H. Jung, Emre Balik, Michael J. Griez, Tromp Wouter, Daniel D. Kirchoff, Anjali S. Kumar, Daniel L. Feingold

1Surgery, St. Luke Roosevelt Hospital, New York, NY; 2Surgery, Columbia University, New York, NY

Ten percent of pts with the preop diagnosis of dysplasia had an invasive cancer whereas 9.7% (28/288) of the adenoma alone pts proved to have a malignancy (p = 0.0001). The mean lymph node harvest for the entire group was 16.0 ± 10.2; there was no difference in lymph node recovery for the cancer and benign adenoma groups. The cancer stage breakdown for the 62 pts with a malignant polyp was: Stage 1, 73%; Stage 2, 8.1%; Stage 3, 1.6%; Stage 4, 3.2%. The mean polyp size for benign lesions was 3.0 ± 1.9cm whereas for cancers it was 3.9 ± 2.4 cm (p = 0.0008). There was a higher incidence of Stage 3 cancers in pts with a preop diagnosis of dysplasia (p = 0.008).

CONCLUSION: Ten percent of pts with the preop diagnosis of adenoma alone and over 1/3 of pts with the preop diagnosis of dysplastic polyp had invasive cancers. Larger polyps were more likely to contain a cancer. A standard "oncologic" colectomy is advisable for pts with dysplastic polyps because of the high likelihood of cancer. ESM, EMR, and wedge resection should be reserved for selected adenoma pts without dysplasia after thorough evaluation.
Single Port Transanal Surgery of a Giant Rectal Adenoma
Benjie M. Barrera1, Pascal G. Doornebosch2, William A. Benitez3, Daleen Dekker4, Paul Fockens1, Thomas M. Van Gulik1, Eelco J. de Graaf1
1Gastroenterology and Hepatology, Academic Medical Center, Amsterdam, Netherlands; 2Surgey, Rivierenland Hospital, Capelle aan den IJssel, Netherlands; 3Surgery, Academic Medical Center, Amsterdam, Netherlands

Single port surgery of rectal tumours may be associated with shorter learning curve and fewer costs than transanal endoscopic microsurgery (TEM). A semicircular cutaneous incision, located 6–12 cm from the anus was successfully resected using a single-site access system transanally. Endoluminal features were comparable to TEM. Full thickness, on bloc resection was possible. The defect was sutured transversely with continuous self-anchoring sutures. Operating time was 55 min. Blood loss was nil. The patient was hospitalised overnight. Histopathology showed tubulovillous adenoma, with focal high grade dysplasia, radically resected. Single port transanal surgery may become an alternative to TEM.

802
Transrectal Endoscopic Myotomy (TEEM) for the Treatment of Achalasia: The United States Human Experience
Gregory R. Menley1,2, Garth R. Jacobson3, Toshio Katagiri4, Kari Thompson1, Abraham Mathew4, Noam Belkind1, Michael Sedrak1, Iryna J. Sandier1, Takanori Doto4, Thomas J. Sadler1, Sania F. Majid1, Shreel Nijhawan1, Mark A. Talisman1, Santiago Horgan4
1Department of Surgery, University of California San Diego, San Diego, CA; 2Department of Surgery, Massachusetts General Hospital—Harvard Medical School, Boston, MA; 3Department of Gastroenterology, University of California San Diego, San Diego, CA; 4Department of Gastroenterology, Penn State Milton S. Hershey Medical Center, Hershey, PA

From our early experience with NOTES, our group has acquired familiarity with transrectal submucosal dissection and myotomy in swine model, which allowed us to perform a model to perfectly endoscopic trans-subsphincteric endorectal myotomy (TEEM) for the treatment of achalasia and apply it into clinical practice. This study was designed to assess the safety, feasibility and efficacy of TEEM in a series of patients with achalasia.

METHODS: Under IRB approval, patients were enrolled on our study, where TEEM was offered as an alternative to laparoscopic or robotic Heller myotomy. The inclusion criteria were patients with achalasia confirmed by esophagogram manometry, age between 18 and 50 years old, and ASA class 2 or lower. The exclusion criteria were pregnancy, prior achalasia surgery, immunossuppression, coagulopathy, and severe medical comorbidities. The procedures were performed under general anesthesia, with the patient in supine position on positive pressure ventilation. With a GIF-180 (Olympus, Tokyo, Japan) positioned at 10 cm above the GEJ, a mucosotomy was performed at the 2 O’clock position, and a submucosal space was developed caudally creating a controlled submucosal tunnel extending 2 cm distal to the GEJ. Upon completion of this tunnel the gastro-esophageal lumen was inspected to ensure mucosal integrity. The scope was then reinserted into the submucosal tunnel and using a triangle-tip knife, myotomy was performed starting at 3 cm above the GEJ and ending at 2 cm below the GEJ. During this process the circular muscle layer of the esophagus was carefully divided with preservation of the longitudinal layer. At the end of the procedure the mucosal incision was closed longitudinally with endoscopic clips and surgical glue.

RESULTS: Four patients underwent TEEM, with no perioperative complication. All patients reported significant improvement of their dysphagia immediately after the procedure. On the first post-op day, all barium swallow showed disappearance of the classical bird beak taper, rapid emptying of contrast into the stomach and absence of leaks. All patients were discharged on the second post-op day on liquid diet. Two patients reported transient heartburn, which was well controlled with medications. The average pre-op GERD-HRQL was 20, which improved to 11.3 at 7 days post-op and to 2 days post-op. To date, two patients have already returned for their 6-month follow-up, reporting adequate swallowing and low LES pressures on esophageal manometry (their mean pre-op LES resting pressure was 33 mmHg and residual pressure was 41.35 mmHg whereas the 6-months follow-up mean LES resting pressure was 10.85 mmHg and residual pressure was 0.8 mmHg).

CONCLUSION: TEEM seems to be safe, feasible and effective for the treatment of patients with achalasia. Long-term data is still necessary for wide-spread utilization of this novel technique.

803
Single Incision Laparoscopic Heller Myotomy and Dor Fundoplication
John Attilfins, Koji Park, James McGinty, Ninan Kuriyil, Julian Victorino
General Surgery, St. Luke’s Roosevelt Hospital Center, New York, NY

INTRODUCTION: We describe our technique for single incision laparoscopic Heller myotomy (SIHM) and fundoplication. This technique can be used in patients undergoing laparoscopic Heller myotomy, especially those patients with obesity, who are at high risk for chest wound complications.

METHODS: Of the 34 patients who underwent SIHM, we report the outcomes of 13 patients who underwent SIHM plus fundoplication.

TECHNIQUE: A Heller myotomy and partial anterior fundoplication are performed through an umbilical SILS port. A penrose drain facilitates retraction. Intraoperative endoscopy confirms adequacy of the myotomy.

CONCLUSION: Heller myotomy and Dor fundoplication is technically feasible through a SILS approach, and offers a competitive, minimally-invasive alternative to non-operative treatment options.

Bariatric Surgery Outcomes in the Elderly Population: An ACS NSQIP Study
Eibein B. Damman, Anaayosa Abraham, Wadidr R. Al-Belai, Helen M. Parsen, Sayed Iskandadin, Elizabeth Habermann, Surgery, University of Minnesota, Minneapolis, MN

INTRODUCTION: Bariatric surgery has been shown to be beneficial in achieving weight loss and in decreasing long-term mortality. To date, however, evidence has suggested an increased mortality following bariatric surgery in patients ≥65 years. With adjustment of confounding variables, we hypothesized that the short-term operative outcome profile in those ≥65 years undergoing bariatric surgery would be comparable to that of younger persons.

METHODS: Patients with BMI ≥55 kg/m² who underwent open and laparoscopic Roux-en-Y gastric bypass, open duodenal switch, laparoscopic adjustable gastric banding and vertical banded gastroplasty in the 2005–2009 American College of Surgeons National Surgical Quality Improvement Program were identified. Controlling for confounders and stratifying by open versus laparoscopic surgery, multivariate regression was used to predict the impact of age (≥65 years) on mortality, major events and prolonged length of stay (PLOS, >90th percentile) at 30 days.

RESULTS: We identified 46,178 patients who underwent the above bariatric procedures between 2005 and 2009.

Table 1: Predictors of 30-day Mortality and Prolonged Length of Stay

<table>
<thead>
<tr>
<th>Factor</th>
<th>30 Day Mortality OR (95% CI)</th>
<th>PLOS OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age ≥65 yrs</td>
<td>1.9 (1.5, 2.4)</td>
<td>1.2 (1.0, 1.4)</td>
</tr>
<tr>
<td>Woman</td>
<td>1.4 (1.2–1.5)</td>
<td>1.1 (1.0–1.2)</td>
</tr>
<tr>
<td>ASA &gt;2</td>
<td>1.5 (1.3, 1.9)</td>
<td>1.3 (1.1–1.6)</td>
</tr>
<tr>
<td>BMI &gt;45</td>
<td>1.8 (1.4, 2.3)</td>
<td>1.3 (1.0–1.6)</td>
</tr>
<tr>
<td>Smoker</td>
<td>2.0 (1.6, 2.5)</td>
<td>1.3 (1.0–1.7)</td>
</tr>
<tr>
<td>Fundoplication</td>
<td>2.1 (1.5, 2.9)</td>
<td>1.3 (1.0–1.7)</td>
</tr>
<tr>
<td>BMI &gt;50</td>
<td>4.0 (1.5, 11)</td>
<td>2.6 (0.6, 11)</td>
</tr>
<tr>
<td>Diabetes</td>
<td>3.0 (2.3, 4.0)</td>
<td>2.3 (1.5, 3.5)</td>
</tr>
</tbody>
</table>

CONCLUSIONS: This large, multi-hospital study demonstrates older age predicts short-term PLOS but not major events. The overall low death rates likely explain the observed trend toward significance in operative mortality in older patients. Thus surgeons should continue to promote caution when considering whether to operate on this patient population. Once corroborated, these results provide important information to patients, surgeons, hospitals, and payers prior to performing bariatric surgery in older persons with obesity.

Over the previous 5 years, the percentage of older patients undergoing bariatric surgery has increased from 1.92% in 2005 to 4.77% in 2009 (p = 0.001). There were only 72 deaths throughout the entire study period. Over the previous 5 years, the percentage of older patients undergoing bariatric surgery has increased from 1.92% in 2005 to 4.77% in 2009 (p = 0.001). There were only 72 deaths throughout the entire study period. Over the previous 5 years, the percentage of older patients undergoing bariatric surgery has increased from 1.92% in 2005 to 4.77% in 2009 (p = 0.001). There were only 72 deaths throughout the entire study period.
Counter-Clockwise Rotation of Roux-en-Y Limb Significantly Reduces Internal Herniation in Laparoscopic Gastrojejunostomy and V-Gast Bypass (LRGB) Kalyana Nandipati, Edward Lin, Farah A. Husain, Jahnani Sinnavan, John F. Sweeney, S. Davis General Surgery, Emory University, Decatur, GA

INTRODUCTION: Internal hernias continue to be a significant source of morbidity after LRGB. Literature addressing the technique of Roux limb construction as a predisposing factor is sparse. The objective of this study is to evaluate the impact of Roux limb construction technique on the development of internal hernias.

METHODS: In this study we included 444 consecutive patients (367 [82.7%] females and 77 [17.3%] males) from a bariatric database who underwent LRGB at our Institution. Variables collected include demographics, body mass index (BMI) before and after the procedure, and postoperative small bowel obstruction secondary to internal hernia. Technical details collected include: type of Roux-en-Y limb construction, Peterson’s defect closure at initial operation, and reoperative findings. Roux limbs were constructed in 291 patients by a clockwise rotation of the bowel and jejuno-jejunoanastomosis performed on the right side of the axis of the mesentry (Group 1). In 153 patients the Roux limb was constructed by a counterclockwise rotation of the Roux limb resulting in the jejuno-jejunoanastomosis on the left side of the axis of the mesentry (Group 2). We also evaluated the impact of Peterson’s space closure on internal hernias. Fisher’s exact test and Chi-square test used for the analysis.

RESULTS: Of a total 444 [mean age – 43.7 ± 10.3 years, mean BMI – 45.8 ± 5.4 kg/m²] after median follow-up of 12 months was 34.5 ± 6.9% patients included in the study. 21 (4.7%) internal hernias were identified. Of 21 internal hernias, 17 (81%) were through Peterson’s space and 4 (19%) were through mesenteric defect. Group 1 had 22 patients with internal hernias (20/291, 6.9% vs 1/153, 0.7%) p = 0.0018 and Peterson’s hernias (16/275, 5.8% vs 1/152, 0.6%, p = 0.0089) compared to Group 2.

In addition, no significant difference was noted in the incidence of Peterson’s hernia whether the defect was closed or not closed (closed group – 4/117, 3.4% vs not closed – 18/327, 5.5%), or in the defect closure group, clockwise rotation and anastomosis to the right side of the axis of mesentry was associated with significantly higher incidence of hernia compared to counter clockwise rotation (4/34 vs 0.6, P = 0.044). In not closed groups, clockwise rotation was associated with higher incidence of internal hernias that did not reach statistical significance (12/237, 5.1% vs 1/90, 1.1%, P = 0.12).

SUMMARY: This study demonstrates that the technique for construction of the Roux limb probably is a major factor for internal hernias. Construction of the Roux limb with a counter-clockwise rotation of the bowel, such that both jejuno-jejunoanastomosis anastomosis and Ligament of Treitz are to the left of the axis of the mesentry significantly reduces the incidence of internal hernias.

Factors Predictive of Recurrence and Mortality After Definitive Surgical Repair of Enterocutaneous Fistula Jose L. Martineau, Enrique Luque-de-León Gastrocirugía, UMAE Hospital Especialidades Centro Médico, Nacional XCCX, Mexico Df, Mexico

BACKGROUND: Most enterocutaneous fistulae (ECF) require operative treatment. Although recent advances have widened therapeutic options, recurrence after surgical repair has not changed substantially. Assessment of outcomes specifically concerning recurrence and mortality after surgical repair has not been studied extensively.

AIM: To determine factors associated with recurrence and mortality in patients submitted to surgical repair of ECF.

MATERIAL AND METHODS: We analyzed prospectively collected databases on all consecutive patients submitted to surgical repair of ECF during a 5 year period. Several patient, disease and operative variables were assessed as factors related to recurrence and mortality. Univariate statistical (UA) comparisons were made using Students T Test for continuous variables and Fischers exact test for categorical variables. Multivariate analyses (MA) were also performed.

RESULTS: A total of 71 patients were included. Median age was 52 y. (range, 17–81). Operative indications included ECF persistence (38), sepsis (17), erosion of mucosa (12), and others (4). Surgical treatment included resection and anastomosis (37), resection and ostomy (21), oversew (4), bypass (3), and catheret placement (2). ECF recurred in 22 patients (31%). Medical treatment was established in 9 (ECF close in 7), surgical repair was re-attempted in 13 others (attained in 11). Thus, management of 22 patients with recurrent ECF was surgical in 18 (82%). UA disclosed non-colonofic ECF origin (p = 0.04) and high output (p = 0.001) as risk factors for recurrence. This latter was confirmed after MA selection. There was no statistical significant, management with an open abdomen (p = 0.06). The non-colonofic ECF origin had a tendency to favor recurrence. A total of 14 patients died (20%). UA revealed high risk factors for mortality measured at diagnosis or referral including malnutrition (p = 0.03), sepsis (p = 0.01), hydroelectrolyte imbalance (p = 0.001), and serum albumin <3 g/dl (p = 0.02). Other significant variables were interval from diagnosis to operation (p = 0.04), and serum albumin <3 g/dl (p = 0.001), and age ≤ 55 years (p = 0.03). Only the latter two remained significant after MA. A slight tendency was observed for female gender (p = 0.07) and non-colonofic ECF origin (p=0.09).

CONCLUSIONS: Among several studied variables, recurrence was only independently associated with high output. Mortality was associated to previously reported bad prognostic factors at diagnosis or referral. Timing of surgical re-operation (>20 weeks) seems to not affect patients functional and nutritional status.

Assessment of In Vivo Functionality of a Novel Cancer-Targeting Adenovirus Expressing Interferon Alpha in an Immunocompetent Model Leondi J. Jimingg, Julia Daryalova, Eric J. Brown, Selwyn M. Vickers, Masato Yamamoto University of Minnesota, Minneapolis, MN

More effective systemic therapy is clearly needed for pancreatic adenocarcinoma. Interferon alpha (IFNs) is promising in multimodality therapy, but has a short half-life and strong side effects. We hypothesize that by expressing IFNs locally in the tumor environment using a replicating tumor-specific adenovirus, systemic side effects can be greatly minimized while allowing for focused tumor delivery and a powerful treatment effect. We generated a novel adenovirus using several strategies to enhance efficacy while reducing toxicity. The COX2 promoter is used to drive viral replication due to its known overexpression in pancreatic tumor cells, while simultaneously avoiding replication toxicity to normal organs such as liver. Our design uses capib fiber modification for optimal infectivity, and adenoviral death protein for enhanced apoptosis and viral spread. Most importantly, localized IFN expression will allow focused tumor treatment and limited systemic toxicity.

Among several studied variables, recurrence was only independently associated with high output. Mortality was associated to previously reported bad prognostic factors at diagnosis or referral. Timing of surgical re-operation (>20 weeks) seems to not affect patients functional and nutritional status.

CONCLUSIONS: Among several studied variables, recurrence was only independently associated with high output. Mortality was associated to previously reported bad prognostic factors at diagnosis or referral. Timing of surgical re-operation (>20 weeks) seems to not affect patients functional and nutritional status.
patients with positive or negative MDM2 staining showed 48 of 89 (54%) of MDM2-negative patients were alive, with median survival of 33.0 months, while 3 of 14 (21%) MDM2-positive patients were alive, with median survival of 17.7 months (p = 0.23). For MDM2, two long-term survivors unduly influenced the results. This is unlikely to be resolved by longer statistical follow-up. HepPariI diagnostic test staining showed that, for negatively stained patients, 11 of 29 (38%) were alive, with a median survival of 38.5 months, while for positively stained patients, 39 of 73 (53%) were alive, with median survival of 54.3 months (p = 0.46). Survival as indicated by prognostic value of HepPariI staining presented with significant differences. In HepPariI prognostic-stained-negative patients, 12 of 43 (28%) were alive, with median survival of 29.3 months, but for patients with positive stain, 38 of 59 (64%) were alive, with median survival of 65.4 months (p = 0.01). Multivariate analysis of variables, which showed significant differences, served as predictors of mortality, out of these variables, only vascular invasion was a significant predictor of mortality (p = 0.05. hazard ratio = 2.2).

CONCLUSION: These data suggest differences in survival according to the molecular pathogenesis of HCC based on racial and regional differences. The results to p53, MDM2, and HepPariI showed a direct correlation between positivity of these proteins and a poorer prognosis for both racial groups. This could explain the different surgical outcomes seen for different ethnic cohorts. It also indicates that adjuvant and palliative systemic therapies for general use can not be directly extrapolated from data derived from one ethnic group.

809 Intestinal Resection-Induced Enterocyte Apoptosis Is Mediated by p38 MAPK-Directed Activation of Bax

[Nutritional Intake and Functional Status in Cancer: Is There a Short-Term Advantage in Complication Rates with a Minimally Invasive Approach?]

Laparoscopic versus Open Abdominopelvic Resection for Rectal Cancer: Is There a Short-Term Advantage in Complication Rates with a Minimally Invasive Approach?

BACKGROUND: Though complication rates following laparoscopic colon cancer resections have been described, these rates are less certain for laparoscopic rectal cancer surgery. The objective of this study was to identify factors predicting short-term complication rates for patients undergoing laparoscopic (LAPR) and open abdominopelvic resections (OAPR) for rectal cancer, and to identify factors associated with choosing either surgical approach.

METHODS: Following IRB approval, the 2005–2008 National Surgical Quality Improvement Program’s Participant User File was used to identify patients undergoing LAPR and OAPR for the treatment of rectal cancer. Logistic regression was used to determine which factors influenced selection of an open vs. laparoscopic surgery. Chi-square and multivariable analysis was used to compare the incidence of 30-day postoperative complications between the two surgeries and to identify factors predictive of complications.

RESULTS: A total of 1197 OAPR’s and 143 LAPR’s were identified. Compared to OAPR, patients undergoing LAPR were more likely to be female (p = 0.02), non-Caucasian (p = 0.02) and were less likely to have a body mass index (BMI) of &gt;30 (p = 0.04). LAPR’s were associated with longer operative times (p=0.001), with 57% requiring 4–8 hours. No difference in 30-day postoperative complication rates between LAPR’s and OAPR’s was found with the exception of a higher odds of sepisis with LAPR (OR 3.12, p = 0.04). LAPR and OAPR were found to have similar rates of surgical site infections (p = 0.13), transfusion requirements (p = 0.17), myocardial infarction (p = 0.48), and need for re-operation within 30 days (p = 0.20). There was no difference in the number of postoperative complications between either group (Table 1). Based on multivariable analysis, the only factor predictive of postoperative complications with LAPR was tumor stage (p = 0.04). Smoking (p = 0.001) and &gt;10% weight loss prior to surgery (p = 0.03) predicted complications with OAPR. The odds of undergoing an OAPR was higher with Caucasian race (OR = 1.54, p = 0.02) and BMI 25± (OR 1.48, p = 0.03). The single factor associated with higher odds of an LAPR was the absence of neoadjuvant radiotherapy (OR = 0.37, p = 0.04).
Prolonged Pre-Operative Hospitalization Correlates with Worse Outcomes After Colectomy for Acute Fulminant Ulcerative Colitis
Brian A. Coakley, Dana A. Telem, Scott Q. Nguyen, Celia M. Divino

Department of Surgery, The Mount Sinai Medical Center, New York, NY

BACKGROUND: Although colectomy has long been considered definitive treatment for fulminant ulcerative colitis (UC) unresponsive to medical management, debate persists as to the proper timing of surgery. Early surgical intervention may be beneficial to patients with acute UC. Our goal was to compare outcomes of those undergoing colectomy for acute UC and to identify pre-operative factors that may predict poor outcome.

METHODS: The charts of 107 patients treated by subtotal colectomy with ileostomy for severe fulminant ulcerative colitis from January 2004 to June 2009 were retrospectively reviewed. Twenty-one patients were excluded for disease categories according to the size: <1, 1–2, 2–4, and >4 mm. These results were also compared to data obtained from a cohort of 146 patients who underwent CBCS surgery between September 2005 and July 2009. Mann-Whitney and Student t-test were used for statistical analysis.

RESULTS: Methylene blue injection failed in 3 cases (3.7%) mainly due to extravasation of colour, mis-identification of the artery and incomplete mapping. The average lymph-node harvest was 17 ± 6 (range 10–33) in the stained and 15 ± 7 (range 4–34) in the unstained group. Methylene blue injection reduced the risk of inadequate LN harvest (LNs < 14% to 0, p = 0.05, LNs < 12 ± 32% to 21%, p = 0.018). When we compare these results to data obtained before the beginning of this study, we confirmed a significant reduction of inadequate harvesting when methylene blue dye is used (LNs=8, from 19% vs. 0%, p=0.002 (12), from 40% vs. 21%, p=0.004). The failed injection did not significantly influence the post-operative result.

CONCLUSIONS: Ex-vivo intra-arterial methylene blue dye injection augments lymph-nodes retrieval thus allowing a more accurate colorectal cancer staging and possibly the oncologic outcome.

813

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CONCLUSIONS: Ex-vivo intra-arterial methylene blue dye injection augments lymph-nodes retrieval thus allowing a more accurate colorectal cancer staging and possibly the oncologic outcome.
Changes in Re-Operative Intervention for Failed Anti-Reflux Surgeries Over the Past 19 Years in Our Practice

Aydin Ilhan, Masato Hoshino, Abbebek Sundaram, Tommy H. Lee, Charles F. R. Filipi, Sumet K. Mittal
Department of Surgery, Creighton University Medical Center, Omaha, NE

BACKGROUND: With the increasing number of laparoscopic anti-reflux operations there is increasing number of re-operative interventions for failed procedures. We have performed 316 re-operative procedures from Feb/1992 to Nov/2010. The aim of this study was to compare presenting symptoms, endoscopic findings and operative approaches over the years.

METHODS: A retrospective review of a prospectively maintained database was performed of patients who underwent re-operative intervention after one or more previous anti-reflux surgeries. After institutional board review the database and charts were reviewed and analyzed for presenting symptoms, pre-operative endoscopic findings and operative procedures.

RESULTS: There was a significant increase in the number of re-operative interventions over the years. The first 5 yrs: 8 procedures, second 5 yrs: 63 operations, third 5 yrs: 105 operations, last 4 yrs: 140 operations. The procedure was the first re-operation in 289 cases, second in 25 cases, third in 1 case and in 1 case it was the fourth re-operation.

We divided the 316 operations into two halves, the first 158 patients (Group 1) were operated on from 2/1/1992 to 6/15/2006 (n=158) and the second half (Group 2) was operated on from 6/15/2006 to 11/2/2010. The most common indications for a re-operative procedure were heartburn (27%/6%) and dysphagia (35%/28% in each group) and did not change over the years. Pre-operative upper endoscopy revealed a recurrent sliding hiatus hernia (>2 cm) in 61 and 71 patients, disrupted fundoplication in 74 and 89 patients, twisted fundoplication or two-compartment stomach in 20 and 26 cases, slipped fundoplication in 56 and 54 patients and a paraesophageal hernia in 32 and 37 patients in each group respectively. There was no significant difference in the patterns of failure over the years. Re-operation consisted of redo-fundoplication in 141 and 81 patients, Roux-en-Y reconstruction (RYN) in 14 and 70 patients and esophagectomy was performed in 3 and 7 patients, respectively. A significantly higher number of procedures were done laparoscopically in the second group: 108 vs 80 (p = 0.001). A large hiatus hernia (>2 cm) with a slipped fundoplication was found in 29 and 38 patients in the two groups. In this subset of patients a significantly larger number of RYN reconstructions were performed in the second group (3 vs 20, p = 0.0003), while gastroplasty was used more frequently in the first group (8 vs 0, p = 0.0001).

DISCUSSION: While there has been no significant change in the frequencies of the other symptoms, the pre-operative endoscopy findings and the types of procedures performed, we have observed a statistically significant increase in the number of patients who were operated on in the second half of the study period.
889
Rage Gene Deletion Inhibits the Development and Progression of Ductal Neoplasia and Prolongs Survival in a Mouse Model of Pancreatic Cancer
Joseph Dobrogosz1, Minna K. Lee2, Donald N. Moncure1, Megan D. Winther1, Parthosh Suman1, Fei Rao1, Helen Remotti1, Yu Shan Zou1, Shi Fang Yang1, Wanglong Guo1, Gloria H. Su1, Ann Marie Schmidt2, John D. Allendorf1,2
1Surgery, Columbia University College of Physicians and Surgeons, New York, NY; 2Medicine, New York University Langone Medical Center, New York, NY; Pathology, Columbia University Medical Center, New York, NY

BACKGROUND: Activating Kras mutations and inactivation of the p16 tumor suppressor gene are commonly present in pancreatic ductal adenocarcinoma. The receptor for advanced glycation end-products (RAGE) is a cell surface receptor implicated in carcinogenesis.

OBJECTIVE: The aim of this study was to evaluate the effect of Rage gene deletion on the development and progression of ductal neoplasia in a conditional Kras<sup> mutant</sup>/p16<sup> mutant</sup> mouse knockout line.

MATERIALS AND METHODS: To evaluate the impact of Rage deletion on pancreatic intraepithelial neoplasia (PanIN), Pdx-1-Cre<sup> mutant</sup>/Kras<sup> mutant</sup>/p16<sup> mutant</sup> mice were crossed with Rage<sup> mutant</sup> mice in the C57BL/6j background to generate Pdx-1-Cre<sup> mutant</sup>/Rage<sup> mutant</sup> mice. To evaluate the impact on pancreatic ductal adenocarcinoma (PDAC), Pdx-1-Cre<sup> mutant</sup>/Kras<sup> mutant</sup>/p16<sup> mutant</sup> mice were crossed with Rage<sup> mutant</sup> mice to generate Pdx-1-Cre<sup> mutant</sup>/Rage<sup> mutant</sup>/p16<sup> mutant</sup> mice. Mice were sacrificed and pancreata were procured for scoring of ductal neoplasia compared to Pdx-1-Cre<sup> mutant</sup>/Kras<sup> mutant</sup>/p16<sup> mutant</sup> controls.

RESULTS: To evaluate the impact on survival, mice were aged to their natural death, and Kaplan-Meier analysis was performed. Categorical variables were compared using Fisher’s exact test, and median survivals were compared with the log-rank test.

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A Root-Cause Analysis of Mortality Following Major Pancreatectomy

Charles M. Vollm, Noberto J. Sanchez, Tara S. Kent, Mark P. Catlin, Pancreatic Mortality Study Group Beth Israel Deaconess Medical Center, Boston, MA

INTRODUCTION: Mortality rates from pancreatectomy have decreased worldwide, death remains an infrequent but profound event at an individual practice level. Root-cause analysis is a retrospective method commonly employed to understand adverse events. We evaluate whether emerging mortality-risk tools sufficiently predict and account for actual clinical events that are often identified by root-cause analysis.

METHODS: We assembled a Pancreatic Mortality Study Group comprised of 32 pancreatic surgeons from 14 institutions in 4 countries. Mortalities after pancreatectomy (30 and 90-day) were accrued from 2000-2010. For root-cause analysis, each surgeon “deconstructed” the clinical events preceding a death to determine cause. We next tested whether mortality-risk tools (ASA, POSSUM, Charlson, NSQIP) could predict those patients who would die (n = 184), and compare their prognostic accuracy against a cohort of resections in which no patient died (n = 630).

RESULTS: 184 deaths (151 Whipple, 18 Distals, 15 Totals) were identified from 10,783 pancreatectomies performed by surgeons whose experience averaged 13.5 years. Overall 30- and 90-day mortalities were 0.92% and 1.71%. Individual institutional rates ranged from 0.3-4.7%. Only 5 patients died intraoperatively, while the other 179 succumbed at a median of 27 days. Mean age patient was 70 years old (range: 16-96 years). Median operative time was 370 min and EBL was 750 cc (range: 50-15,000 cc). Vascular repair or multivisceral resections were required for 14% and 16% respectively. 82% had a variety of major complications before death. 84% required ICU care, 51% were transfused, and 36% were reoperated upon. 52% died during the index admission while another 9% died after a readmission. Almost half (n = 85) expired between 31 and 90 days. Only 12% had autopsies. Operation-related complications contributed to 42% of deaths, with pancreatic fistula being the most evident (16%). Technical errors (23%) and poor patient selection (16%) were cited by surgeons. 3.4% of deaths had associated cancer progression – all occurring between 31-90 days. Even after root-cause scrutiny, the ultimate cause of death could not be determined for 41 patients – most often between 31-90 days. While assorted risk models predicted mortality with variable discrimination from non-mortalities, they consistently underestimated the actual mortality rate events we report (Table). Analysis with POSSUM illustrates the impact of operative performance on determining outcome.

CONCLUSION: Root-cause analysis suggests that risk prediction should include, if not emphasize, operative factors related to pancreatectomy. While risk models can distinguish between mortalities and non-mortalities in a collective fashion, they vastly misclassify the actual chance of death on an individual basis.

Mortality Risk Prediction Comparison

<table>
<thead>
<tr>
<th>Risk Prediction Tool</th>
<th>All mean value</th>
<th>Mortality N = 184</th>
<th>No Mortality N = 630</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>ASA Score</td>
<td></td>
<td>19.97 ± 18.00 22.4%</td>
<td>15.14 ± 15.69 13.2%</td>
<td>0.047</td>
</tr>
<tr>
<td>POSSUM Score</td>
<td></td>
<td>-8.30 ± 4.20</td>
<td>-3.80 ± 4.20</td>
<td>0.093</td>
</tr>
<tr>
<td>Predicted Mortality</td>
<td></td>
<td>-8.30 ± 4.20</td>
<td>-3.80 ± 4.20</td>
<td>0.093</td>
</tr>
<tr>
<td>Charlson</td>
<td></td>
<td>5.17 ± 1.47</td>
<td>2.94 ± 0.68</td>
<td>0.093</td>
</tr>
</tbody>
</table>

Table 1: Patient Characteristics

<table>
<thead>
<tr>
<th>Patient Number</th>
<th>Age</th>
<th>Sex</th>
<th>Diagnosis</th>
<th>Procedure</th>
<th>Outcome</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>30</td>
<td>Male</td>
<td>Desmoid</td>
<td>Absorbed resection</td>
<td>Died</td>
<td>Abdominal wall and para-renal fistula at operation</td>
</tr>
<tr>
<td>2</td>
<td>54</td>
<td>Male</td>
<td>Liposarcoma</td>
<td>Ex-vivo resection; auto-transplant</td>
<td>Alive</td>
<td>Full oral feeds</td>
</tr>
<tr>
<td>3</td>
<td>59</td>
<td>Male</td>
<td>Fibromatosis</td>
<td>Conventional resection</td>
<td>Alive</td>
<td>Full oral feeds</td>
</tr>
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<td>Male</td>
<td>Desmoid</td>
<td>Ex-vivo resection</td>
<td>Died</td>
<td>External clip, intestinal allograft, died of ‘sue HN1’ infection</td>
</tr>
<tr>
<td>5</td>
<td>28</td>
<td>Female</td>
<td>Fibromatosis</td>
<td>Ex-vivo resection; failed auto-transplant</td>
<td>Alive</td>
<td>Mesenteric ischemia after auto-transplant; full graft function after auto-transplant</td>
</tr>
<tr>
<td>6</td>
<td>43</td>
<td>Male</td>
<td>Desmoid</td>
<td>Conventional resection</td>
<td>Alive</td>
<td>Complete enterectomy, awaiting intestinal allograft</td>
</tr>
<tr>
<td>7</td>
<td>31</td>
<td>Female</td>
<td>Desmoid, FAP</td>
<td>Conventional resection</td>
<td>Alive</td>
<td>Short bowel on viable tip</td>
</tr>
</tbody>
</table>
Long Term Outcome of Patients Undergoing Pancreaticoduodenectomy for Non-Malignant Disease

Conclusions: Figure 1: A positive SMA margin was identified in 8 (4%) specimens. Accurate histologic measurements were available in 178 (96%) of 186 patients with a negative SMA margin; of these, the free margin measured ≤1 mm in 40 (22%) patients, between 1 and 10 mm in 72 (40%), and ≥10 mm in 66 (37%). Neoadjuvant chemotherapy and/or chemoradiotherapy was delivered to 150 (77%) patients; a positive SMA margin was identified in 3 (2%) of these patients versus 5 (11%) of the 44 patients who received no preoperative therapy (p = 0.02). Locoregional recurrence developed in 23% of patients with a negative SMA margin ≤1 mm and 21% of patients with a negative margin >1 mm (p = 0.84). The overall survival of patients with a negative SMA margin ≤1 mm did not differ from that of patients with a negative margin >1 mm (median 31 [95% CI, 22, 44] months v. 38 [95% CI, 34, 42] months, p < 0.12). Preoperative CT predicted a negative SMA margin (median 8.5 mm, range 2–18 mm) in 6 (75%) of 8 patients in whom it was positive. The concordance coefficient between the pathologic (median 2 mm) and radiographic (median 8 mm) measurements of the SMA margin in patients with a margin ≤10 mm was 0.07 (95% CI, 0.02, 0.13) (Figure 1).

Background: Due to improved detection of pancreatic lesions, the resection of non-malignant tumors and indeterminate masses has increased. Prior studies have examined outcomes of pancreaticoduodenectomy (PD) performed for malignancy, but few have examined the long-term implications of this operation for non-malignant lesions.

Methods: Patients undergoing PD for non-malignant disease between 2004 and 2008 were evaluated. The SMA margin dissection was performed as a mean 1.7 mm (range 0–5 mm) dissection adjacent to the superior mesenteric artery (SMA). In patients with rectal cancer, tumor cells within 1 mm of the analogous radial margin predict early treatment failure. The significance of this close SMA margin following a pancreaticoduodenectomy lies adjacent to the superior mesenteric artery (SMA). In patients with rectal cancer, tumor cells within 1 mm of the analogous radial margin predict early treatment failure. The significance of this close SMA margin following a pancreaticoduodenectomy lies adjacent to the superior mesenteric artery (SMA). In patients with rectal cancer, tumor cells within 1 mm of the analogous radial margin predict early treatment failure.
Updated Results for Dual Modality Versus Percutaneous Drainage for the Treatment of Symptomatic Walled-off Pancreatic Necrosis

Michael Gluck, Andrew S. Ross, Shayan Iraniz, S. Ian Gan, Mehran Fotouhi, Robert Crane, Justin Segil, Ellen Hauptmann, Richard A. Kozelek

Digestive Disease Institute, Virginia Mason Medical Center, Seattle, WA

BACKGROUND: Treatment of symptomatic walled-off necrosis (WOPN) by dual modality-endoscopic and percutaneous-drainage (DMD) has been shown to decrease length of hospitalization (LOH), use of CT scans and drain studies by comparison in percutaneous-drainage alone.

AIM: To demonstrate the durability of the initial conclusions as the cohort of DMD patients expanded. Methods: A prospective database of patients undergoing DMD was analyzed and compared to patients who had standard percutaneous drainage from 2006 to the present time.

RESULTS: 41 patients had undergone DMD with 39 completing therapy, defined as removal of percutaneous drains, definitive surgery, or death. 43 patients underwent percutaneous drainage alone. Patient characteristics including age, comorbidities, etiology of pancreatitis, and based on computed tomography severity index were indistinguishable between the two groups. Initial endoscopic access to the necrosis was obtained by endoscopic ultrasound in 30 of the 41 patients undergoing DMD.

METHODS: DMD cohort had fewer mean LOH (27 vs 55 days), time until removal of percutaneous drains (78 vs 186 days), fewer CT scans post op (1 vs 13), decreased number of drainages per patient (1.29 vs 2.0), statistically significant. The DMD cohort also had fewer total ERCP's (2.0 vs 2.6, p < 0.026). There have been 3 total deaths in the DMD group: 1 from mesenteric ischemia during therapy for an incipient pancreatic abscess, 1 from metastatic spread of NSCM and 1 from sepsis. The median survival time for the DMD cohort was 1 year vs 11 months for the controls, 1 year vs 12 months for the controls.

Conclusions: DMD cohort also had fewer total ERCP's (2.0 vs 2.6, p < 0.026). There have been 3 total deaths in the DMD group: 1 from mesenteric ischemia during therapy for an incipient pancreatic abscess, 1 from metastatic spread of NSCM and 1 from sepsis. The mean survival time for the DMD cohort was 14 months vs 5 months for the controls. Further analysis of the durability of the initial conclusions will be presented at our poster presentation.

963 Is It Worth Looking? Abdominal Imaging After Pancreatic Cancer Resection: A National Study

Jan E. Wilkomsky, Jillian K. Smith, Elizabeth Ragulin-Coyne, Jing Chen Ng, Mohul A. Shah, Jennifer F. Tun

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

BACKGROUND: Sequential followup imaging is often performed after pancreatic resection for cancer. We attempted to quantify the volume and cost of abdominal imaging after pancreatic resection nationwide, and determine whether their frequent use confers benefit.

METHODS: Patients with pancreatic adenocarcinoma who underwent surgical resection were identified in SEER-Medicare (1991–2005). Claims for abdominal imaging (CT/CTA, MRI/MRA, PET) ≤ 6 months after resection were analyzed. After initial screen, CT/CTA was used for longitudinal analyses. Underivatized and multireplicate analyses were performed by Kruskal-Wallis, logistic regression, and Cox. CT utilization was calculated by dividing total scans by months of available postoperative data. Routine annual CT scanning was defined as at least one CT/CTA performed within each 12-month block, excluding year of death/censoring. To assess frequency of annual CT scanning in patients with complications, we determined if CDX2 expression was further analyzed.

RESULTS: Within 5 years of pancreatic resection, 3931 studies were performed on 2792 patients. The majority of these were CT scans (36521, 92.9%), and the remainder MRI (2425, 6.2%) and PET (370, 0.9%). A minority received no imaging after resection, both when analyzing all patients (168/2792, 6.0%), as well as the subset with ≥ 5 years survival (11/265, 4.2%). Mean monthly CT utilization per patient increased from 0.4 in 1991 to 1.1 in 2004. Routine annual CT scans were associated with increased survival (60 vs 57 months, p = 0.031). Postoperatively (≥ 1 year), mean number of CT scans per patient was 2.6. CT scans within 3 months of surgery, 4.7 scans between 3 months and 1 year, and 5.6 scans between 1 year and study termination. Among 1127 patients with sufficient survival to allow for analysis, 569 (50.5%) received annual CT scans as previously defined. Interestingly, only 81 (28.9%) of the top-performing patients received annual CT scans. Among all patients, postoperative complications, non-white race, advanced age, and receipt of chemotherapy or radiation were predictive of receiving routine annual CT scans (p < 0.05). Routine annual CT scans were associated with negative rather than positive impact on survival for death (HR 1.2, p = 0.02). Based on current Medicare line-item payments, the bare minimum mean imaging cost incurred per patient would be $3736, or $5287 over 5 years of survival.

Conclusions: Compared to standard percutaneous drainage, DMD of WOPN reduces LOH and the use of radiological and endoscopic resources. Surgery and PCFs were avoided in patients undergoing DMD while single digit mortality was maintained.
INTRODUCTION: Older patients with pancreatic cancer have significant comorbidities, and as a result, some are not offered pancreaticoduodenectomy (PD) due to potentially high perioperative risk and prolonged post-operative recovery. These patients may have undetected vulnerabilities related to frailty that may adversely affect surgical outcomes. Older patients with pancreatic cancer have significantly decreased over time. The introduction of multi-disciplinary care programs and improved perioperative management have led to improved outcomes. We sought to define the utilization patterns of perioperative procedures for patients undergoing PD.

RESULTS: Seventy-eight patients were enrolled from 10/1/2007-9/1/2010: 53 had a PD median age 68 years; range 46-85) and 25 were inoperable or declined PD. Significant preoperative vulnerability was identified in selected patients: PRE-17 in 24% (FPPR = <0.10 in 49%), Fried's exhaustion in 40%. The perioperative morbidity rate was 70% and three patients died (8.6%). Twenty-three patients (43%) had severe complications (Clavien grade ≥ III). Abnormal VES-13 showed predictive promise for post-operative admission to the ICU (rs (53) = .42, p < .01, and total hospital days rs (53) = .26, p = .09). Self-reported exhaustion predicted complications and post-operative admission to the ICU, rs (21, N = 53) = .41, p < .05. Older age was predictive of not being discharged to home (rs (53) = .35, p < .05) and perioperative death, rs (31) = .31, p < .05. 22 patients have complete QoL data that shows a wide variance at baseline, a significant drop-off at 1 month and return to baseline by 6 months.

CONCLUSION: We identified significant vulnerability in older patients undergoing PD. Early analyses suggest that comprehensive preoperative geriatric measures can predict post-surgical outcomes. If sought for and identified, these issues could be managed expectantly, leading to more adequate preoperative counseling and in-hospital care.

967 Trends in the Palliative Surgical Management of Patients with Unresectable Pancreatic Adenocarcinoma: Lessons Learned from a Large, Single Institution Experience

METHODS: Between January 1996 and June 2010, 1913 patients with pancreatic adenocarcinoma (PAC) were explored with palliative procedures, of whom 583 (30%) did not. Among the 583 patients who did not undergo curative intent surgery, most (70%) had resection performed, with an overall perioperative mortality rate of 7.5%.

CONCLUSION: Utilization of PBP for inoperable patients with pancreatic adenocarcinoma is effective and has been well-accepted. Future studies should focus on optimizing the selection process of candidates to surgery for such disease.
Trends in Perioperative Staging, Mortality, and Complications
1991–2005 for Patients with Resected Pancreatic Adenocarcinoma

RESULTS: Of 583 patients undergoing DP, 90 patients with pre-existing type I (n = 24) or type II (n = 66) diabetes were excluded. The remaining 493 patients represent the study population with a mean age of 57 years and BMI (kg/m²) of 27.4. Operative indications included benign lesions in 253 patients (51%) and malignancy in 240 (49%). Extent of pancreatic resection was limited in 141 patients (37%), standard in 87 (23%), extended in 126 (33%), and subtotal in 30 (80%). Postoperatively, 179 patients (36%) required no postoperative treatment, 269 (55%) required perioperative hyperglycemic control, and 49 (9%) developed diabetes including 44 requiring insulin, and 11 oral hypoglycemic medication. Patients developing PRD had higher mean preoperative glucose levels (98.2 vs 112.1, p = 0.001), BMI (27.5 ± 29.1 kg/m², p = 0.019), estimated blood loss (594 vs. 845 ml, p = 0.001), longer operative time (238 vs 269 min, p = 0.003), and greater pancreatic specimen length (9.3 vs 10.9 cm, p = 0.024). Incidence of PRD correlated with CT extent of pancreatic resection, occurring after limited resection in 4.2%, standard in 4.6%, extended in 13.2%, and subtotal in 30%. On multivariate analysis, factors associ-ated with increased risk of PRD included preoperative glu- cose ≥120 (OR 10.06, p = 0.001), BMI ≤4, ≤21 (OR 0.01, p = 0.013), or subtotal resection (OR 9.86, p < 0.001), and blood transusion (OR 2.38, p = 0.057).

CONCLUSION: Postresection diabetes occurs in approxi-mately 9% of patients after DP. Factors associated with increased risk include elevated preoperative glucose, BMI, extent of resection, and need for blood transfusion. These results are critically important for clini-cal evaluation and expected pancreatic remnant based on CT imaging. These findings will help counsel patients pre- and postoperatively about the risks of postresection diabe-tes after DP.

970
Assessment of Quality of Life following Total Pancreatic and Islet Cells Autotransplant for Chronic Pancreatitis

The Mayo Clinic, Rochester, MN

BACKGROUND: The primary goal in TP-IAT is to improve QOL by alleviating pain and discontinuing narcotics while preventing or minimizing surgical diabetes. QOL outcomes following any surgery for CP are lacking.

OBJECTIVE: Review the results of the TP-IAT by assessing QOL and beta cell function.

METHODS: A retrospective review of a prospective database for TP-IAT from November 2007 through October 2010. A standardized pre and post-operative using the Depression Anxiety Stress Scale (DASS) and the Pain Disabil-ity Index (PDI). A visual scale was used to assess global pain. Diabetes assessment by measuring Hb 1Ac pre and post surgery, and C-Peptide postoperative.

RESULTS: There were 20 patients who underwent TP-IAT. The median age was 42 years old (17–73) and 8 (40%) were women. CP etiology was idiopathic in 10 (50%) familiar in 5, alcohol in 4, autoimmune and gastilines in 2. Prior pancreatic resection was performed in 2 (10%) patients. The median islet cell equivalents infused was 293,508. There was no mortality. Complications were presented in 8 (40%): bleeding in 4 (20%) due to anticoagu-la- tion or 2 of these required a reoperation; gastroparesis in 3 (15%). Median LOS was 12 days. The median follow-up was 16 months. The median pre HbA1c was 6.03 and post HbA1c was 7.72. The median post-op C-peptide levels were 0.78. Disease of Novolov was 12U (4–25) per day, Lan-tus 971U (5–20) per day. Humalog 7.3U (2–30). The QOL data are summarized in this table. The patients rated their abdominal pain pre and postoperative are as follows: none to mild in 0 (0%) vs 15 (76%), moderate in 9 (45%) vs 3 (15%) and severe in 11 (55%) vs 2 (10%). The DASS was completed pre and post operative. Depression was catego-rized as follows: mild in [5 (14%) vs 2 (10%)], moderate in [3 (14%) vs 1 (4%)], severe [4 (19%) vs 0], extremely-severe [5 (14%) vs 2 (10%)] (p = 0.012). Anxiety was categorized as mild in [2 (10%) x 1 (10%)], moderate in [4 (19%) vs 1 (4%)], severe in [1 (4%) x 1 (4%)], extremely-severe [4 (19%) vs 2 (10%)] (p = 0.062). DPD was completed both pre and post operative. 1. Family home responsibilities: Severe in [12 (61%) vs 2 (10%)]. 2. Recreation: Severe in [16 (60%) vs 4 (20%)]. 3. Social Activity: Severe in [13 (66%) vs 3 (15%)]. 4. Occupation: Severe in [14 (70%) vs 3 (20%)]. 5. Sexual Behavior: Severe in [11 (55%) vs 2 (10%)]. 6. Self care: Severe in [6 (30%) vs 0 (0%)]. 7. Life support activities: Severe in [9 (45%) vs 1 (10%)]. Alcohol and drug abuse were diagnosed in 3 patients post operative. Passive suicidal ideation was present in 2 patients.

Table 1:

<table>
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<th>PostOp</th>
<th>p Value</th>
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<td>0.016</td>
</tr>
<tr>
<td>Social Activity</td>
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</tr>
<tr>
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<tr>
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<td>4</td>
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</tr>
<tr>
<td>Pain Scale</td>
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CONCLUSIONS: The preliminary results show that TP-IAT significantly improves pain, depression, anxiety and DASS measures in appropriately selected patients with CP.

971
Acute Portomesenteric Venous Thrombosis Following Abdominal Surgery: Observe, Anticoagulate or Operate?

Michael J. Leonard, Lindsay L. Hollander, Henry A. Pitt, Michael G. House, Nicholas J. Zyromski, C. Max Schmidt, Atlita Nakeeb, Thomas J. Howard, Keith D. Lillemoe

Acute portomesenteric venous thrombosis (PMVT) is a rare, but serious, complication of abdominal surgery with no agreed standard of care. Management options include observation, anticoagulation, and thrombectomy. Our study aims to characterize a large series of patients with PMVT after abdominal surgery with a focus on man-agement and outcomes.

METHODS: We performed a retrospective analysis of more than 4000 patients having abdominal surgery at an aca-demic medical center between January 2007 and August 2010. Patients with postoperative thrombosis of the portal, splenic mesentery, and/or splenic veins were reviewed. Patients with pre-existing PMVT were excluded. The diagnosis was established by computed tomography (CT), magnetic resonance imaging (MRI), and/or duplex ultrasound.

RESULTS: Forty-four patients had PMVT (23 isolated por-tomesenteric, 8 portal and mesenteric and/or splenic, 8 isolated mesenteric, 1 isolated splenic). Average patient age was 55 years, and 55% were male. Four patients (9%) were on preoperative anticoagulation that was held for surgery, and 25 patients (57%) had a malignancy. Operations per-formed included pancreas resection (21), liver resection (5), colo-rectal resection (5), pancreas debridement (4), sple-nectomy in 2 patients, major biliary, combined pancreatic and colon resection (2), palliative gastrojejunostomy (1), and abdominal wall reconstruction (1). Median time from operation to PMVT diagnosis was 14 days, and 23 patients were diagnosed after discharge from the operating room. Diagnostic imaging included computed tomography (35), duplex ultrasound (8), and magnetic resonance imaging (1). Treatment included observation in 15 patients, anticoagulation in 24 patients (20 continued as outpatient), and operative thrombectomy in 5 patients. All patients who underwent operative thrombectomy developed PMVT on postoperative day 1 after their initial operation, and half of these patients had a portomesenteric venous resection and construction as part of their initial operation. PMVT induced liver abscess occurred in 1 patient. Small bowel and/or colon resec-tion for ischemia occurred in 2 patients. Seventeen (40%) patients were readmitted within 30 days of discharge from the PMVT admission. Only one patient died five days after a liver resection complicated by portal vein thrombosis requiring operative thrombectomy and enterectomy.

The Society for Surgery of the Alimentary Tract
CONCLUSIONS: Portal-enteric venous thrombosis (PMVT) is an uncommon complication following abdominal surgery. It occurs in 1-2% of patients postoperatively, but often without clinical symptoms and presents after discharge. While the morbidity associated with PMVT is high, the mortality is typically low (2%). Management of PMVT should be tailored to individual patient characteristics with respect to timing and severity of presentation.

972 Preoperative Assessment of Pancreatic Fibrosis and Risk of Pancreatic Anatomical Failure Following Pancreateoduodenectomy by Dual-Phase Computed Tomography
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BACKGROUND: Delayed or decreased enhancement characteristics on computed tomography (CT) in patients with pancreatic fibrosis have been described. However, studies comparing clinical outcomes following pancreateoduodenectomy (PD) to preoperative CT enhancement characteristics are lacking.

AIM: To study the ability of dual-phase CT to assess pancreatic fibrosis and to predict the risk of developing a pancreatic anatomical failure (PAF) following PD.

METHODS: Review of 175 consecutive patients with preoperative dual-phase CT between 2004 and 2009. Pancreatic fibrosis was assessed based on the mean CT attenuation upstream from the tumor was measured in the pancreatic and hepatic imaging phases. The ratio of the mean CT attenuation in the pancreatic (late) and hepatic (early) phase was calculated, the L/E ratio and the presence of ductal dilatation (L) were defined as significant predictors of pancreatic fibrosis and to predict the risk of developing a pancreatic anatomical failure (PAF) following PD.

RESULTS: The L/E ratio was increased with larger duct size (P < 0.001), the presence of diabetes (P < 0.05), and the surgeon’s assessment of pancreas firmness (P < 0.001). In multivariate analyses L/E ratio increased with larger duct size (P = 0.001), the presence of diabetes (P < 0.05), and the surgeon’s assessment of pancreas firmness (P = 0.001). In multivariate analyses L/E ratio increased with larger duct size (P = 0.001), the presence of diabetes (P < 0.05), and the surgeon’s assessment of pancreas firmness (P = 0.001).

CONCLUSIONS: Pancreatic CT enhancement characteristics can be used to identify patients with increased risk of pancreatic anatomical failure following PD.

973 Fifteen-Year Single Institution Experience with Surgical Treatment of Duodenal Adenocarcinoma: A Comparison of Periampullary and Extra-Ampullary Duodenal Adenocarcinomas
Edward O. Onkendi1,2, Nabil Wasif1
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BACKGROUND: Duodenal adenocarcinoma constitutes 44.5% of small bowel malignancies. Despite resection, the disease-free survival (DFS) and overall survival (OS) remains poor and is estimated to range from 15-33% in node-negative and 38-83% in node-negative at 5 years. Our aim was to describe the surgical management of patients with duodenal adenocarcinomas.

METHODS: We reviewed, retrospectively, the medical records of 124 patients treated for duodenal carcinoma by surgical palliation or curative resection from January 1994 to January 2009 at our institution.

RESULTS: 124 consecutive patients (75 males/49 females) underwent surgical treatment for duodenal adenocarcinoma between 1/1994 and 1/2009. The mean age at diagnosis was 65 years (range 33-87 years). 110 patients were diagnosed by endoscopic biopsy and 14 patients by CT or surgical exploration. There were 25 periampullary tumors and 99 extra-ampullary tumors. Eight patients had adenocarcinoma in the first portion of the duodenum (D1), 73 in the second portion (D2), 23 in the third portion (D3), and 15 in the fourth portion (D4). Two patients had tumors extending beyond the duodenum, without a defined portion. There were no grade 1 tumors. Three patients had metastatic disease that was confirmed at operative exploration. Ninety patients had stage 1, 26 patients had stage 2, 33 had stage 3, and 56 had stage 4 disease. Eighty percent of patients had positive margins, 93 had negative margins. Fifty-one patients had node-positive disease and 49 had node-negative disease.

CONCLUSIONS: Duodenal adenocarcinoma is a rare and found in the second portion of the duodenum in 59% of patients. Advanced T stage and pathologic grade 3 or 4 were associated with decreased survival. Nodal status and margin status had significant impact on overall survival. There was no difference in survival between periampullary and extra-ampullary duodenal tumors.

974 Adult Intussusception in the Last 25 Years of Modern Imaging: is Surgery Still Indicated
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1Surgery, Mayo Clinic, Rochester, MN; 2Gastroenterology, Mayo Clinic, Rochester, MN

BACKGROUND: Intussusception in adults, unlike in children, is rare and commonly reported to be due to malignancy. Adult colonic intussusception is associated with primary carcinoma in 65-70% of cases. Adult small bowel intussusception is associated with malignancy in only 30-35% of cases. The majority of lesions are metastatic. As a result, most authors recommend surgical exploration for diagnosis and therapy. In light of the current availability of CT scans, we questioned the need for mandatory surgical exploration for all adult intussusceptions.

METHODS: A retrospective review of all records of adults treated with a large tertiary referral center for intussusception from 1983 to 2008 was performed. A comparative analysis of the medical history, imaging, operative and pathological reports was performed.

RESULTS: A total of 200 adult patients had intussusception over a 25-year study period. A total of 13% (68/55) of patients had enteric intussusception, 18 (9%) had ileocecal intussusception, 15 (7.5%) had ileoceleal and 30 (15%) patients had colocolonic intussusception. CT scan was the most common imaging modality used. The average patient age was 34 years and 154 patients (76.5%) of all intussusceptions. The remaining 66 patients (33%) were jejunal in location. Neoplasms were the most common etiology of intussusception, there were 25 primary (12.5%), 20 metastatic (10%), and 49 (24%) benign neoplasms identified. Adhesions from prior surgery (12), celiac disease (8), inflammatory bowel disease (7), infection (7), Meckel’s diverticulum (6), and a gall stone were identified for the remaining 41 cases. Obstructive symptoms, hematochezia and palpable mass were clinical indicators present in 87% of patients with a neoplastic lead point. One hundred and twenty patients underwent operative intervention for intussusception. Overall, 99 (82.5%) patients underwent primary resection of the intussusception without prior reduction, thirteen (10.8%) patients had reduction of their intussusception followed by resection and eight (6.7%) patients underwent reduction only. Six of the 78 patients with surgical intervention had 66 ideopathic cases, 36 patients had spontaneous reduction and 12 patients had reduction of the intussusception. Twenty four of the remaining 30 patients were successfully managed nonoperatively and six had a negative surgical exploration.

CONCLUSION: In the current era of modern imaging the incidence of adult intussusception has increased 4-fold. While idiopathic intussusception has become more common, the majority of adult intussusception cases are still associated with a pathologic lead point which may be a primary malignant mass, with symptoms including symptoms of bowel obstruction and obstructive symptoms.

975 Under-Utilization of Surgical Resection for Gastric Cancer in the Era of Multi-Modality Therapy
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1General Surgery, Mayo Clinic, Arizona, Scottsdale, AZ; 2General Surgery, Mayo Clinic Florida, Jacksonville, FL

INTRODUCTION: Surgical resection of gastric adenocarcinoma is the cornerstone of potentially curative therapy. We studied the recent utilization of surgical resection for patients diagnosed with gastric adenocarcinoma in the United States in the era of multi-modality therapy.

METHODS: A retrospective review of all patients with gastric adenocarcinoma diagnosed between 2004-2008. Surveillance, Epidemiology and End Results (SEER) cancer registry was conducted. Utilization and extent of surgery performed was reviewed according to stage at presentation, and factors associated with receipt of surgery were identified.

RESULTS: A total of 18,815 patients diagnosed with gastric adenocarcinoma were identified, of whom 47% underwent a surgical resection (defined as any procedure more extensive than a simple local excision). Eleven percent of patients had positive margins, 93 had negative margins. Fifty-one patients had node-positive disease and 49 had node-negative disease. The 5-year OS and DFS rates were 37% and 56%, respectively, for patients with extra-ampullary adenocarcinomas, and 24% and 31% for patients with periampullary tumors. Advanced T stage and pathologic grade 3 or 4 were associated with decreased survival. Nodal status and margin status had significant impact on overall survival. There was no difference in survival between periampullary and extra-ampullary duodenal tumors.

CONCLUSION: Duodenal adenocarcinoma is a rare and found in the second portion of the duodenum in 59% of patients. Advanced T stage and pathologic grade 3 or 4 were associated with decreased survival. Nodal status and margin status had significant impact on overall survival. There was no difference in survival between periampullary and extra-ampullary duodenal tumors.

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(online didactics, ½ day tutorial, and 9 inanimate exercises) that aimed to address 23 unique skills identified via

**INTRODUCTION:**

5-Lipoxygenase (5LO) is an essential enzyme in arachidonic acid metabolism. Overexpression of 5LO has been demonstrated in a variety of cancers, including colorectal carcinoma, gastric adenocarcinoma, and colorectal polyposis. Overexpression of 5LO is known to promote cancer progression by promoting angiogenesis, inhibiting apoptosis, and stimulating tumor cell proliferation. The 5LO knockout (5LO−/−) mouse model provides an opportunity to study the role of 5LO in cancer development and progression.

**BACKGROUND:**

**Su1837**

5-Lipoxygenase Deficiency Diminishes Th2 Cell, Regulatory T-Cell and Dendritic Cell Infiltration of Murine Intestinal Polyps

Joseph D. Phillips1, Mohammad W. Khan, Erin C. Cheen2, Paul Grippo1, Khadayasha Khaaza1, David J. Bentrem1,4

1Surgery, Northwestern University, Feinberg School of Medicine, Chicago, IL; 2Surgery, Mount Sinai Hospital, Chicago, IL; 3Gastroenterology, Northwestern University, Feinberg School of Medicine, Chicago, IL; 4Surgery, Jesse Brown VA Medical Center, Chicago, IL

**CONCLUSIONS:** The deletion of 5LO results in decreased inflammatory microenvironment and polyposis. These data indicate that initial implantation of the comprehensive robotic training curriculum was feasible with all participants completing training. Moreover, significant performance improvement was documented after a modest amount of practice with all trainees achieving proficiency. Further adoption of this curriculum is encouraged.
CONCLUSIONS: Certain cytokines apart from MCP-3 and SDF-1 are upregulated and are downregulated on the 10th day. These can be further pursued to isolate key homing factors for mesenchymal stem cells (MSC). We aim to identify the cytokines that are upregulated that could be stem cell homing factors in the anal sphincter after acute injury.
Su1841
A Sprayable Hyaluronate/Carboxymethylcellulose Based Adhesion Barrier Reduces Remote Intraabdominal Adhesion Formation and Does Not Impair Intestinal Healing
1General Surgery, Boston Medical Center, Boston, MA; 2Genzyme Corporation, Cambridge, MA

BACKGROUND: Intraabdominal adhesions are a significant source of postoperative morbidity. While biodegradable solid physical barriers such as modified hyaluronate/carboxymethylcellulose (HA/CMC) film (Seprafilm - SS) are effective in preventing adhesions, their efficacy is limited to the site of application. The aim of this study was to compare the effectiveness of modified HA/CMC sprayable powder (Sepraspray - SS) and SF in preventing adhesions not only to sites of direct application, but also to remote peritoneal defects to which a barrier was not directly applied.

METHODS: Adhesion reduction was assessed in a rat ischemic button model and also in a rabbit cecal-sidewall injury model. Intraabdominal adhesions were induced in 30 rats by creating 3 peritoneal sidewall ischemic buttons on each side of a midline incision. SS (5 mg/button) or SF (1 cm² button) was applied intraoperatively over the 3 ischemic buttons on one side of the midline only. Adhesions were induced in 50 rabbits by cecal ablation with the concurrent creation of a 3 cm x 5 cm sidewall defect delineated with silk sutures and knots. Operated control animals received no SS or SF. On day 7, adhesions were scored in rats as the percent of buttons with attached adhesions and in rabbits as the % of the sidewall defect covered by adhesions. To assess the effect of either SS or SF on intestinal healing, an additional 27 rats underwent a colonic transection distal to the cecum, which was repaired with an end-to-end anastomosis. SS or SF was applied circumferentially to the anastomosis. Exposure of the luminal colonic sections were removed 7 days later and their integrity was assessed by burn pressure and tensile strength measurements.

RESULTS: The direct application of both SS and SF significantly (p < 0.04) reduced adhesion formation compared to controls in both efficacy models (Table). While SF had no remote effects on adhesion formation in either model, SS significantly (p < 0.01) reduced adhesion formation to ischemic buttons to which the powder was not directly applied. In rabbits, SS reduced remote adhesion formation to the sidewall defect by 70% (p < 0.1). In the anastomosis healing model, neither SS nor SF affected intestinal anastomotic burst pressure (Control: 240 ± 8.2 vs. SS 251 ± 19.0 vs. SF: 216 ± 27.2 mm Hg) or tensile strength (Control: 2.4 ± 0.2 vs. SS: 2.3 ± 0.2 vs. SF: 2.2 ± 0.2 Newton).

Su1842
The Micro-RNA 192 as an Effective Response Prediction Factor in the Multimodality Treatment of Gastric Cancer
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BACKGROUND: Neoadjuvant multimodality treatment is frequently applied to improve the poor prognosis associated with locally advanced esophageal cancer. However, only patients with a major histopathologic response to neoadjuvant therapy seem to have a significant survival benefit. We have shown in a recent pilot study using microarray technique that the expression profile of microRNAs depends significantly on the histopathologic response of patients with locally advanced esophageal cancer undergoing multimodality treatment. This study aimed to validate these identified single microRNAs by real-time PCR.

METHODS AND PATIENTS: Eighty-eight patients with locally advanced esophageal cancer (cT4-L, N0, M0) were included in the study. All patients received neoadjuvant chemoradiation (capecitabine, S-5, 45 cGy) and subsequently underwent transhiatal esophagectomy. Histopathologic response was defined as major histopathologic response when resected specimens contained less than 10% vital residual tumor cells (major response: 34 patients; minor response: 54 patients). Intratumoral microRNAs was isolated from pretherapeutic tissue biopsies and corresponding surgical specimens. Based on the microarray results, the amplification profile of dysregulated microRNAs was analyzed and the microRNAs 192, 194 and 622 were selected for the further analysis of the validation population.

RESULTS: The expression of all three microRNAs was significantly reduced during neoadjuvant therapy, showing lower levels in post-therapeutic tumor samples (p < 0.001). Furthermore, the pretherapeutic intratumoral expression of microRNA 192 was significantly correlated with histopathologic response: patients with a major response had a significantly higher microRNA 192 amount compared with patients having a minor response (p < 0.01). Moreover, by using an expression cut-off value of 0.63, the sensitivity, specificity and accuracy of pre-therapeutic intratumoral microRNA 192 expression for assessment of histopathologic response was 96%, 82% and 96% respectively (p < 0.05).

CONCLUSION: Our data support the role of micro RNA 192 as a predictive marker for the response in the multimodality therapy of patients with locally advanced esophageal cancer. In a multi-institutional trial we will now confirm these results.
Sui1843
Diazoxide, a Opening mitoATP, Reduces Liver Damage Secondary to Ischemic/Reperfusion Injury
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BACKGROUND/AIM: Previous studies have demonstrated that diazoxide protects heart from ischemia/reperfusion injury however there are no prior studies of the role of diazoxide on liver ischemic reperfusion injury. In the present study we evaluated the effect of diazoxide on local and systemic liver ischemia/reperfusion injury.

METHODS: Wistar male rats underwent partial liver ischemia performed by clamping the pedicle from medium and left anterior lateral segments during an hour under mechanical ventilation. They were divided into 2 groups: Control Group (n = 26): rats received saline and Diazoxide Group (n = 26): rats received IV diazoxide (3.5 mg/kg) 15 minutes before liver reperfusion. Four and 24 hours after reperfusion, blood were collected for determinations of AST, ALT, TNO-α, IL-6, and IL-10. Liver tissues were assembled for histologic analysis, malondialdehyde (MDA) content, and mitochondrial oxidation and phosphorylation. Pulmonary vascular permeability and myeloperoxidase (MPO) were also determined.

RESULTS: Four hours after reperfusion Diazoxide Group presented elevation of AST, ALT, TNO-α, IL-6 and IL-10 serum levels significantly lower than Control Group (p < 0.05). No differences in liver MDA content and on mitochondrial dysfunction were observed in Diazoxide Group in comparison with Control Group (p > 0.05). No differences in pulmonary vascular permeability and MPO activity were observed between groups. Twenty four hours after reperfusion, inflammation probably by a mechanism related to mitochondrial function preservation during liver ischemia.

CONCLUSION: Diazoxide attenuates liver ischemia/reperfusion injury probably by a mechanism related to mitochondrial function preservation during liver ischemia.

Sui1844
Peristelline Induces Mitochondrially-Derived Apoptosis in Pancreatic Cancer Cells by Increasing MnSOD Activity and Release of Cytochrome C and Smac/DIABLO
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BACKGROUND: We have previously shown that Peristelline (3,5-dimethoxy-4-coumaroylstilbene), a compound found in blueberries, inhibits cell proliferation and promotes apoptosis in pancreatic cancer in vitro by induction of mitochondrial membrane depolarization and caspase 3/7 activation. To further investigate this role of mitochondria in Peristelline-induced apoptosis in pancreatic cancer, we examined its effects on manganese superoxide dismutase (MnSOD) activity, Cytochrome C and Smac/DIABLO release. The mitochondrial enolase MesSOD plays a critical role in regulation of cancer cell proliferation through an unknown mechanism. Smac/DIABLO is a mitochondrial protein that potentiates apoptosis. Both Smac/DIABLO and Cytochrome C have been shown to exit mitochondria and enter the cytosol during apoptosis.

RESULTS: Peristelline would increase MnSOD activity and cytosolic levels of Cytochrome C and Smac/DIABLO in a dose-dependent manner.

METHODS: Mia and Panc-1 cell lines were treated with 25 micromolar and 50 micromolar concentrations of Peristelline for 48 hrs and quantitative MnSOD activity was measured by superoxide dismutase ELISA assay. In separate experiments, Mia and Panc-1 cell cells were treated with 25 micromolar, 50 micromolar and 75 micromolar concentrations of Peristelline for 24 hrs and cytosolic extracts were analyzed for Cytochrome C and Smac/DIABLO utilizing ELISA protocols. Using a bioinformatic approach, we identified putative HuR targets from the 540 overexpressed genes identified in previous studies. HuR binding to mRNA targets was validated by PCR-based analysis in ribonucleoprotein immunoprecipitated with antibodies against HuR. Further validation of expression of HuR target genes was performed by quantitative PCR analysis and immunoblotting.

RESULTS: Peristelline increased enzymatic activity of MnSOD. Peristelline increased MnSOD activity in both Mia and Panc-1 cell lines in a dose-dependent manner (p < 0.01). Peristelline treatment increased cytosolic levels of Cytochrome C in both Mia and Panc-1 cell lines (p < 0.01) and 75 micro molar concentrations in Panc-1 cells (p < 0.01).

CONCLUSION: Although BDL was also associated with pulmonary neutrophil infiltration it was not associated with increased IL-10 or TNF-α levels on day 2, increased plasma IL-10 and TNF-α levels on day 3, that peaked on day 3, in parallel with worsening hypotension and bradycardia; bronchoalveolar lavage (BAL) fluid neutrophil count and IL-10 level, and plasma apoptotic ami-notransferase (AST) level, also peaked on day 3; pulmonary neutrophil infiltration and plasma creatinine level peaked on day 4. Liver injury evidenced by raised AST after hepatic obstruction was exacerbated by PDL. Increased plasma IL-10 and TNF-α levels on day 2 after BDL, subsided thereafter. Although BDL was also associated with pulmonary neutrophil infiltration it was not associated with increased IL-10 or neutrophils in BAL fluid. BDL-induced renal tubular damage was associated with raised plasma creatinine. Our findings indicate that the high mortality rate seen in PDL-induced acute pancreatitis in mice is associated with proinflammatory cytokine release in both cell lines with treatment at the 75 micromolar concentration of Peristelline (p < 0.01).

CONCLUSION: We have previously demonstrated that Peristelline, a natural plant-derived stilbene, inhibits pancreatic cancer in vitro through activation of the mitochondrial apoptosis pathway. MnSOD, an inducible mitochondrial enzyme that converts superoxide anion to hydrogen peroxide, has an essential role in regulation of pancreatic cancer cell proliferation. The results of our current study confirm the previous work that Peristelline increases MnSOD activity in pancreatic cancer cells. In addition, Peristelline increases cytosolic levels of Cytochrome C and Smac/DIABLO in both cell lines, confirming mitochondrial model-driven apoptotic cell death. Further studies are ongoing to elucidate the intricate relationship between intrinsic apoptosis, MnSOD activity, and pancreatic cancer cell death upon Peristelline treatment.

Sui1845
Systemic Inflammation with Multorgan Dysfunction Is the Cause of Death in Murine Pancreatic Duct Ligation-Induced Acute Pancreatitis
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 Existing animal models of acute pancreatitis (e.g., cerulein, choline-deficient ethionine-supplemented diet) do not resemble gallstone pancreatitis as the etiologies are not analogous. Distal pancreatic duct ligation (PDL) more closely resembles early events in gallstone pancreatitis. We recently developed a novel murine model of PDL-induced acute pancreatitis associated with substantial mortality. Using this model, we previously showed that specific inhibition of the stress kinase ERK with in vivo gene modulation significantly improves survival. In the present study we determine the cause of death in our murine model by serial examination of multiple parameters in three groups: a) Acute pancreatitis group had PDL; b) Hepatic obstruction group had bile duct ligation (BDL) without PDL; c) Sham operation group. The mice were observed for 15 days post-operative. BDL and Sham controls had no mortality. Close to 100% mortality was seen in PDL-induced acute pancreatitis with most deaths occurring between day 2 and day 4. Characteristics of mice with acute pancreatitis included the following (ANOVA, P < 0.05): ERK activation in the pancreas and distant organs; pancreatic neutrophil infiltration and acinar cell necrosis maximal on day 2; increased plasma IL-10 and TNF-α levels on day 2, that peaked on day 3, in parallel with worsening hypotension and bradycardia; bronchoalveolar lavage (BAL) fluid neutrophil count and IL-10 level, and plasma apoptotic aminotransferase (AST) level, also peaked on day 3, pulmonary neutrophil infiltration and plasma creatinine level peaked on day 4. Liver injury evidenced by raised AST after hepatic obstruction was exacerbated by PDL. Increased plasma IL-10 and TNF-α levels on day 2 after BDL, subsided thereafter. Although BDL was also associated with pulmonary neutrophil infiltration it was not associated with increased IL-10 or neutrophils in BAL fluid. BDL-induced renal tubular damage was associated with raised plasma creatinine. Our findings indicate that the high mortality rate seen in PDL-induced acute pancreatitis in mice is associated with pro-inflammatory cytokine release in both cell lines with treatment at the 75 micromolar concentration of Pterostilbene (p < 0.01).

RESULTS: Pterostilbene, a natural plant-derived stilbene, inhibits pancreatic cancer in vitro through activation of the mitochondrial apoptosis pathway. MnSOD, an inducible mitochondrial enzyme that converts superoxide anion to hydrogen peroxide, has an essential role in regulation of pancreatic cancer cell proliferation. The results of our current study confirm the previous work that Pterostilbene increases MnSOD activity in pancreatic cancer cells. In addition, Pterostilbene increases cytosolic levels of Cytochrome C and Smac/DIABLO in both cell lines, confirming mitochondrial model-driven apoptotic cell death. Further studies are ongoing to elucidate the intricate relationship between intrinsic apoptosis, MnSOD activity, and pancreatic cancer cell death upon Pterostilbene treatment.

CONCLUSION: We have previously demonstrated that Peristelline, a natural plant-derived stilbene, inhibits pancreatic cancer in vitro through activation of the mitochondrial apoptosis pathway. MnSOD, an inducible mitochondrial enzyme that converts superoxide anion to hydrogen peroxide, has an essential role in regulation of pancreatic cancer cell proliferation. The results of our current study confirm the previous work that Peristelline increases MnSOD activity in pancreatic cancer cells. In addition, Peristelline increases cytosolic levels of Cytochrome C and Smac/DIABLO in both cell lines, confirming mitochondrial model-driven apoptotic cell death. Further studies are ongoing to elucidate the intricate relationship between intrinsic apoptosis, MnSOD activity, and pancreatic cancer cell death upon Peristelline treatment.
Basic: Small Bowel

Su1847
Changes in Neurotransmission via Alpha- and Beta-Receptors During Postoperative Ileus in Rat Circauseal Jejunal Muscle
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BACKGROUND: Our aim was to: 1) investigate the role of α and β-receptors in control of contractile activity in rat circular jejunal muscle, 2) explore changes in adrenergic neurotransmission via these receptors during postoperative ileus (POI), 3) determine if these changes are paralleled by intramural inflammation and delayed intestinal transit.

METHODS: Muscle strips (n = 8/rat) from 6 male Sprague-Dawley rats per group were studied in organ chambers. Groups: Naive controls (NC), sham controls (SC) 24 h after laparotomy, rats 12 h (P12h), 1 (P1d), 3 (P3d), and 7 days (P7d) after laparotomy and standardized small bowel manipulation to induce POI. After spontaneous contractile activity (g/mm/min) was recorded, dose-response curves for phenylephrine (oa, α-agonist; 10−8−5×10−6 M) and isoprenaline (βa, β-agonist; 5−10−10−10 M) were established. Responses were repeated with tetrodotoxin (TTX; blocking enteric nerves; 10−6 M), after precontraction with betahanechol (3 × 10−6 M), and with phentolamine (α-antagonist; 10−5 M), or propranolol (βa-antagonist; 5−10−6 M). Intestinal transit was studied by charcoal transit (% of small bowel passed). Histology of jejunal whole mounts was performed for myoelectrophysiological active cells (MPO), macrophages, and mastcells (mm2). Data: mean ± SEM.

RESULTS: Spontaneous contractile activity was increased in P12h (NC 3.3 ± 0.5, P12h 4.5 ± 1.5; P7d 3.6 ± 1.0, p < 0.05), but not in P1d (1.7 ± 0.4 and TTX 1.8 ± 0.5; p = NS). oa and ja inhibited spontaneous contractile activity dose-dependently in all groups (p < 0.05). In NC, TTX reduced oa-induced inhibition (p < 0.05), but TTX had no effect on oa-responses in POI groups (p = NS). In contrast, TTX did not affect ja-response in NC (p = NS), but increased responses in POI groups (p < 0.05). oa and ja-induced inhibition was reduced in P12h, P3d, and P7d and in all POI groups, respectively (p < 0.05). Intestinal transit was delayed in all POI animals and recovered over time (NC 53 ± 2, P12h 22 ± 2, P7d 44 ± 2%, p < 0.05), but was unaffected in SC (50 ± 5%; p = NS). MPO positive cells and mastcells increased postoperatively and peaked in P1d (NC 14±2, P1d 76±48) and P12h (NC 9 ± 1, P12h 700 ± 79; p < 0.05), respectively; no effect was observed in SC (56 ± 17 and 30 ± 12, respectively; p = NS). Macrophages peaked in P3d (NC 367 ± 41, P3d 1.006 ± 178; p < 0.05), counts in SC and P12h were similar to NC (SC 395 ± 82, P12h 706 ± 19; p = NS).

CONCLUSION: Contractile activity can be inhibited predominantly via muscular α- and β-receptors. However, during POI long lasting changes in balance of muscular and neuronal α- and β-receptors occur that might participate in pathophysiology of POI. These changes are paralleled by intramural inflammation and impaired intestinal transit.

Su1848
Central Vagal Activation During Early Postoperative Ileus in the Mouse
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INTRODUCTION: Postoperative ileus (POI) involves reflex inhibition of intestinal motility and a subsequent intestinal inflammatory response that is characterized by effenter vagal modulation. However, the role of central vagal afferents in the early phase of POI is unknown. We, therefore, aimed to explore central vagal afferent nerve activation early during POI.

METHODS AND MATERIALS: C57BL/6 mice were vagotomized 2−4 days prior to ileus experiments, while control animals received a sham operation without vagotomy. For ileus experiments, ligature was either performed with standardized small bowel manipulation to induce POI or sham treatment for control. Then, after 3h or 9h, the brain was removed. Fixed and immunohistochemistry was performed to determine neuronal activation in the vagal nucleus of the solitary tract (NTS) and the area postrema. Each subgroup contained an n of 6 data were analyzed by two-way ANOVA.

RESULTS: The number of Fos-positive neurons in the NTS was 15 ± 0.5 at 3 h following ileus which was not different from 14 ± 0.4 in sham controls and uninfuenced by vagotomy (12 ± 2). At 9h after induction of POI, the number of Fos-positive neurons was increased in the NTS to 36 ± 6 compared to 60 ± 4 in sham controls (p < 0.05) which was not different to 74 ± 4 neurons after vagotomy (n.s.). In the area postrema, after performing a vagotomy, the number of Fos positive cells was higher during POI at 9 h compared to sham controls (14 ± 2 in POI vs 2 ± 1 in sham controls, p < 0.05).

CONCLUSIONS: Central nerve activation in the NTS occurs via vagal afferents 9 h after induction of POI. This suggests that vagal afferents projecting to the CNS are sensitized, potentially by inflammatory mediators released in the intestinal wall. Central activation in the area postrema may be secondary to higher permeability of the blood-brain-barrier in this area, allowing access of inflammatory mediators via the systemic circulation with subsequent neuronal activation.

CONCLUSIONS: H2S at physiologic concentrations and L-cysteine inhibit contractile activity of rat jejunal circular muscle. The inhibitory effect of H2S on jejunal circular muscle does not appear to be mediated via K+ channels as in the vascular tree or by the more classic pathways via the enteric nervous system, a nitric oxide pathway, activity of visceral afferent nerve fibers, or K+ channels but rather via myosin light chain phosphatase. [Support KO1-DK93377 (MGI)].
Molecular Determinants of Hyperthermic Intraperitoneal Chemotherapy (HIPEC) in a Model of Peritoneal Gastric Cancer Carcinogenesis

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Energy Metabolism Following High-Fat Diet and Bariatric Surgeries (Gastric Bypass, Sleeve Gastrectomy, Duodenal Switch and Ileum Transposition) in Rats

Male rats were fed with food containing either 60% or 10% fat (as controls) for 36 weeks, or subjected to gastric bypass (GB), sleeve gastrectomy (SG), duodenal switch (DS), SG + DS, ileum transposition (IT), or sham operation (SO) for 8–14 weeks follow-up. Energy metabolic parameters were measured by an open-circuit indirect calorimeter composed in comprehensive laboratory animal monitoring system.

RESULTS: The course of high-fat diet-induced obesity, total energy expenditure (TEE kcal/kg/rat), but not energy expenditure relating to body weight (EE kcal/kg/100 g b.w.), was elevated at 3 and 20 weeks but not at 36 weeks compared with age-matched controls. Respiratory exchange ratio (RER) was reduced, due to low production of CO2, (VCO2 ml/kg/h), throughout the course. After GB, TEE was unchanged, but EE was increased at both 3 and 14 weeks (P < 0.05). After SG, TEE was unchanged at 3 weeks but reduced at 14 weeks. Oxygen consumption (VO2 ml/kg/h) was elevated at both 3 and 14 weeks, whereas VCO2 was unchanged at 3 weeks but increased at 14 weeks. After SG, neither TEE nor EE was changed neither at 2 nor 11 weeks compared with controls. RER was increased only at 11 weeks during nighttime. After DS, TEE, but not EE, was reduced during both daytime and nighttime at 2 and 8 weeks compared with preoperative levels. RER was reduced at 2 weeks but increased at 8 weeks during daytime but unchanged during nighttime. After SG + DS, TEE was reduced at 2 weeks (both daytime and nighttime) and 8 weeks (both daytime and nighttime), whereas EE was unchanged only at 8 weeks (both daytime and nighttime). RER was reduced at 2 weeks but increased at 8 weeks during daytime but unchanged during nighttime. After SG + DS, TEE was reduced at 2 weeks (both daytime and nighttime) and 8 weeks (both daytime and nighttime). After SG + DS, RER increased at 2 weeks and decreased at 8 weeks (both daytime and nighttime). After IT, neither TEE nor EE was changed at 2 weeks. Resting VO2 and VCO2 (during 7–8 a.m) were increased. RER was increased during both daytime and nighttime, due to higher VCO2.

CONCLUSIONS: In high-fat diet-induced obese rats, TEE was increased initially and energy was provided mainly by fat metabolism. GB or SG + DS increased EE and the fat oxidation, whereas SG or IT was without effects on EE but increased the carbohydrate metabolism. The hypermetabolic state is likely to contribute to the metabolic benefits after IT procedure.

High Expression of Telomerase Is an Independent Prognostic Factor in Ampullary Carcinoma

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The 5-year survival rates of the patients with high or low telomerase activity were 66.2% and 94.4%, respectively. Telomerase activity and expression showed a tendency toward association with prognosis (P = 0.054). In multivariate analysis, only telomerase activity (P = 0.031) were significantly associated with disease specific survival. TERT expression showed a tendency toward association with prognosis (P = 0.054). In multivariate analysis, only telomerase activity remained independent predictors of prognosis (P = 0.013). The 5-year survival rates of the patients with high or low telomerase activity were 66.2% and 94.4%, respectively.

CONCLUSIONS: Our results suggest that telomerase activity has a prognostic significance for survival in patients with resected ampullary carcinoma. Telomerase activity may provide a new marker for evaluating the progression of patients with ampullary carcinoma, and may help to identify patients in need of adjuvant treatment.
Single Incision Laparoscopic Cholecystectomy: A Combined Analysis of Resident and Attending Learning Curves at a Single Institution

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INTRODUCTION: Single Incision Laparoscopic Cholecystectomy (SILC) is a recent technical modification on standard laparoscopic cholecystectomy that has been shown to be safe and feasible. Studies to date have focused on determining the role of SILC in modern surgery. Recent studies suggest that experienced laparoscopic surgeons have a shorter learning curve to become proficient in SILC. However, little is known about the interaction of the learning curves of residents and attending surgeons at academic teaching programs.

METHOD: We prospectively evaluated various metrics of both attending and resident surgeons as they progressed in their experience with SILC. Patients were placed into cohorts of 25 based on teaching surgeon experience. Data recorded included patient specific variables as well as operative variables, complications, conversions, standard laparoscopic cholecystectomy, and outcomes.

Operative Times of Patient Cohorts Versus Teaching Surgeon Experience

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<tr>
<th>Cohort</th>
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<th>3rd</th>
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<th>(Patients 1–24)</th>
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<th>(Patients 75–101)</th>
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<td>Operative</td>
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Each cohort represents 25 patients.

RESULTS: 101 patients underwent SILC. 17% of patients required conversion to standard laparoscopic cholecystectomy. No significant difference was found in operative times between that of standard laparoscopic cholecystectomy, as well as within the experience-based cohorts (p = 0.152). 143 patients responded (response rate 65%), 71% were female (63%) received preoperative, 35% (25%) postoperative XRT, and 55 (38%) were treated with surgery alone. Data: median (range) or mean (SD).

RESULTS: Patients treated without XRT were older compared to both other groups (66 [38–93] years vs. preoperative XRT 57 [25–92] and postoperative XRT 60 [37–93]; p < 0.05). While patients who underwent postoperative XRT had the longest follow-up (93 [6–137] months vs. preoperative XRT 47 [1–104] and no XRT 56 [1–112]; p < 0.05). Gender distribution was comparable between groups (NS) while XRT patients had higher tumor stages (p < 0.05). Ultrasound infection was impaired after preoperative XRT compared to patients treated with surgery alone (p < 0.03), while postoperative XRT had no effect. Patients reporting that their QOL was worse after APR showed higher AUSI symptoms scores (11.2 [6–6] vs. better 7.2 [5–7] and similar 8.8 [6; 4]; p = 0.02) and AUSI satisfaction scale scores (2.9 [1.2] vs. better 1.8 [1.5] and similar 2.2 [1.2]; p = 0.01), demonstrating correlation of deteriorated urinary function with perception of impaired QOL after APR. Pre- and postoperative XRT increased sexual dysfunction in female patients (p < 0.05), while sexual function in male patients was unaffected by pre- and postoperative XRT (NS). However, male APR patients had impaired sexual function on all domains of the BSI compared to previously published, age-stratified controls (p < 0.05). 33% of patients were sexually inactive at follow-up with higher age, preoperative vs. no XRT, and not living in a relationship being associated with sexual inactivity in multivariable analysis (p < 0.05). In sexually inactive patients, younger age, female gender, and preoperative vs. no XRT were associated with the feeling that surgery for rectal cancer caused sexual inactivity (p < 0.05). Postoperative vs. no XRT had no such effect (NS).

CONCLUSIONS: Although urinary and sexual function might be impaired after APR, effects of XRT appear to be limited. Indication and timing of XRT should be based on oncological aspects rather than on QOL and functional outcome considerations.

Hospital Costs, Length of Stay and Readmission Rates for C. Difficile Colitis Comparing Outcomes Between CDC as the Primary and Secondary Admission Diagnosis

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PURPOSE: It is unknown how C. difficile colitis (CDC) patients differ in terms of hospital costs, length of hospital stay (LOS) and readmission rates depending on whether patients were admitted principally to treat CDC versus developing CDC while admitted for other reasons.

METHODS: After IRB approval, the MarketScan Research Database was used to study individual-level healthcare claims data for the 2007 year. Patients with employer-based insurance for 12 continuous months and who were treated in the hospital for CDC were analyzed. A principle admission diagnosis of CDC during hospitalization was defined as primary CDC (PCDC), while secondary CDC (SCDC) was defined as contracting CDC while in the hospital for other reasons. Two-sample t-tests and z-tests were used for a comparison of means, Chi-square tests were used to test associations, and logistic regression was conducted to analyze 30-day and 60-day readmission rates for CDC.

RESULTS: Among the study population, SCDC was more common and associated with greater hospital costs and longer LOS than PCDC. Admission to the hospital for digestive disorders was set as the primary CDC (PCDC), while secondary CDC (SCDC) was defined as presenting with 1-24 days to CDC while in the hospital for other reasons. A principal admission diagnosis of CDC during hospitalization was defined as primary CDC (PCDC), while secondary CDC (SCDC) was defined as contracting CDC while in the hospital for other reasons. Two-sample t-tests and z-tests were used for a comparison of means, Chi-square tests were used to test associations, and logistic regression was conducted to analyze 30-day and 60-day readmission rates for CDC.

CONCLUSIONS: Among the study population, SCDC was more common and associated with greater hospital costs and longer LOS than PCDC. Admission to the hospital for digestive system disorders is associated with developing CDC. Readmission rates for subsequent bouts of CDC are two to three times as likely for PCDC. A surprisingly large percentage of patients are not provided with antibiotics at discharge, which helps explain the observed re-admission rates and may indicate a widespread under-treatment of the disease.
Su1605 Laporasposcopic Ventral Rectectomy for Rectal Prolapse Using Biological Mesh
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BACKGROUND: In this retrospective study we evaluated the results of patients with severe pelvic organ prolapse treated with a laparoscopic ventral rectopexy (LVR) using biologic mesh.

METHODS: A retrospective review was performed of all patients who underwent LVR between January 2006 and October 2010. LVR was performed in 35 consecutive women (median age 50 years, range 23-74 years). Patients were treated for severe pelvic organ prolapse (uterus prolapse stage ≥III, anal sphincter dehiscence, and/or rectocele). Twenty-five consecutive patients underwent LVR using biological mesh: a 4–5 cm pouch was created in the rectal wall, inserted into the lesser peritoneal sac, and closed with interrupted non-absorbable stitches. A biological mesh was then sutured anteriorly on the rectum with two parallel rows of interrupted non-absorbable stitches and secured proximally on the sacral promontory. Postoperative complications were evaluated with medical charts and telephone follow-up (minimum 6 months).

RESULTS: Twenty-five consecutive patients underwent LVR median age 61 range 46–78 years, median follow up was 4 months). Nineteen patients (76%) had a constipation score >1, 15 patients (65%) had a FI grade ≥1, and 3 patients (12%) had mixed CH and FI. One patient required conversion to open surgery (3%). Median length of stay was 2 days. We did not observe readmission. Two patients (12%) reported a radicalurea (2, 7%), primary peritoneal (2, 7%), endometrial (5, 12%), malignant solitary fibrous tumor (1, 3%), and an unknown gastrointestinal primary (1, 3%). The American Society of Anesthesiologists score was 3 or greater in 28 patients (93%). Median operative time was 426 minutes (range 350-466) and median blood loss was 800 milliliters (range 150-3,000). Seventeen patients (57%) required intraoperative blood transfusion (median 1 units, range 1-9). Median number of organs resected was 4 range (1-9). Completeness of cytoreduction (CCR) was CCR-0 in 18 patients (60%), CCR-1 in 5 patients (17%), and CCR-2 in 7 patients (23%). HIPEC was performed in 26 patients (87%). Eight patients (27%) required a stay in the intensive care unit for a maximum of 4 days, range 2-4 days, and the median hospital stay was 8 days range 4-63). There were 19 grade 3 or higher National Cancer Institute Common Toxicity Criteria complications in 14 patients (47%, Table). The most common complication was bowel perforation/ fistula (6 patients, 20%). Eight patients (27%) required reoperation. The overall morbidity was 63%. Two patients (7%) died of complications directly related to surgery at 5 and 44 days postoperatively.

CONCLUSIONS: In this series of 265 patients of age who underwent CRS + HiPEC, the morbidity and mortality was comparable to that previously reported in the literature (major morbidity 12-66%, mortality 1-12%). Given the potential for significant morbidity associated with this treatment, patient selection for this procedure is critical.

Su1607 Liver Resection for Colorectal Metastases: Does Primary Tumor Grade Predict Positive Surgical Margins?
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BACKGROUND: The gold standard of treatment for hepatic colorectal metastases is radical surgical resection with R0 margins. In fact positive surgical margins are associated to a higher incidence of recurrences and lower survival rates. The aim of this paper was to evaluate the preoperative factors that predict the presence of residual neoplastic tissue in surgical resection margins in patients who underwent preoperative chemotherapy.

PATIENTS AND METHODS: 87 consecutive patients that underwent resection for colorectal metastases in our unit from January 2005 till December 2009 were enrolled. The patients were divided into 2 groups: group 1 with 48 patients (55%) that underwent liver resection after preoperative chemotherapy and group 2 with 39 patients (45%) that underwent resection of primary tumor alone. The following param- eters were taken into consideration: age, sex, primary tumor site, type of operation, tumor stage, grading of primary tumor, surgical margins classified as R0, R1 and R2. Univariate and multivariate analyses were performed.

RESULTS: Patients that underwent preoperative chemotherapy had a higher probability of positive surgical margins (R1 or R2) and subsequently a non radical operation compared to patients that underwent surgery alone (OR = 2.05). This result did not reach statistical significance.

CONCLUSIONS: The grading of the primary tumor seems to be significantly associated to positive surgical margins following liver resection for colorectal metastases. A higher grading probably determines the presence of micrometastases and therefore a higher incidence of positive surgical margins.

Su1608 Magnetic Resonance Enterography for Crohn’s Disease: What the Surgeon Can Take Home
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BACKGROUND: Crohn’s disease (CD) is a life long, chronic, relapsing condition that involves the entire digestive tract requiring often morphological assessment. MR enterogra- phy (MRE) offers advantages not just using tonization and yielding intra luminal and intra abdominal informa- tion. The aim of our study was to identify how MRE can be useful in planning surgical procedures.

PATIENTS AND METHODS: In this retrospective study we prospectively reviewed and analyzed 87 consecutive patients that underwent surgery for CD were enrolled from 2006 to 2010. MRE findings were compared to intraoperative findings. Histology of operative specimens, systemic inflammatory parameters (white blood cells count, platelets count, CRP, ESR, albumin, iron) and fecal lactoferrin were also evaluated. MRE identified bowel stenosis with a sensitivity of 0.95 (95% CI 0.76-0.99), a specificity of 0.72 (95% CI 0.39-0.92). The concordance of MRE findings with intraoperative findings was high (Cohen’s κ = 0.72 (0.16). Abscesses were detected with a sensitivity of 0.92 (95% CI 0.62-0.99) with a specificity of 0.90 (95% CI 0.69-0.98) with a Cohen’s κ = 0.52 (0.16). MRE identified bowel fistulas with a sensitivity of 0.71 (95% CI 0.42-0.90), a specificity of 0.17 (95% CI 0.52-0.90) and with Cohen’s κ = 0.47 (0.17). The grade of proximal bowel dilation was significant (p = 0.03) between patients that underwent bowel resection either at univariate or at multivariate analysis.

CONCLUSIONS: MRE findings were missing significantly with disease activity and decided that the patient should undergo surgical treatment MRE can provide the surgeon useful and adequate information about abscess, stenosis and fistulae. Detailed information in patients could suggest percutaneous drainage that could ease the following surgery or avoid emergency laparotomy. Proximal bowel dilation can suggest the possibility to perform bowel sparing surgery such as strictureplasty.
Diverticulitis is a common 
BACKGROUND AND AIMS: 
CONCLUSIONS: Our finding of significantly worse outcomes for elective surgical treatment of diverticulitis in older adults, and especially among those with CHF and COPD, suggests that a reappraisal of the proper role of elective surgery in this population may be warranted.
Su1612
Ileoecoccectomy for Crohn's Disease (CD): Which Factors Augment Intraoperative Small Bowel Preservation? Liliana Bordinato1, Richard A. Hodor2, Abdelmietin Duran3, Joshua R. Korzenik2, Vanessa P. Ho1, Toyoki Sonoda2, Sang Lee1, Shannon L. Stein2
1Surgery, Massachusetts General Hospital, Boston, MA; 2Colon & Rectal Surgery, Cornell University, New York, NY; 3Colon & Rectal Surgery, Case Western Reserve University, Cleveland, OH

INTRODUCTION: Preservation of small bowel is a crucial element in surgery for patients with CD, yet it is not known whether perioperative factors or preoperative therapies influence specimen length. Our aim was to utilize a large multicenter database of CD patients treated with ileoecoccectomy (IEC) to determine predictors of length of small bowel resection.

METHODS: Retrospective analysis of prospectively collected data on patients with CD who underwent IEC between 9/1993-10/2010 at two academic centers was performed. T-tests were used to determine whether the mean length of small bowel resection (length of colon excluded) was modified by patient demographics, preoperative medical treatment, type of CD, or surgeon expertise. A Multiple Linear Regression model was fitted to account for confounders and to identify predictors of length of resection.

RESULTS: 269 CD patients (51% female, mean age 39 y) were included. On univariate analysis, the mean length of small bowel resection (20.8 cm, SD 17.18 cm) was not affected by age (p = 0.23), sex (p = 0.12), history of prior resections (p = 0.23), presence of fibrostenotic (p = 0.51), penetrating (p = 0.78) or active disease (p = 0.97). Patients with microscopically positive margins were not spared bowel length (22.5 vs 19.8 cm, p = 0.34). Patients with suspected malignancy had a longer resection margin (24 ± 19.6 cm, p = 0.011; 5-ASA (p = 0.54), steroids (p = 0.51), azathioprine (p = 0.59) and TNF agents (p = 0.13) did not augment length of resection, however exposure to 6-MP within 3 months of surgery decreased resection length (17 ± 22.4, p = 0.03). Surgeons with expertise in CD were more likely to salvage bowel (19.9 vs 29.5 cm, p = 0.0008). On multiple linear regression history of prior resections (p = 0.0001), suspected malignancy (p = 0.02) and surgery by a non-expert (p = 0.0004) were predictive of longer resections.

CONCLUSIONS: Length of small bowel resection during ileoecoccectomy for CD is most affected by surgical expertise, concerns for malignancy and history of prior resections. Various preoperative medical regimens do not appear to have an effect on ultimate resection length.

Su1613
Laparoscopic Heller's Myotomy and Fundoplication in Patients with Massive Dilated Megaeosophagus Carlos Pantanal1, Fernando A. Herbelina2, Maria A. Henry3, Jose F. Fatah1, Marco G. Patti4, Jose C. Del Grande1
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INTRODUCTION: Laparoscopic Heller's myotomy and fundoplication is considered the treatment of choice for non-advanced achalasia. The optimal treatment for end-stage achalasia with esophageal dilation is still debatable.

AIMS: This study aims to evaluate in a multicenter and retrospective study the outcomes of patients with massive dilated esophagus submitted to laparoscopic Heller's myotomy.

METHODS: 11 patients (mean age 56 years, 6 men) with massive dilated megaeosophagus (maximum esophageal diameter >10 cm) underwent a laparoscopic Heller myotomy and Pinotti fundoplication between 2000 and 2009 in three different institutions. Preoperative workup included upper digestive endoscopy, esophagogram and esophageal manometry in all patients. Symptoms were evaluated at the last follow-up.

RESULTS: On follow-up (mean 29, range 3–81, months), postoperative complaints were mild and occasional dysphagia to solid food in 4 (36%), severe dysphagia in 3 (27%) and absence of dysphagia in 4 (36%) patients. All patients gained weight except for the 3 patients with severe dysphagia. The 3 patients with severe dysphagia underwent esophageal dilation (n = 2) or laparoscopic esophagectomy (n = 1) and currently complain of occasional dysphagia and gained weight.

CONCLUSION: Heller's myotomy and fundoplication relieves dysphagia even in patients with massive dilated esophagus.

Su1614
Efficacy and Durability of Laparoscopic Heller Myotomy: Patient Symptoms and Satisfaction at Long Term Follow Up John G. Lim5, Anthony N. Chan6, Sarwat Ahmed, Peter Muncarcia7, W. S. Melvin8, Kyle A. Perry

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INTRODUCTION: Laparoscopic Heller myotomy with partial gastric fundoplication has become the standard treatment for achalasia. While this procedure has demonstrated excellent short term outcomes, there is a paucity of data regarding long term patient symptoms and satisfaction after the operation. We report a single institution series of minimally invasive Heller myotomy with long term evaluation of gastroesophageal reflux (GERD) symptoms, dysphagia, and patient satisfaction.

METHODS: A retrospective review of a prospectively collected database was conducted for patients undergoing laparoscopic Heller myotomy from 1995–2006 under an institutional review board approved protocol. Long term follow-up evaluation was performed by mail or telephone questionnaire. Outcomes included operative data, treatment for recurrent dysphagia, GERD symptoms, and patient satisfaction with their operation. Post-myo-Myotomy reflux symptoms were assessed using the validated GERD-HQ10 instrument. A score greater than 20 was considered indicative of significant reflux symptoms, as this correlated with patient dissatisfaction.

RESULTS: 56 patients underwent primary laparoscopic Heller myotomy during the study period. At long term follow-up, 7 patients were deceased and follow-up was obtained in 51 (91%). Median follow up interval was 6 years (range 4–14 years). All operations were completed laparoscopically, and no patient required robotic assistance. All patients reported relief of dysphagia postoperatively. At long term follow up, 72% of patients had no further treatment for dysphagia. Of those with recurrent dysphagia, 2 patients underwent Botulinum injection, 5 underwent pneumatic dilation, and 1 required a second esophageal myotomy. All patients reported adequate relief of dysphagia after re-resection. 55% of patients used acid-suppressing medications to control GERD symptoms; however, only 10% of patients reported Velocard scores indicative of severe GERD that impacts patients’ overall satisfaction with their operation. When asked to reconsider their achalasia treatment, 97% of patients would choose laparoscopic Heller myotomy again.

CONCLUSION: Laparoscopic Heller myotomy provides durable, effective, long term dysphagia relief in the vast majority of patients. At a median follow-up interval of 6 years, patients remain highly satisfied with the operation. While patients report mild reflux symptoms, up to 10% report symptoms indicative of significant GERD that negatively impacts overall satisfaction with the operation.

Su1615
Advanced Esophageal Carcinoma: Is It Still Worth to Operate? Dean Bogoevski1, Matthias Reeb2, Maximilian Rockhorn2, Alexandra M. Koengi3, Asad R. Kutup4, Thomas Roeb5, Jakob Ibs4
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OBJECTIVES: The role of surgical therapy in patients with locally advanced esophageal cancer is still controversially discussed. There is also controversy about whether neo-adjuvant chemo or radio-chemotherapy should be the standard management in patients with locally advanced esophageal carcinoma. Furthermore, many gastroenterologists and oncologists believe that surgery should be avoided in locally advanced esophageal cancer due to high mortality and morbidity rates related to the procedure and the very low benefit for the patient.

MATERIAL AND METHODS: Retrospective analysis of prospectively collected data of 256 patients with locally advanced esophageal cancer (220 patients with pT3 and 36 patients with pT4) that were not neoadjuvantly treated and had 1 different institution. One-hundred-sixty-one patients underwent extensive Ivor-Lewis thoracoabdominal esophagectomy (TA) whereas 95 had limited transthiatal (TH) resection. Locally advanced esophageal cancer was defined, based on the final histological report of the resection specimen, as a tumor infiltrating the paraesophageal lymph nodes (pN3) or the adjacent structures, without respect of the lymph node affection, the distant metastases or the histological grading.

RESULTS: Complete resection (R0) was achieved in 74.9% of patients and that under the consideration of the lymph node affection and in 61.1% of the patients with TH resection (p = 0.016). The median lymph node yield in TA was significantly higher (25 lymph nodes, range 2-89) than in patients operated TH (14 LN, range 2–100; p = 0.008), although no benefit for overall survival was found for patients with radical lymphadenectomy (lymph node yield of 19 or more – median 9 months vs. lymph node yield of 18 or less – median 10.8 months; p = 0.480). Patients with locally advanced esophageal cancer but without evidence of tumor rest disease (pT3 & pM0 & R0, irrespective of the lymph node status) had similar overall survival (median 23.7 months, 5-Y survival 22.4%) to pT4 patients with no evidence of tumor rest disease (median 33 months, 5-Y of 27%; p = 0.152). The operative method had significant influence on the disease free survival (TA-median 12.1 months, 5-Y 22.9%; or TH -median 10 months, 5-Y 18.9%; p = 0.049, data not shown).

CONCLUSIONS: In locally advanced esophageal carcinoma (median 13.7 months, 5-Y of 14.4%) are comparable to the results of the patients neoadjuvantly treated with chemoradiotherapy (median 10 to 14 months, 5-Y of 19-23%).
Dysphagia After Esophagectomy for Esophageal Cancer
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OBJECTIVE: To assess the impact of site of anastomosis on dysphagia in esophageal carcinoma.

SUMMARY BACKGROUND DATA: As overall survival after esophageal cancer surgery remains poor, postoperative quality of life has gained importance as an additional outcome parameter. While the two most commonly used reconstructive methods, intrathoracic and collar anastomosis, have shown similar oncologic effectiveness, it remains undecided whether subsequent quality of life is different. The present analysis compares these reconstruction methods, focusing on dysphagia as the main postoperative symptom.

METHODS: Between 2003 and 2007, 71 patients (mean age 61.5 years; 72% male, 28% female) with complete resection of esophageal carcinomas (37 adenocarcinomas, 34 squamous cell cancers) and with long-term survival of at least 18 months were contacted and completed a modified quality of life (QoL) questionnaire (median 24.1 months after surgery). Our analysis compared the reconstruction groups using a gastric tube with either collar (group A, n = 36) or high intrathoracic anastomosis (group B, n = 35). In order to quantify the given answers from the patients and the extent of the dysphagia, we have devised a scoring system. For each question we have assigned a point allocation, depending on the impact of the symptoms or grade of dysphagia.

RESULTS: Postoperatively, the rate of surgical complications in our study population was 27.8% (anastomotic leakage 22.2%) in group A vs. 11.4% in group B (p = 0.075). The long-term follow-up showed symptoms of dysphagia in 29 patients (group A, n = 20; group B, n = 9; p = 0.007). Significantly more patients within group A had to undergo endoscopic bougienage (13 vs. 1, p < 0.0001). The scoring system significantly correlated with severe symptoms in patients with collateral anastomosis (median 17) compared to intrathoracic anastomosis (median 8).

CONCLUSION: High intrathoracic anastomosis appears to carry more risk for dysphagic symptoms compared with collar anastomosis, and should therefore be the preferred method for reconstruction after surgical resection of esophageal carcinoma.

Prognostic Factors for Adenocarcinoma of Esophagogastric Junction
Ronald A. Hinder, Horacio J. Asbun, C. Daniel Smith

INTRODUCTION: The incidence of Barrett’s esophagus is low in Chinese population. Most of our patients who have adenocarcinomas of the esophagogastric junction (AEG) are Siewert type II or III. This study aims to evaluate the outcome after surgical resection in this group of patients comparing clinicopathological differences between type II and III cancers, and identify prognostic factors.

MATERIAL AND METHODS: Patients who underwent resection for AEG tumors between 1995 and 2008 were included. Those with Siewert type I cancers were excluded. Data were retrieved from a prospectively collected database. Patient characteristics and clinicopathological data and outcome were evaluated.

RESULTS: There were 126 patients (99 men, 27 women). The median age was 70 yrs (range: 23-87). Type II tumors were found in 65 patients and type III in 61. Thoracotomy was required for tumor extraparation in 50 (76.9%) and 34 (55.7%) patients, respectively (p = 0.014). The operative blood loss was higher for type III tumors (median 300 ml vs. 400 ml, p = 0.005). There was no hospital mortality. Type III AEG was associated with significantly higher incidence of poorly differentiated cancer (44.6% vs. 73.8%, p = 0.003), higher number of nodal metastasis (median 3 vs. 7, p = 0.031), and advanced TNM stage (stage IIA-IV disease in 64.6% vs. 86.9%, p = 0.004). Overall median survival for the whole group was 17 months. Patients with type II AEG had longer survival (37.6 vs. 10.4 months), (p < 0.01). Independent variables identified by Cox regression model for better survival were Siewert type II (p = 0.021), earlier N-stage (p < 0.01) and R0 resection (p < 0.01).

CONCLUSION: Type III AEG tumors were more likely to be poorly differentiated, more advanced and had worse survival compared to type II AEG cancers. Other independent prognostic factors were N-stage and B-category of resection.

Revisional Surgery After Failed Esophagogastric Myotomy for Achalasia: Successful Esophageal Preservation
Bos E. Goldberg*, Steven F. Bowers, Michael Parker, John Stauffer, Ronald A. Hinder, Horacio J. Asbun, C. Daniel Smith

INTRODUCTION: Treatment failure with recurrent dysphagia after Heller myotomy occurs in fewer than 10% of patients, most of whom will seek reoperation. There exist only limited reports of reoperation with esophageal preservation in such patients.

METHODS AND PROCEDURES: We retrospectively reviewed the records of patients presenting for symptomatic treatment failure after Heller myotomy. From March 1998 to November 2010, 47 patients were evaluated. Seven patients had undergone more than one prior myotomy. Three patients became symptom-free after endoscopic dilation and/or Botox injection therapy, and seven patients opted not to undergo reoperation. Thirty-five of 37 patients underwent reoperation with the goal of esophageal preservation.

RESULTS: Thirty-five patients underwent laparoscopic reoperation for either presumed incomplete myotomy or anatomic distortion due to the fundoplication. Intraoperative findings were incomplete myotomy in 28 patients and fundoplication failure in 7 patients. Intraoperative esophagogastric perforation occurred in six patients. Fundoplication was not reconstructed in 15 patients. Of the 31 patients undergoing a first-time reoperation, 24 achieved relief of symptoms without re-intervention (77%). Less than half of patients undergoing two or more reoperations had successful reoperation. Three patients failed a strategy of esophageal preservation and eventually required esophagectomy.
Su1620
Endoscopic Stapling System for Trans Oral Treatment of GERD: Three Years Follow Up

INTRODUCTION: Between May and October 2007, an IRB approved, pilot study of a new endoscopic stapling device for the treatment of GERD was conducted on 13 subjects in Pune, India. Subjects with history of PPI use ≥2 y for GERD and no co-morbidity were included. The device is a modified gastroscope, which includes a surgical stapler, that fires a staggered quintuplet of standard titanium B shaped 4.8 mm staples, and an ultrasonic range finder. All procedures were done under general anesthesia by a single operator. Either 2 or 3 staple quintuplets were used to staple the fundus to the esophagus, creating a 90-180° degree anterior fundoplication over the distal 2-3 cm of the esophagus. This is a report of the results of a three year follow up on this group of subjects.

METHODS: The original informed consent specified that the subjects may be contacted annually or over 5 years following the study. Accordingly, subjects were contacted for a telephone interview during the first week of October 2010. The following data were collected: Velanovich GERD-HRQL scores, PPI use, symptoms, satisfaction with the procedure, and willingness to repeat the procedure again.

RESULTS: 11 of the 13 subjects could be reached by phone. GERD-HRQL scores were less than 9 or less in 10 subjects and 13 in one subject. The latter subject improved his score from 29 to 15, in all scores improved by more than 4. The subjects agreed to do the procedure again. Mean satisfaction score was 7.7 (6-10) on a scale of 1-10. There was no dysphagia reported. All subjects resumed PPI intake, (compared to 2 at the 2 y follow up) and 3 subjects report PPI at a reduced dose. 1 subject takes PPI only after large meal and 4 subjects remained completely off PPI.

CONCLUSION: At 3 years, the procedure remained effective in improving the quality of life in moderate to severe GERD without causing dysphagia. PPI use was eliminated or reduced in 73% of subjects. All subjects remain satisfied with the procedure and would do it all over again. Further studies are necessary to validate these data and determine optimal staple placement.

Su1621
Neoadjuvant Chemoradiotherapy Modifies the Histologic Grade of Esophageal Cancer

INTRODUCTION: The introduction of the number of nodal metastasis, grading and tumor location in the 2010 TNM staging could redefine the management of esophageal cancer. In early stages (T1a/T1b and T2a/T2b) histologic grade modulates stage grouping and prognosis. The aim of the study was to investigate the hypothesis that neoadjuvant Chemoradiotherapy (nCRT) may modify the grading of esophageal cancer.

METHODS: We evaluated 463 patients who underwent surgical resection for esophageal cancer or esophageo-gastric junction 252 had surgery (SURG) as first treatment and 211 had nCRT before surgery. Pathological findings were evaluated from the pre-treatment endoscopic biopsies and the surgical specimen. Patients who had R1-R2 were included in our analysis. Preoperative histologic grade was measured in 170 pts (123 SURG/47 nCRT) and squamous cell carcinoma (SCC) in 293 pts (129 SURG/164 nCRT). Median age was statistically different between SURG 60.4 years (IQR 59.9-66.3) and nCRT 65.8 years (IQR 58.7-71.2) p < 0.0001, while the sex distribution was similar in the SURG and nCRT groups. Histologic grade was unchanged in 172/252 (68.3%) in SURG group and 63/211 (29.9%) in nCRT group (p < 0.0001). The shift from less well-differentiated to well-differentiated grade was statistically different between the two groups: 9.5% (24/252) for SURG group and 64% (135/211) for nCRT group (p < 0.0001). The shift from less well differentiated to well-differentiated grade wasn’t correlated with the histological type: 9.125 AK (7.3%) and 13/212 SCC (11.6%) for the SURG group and 28/47 AK (59.6%) and 107/168 SCC (65.2%) for the nCRT group.

CONCLUSION: nCRT can modify the histologic grade of both AK and SCC of the esophagus. These findings, based on the 2010 TNM classification, affects stage grouping and prognosis.

Su1622
Incidence and Resolution of Anemia with Paraesophageal Hernia Repair

INTRODUCTION: Paraesophageal hernias may produce a variety of clinical sequelae. One of these is anemia, which may or may not be associated with esophageal or gastric ulcers. The purpose of this study was to assess the incidence of anemia in patients with paraesophageal hernias and frequency of resolution of anemia with hernia repair.

METHODS: Patients undergoing all types of laparoscopic or open paraesophageal hernia repairs from 7/96 through 9/10 were eligible for the study. Data gathered included age, gender, type of paraesophageal hernia, presence of anemia (defined as hemoglobin level <13.5 g/dl or symptomatic drop in hemoglobin), presence of symptomatic anemia or specific surgical referral for anemia from a paraesophageal hernia, presence of esophageal or gastric ulcers or erosions by endoscopy, type of repair, and resolution of anemia.

RESULTS: 187 patients underwent paraesophageal hernia repair, of these 66 (35%) were anemic. Of these anemic patients, 37 (56%) were symptomatic from their anemia or specifically referred for anemia. Of these, 30 (80%) were anemic or a pathologic drop in hemoglobin, 54 (89%) had anemia, 20 (30%) had esophageal or gastric ulcer or erosions. All patients underwent paraesophageal hernia repair, with 56 having documented follow-up. Overall, of these, 33 (59%) had resolution of their anemia. 68% of symptomatic patients had resolution of their anemia, compared to 48% of asymptomatic patients (p = 0.1). Of patients with esophageal/gastric ulceration/erosion, 85% were symptomatic and 94% had resolution of anemia, compared to 53% of patients without ulceration/erosion (p = 0.003).

CONCLUSIONS: Anemia is a common finding in patients with paraesophageal hernia. Most of these patients were symptomatic because of their anemia. Those patients with esophageal or gastric ulceration or erosion were very likely to have symptomatic anemia, and, interestingly, these patients were more likely to have their anemia resolve with paraesophageal hernia repair. Patients with asymptomatic anemia or no ulceration/erosion were less likely to have resolution of their anemia with paraesophageal hernia repair.

Su1623
The Hypertensive Upper Esophageal Sphincter Is Related to GERD and Is Improved by Antireflux Surgery

BACKGROUND: Hypertension of the upper esophageal sphincter (UES) is frequently encountered on manometric evaluation of foregut symptoms. Although the clinical significance of a hypertensive UES is variable, it has been suggested that it may be a result of esophageal acid exposure in patients with gastroesophageal reflux disease (GERD). There is no evidence in the literature to support this theory. We hypothesized that successful control of acid reflux with surgery in patients with GERD may lead to resolution of UES hypertension, if it is a reflux-related phenomenon.

METHODS: A prospectively maintained database of patients undergoing antireflux surgery at our institution was retrospectively reviewed for the years 2006 to 2009. Only patients with hypertensive UES (≥120 mmHg), preoperative objective findings of GERD and subsequent primary anti-reflux surgery were included in our analysis. Postoperative results were compared to preoperative UES pressure, while resolution of reflux was confirmed with 24-hour pH study.

RESULTS: Thirty-three patients met the inclusion criteria. Thirty-one of those had normalization of their postoperative pH and two had reduction without complete normalization. The mean preoperative UES pressure was 154.3 mmHg (range 121.7-250.3) (normal 30-120 mmHg) and decreased to a mean postoperative UES pressure of 122.9 mmHg (range 52.9–262.7) (p < 0.05). The statistical significance remained after excluding extremes. Twenty-seven patients had a decrease of the UES pressure (of which 18 ≥0.0001) and 6 patients were found to have increased UES pressure after surgery. Both patients with abnormal postoperative pH studies had persistent hypertension of their UES. The mean length of time between surgery and postoperative manometry was 267 ± 134 days.

CONCLUSION: Patients with GERD and a hypertensive UES, who undergo anti-reflux surgery, demonstrate a significant reduction of their UES pressure. This may be considered supportive of the suggestion of an etiologic link between GERD and UES hypertension. Although the mechanism of this association is unclear, it appears to be reversible with anti-reflux surgery. Our results warrant further investigation in a prospective fashion for confirmation and assessment of the potential clinical impact.
The effect of laparoscopic nissen fundoplication (LNF) on acid and non-acid reflux: A prospective evaluation at 1, 3, and 6 months using 24-h pH-multichannel intraluminal impedance (pH-MII) on acid and non-acid reflux.

**METHODS:**

Isolated upright refluxers (n = 27) and combined/supine refluxers (n = 36) were prospectively assessed. pH-MII study was performed with the patient in decubitus position and then sitting up, in each position for 3 h. The results were compared to normal controls (n = 12).

**RESULTS:**

The table below shows the comparison of the reflux episodes and symptoms index between the two groups at baseline and at 1, 3, and 6 months.

<table>
<thead>
<tr>
<th>Reflux Parameter</th>
<th>Baseline</th>
<th>1 Month</th>
<th>3 Months</th>
<th>6 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acid reflux episodes</td>
<td>2.2 ± 2.1</td>
<td>1.8 ± 1.9</td>
<td>1.5 ± 1.7</td>
<td>1.5 ± 1.7</td>
</tr>
<tr>
<td>Non-acid reflux episodes</td>
<td>3.0 ± 3.6</td>
<td>2.8 ± 2.6</td>
<td>2.6 ± 2.4</td>
<td>2.6 ± 2.4</td>
</tr>
<tr>
<td>% Symptom Index</td>
<td>14.0 ± 11.3</td>
<td>12.0 ± 10.2</td>
<td>10.0 ± 9.1</td>
<td>10.0 ± 9.1</td>
</tr>
</tbody>
</table>

**CONCLUSION:**

LNF provides symptomatic control as high as 90% in GERD. The use of combined 24-h pH-MII for intraluminal impedance (pH-MII) has shown an important factor in refractory GERD. However, the information regarding the effects of LNF on NAR is limited.

**AIM:**

To prospectively evaluate acid and NAR episodes in patients with typical symptoms of GERD.

**MATERIAL AND METHODS:**

We retrospectively assessed 14 consecutive patients (5 male and 9 female, mean age 46 ± 12 years) who underwent anti-reflux surgery (LNF) between October 2007 and May 2010. All subjects had heartburn and/or regurgitation and evidence of hiatal hernia and a positive symptom response to proton pump inhibitor (PPI) therapy. Nine patients had evidence of erosive GERD during endoscopy. Before surgery, all subjects underwent a symptomatic evaluation using a 5-point Likert scale for esophageal symptoms, stationary esophageal manometry using a solid state catheter and a 24-h pH-MII using a six-impedance 1-pH catheter (Sandhill Scientific, Littleton, CO, USA). The design of the catheter allowed recording impedance data at 3, 5, 7, 9, 15 and 17 cm above the LES. Patients were asked to discontinue PPI or histamine blockers for 1 week before the baseline evaluation. pH-MII and esophageal manometry were performed 1, 3, and 6 months after LNF. Reflux episodes (acid and NAR, % of time of pH <4, JDM score, proximal extent episodes and symptoms index were calculated according to standard definitions.

**RESULTS:**

At baseline 7/14 (50%) of subjects had a hypotensive LES and 12/14 (86%) had normal esophageal peristalsis. 2 subjects had criteria for ineffective peristalsis. The mean LES pressure was 10.9 ± 3.3 mmHg. All patients underwent LNF without perioperative complications by a single surgeon (ARSDM) in a standard fashion using 5 upper abdominal ports. A 2 cm loose fundoplication calibrated over a 36 French bougie was performed with extensive transection of the esophagus and division of short gastric vessels.

Successful symptom control reflux after LNF was achieved at 1 and 3 months for all but one patient (92%). Patients declared their symptoms improved in 8/14 (57%), normalized in 4/14 (28%) and unchanged in 2/14 (14%) at 6 months. The 24-h pH-MII confirmed the postoperative reduction of acid and non-acid reflux episodes at 1, 3, and 6 months (Table I).
Su1627
Surgical Outcomes of Hepatic Resection in Elderly Patients with Colorectal Liver Metastases
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BACKGROUND: Liver resections (LR) for colorectal metastases have been established to prolong survival with acceptable morbidity; however, with limited health resource, candidacy of the elderly for such operations has been questioned in terms of safety and efficacy.

AIM: To determine 30-day mortality, overall survival (OS) and morbidity after liver resection for colorectal liver metastasis (CRLM) in patients ≥75y old in comparison to patients 60-74 y of age.

METHODS: Patients ≥75y (n = 68) (Group 1) were matched on ASA status with patients 60-74 y of age (n = 67) (Group 2) who underwent LR for CRLM between January 1996 and December 2005. Retrospective review of medical records was performed to compare outcomes between both groups.

RESULTS: Females constituted 49% and 28% of Group 1 and Group 2, respectively (p = 0.02). Eighty-one percent and 19% of Group 1 and 62% and 38% of Group 2 had colon cancer and rectal cancer, respectively. Sixty-four percent of Group 1 and 71% of Group 2 had nodal positive disease of the primary tumor. A major LR (lobectomy or extended lobectomy) was performed in 30.9% of Group 1 and 41.8% of Group 2 patients, p = 0.21. One patient in each group underwent a portal vein embolization vs. two patients in the younger cohort. There was no difference in the overall morbidity rate between both groups (67% for Group 1 and 71% for Group 2). There were no significant differences in age groups and Clavien Grade I-V postoperative complications (p = 0.08). There was only one death at 36-days and it occurred in Group 1. Median hospital stay for both groups was 7 days (p = 0.15). Fifteen percent of patients in Group 1 required ICU stay compared to 10% in the younger cohort (p = 0.46). Adjuvant chemotherapy was administered more frequently in Group 2 (33%) compared to Group 1 (25%; p = 0.002). There was no significant association between the age groups for disease recurrence (p = 0.44) with a 3-year recurrence-free survival of 53.9% in Group 1 and 50.2% in Group 2. There was no difference in 1-, 3-, 5-year OS between the two groups (p = 0.21) with a 5-year survival of 22.3% and 37.2% respectively. On multivariable analysis, evaluating age ≥60–74 vs ≥75, sex and postoperative complications (minor and major vs no complication) there was no significant difference in survival between both groups (HR 0.64 (0.37–1.08), p = 0.09).

CONCLUSION: Liver resection in elderly patients is safe with acceptable morbidity rates comparable to those of younger patients. Therefore, selection criteria for preoperative chemotherapy, and treatment algorithm should be considered in carefully selected patients.

Su1628
Safety and Efficacy of Preoperative Portal Vein Embolization in Patients at Risk for Postoperative Liver Failure
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BACKGROUND: Portal vein embolization (PVE) is utilized in preparation for major hepatopancreatico-duodenectomy to induce hypertrophy and prevent postoperative liver insufficiency. Since 2006 our multidisciplinary team has been using PVE in patients with <30% predicted liver remnant or underlying liver disease prior to major hepatopancreatico-duodenectomy. The strat-egy includes embolization of segment IV portal venous branches when an extended right hepatectomy is in the preoperative plan. The aim of this study is to report the short-term outcomes following this approach.

METHODS: Records of patients who underwent PVE during 2006–2010 were retrospectively reviewed. Patient demographics, indications for and extent of resection, operative time, transfusion, hospital course, complications and outcomes were analyzed. CT based volumetrics were performed to deter-mine future liver remnant (fLR) and standardized future liver remnant (sFLR) volume pre and post-PVE as well as degree of hypertrophy. Patients were stratified by segment IV embolization and compared. Significance was reported for p < 0.05.

RESULTS: Twenty-three patients were identified. Ten patients underwent PVE without segment IV while 13 patients underwent PVE+IV embolization. Post emboliza-tion liver volumes and hypertrophy rates did not differ between the groups (Table 1). The majority of patients in the PVE+IV group underwent extended right hepatectomy while right hepatectomy was more common in the PVE group. Twenty-six percent of patients were resected for an indication other than colorectal cancer. Seventy-eight percent of patients received perioperative chemotherapy. Three patients did not undergo resection: two for progression of disease and one for cirrhosis discovered at opera-tion. There was no difference in length of stay, operative blood loss or blood products transfused between groups. Most surgical complications were minor and rates were similar between the PVE and PVE+IV groups at 50% and 54%, respectively. There were no episodes of post-operative liver failure or death. Complication rates from PVE were also similar at 36% among those undergoing PVE vs. 31% for PVE+IV. One patient in the PVE group underwent modified surgical resection due to a complication of portal vein embolization.

CONCLUSIONS: Portal vein embolization resulted in an overall 38% increase in sFLR volume. Complications related to portal vein embolization occurred but they did not pre-vent eventual resection. Following embolization, resection was associated with a low incidence of complications.

Clinical: Pancreas

Su1629
Intrapancreatic Nerve Invasion as a Predictor for Recurrence After Pancreaticoduodenectomy in Patients with Invasive Ductal Carcinoma of the Pancreas
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AIM: The median disease-free survival of the 153 patients was 9 months, with a disease-free 5-year survival of 17.3%. The incidence of histological intrapancreatic nerve invasion was as follows: ne0 = 7 (5%); ne1 = 38 (25%); ne2 = 85 (56%); and ne3 = 19 (12%). There were significant differences between groups: ne0 vs ne1 (P = 0.516), ne1 vs ne2 (P = 0.0007), ne2 vs ne3 (P = 0.0234), ne vs ne3 (P = 0.0000), and ne0 vs ne3 (P = 0.0009) in multivariate analys-ys, with a lymph node metastases (P = 0.001), incidence of intrapancreatic nerve invasion (P = 0.001), and nega-tive surgical margin (P = 0.011), significantly increased the overall survival.

METHODS: The tumor stage was not associated with intrapancreatic nerve invasion (P < 0.001), and the presence of extrapancreatic nerve plexus invasion (P < 0.001). A higher incidence of lymphatic invasion (P = 0.016), and the presence of intrapancreatic nerve invasion (P = 0.255) However, a larger tumor size (P = 0.024), a higher incidence of lymphatic invasion (P = 0.036), and the presence of extrapancreatic nerve plexus invasion (P = 0.001), were identified as independent factors associated with a higher incidence of intrapancreatic nerve invasion.

CONCLUSION: Intrapancreatic nerve invasion may be a useful predictor as a recurrence after pancreaticoduodenec-tomy in patients with invasive ductal carcinoma of the pancreas.
Assessment of Pancreatic Fat Infiltration of Pancreatic Ductal Adenocarcinoma by Multidetector-Row Computed Tomography: Correlation to Extrapancreatic Invasion and Surgical Outcomes

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BACKGROUND: Retropertioneal invasion including extra- pancreatic nerve plexus invasion of pancreatic ductal adenocarcinoma, which has been demonstrated as peripancreatic fat infiltration by multidetector-row computed tomography (MDCT), is a distinct characteristic associated with unresectability and impaired survival after surgery. The aim of this study was to investigate whether the degree of peripancreatic fat infiltration determined by MDCT is a useful predictor of surgical outcomes in patients with pancreatic ductal carcinoma.

RESULTS: The incidence of peripancreatic fat invasion was as follows: grade 0, n = 8 (6%); grade 1, n = 54 (43%); grade 2, n = 23 (18%); grade 3, n = 21 (16%). Five-year survival rate was 55.6% for grade 0, 38.7% for grade 1, 16.4% for grade 2, and 3% for grade 3. Intratumoral and peritumoral lymph node metastases were significantly more frequent among patients with peripancreatic nerve plexus invasion (p < 0.05). Multivariate survival analysis showed that lymph node metastasis, surgical margin positive, and grade 2 and 3 peripancreatic fat infiltration were independently associated with a poorer prognosis. Only extrapancreatic nerve plexus invasion was significantly associated with grade 2 and 3 peripancreatic fat infiltration.

CONCLUSION: The grade of peripancreatic fat infiltration determined by MDCT, which was significantly related to the incidence of histological extrapancreatic nerve plexus invasion, may be useful as a predictor for survival after pan- creatococutaneous islet transplantation in patients with invasive ductal carcinoma of the pancreas.

Does Routine Endoscopic Ultrasound Alter Surgical Management of Patients with Pancreatic Cystic Lesions?: A Retrospective Analysis of 93 Consecutive Patients

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INTRODUCTION: Endoscopic ultrasound (EUS) has been increasingly used to evaluate pancreatic cystic lesions. We investigated the impact of EUS results on the surgical management for patients with pancreatic cystic lesions.

METHODS: Using IRB approved prospectively maintained data base, all patients with pancreatic cystic lesions presented to a tertiary care center over 20 months were included. All patients had EUS as part their evaluation process. Patients’ demographics, EUS findings and fine needle aspiration results were collected.

RESULTS: 137 patients underwent distal pancreatectomy, which included 26 (19%) that were diabetic preoperatively. New-onset diabetes was identified in 27 of remaining 111 patients (24.3%) with a mean time of onset of 6.4 months, and a median follow up of 25 months. Diabetes was seen more commonly in patients with chronic pancreatitis (5/13; 38.5%) and adenocarcinoma (7/22; 31.8%), but was not seen in patients undergoing resection for serous cystic adenoma (0/8), or intraductal papillary mucinous neoplasm (IPMN) (0/9). Patients developing diabetes were older (63.5 vs. 55.1, p = 0.01) but there was no difference in gender or extent of surgery. The development of diabetes was linked to the volume of parenchyma resected: lower volumes of tissue were resected in those with diabetes (119.2 cm³ vs. 137.4 cm³, p = 0.01), or related to patient body mass index (BMI) (28.3 Kg/m² vs. 28.1 Kg/m², p = 0.51). On the 26 patients with pre-resection diabetes, 9 were taking insulin. In the remaining 17, 8 (47%) deteriorated and required insulin postoperatively. The development of postoperative impaired glycemic control is common fol- lowing distal pancreatectomy, especially in those resected for chronic pancreatitis or cancer. In patients requiring distal pancreatectomy for chronic pancreatitis, improved outcome may include islet replacement.

Impaired glycemic control is common following distal pancreatectomy, especially in those resected for chronic pancreatitis or cancer. In patients requiring distal pancreatectomy for chronic pancreatitis, improved outcome may include islet replacement.

In patients requiring distal pancreatectomy for chronic pancreatitis, improved outcome may include islet replacement.
Prior Acute Pancreatitis Is the Most Common Cause of Obstructive Pancreatitis in Patients Undergoing Distal Pancreatectomy

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BACKGROUND: The natural history of obstructive pancreatitis (OP) is currently poorly characterized. While it has been reported with a few retrospective cases of necrotizing acute pancreatitis, there is uncertainty as to whether it is the initial presentation of chronic pancreatitis, or a sequela from previous acute pancreatitis. Our study attempts to elucidate the pathogenesis of OP.

METHODS: Clinical records of all patients who underwent distal pancreatic resections between February 1999 and July 2010 by a single surgeon were retrospectively reviewed focusing on the incidence and type of pancreatic fistula as defined by ISGPF. Study variables included age, gender, surgical approach, extent of resection, ASA classification, type of stapler cartridge, use of Seaguard™, and ISGPF classification. Statistical analysis was performed using Fisher’s exact test, univariate and multivariate logistic regression.

RESULTS: Sixty four patients (median age 60, range 21–85; 54% male) underwent distal pancreatic resection (laparoscopy 50% vs. open 50%). The most common indications were pancreatic adenocarcinoma (N = 15; 23%) and neuro-endocrine neoplasms (N = 14; 22%).

CONCLUSIONS: Prior acute pancreatitis was the main cause for OP in patients undergoing distal pancreatectomy, and de novo chronic pancreatitis was a less common cause. The natural history of OP has not been studied. Our study extends our understanding of OP and its natural history.

Can We Downstage Regionally Advanced Pancreatic Cancer to Resectable: A Phase I/II Study of Induction Oxaliplatin and 5FU Chemo-Radiation

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BACKGROUND: The majority of patients with pancreatic adenocarcinoma (PC) present with regionally advanced disease. This includes borderline resectable and locally advanced unresectable tumors as defined by current NCCN guidelines for resectability. Chemo-radiation (CRT) is used in this setting in an attempt to control regional disease, and to downstage the tumor for resection.

METHODS: Patients with biopsy-proven borderline resectable or locally advanced unresectable pancreatic adenocarcinoma were eligible. Chemotherapy included continuous infusion 5FU (200 mg/m2) and oxaliplatin weekly for 5 weeks.

RESULTS: Oxaliplatin was escalated from 30 mg/m2 in 10 mg intervals up to 60 mg/m2. Concurrent radiation therapy consisted of 4,500 cGy in 25 fractions (180 cGy/fx) followed by a conedown to the tumor and margin for an additional 540 cGy. 3D (total dose 5040 cGy in 28 fractions). Following completion of CRT, patients deemed resectable underwent surgery. Those who remained unresectable for cure but did not progress (PD) received mOLXOX6 cycles. Survival was calculated using Kaplan-Meier analysis. End points of the phase II portion were resectability and survival.

RESULTS: Fifteen patients were initially enrolled in the Phase I component of the study and all completed neoadjuvant therapy. The highest dose (60 mg/m2) of oxaliplatin was well tolerated and this was carried forward in the phase II portion of the study. Grade 4 toxicities were observed during Phase I (n = 2, pulmonary embolism and lymphopenia) and phase II (n = 5, fatigue, leukopenia and thrombocytopenia). Additional 9 patients were treated in the phase II portion. Overall, 24 subjects (14 men and 10 women, mean age 65 years) were enrolled and received CRT. 12 of the 24 did not complete the treatment. Reasons for not completing treatment included progression (7), withdrawal of consent (2), grade 4 toxicity (3). Following CRT, 8 (33%) patients were deemed possibly resectable and were explored. Two additional patients were found to have PD (hormonoresistant). Four had stable disease (SD) but remained unresectable and 2 (8%) of all study subjects were not resected for cure due to negative margins. Follow up was available for 23 patients. Median overall survival was 14 months (9 and 15 months respectively for PD and SD). Of the 2 resected patients, one died of disease at 21 months and one is alive without disease for 31 months from trial entry.

CONCLUSIONS: Combined modality treatment for regionally advanced pancreatic cancer with oxaliplatin, 5FU and radiation was reasonably well tolerated. The majority of patients remained unresectable. Survival data with this regimen are comparable to others for locally advanced pancreatic cancer.

Influence of Staple Size on Fistula Formation Following Distal Pancreatectomy

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BACKGROUND: Pancreatic fistula continues to be a source of significant morbidity following distal pancreatic resection. The technique of pancreatic division varies widely among surgeons, and there is no evidence that identifies a single method as superior. In our practice, the technique of pancreatic division varies widely among surgeons, and there is no evidence that identifies a single method as superior. In our practice, the technique of pancreatic division varies widely among surgeons, and there is no evidence that identifies a single method as superior.
Novel Prediction of Pancreatic Anastomotic Failure After Pancreatoduodenectomy Using Preoperative CT Imaging with the Evaluation of Remnant Pancreatic Volume and Body Composition

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BACKGROUND: The most common complication after distal pancreatectomy (DP) is leakage from the pancreatic stump closure. Clues to the leakage may help in prevention.

OBJECTIVE: We sought to determine the incidence, severity, and risk factors for leakage using a large number of DP cases performed with traditional open surgery.

PATIENTS AND METHODS: Our prospectively maintained single-surgeon database identified 223 consecutive DP cases between 1992 and 2008. The operation was the same in all cases performed with a hand-sewn fistula-mucosal closure of the pancreatic stump. Using daily drain amylase measurements, stump leakage (LEAK) was defined and graded as no LEAK, Grade A, B, or C, according to the severity classification system of the International Study Group on Pancreatic Surgery (ISGPS). Clinically relevant LEAK was defined as ISGPS Grade B/C (LEAK) leaving the no LEAK and Grade A cases in a "Non-clinically relevant" group (No LEAK). A public web-based calculator was used to standardize the ISGPS system. The incidence of LEAK and risk factors for clinically-relevant LEAK were assessed.

RESULTS: ISGPS grading of these 223 cases were: No LEAK 53%, Grade A 32%, Grade B 13.9%, and Grade C 0.9% with an overall mortality of zero. Therefore, the clinical relevance of the LEAK rate was 14.8% (Grade B/C). Of these B/C cases 24% were due to surgical drain failure – lack of patency and/or misplacement from their original location. The following risk factors were significant by univariate analysis: obesity (BMI > 30) in 52% of LEAK cases vs. 21% of No LEAK cases, neuroendocrine tumors (NET) in 30% of B/C cases vs. 10% of No LEAK cases, BMI > 40% in 30% of LEAK cases vs. 16% of No LEAK cases, and blood loss > 1,000 ml (21% of LEAK cases vs. 7% of No LEAK cases). In 46 cases with preoperative endoscopic ablation or stenting of the major pancreatic duct, there were no episodes of LEAK. Some of those who did not undergo preoperative major pancreatic sphincter ablation/stenting (9, 5.5%).

CONCLUSIONS: Clinically-relevant LEAK was observed after DP in 14.8% of the 223 cases, one quarter of these B/C cases might have been just non-relevant leaks (Grade A) if drain failures are excluded. Other risk factors for clinically relevant LEAK were obesity, NET and high blood loss. A public web-based calculator was used to standardize the ISGPS system. The incidence of LEAK and risk factors for clinically-relevant LEAK were assessed.
Su1641
Prognostic Value of Lymph Node Ratio Increases with Number of Lymph Nodes Evaluated: A Concomitant Review of SEER and MHG Patients
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BACKGROUND: Lymph node ratio (LNR) has been shown to predict survival in patients with pancreatic cancer. However, its role has not been evaluated in the context of the number of lymph nodes (LN) examined.

METHODS: A national population-based dataset (SEER) of 10,254 patients and a prospective database of 827 patients who underwent surgery at a single institution were reviewed for tumor and patient characteristics. In each database, patients were divided into subsets based on the number of examined LNs, with cut points putting approximately a third of the patients into each subset. The SEER database was divided into ≤5, 6–12, and ≥12 examined LNs. The number of examined LNs at the single institution was generally higher and correspondingly the single institution’s patient’s were divided into ≤9, 10–16, and ≥17 lymph nodes. Univariate and multivariate analyses were done using Kaplan-Meier curves and Cox regression modeling.

RESULTS: The different subgroups were uniform in terms of patient’s age at presentation, sex, tumor size, stage, and pT status (Chi2, p < 0.05). In SEER, the mean LNR decreased in a stepwise manner as the number of examined lymph nodes increased (0.38 for ≤5 LNs vs. 0.19 for ≥12 LNs, p < 0.05). A similar trend was also seen in the single institution’s database (0.29 for ≤9 LNs vs. 0.15 for ≥17 LNs, p < 0.05). Overall, age at diagnosis (>65 yrs), absolute numbers of positive LNs, and a higher LNR (≥0.2) were associated with a worse survival. On multivariate analysis in the regression model showed that LNR > 0.2 has an adverse impact on survival in each subgroup and the magnitude of this impact increased with the number of examined LNs: HR (95% CI): ≤5 LNs:1.52 (1.20–2.95), 6–12 LNs:1.71 (1.10–2.62), and ≥12 LNs: 3.75 (4.75-76). For the single institution, the Cox regression showed that a lymph node ratio ≤0.2 had an adverse effect on survival, except for ≤5 LNs. In the ≥12 LNs were examined, HR (95% CI) was ≤5 LNs:1.52 (1.20–2.95), 6–12 LNs:1.71 (1.10–2.62), and ≥12 LNs: 3.75 (4.75-76). For the single institution, the Cox regression showed that a lymph node ratio ≤0.2 had an adverse effect on survival, except for ≤5 LNs. For the ≥12 LNs were examined, HR (95% CI) was ≤5 LNs:1.52 (1.20–2.95), 6–12 LNs:1.71 (1.10–2.62), and ≥12 LNs: 3.75 (4.75-76).

CONCLUSIONS: The different subgroups were uniform in terms of patient’s age at presentation, sex, tumor size, stage, and pT status (Chi2, p < 0.05). In SEER, the mean LNR decreased in a stepwise manner as the number of examined lymph nodes increased (0.38 for ≤5 LNs vs. 0.19 for ≥12 LNs, p < 0.05). A similar trend was also seen in the single institution’s database (0.29 for ≤9 LNs vs. 0.15 for ≥17 LNs, p < 0.05). Overall, age at diagnosis (>65 yrs), absolute numbers of positive LNs, and a higher LNR (≥0.2) were associated with a worse survival. On multivariate analysis in the regression model showed that LNR > 0.2 has an adverse impact on survival in each subgroup and the magnitude of this impact increased with the number of examined LNs: HR (95% CI): ≤5 LNs:1.52 (1.20–2.95), 6–12 LNs:1.71 (1.10–2.62), and ≥12 LNs: 3.75 (4.75-76). For the single institution, the Cox regression showed that a lymph node ratio ≤0.2 had an adverse impact on survival, except for ≤5 LNs. For the ≥12 LNs were examined, HR (95% CI) was ≤5 LNs:1.52 (1.20–2.95), 6–12 LNs:1.71 (1.10–2.62), and ≥12 LNs: 3.75 (4.75-76).

CONCLUSIONS: Although an LNR of > 0.2 has a strong negative predictive value for survival, the accuracy of this prediction and the relative risk of death is higher when more lymph nodes are examined. This suggests that LNR must always be interpreted in the context of the number of examined lymph nodes.

Su1642
The Utility of Positron Emission Tomography Scans in the Diagnosis and Management of Pancreatic Adenocarcinoma
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BACKGROUND: Positron emission tomography (PET) using 18F-fluorodeoxyglucose (FDG) is increasingly used in the preoperative diagnosis and management of pancreatic cancer. Its anatomic utility is limited however, and the quality of standard imaging continues to improve. We evaluated the effect of PET on the management of patients referred for treatment of pancreatic cancer.

METHODS: We evaluated all patients referred to our center between January 2006 and September 2010 with a final diagnosis of pancreatic ductal adenocarcinoma and examined the role of PET in their diagnostic workup and management. Patients who had PET following successful surgical resection or to stage metastatic disease were excluded. PET “positivity” was determined by radiologist interpretation.

RESULTS: Between January 2006 and September 2010, 636 patients were diagnosed with pancreatic ductal adenocarcinoma and 52% went on to resection. PET was utilized in thirty patients with thirty-two resectable disease and in thirty-four with locally advanced adenocarcinoma. PET failed to identify three metastatic lesions in two patients (two liver metastases, one peri- toneal metastasis) and one primary lesion. In five patients, PET produced a false positive result leading to additional imaging and procedures that delayed surgery by an average of three weeks. PET identified liver metastases in three patients who underwent completion pancreatectomy at an average of 17.8 months after their initial surgery (range 8.7–27.5). Two of these patients were diagnosed with IPMN at the original surgical margin. Three additional patients have recurred, two with locally advanced disease.

CONCLUSION: Although an LNR of > 0.2 has a strong negative predictive value for survival, the accuracy of this prediction and the relative risk of death is higher when more lymph nodes are examined. This suggests that LNR must always be interpreted in the context of the number of examined lymph nodes.
Su1645

Prospective Comparison of Longterm Outcomes in Patients of Severe Acute Pancreatitis Managed by Operative and Non-Operative Means

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BACKGROUND: The present study reports the long term functional and morphological changes following severe acute pancreatitis and compares the patients managed by operative and non-operative methods.

METHODS: 30 patients who had completed one year of follow up after recovery from attack of acute pancreatitis were evaluated. 72 hours fecalcal analysis, glucose tolerance test and pancreatic morphology (MRI) were examined and recurrences if any were noted.

RESULTS: Etiology was alcohol (15), gall stones (10), and idiopathic (5). Twelve patients were managed non-operatively, out of which five patients needed pigtail drainage. 18 patients required open necrosectomy. 11 patients (36.7%) had exocrine deficiency, 7 patients had both 82.8% patients had morphological changes in pancreas. Patients undergoing necrosectomy had higher incidence of exocrine dysfunction (61.1% of patients in surgical group and 25% in non-operative group (p = 0.057). Exocrine abnormality was also significantly higher in surgical group compared to non-operative group 55.6% versus 8.3%, p = 0.010. Morphological changes in pancreas were also higher in operated group but was not statistically significant.

CONCLUSION: Patients of severe acute pancreatitis on follow up had significant functional, and morphological changes with 62% patients requiring readmission. Patients who were managed non-operatively had lesser incidence of exocrine dysfunction (61.1% of patients in surgical group and 25% in non-operative group (p = 0.057). Exocrine abnormality was also significantly higher in surgical group compared to non-operative group 55.6% versus 8.3%, p = 0.010. Morphological changes in pancreas were also higher in operated group but was not statistically significant.

Su1646

Pre Resection Gastric Bypass Reduces Post Resection BMI but Not Liver Disease in Short Bowel Syndrome

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ABSTRACT: Patients who develop short bowel syndrome (SBS) while morbidly obese maintain a higher BMI and are more likely to develop hepatobiliary complications than non-obese patients. The mechanisms for these findings are unknown. Our aim was to determine the effect of pre resection gastric bypass (GBP) on postresection BMI and the incidence of liver disease in SBS patients.

METHODS: We reviewed 100 adult patients with SBS. 55 patients with initial BMI < 35 were controls, 28 patients with initial BMI > 35 were the obese group, and 17 patients had undergone GBP prior to SBS.

RESULTS: There were no differences in age, gender, or intestinal anatomy. Obese patients were more likely to be resewn off PN (44% vs 25% control and 12% GBP p = 0.05). Overall 38% of patients have undergone ostoomy closure, intestinal lengthening or intestinal transposition with a similar occurrence in all groups (11% of patients have had gastric continuity reestablished). Pre resection GBP in controls was significantly lower than obese and GBP groups (26 vs 43 and 37). BMI at 1, 2, and 5 years was similar in control and GBP groups (23, 23, and 23 versus 23, 24, and 26). Obese patients had a persistently increased BMI (37, 32, and 31 at 1, 2, and 5 years) % BW trends were similar. 7 (41%) of the GBP patients had a pre resection BMI > 35. BMI and %BW were similar at 1,2, and 5 years in those GBP patients with BMI > 35 and those < 35 (26, 26, and 26 vs 22, 20, and 26). Choledolithiasis and cirrhosis occurred in a similar extent in gastric or intestine patients. Radiographic fatty liver tended to be higher in the GBP group (41% vs 16% controls and 32% obese groups). End stage liver disease occurred only in patients on PN > 1 year and tended to be higher in obese and GBP patients compared to controls (33% and 33% vs 17%).

CONCLUSIONS: GBP prevents the nutritional benefits of obesity in SBS patients. This occurs independent of pre SBS BMI suggesting that GBP itself rather than surgically induced weight loss is the important factor. However, GBP does not appear to eliminate the increased risk of hepatobiliary disease observed in obese SBS patients.

Su1647

Neoadjuvant Treatment of Duodenal Adenocarcinoma: A Rescue Strategy

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ABSTRACT: Recent advances in chemotherapy have been shown to downsize initially unresectable colon cancer. The role of neoadjuvant therapy in duodenal adenocarcinoma, especially its effect on resectability, disease-free survival (DFS) and overall survival (OS) is unknown. Our aim was to evaluate the long-term outcome in initially unresectable patients with duodenal adenocarcinoma following neoadjuvant chemotherapy and rescue surgery.

METHODS: A retrospective review between 1/1994-1/2010 of all patients who underwent rescue duodenectomy following neoadjuvant therapy was performed.

RESULTS: Ten patients received neoadjuvant chemother-apy prior to surgical resection (7 men, 3 women) with a mean age of 54 years (range 45–67 years). Reasons for unresectable disease were vascular encasement in 6 patients, retroperitoneal extension of tumor intestinal lengthening in 3 patients or inferior venacava in 1 patient and bulky local disease causing malignant bowel obstruction in 1 patient. Six were primary presentations and 4 were local recurrences. Of the 6 primary presentations, 4 received neoadjuvant therapy with FOLFIRINOX, one with chemoradiation with 5-FU and one with CPT-11, oxaliplatin and capcitabine. Of the 4 patients with locally recurrent disease, one had radiodur-therpy with S-FU and capcitabine, one had FOLFIRI, one had CPT-11, 5-FU and leucovorin, and one had FOLFOX. All 10 patients underwent R0 resection following neoadjuvant therapy. Pathologic evaluation revealed that 2 patients had complete pathologic response (1 on FOLFIRINOX and 1 on chemoradiation with S-FU) and one patient had only 10% viable tumor remaining after FOLFIRINOX. Two patients had >50% decrease in tumor size. The average tumor size was 3.4 cm (range <1 cm–4.6 cm). Eight patients had grade 3 tumors and 2 patients had grade 4 tumors. Three patients had positive lymph nodes and 7 had negative lymph nodes. Five patients had T3 tumors, 3 had T4 tumors, one had T2, and 1 patient had no residual tumor identified on patho-logic evaluation. Four patients with tumors in the fourth portion (D4) and 4 patients with tumors in the third por- tion (D3) underwent segmental resections, while 1 patient with tumor at the second portion (D2) underwent standard Whipple resection and 1 patient with tumor at D3/D2 junction underwent standard Whipple with en bloc resection. On follow up, 5 patients are alive today (follow-up range 15–48 months) including 2 of the patients presenting with recurrent disease. Of these 5 patients, 2 had positive nodes, and 3 had negative nodes. Since rescue surgery, all patients have no evidence of recurrent disease.

CONCLUSION: Long-term survival can be achieved in select patients with initially unresectable duodenal adenocarcinoma. From our experience, neoadjuvant chemotherapy may improve resectability of previously unresectable duodenal adenocarcinoma.

Su1648

Laparoscopic Roux-en-y Gastric Bypass vs. Laparoscopic Band for the Treatment of Morbid Obesity: Data from the Nationwide Inpatient Sample (NIS), 2006–2008

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INTRODUCTION: Laparoscopic Roux-en-y gastric bypass (L-GBP) and Laparoscopic gastric banding (lap-bands) are the two most commonly performed bariatric operations in the United States. OBJECTIVE: To compare surgical outcomes of L-GBP versus lap-band in morbidly obese patients.

METHODS: Using the Nationwide Inpatient Sample (NIS) database, clinical data of morbidly obese patients who underwent L-GBP or lap-band from 2006–2008 was analyzed. Outcome measures included patient characteristics, comorbidities, postoperative complications, length of hos-pital stay (LOS), in-hospital mortality and hospital charges. RESULTS: Of the 254,760 patients, 183,452 patients under-went L-GBP and 71,308 patients underwent lap-band. The majority of patients were female (L-GBP: 81.0% vs. Lap-band: 78.3% p = 0.001) and Caucasian (L-GBP: 73.9% vs. Lap-band: 75.5%, p = 0.001) in both groups. The mean age in the L-GBP group was lower compared with the Lap-band group (43.4 vs. 45.8 years, p < 0.001). Most of comorbiditi-ies was significantly higher in the L-GBP group. The overall post operative complications was lower in the Lap-band group (1.39% vs. 4.18%, p < 0.001). Specific postoperative complications were all lower in the Lap-band group (UTI, pneumonia, acute renal failure, respiratory failure, myocardial infarction, venous thromboembolism, ileus, abscess, wound infection and bowel obstruction). Compared with L-GBP patients, who underwent Lap-band had a shorter mean LOS (1.16 vs. 2.41 days, p < 0.001), lower mortal-ity (0.03% vs.0.06%, p < 0.001), and lower mean hospital charges (L-GBP $43,897 ± 39,570 vs. $39,041 ± 29,041).

CONCLUSION: Compared to laparoscopic gastric bypass, laparoscopic gastric banding is associated with better perioperative outcomes with a shorter length of stay, lower mortality and lower morbidity. Further studies are needed to examine the weight loss outcome between the two operations.
Su1649

Minimally Invasive Gastroectomy for Gastric Cancer: A Single Institution Experience

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BACKGROUND: The application of minimally invasive techniques for gastric malignancy is in evolution. In Asia, laparoscopic assisted gastric resection is commonly performed with open reconstruction of intestinal continuity. In the United States, minimally invasive bariatric surgical techniques have been adapted to enable gastric resection with intracorporeal reconstruction. The aim of this study is to access the short term outcomes of minimally invasive gastroectomy and reconstruction for gastric malignancy at a single institution.

METHOD: Between November 2004 and October 2010, 68 patients with gastric malignancies underwent MIG. Short term clinical and histopathologic results were analyzed.

RESULTS: A total of 68 minimally invasive gastric resections were performed on 31 men and 37 women with median age of 69 years (range 35–96). There were no conversions to open resection. Indications for the procedures were gastric adenocarcinoma (56), gastrointestinal stromal tumor (GIST) (7), high grade urothelial carcinoma (1) and rhabdomyosarcoma (1). There were 17 total gastrectomies, 40 distal, 5 proximal, and 6 wedge gastrectomies. Among patients with gastric adenocarcinoma, 40 underwent a D2 lymphadenectomy and 14 underwent a D1 lymphadenectomy. The median lymph node count was 27.5 (range 8–71) for D2 lymphadenectomy and 20.5 (range 8–29) for D1 lymphadenectomy. Patients were resected with negative margins. The median operating time was 385 minutes (range 76–579 minutes). Median estimated blood loss was 200 mL (range 10–1,000 mL). Median length of stay for total gastrectomy was 7 days (range 5–19) and 6 days (range 1–41) for partial gastrectomy. There was one postoperative mortality (1.5%), eight major (11.8%) and 12 minor (17.7%) complications. With a median follow-up of 12.5 months (range 0.2–70.5), 82.4% of patients are alive with no evidence of disease.

CONCLUSIONS: Minimally invasive gastroectomy presents an oncologically sound alternative to open gastroectomy and can be performed with a low mortality rate and an acceptable overall morbidity rate.

Su1650

Pre-Operative Nomogram to Predict Risk of Peri-Operative Mortality Following Gastric Resections for Malignancy

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INTRODUCTION: Surgery remains one of the major treatment options available to patients with gastric cancer; therefore operative mortality is an important consideration. 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-operative mortality following gastric resection for malignancy.

METHODS: The National Inpatient Sample database was queried to identify adult patients that underwent gastric resection for malignancy. The pre-operative co-morbidities, identified as predictors were used and a nomogram was created with multivariate regression using the Taylor expansion method in SAS Software, SURVEYLOGISTIC Procedure. A Training set (1993, 1996, 1997, 1999, 2000, 2002, 2004 and 2005) was utilized to develop the model and a validation set (Years 1994–95, 1998, 2001 and 2003) was utilized to validate this model.

RESULTS: A total of 14,235 and 9,404 patients were included in the training set and validation set, respectively. The overall actual observed peri-operative mortality rate for each individual patient. The accuracy of the nomogram was further reinforced by a concordance index of 0.75 with 95% confidence interval of 0.73 to 0.77 calculated using the validation set.

CONCLUSION: This pre-operative nomogram has been shown to accurately predict the risk of peri-operative mortality following gastric resections for malignancy.
A Comparison of Short Term Outcomes Following Abdominal Wall Hernia Repair Based on Pre-Operative Functional Health Status

Emily Albright, John S. Roth, Daniel L. Davenport
University of Kentucky, Lexington, KY

INTRODUCTION: Abdominal wall hernias are a common problem facing surgeons today. As the patient population ages not only is there an increase in the number of comorbidities but a decrease in the ability to perform basic daily activities. Within the American College of Surgeons National Surgical Quality Improvement Program (ACS NSQIP) this is tracked as a patient’s pre-operative functional health status.

METHODS: We reviewed all patients that underwent abdominal wall hernia repair from 2005–2010 in the ACS NSQIP database. Patients were identified based on the following CPT codes: 49560, 49561, 49565, 49566, 49568, 49570, 49572, 49583, 49586, 49562, 29653, 49654, 49655, 49656, and 49657. Patients were grouped based on functional status as listed in NSQIP: independent, partially dependent and totally dependent. Any patients with an unknown functional health status were excluded. Pre-operative and operative variables were recorded for all patients. Short-term outcomes between the groups were then compared.

RESULTS: 76,397 patients were identified that underwent abdominal wall hernia repair. 74,785 were classified as independent (97.9%), 1,317 as partially dependent (1.7%) and 295 as totally dependent (0.4%). Classification as totally dependent was associated with a significant increase risk in all short term outcomes examined: wound occurrence, pneumonia, pulmonary embolism, urinary tract infection, myocardial infarction, deep venous thrombosis, sepsis, return to the operating room and death (p < 0.001 for all).

DISCUSSION: Given the significant increase in complications and mortality following ventral hernia repair in patients with limited functional health status, a period of watchful waiting should be strongly advised, especially for asymptomatic hernias.

Combined Science
Su2087

A Comparison of Short Term Outcomes Following Abdominal Wall Hernia Repair Based on Pre-Operative Functional Health Status

Emily Albright*, John S. Roth, Daniel L. Davenport
University of Kentucky, Lexington, KY

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Basic; Colon-Rectal
Mo1861

Sustained Anal Pressure Improvement After Anal Sphincter Injury and Serial IV Infusions Suggests Homing of Mesenchymal Stem Cells

Mansurat Zutshi*, Levilester Salcedo1, Margot S. Damaser2, Marc Peters3
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We have previously shown that mesenchymal stem cells (MSC) improve anal sphincter pressures after injury. We aim to demonstrate MSC homing to the injured anal sphincter by comparing anal sphincter pressures following IM MSC injection and serial IV MSC infusion in a rat model of acute anal sphincter injury.

METHOD: 45 virgin rats were divided into injury (n = 35) and no injury (NI, n = 10) groups. The injury group was divided into saline (PBS) or MSC treatment and a control group (n = 5) which received no treatment. Each treatment group was further divided into IM and serial IV (n = 5) group. The MSC IM and IV (n = 5) and control groups were followed up for 5 weeks. The injury was a partial anal sphincter excision (PSE) of 25% of the anal sphincter. Anal pressures were recorded prior, 10 days and 5 weeks after treatment with a balloon connected to a digital recorder. 24 hours after injury, the animals received 5 x 106 labeled MSC or 0.2 ml saline into the anal sphincter for IM treatment, while IV treatment group received the same dose daily for 6 consecutive days via the tail vein. Anal sphincters were harvested and submitted for Masson’s staining.

RESULTS: 10 days after IM treatment, significant increase in resting (P < 0.001) and peak pressures (P < 0.001) was seen after MSC treatment when compared with PBS after injury (9.78 ± 0.84, 13.13 ± 1.2, respectively) vs. (6.23 ± 0.48, 8.32 ± 0.64, respectively). When compared with the NI group and MSC treatment, recovery of the anal pressures was not complete (resting (P = 0.04) and peak pressures (P = 0.02)). The IV infusion group showed significantly increased resting (P = 0.001) and peak pressures (P < 0.001) in MSC treated animals compared with PBS (11.03 ± 0.71, 16.68 ± 1.33, respectively) vs. (6.94 ± 0.28, 8.56 ± 0.34, respectively) after injury (Figure). However recovery was complete and no significant difference was seen pressures when compared to NI group.

CONCLUSION: Although IM MSC treatment after injury causes increase in anal pressures it is not sustained at 5 weeks. MSC home after serial IV infusion to the injured anal sphincter causing increase in the anal sphincter pressures which are comparable to sham treatment and increase tit 5 weeks. Healing is by fibrosis in the control animals while the MSC treated group showed less scarring with IV infusion group showing the least scarring.

Basic; Colon-Rectal
Mo1861

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Mo1862
Gene Chip Analysis for Detection of Potential Tumor Suppressor Genes (CTGs) in Colorectal Cancer Cell Lines
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BACKGROUND: Anomalies within the chromosomal structure are fundamentally involved in tumorogenesis of colorectal cancer (CRC). Actual generations of gene chips provide very high resolution to study phenomena like loss of heterozygosity (LOH) or total losses that are known to cause inactivation of tumor suppressor genes (TSGs). In this study we use the latest generation of gene chips to reveal significant LOH and total losses in coding regions of CRC cell genome and thereby to reveal unknown TSGs.

METHODS: The genome of 7 established human CRC cell lines was analyzed using latest gene chip technology (180K Genome Wide SNP 6.0 chip by Affymetrix). Results were compared in selected cases with conventional cytogenetic (mFISH analysis). After selecting potential TSGs their expression profile on mRNA level was analyzed using end point and real time PCR. cDNA cloning with subsequent sequencing was performed to reveal possible mutations as well as alternative splice variants.

RESULTS: Gene chip results were basically congruent to those of mFISH analysis but provided a major improvement in terms of resolution. In this initial analysis we limited us to examine a microsatellite unstable cell line. We found four genes as candidate TSGs, two of them turned out to be described as TSG for CRC (FHIT and WWOX).

CONCLUSION: We discovered two genes as potential, probably novel TSGs for CRC. These genes need further investigation. Additionally gene chip analysis proved to be a simple and efficient technical detection of possible TSGs in tumor cell lines.

Mo1863
The Cancer Tests Antigens CABYR a/b and CABY C Are Expressed in a Subset of Colorectal Cancers and Hold Promise as Targets for Specific Immunotherapy
Michael D. Kuch1,2, Xiaohong Yan1,3, Daniel D. Kirchoff1,4, Aqeel Ahmed2, Sonali a C. Herath1, Vesna Cekic1, Xiaohong Yan1, H. Lee Moffitt Cancer Center and Research Institute, Tampa, FL

INTRODUCTION: The novel tumor suppressor gene, HIPPI, is epigenetically silenced in over 80% of colorectal cancers. Despite growing interest in HIPPI as a potential tumor marker, there is very little known about its bio logic mechanisms of action. We have previously reported that the growth suppressive effects of HIPPI require the activation of STAT1 and STAT3 and are associated with the concomitant downregulation of oncoprotein STAT3. Janus-associated Kinase 1 (JAK1) (4) is the upstream regulator of STAT proteins and can demonstrate cross reactivity. In this study, we sought to elucidate the roles of the different JAKs in mediating HIPPI’s biologic functions.

METHODS: Full-length HIPPI was cloned and cloned into the pcDNA3 expression vector which was then stably transfected into the HCT116 colorectal cancer cell line. We have previously demonstrated that this results in substantial in vivo and in vitro growth suppression. Western Blot analyses were performed to assess both expression and phosphorylation status of JAK1 relative to JAK2, JAK3 and TYK2 in HIPPI transfected and empty vector controls. Transient knockdown was achieved using RNA interference with subsequent analysis of effects on STAT1 and STAT2 as well as on cell behavior by MTT and soft agar assays.

RESULTS: We have demonstrated that overexpression of HIPPI results in a substantial increase in both the expression and activation of JAK1 with corresponding reductions for STAT3 (the dominant STAT in colorectal cancer). JAK1 siRNA treatment of HIPPI expressing cells resulted in a 90% reduction of JAK1 expression. The inhibition of JAK1 resulted in a dramatic reduction in the levels of activated STAT1 and STAT2.

CONCLUSION: Suppression of JAK1 activity in the setting of HIPPI overexpression results in an attenuation of STAT1/STAT2 activity and a restoration of proliferative potential. JAK1 appears to be the critical upstream regulator of the growth suppression via activation of STAT1/STAT2 pathways.

Mo1864
HPP1 Mediates Tumor Suppression by Upregulation of JAK1-STAT Signaling Pathways in Colorectal Cancer
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INTRODUCTION: Inovation Center, Kalamazoo, MI; 4Surgery/ Colorectal, University of Southern California, Los Angeles, CA

JAK1-STAT Signaling Pathways in Colorectal Cancer

HPP1 results in a substantial increase in both the expression and activation of JAK1 with corresponding reductions for STAT3 (the dominant STAT in colorectal cancer). JAK1 siRNA treatment of HIPPI expressing cells resulted in a 90% reduction of JAK1 expression. The inhibition of JAK1 resulted in a dramatic reduction in the levels of activated STAT1 and STAT2.

CONCLUSION: Suppression of JAK1 activity in the setting of HIPPI appears to be critical for the observed growth suppression via activation of STAT1/STAT2 pathways.
**Basic: Esophageal**

Mo1866

The Prognostic Significance of Multiple Molecular Markers in Blood of Patients with Multimodal Treatment of Esophageal Cancer

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**BACKGROUND:** Aim of this study was to evaluate the prognostic significance of ERCC1 (Excision Repair Cross Complementing gene), COX2 (cyclooxygenase-2), TS (thymidylate synthase), DPD (Dihydropyrimidine-Dehydrogenase)-RNA expression and the single-nucleotide-polymorphisms (SNP) of ERCC1, GNAS, and XRCC1 in blood of patients with neoadjuvant treated cancer of the esophagus.

**MATERIAL AND METHODS:** A total of 29 patients with locally advanced cancer (cT3-T4, Nx, M0) of the esophagus were included in this study. Blood samples from each patient were drawn prior to neoadjuvant radio-chemo-therapy (cis-Platin, 5-FU, 36Gy). Transthoracic en-bloc esophagectomy was performed in all patients following completion of neoadjuvant therapy. After extraction of cellular tumor-RNA from several quantitativeitative molecular analysis was done by real-time RT-PCR (Taqman®). Histo- morphological regression was defined as major response when restected specimen contained <10% of residual vital tumor cells, and minor response with >10% of vital residual tumor cells.

**RESULTS:** Nineteen of 29 (65.5%) of patients showed a minor histopathological response and 10 of 29 (34.5%) showed a major response to neoadjuvant radio-chemotherapy. The median survival of patients was 2.08 years (0.15 - 4.5). Blood TS RNA expression and the ERCC1 C118T SNP were significantly associated with patient survival. Patients with high expression had a median survival of 1.1 years (0.21 – 3.16) compared to 3.36 years for patients with a low TS expression (p = 0.031, Logrank test). Patient’s with the ERCC1 genotype GG had a median survival of 0.3 years (0.10 – 0.52) compared to 2.8 years (0.4 – 4.9) for the AG genotype and 4.0 years (4.4 – 2.2) for the AA genotype (p = 0.001). There were no associations between patient’s clinical variables and gene expression status.

**CONCLUSIONS:** TS RNA expression and the ERCC1 C118T SNP in blood are associated with the prognosis of patients with neoadjuvant treated esophageal cancer and are potential non-invasive prognostic markers in this disease. Future studies are warranted to determined the clinical potential of this molecular approach.

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**Basic: Hepatic**

Mo1867

Pentoxifylline Inhibits Tumor Necrosis Factor Synthesis and Improves Liver Regeneration After Partial Hepatectomy in Rats by a Mechanism Related to Inhibition of TGF Beta 1 Expression

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**BACKGROUND:** Liver regeneration in small for size liver grafts and in subtotal hepatectomies may be suppressed increasing the mortality. TNF-α and IL-6 are strong promoters of hepatic regeneration after hepatectomy and recognized as initial phase cytokines in inflammatory response to systemic infection or injury, and in liver dam-age following hepatectomy or ischemia/ reperfusion injury. TGF-beta 1 is an anti-inflammatory cytokine and a potent growth inhibitor. There are evidences that TNF-α induces TGF-beta 1 expression in many cell types. We hypothesized that pentoxifylline (PTX) an inhibitor of NF-κappa-B could improve liver regeneration by reducing TGF-beta 1 expression in the liver and the deleterious effects of high levels of TNF-α after partial hepatectomy. The aim of the present study was to evaluate the effect of pentoxifylline on liver regeneration after partial hepatectomy in rats.

**METHODS:** Wistar rats were randomized into 2 groups: A (n = 26) animals submitted to 70% hepatectomy and saline administration, and Group PTX (n = 26) animals submitted to 70% hepatectomy receiving pentoxifylline (25 mg/kg). AST, ALT, TNF-α, and IL-6 serum levels were measured at 2 and 6 h after hepatectomy. ATG 4 h after hepatectomy residual liver were removed and stained with hematoxylin-eosin. Hepatocyte proliferation was assessed by mitotic index and by delimiting cell nuclear antigen (PCNA) staining. Total RNA was isolated from liver tissues and qRT-PCR analysis for TGF-beta 1.

**RESULTS:** AST and ALT levels were not significantly reduced in rats treated by PTX, TNF-α, and IL-6 blood levels increased at 2 and 6 hours after partial hepatectomy. Administration of PTX significantly decreased serum levels of TNF-α and IL-6 at 2 hours after resection. A signifi- cant reduction in TGF-beta 1 expression in liver tis-sue was observed in rats receiving PTX. The pathologic results obtained 48 hours after the hepatectomy showed an increased mitotic index and PCNA labeling index in ani-mals treated with PTX compared to saline treated rats. Pentoxifylline decreases the systemic inflammatory response reduces liver TGF-beta 1 expres-sion, enhancing liver regeneration and may be useful to improve the function of small for size liver grafts.

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**Basic: Pancreatic**

Mo1868

Reparative Stress-Induced Midline Expression and Secretion Activates Notch Signaling and Is Linked to Epithelial-Mesenchymal Transition and Chemoresistance in Pancreatic Cancer

Cemal Guğur, Hilke Zander, Florian Gebauer, Michael Tachery, Enner F. Yelbuz, Jakob K. Izbicki, Maximilian Buckhoff, General, Visceral and Thoracic Surgery, University Hospital, Hamburg, Germany

Pancreatic ductal adenocarcinoma (PDAC) still remains an exceptional case among solid tumors, since its incidence nearly equals mortality rate. Despite formidable improve-ment of understanding the molecular mechanisms contrib-uting to cancer progression and metastasis, no real progress has been done in catching cellular mechanisms governing chemotherapy-resistance in cancer cells, although almost all PDACs are intrinsically chemoresistant. It was recently shown that chemoresistant PDAC cells overexpress the Notch-2 receptor and acquire an epithelial-mesenchymal transitioned (EMT) phenotype. Cellular mechanisms that assist an EMT phenotype are not completely understood. However, the present study identified Midkine (MK) as fre-quently overexpressed in chemoresistant PDAC through gene-expression profiling and real-time PCR. We also found that MK expression is inducible by the chemotherapeutic gemcitabine in a dose-dependent manner in chemoresistant PDAC cells whereas no induction was observed in chemo-sensitive PDAC cells confirmed by real-time PCR. In addi-tion, depletion of MK by RNAi correlated with decreased proliferation rates and more interestingly with a strong increase in sensitization towards gemcitabine. Main attrac-tion is the identification of Notch-2 receptor as a new MK interactor in PDAC cells. Surprisingly, our results indicate that the MK-Notch-2 interaction activates Notch signaling in PDAC cells leading to induction of EMT, upregulation of NF-

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**Basic: Pancreatic**

Mo1869

Pancreatic Consistency and Hounsfield Unit on CT Scan in Mature (65+) Subjects

Yuchi Kitagawa*

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**INTRODUCTION:** Consistency of the pancreas is one of the most important prognostic factors for pancreatic anas-to-mosis. However, pancreatic stiffness had been evaluated, subjectively. We introduce a tactile sensor for digitize the consistency of the pancreas.

**MATERIALS AND METHODS:** A material has its own resonance frequency. If material touches an oscillated object, a shift of the resonance frequency will be observed. The difference between the frequencies under pre and post oscillate conditions depends on the stiffness of the object. So, the consistency of material can be measured by moni-toring the shift in the frequency. The tactile sensor system is composed of a sensor probe, an amplifier and a filter; the probe is connected to a piezoelectric transducer with a resonance frequency of 5.7 KHz. Measurements were made 200 times per second, and the magnitude of frequency change was processed by connected computer with origi-nal software. 85 patients with mean age 70 ± 9.5 were registered with this study. These patients did not have any clinical sign of pancreatitis. 35 patients were excluded from this study, because of high serum amylase level. And mean serum amylase level was 92.9 ± 21.5 U/L. Patients were divided two groups into over and under 65 years old. Consistency of the pancreas was measured with a tactile sen-sor system (Ventus Handy Biosensor system TM, AXIOM, Fukushima, Japan). Pancreas head and body (neck) were measured 2 or 3 times on the same point. If the patients had pancreatic tumor, the measurement was performed far from the tumor. Hounsfield Unit (HU) on CT scan was measured in head and neck of the pancreas. HU was measured on SOMATOM Sensation Cardiac-64 (SIEMENS Japan, Tokyo, Japan) CT system with SIEMENS image server using the original software.

**RESULTS:** The consistency of the pancreas head was 670.0 ± 172.9 Hz in mature and 708.0 ± 239.3 Hz in younger, respectively. The consistency of the pancreas neck was 737.1 ± 212.9 Hz in mature and 708.0 ± 239.3 Hz in younger, respectively. The consistency of the pancreas body was 708.0 ± 239.3 Hz in mature and 708.0 ± 239.3 Hz in younger, respectively. The HU of the pancreas was 52.9 ± 4.9 HU in mature and 43.0 ± 4.3 HU in younger, respectively. The HU of the pancreas neck was 43.7 ± 5.4 HU in mature and 44.4 ± 5.7 HU in younger, respectively. There was no correlation between age and hardness of the pancreas. Also, there was no relation with hardness and HU in each age group.

**CONCLUSION:** This method is easily maintained the consistency of pancreas non-invasively. Further investigation will be needed for elucidate the relationship between consistency and Hounsfield Unit of pancreas.
Mo1870
B Lymphocytes Inhibit Proliferation of Pancreatic Cancer
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INTRODUCTION: Tumor immunology is important in cancer progression, but poorly understood. Few data evaluate the effects of B lymphocytes on cancer. In our model of murine pancreatic cancer in obesity, we have observed fewer circulating B lymphocytes, reduced B lymphocyte gene expression, and fewer tumor infiltrating B lymphocytes in the tumor microenvironment of obese mice. These mice also had larger tumors than control mice. These observations suggest that decreased B lymphocytes, as seen in obesity, permit accelerated pancreatic cancer growth. We therefore hypothesized that B lymphocyte activity inhibits the growth of murine pancreatic cancer.

METHODS: Seven-month old C57 Bl/6J mice were studied. Splenic lymphocytes were extracted by pressure injection and B lymphocytes isolated by nylon wool microfiltration. The B lymphocytes were activated with 10 μg/ml LPS. For time course evaluation, B cells were incubated for 18, 24, 48, and 72 hours before collection of the supernatant media. For concentration evaluation, B cells were seeded at 1 x 10^6, 3 x 10^6, and 5 x 10^6 cells/ml and incubated for 24 hours. 5 μl of the conditioned media was collected and added to 5000 PAN02 murine pancreatic cancer cells. After 20 hours of growth, a standard MTT assay was performed to evaluate proliferation. Student's t-test and ANOVA were used to compare results, with a p value <0.05 considered significant.

RESULTS: B lymphocyte conditioned media significantly inhibited PAN02 proliferation in both a time- and concentration-dependent fashion relative to control (see figure). We hypothesized that increased TEER corresponds with the intestinal epithelial cell's ability to respond to an inflammatory signal in a vectorial manner.

CONCLUSION: These data show that B lymphocyte conditioned media inhibited PAN02 proliferation in both a time- and concentration-dependent fashion. We conclude that B lymphocyte activity inhibits the growth of murine pancreatic cancer.

Mo1871
TNFα-Induced Vectorial Secretion of IL-8 Corresponds to Development of Transepithelial Electrical Resistance in Caco-2 Cells
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The intestinal epithelium, a vital part of the innate immune system, provides a physical barrier between gut lumens and lamina propria and plays an active role in the inflammatory response. Previously, we found that polarized intestinal epithelial cells respond to an inflammatory stimulus in a directional, vectorial manner, with secretion of IL-8 directed toward the inflammatory stimulus. Under specific conditions, cellular differentiation in vitro mirrors the in vivo process, where the cell matures into a columnar, polarized epithelial cell with distinct apical and basolateral regions. Transepithelial electrical resistance (TER) is used to detect formation of tight junctions and as a measure of apical to basolateral polarity. The relationship of TEER to cellular processes such as brush border enzyme transport, nutrient receptors and barrier function is well described, the relationship between TEER and the intestinal epithelial cell's inflammatory polarity is unknown. We hypothesized that increased TEER corresponds with the intestinal epithelial cell's ability to respond to an inflammatory signal in a vectorial manner.

RESULTS: TEER increased from day of plating until day 13. TEER increased markedly between days 13 and 18, to a peak level above 2,000 Ω cm^2 and maintained a level of 1,500 Ω cm^2 or greater for the remainder of the experiment. Prior to the increase in resistance, treatment of apical or basolateral chambers with TNF-α resulted in equal apical and basolateral secretion of IL-8. After the TEER increase, at on day 20, apical TNF-α treatment resulted in only apical IL-8 secretion while basolateral stimulation resulted in both apical and basolateral IL-8 secretion. Subsequent apical or basolateral treatments, as on day 27, maintained this vectorial secretion pattern, but with a significant increase in the magnitude of basolateral secretion.

CONCLUSIONS: In the present study, the ability of intestinal epithelial cells to respond to inflammatory stimuli in a vectorial manner correlated with an increase in TEER. These findings are important because they suggest the importance of cell polarity in the development of the intestinal epithelial cell's mature inflammatory phenotype.

Mo1872
Eating Behavior in Rats Subjected to Ileum Transposition and Sleeve Gastroctomy
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BACKGROUND/AIM: We have reported that eating behavior differed in rats that underwent bypass gastric, sleeve gastroctomy, and/or duodenal switch procedures. Ileum transposition has been recently suggested as a metabolic surgery. The aim of the present study was to examine the eating behavior in rats that underwent ileum transposition (IT) and sleeve gastroctomy (SG).

METHODS: Male rats were subjected to laparotomy or IT, and 6 weeks later both groups underwent SG. Body weight was recorded weekly. Calorie intake, body composition, eating behavior, energy expenditure and fecal energy density were measured by comprehensive laboratory animal monitoring system, dual x-ray absorptiometry, and bomb calorimeter before and after surgery.

RESULTS: Body weight was lower in rats undergoing IT than those subjected to laparotomy (at 1 week, p < 0.05) until 6 weeks (p > 0.05) postoperatively. Fat compartment was reduced at 2 weeks after IT compared to laparotomy (p = 0.02). After SG, body weight was reduced in both groups but more so in IT-rats (pre-operation 466 ± 14 g vs. post-operation 378 ± 21 g, p < 0.01), which was due to reduced fat compartment. Satiety ratio was higher during daytime than nighttime regardless of surgery. At both 2nd and 6th week after IT, satiety ratio was reduced during daytime but not nighttime. Calorie intake per 24 h per rat as well as per 100 g body weight was increased, which was on account of increases in number of meals, meal size, and meal duration, particularly during nighttime. Rate of eating was unchanged neither during daytime nor nighttime. Energy expenditure (kcal/kg/100 g body weight) was unchanged. The fecal energy density was unchanged. In laparotomy rats following SG, caloric intake relative to body weight was unchanged due to an increased appetite during daytime 2 weeks after SG. In IT-rats following SG, however, satiety ratio, caloric intake and energy expenditure were unchanged neither during daytime nor nighttime, but eating behavior was altered as characterized by reduced rate of eating during both daytime and nighttime, reduced meal size during nighttime, and increased meal duration during both daytime and nighttime.

CONCLUSION: After IT procedure, satiety ratio was reduced and caloric intake increased, but these changes disappeared after SG. Instead, the altered eating behavior took place as manifested by eating slowly with small meal size, which may have the metabolic benefits.
INTRODUCTION: Intestinal sugar sensors are involved in achieving the metabolic benefit of RYGB. Confluent cells were incubated under hypoxic (1% O2) or normoxic (21% O2) conditions for 24 hours and exposed to SP (10 and 100 nM), a NK-1R antagonist (NK-1RA; CJ-12,255, Pfizer, Inc.), or SP+NK-1RA. Cells were harvested to assess the upregulation of NR-1 signaling by immunofluorescence and tissue hypoxia by pimonidazole staining.

RESULTS: Pimonidazole staining was increased in peritoneal tissue compared to non-operative controls. Immunofluorescence showed upregulation of the NK-1R in vivo, primarily localized to the mesothelial cell layer on the surface of ischemic but-tons of the proximal jejunum. Proximal jejunum compared to distal, although this was not significant (p = 0.16). There was no topographic difference or correlation with BMI in T1R2 expression.

CONCLUSIONS: Ischemia, or hypoxia, contributes to adhesion formation through the upregulation of NK-1R signaling suggesting that early hypoxia-induced signaling pathways may be novel targets for adhesion prevention.

Mo1874
Topographic Expression of Intestinal Sugar Sensors and Transporters in Obesity: Tissue Analysis of Patients Undergoing Gastric Bypass Surgery.
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INTRODUCTION: Obesity and associated type 2 diabetes mellitus (T2DM) have reached epidemic proportions around the world. Roux-en-Y Gastric Bypass surgery (RYGB) remains the gold standard therapy for obesity that also leads to a rapid resolution of T2DM. Our previous rodent studies have suggested a role for SGLT1 in mediating these metabolic benefits. These experiments had shown that RYGB alters SGLT1 function by blunting intestinal taste receptor stimulation, leading to decreased SGLT1 function. There is a paucity of data on intestinal expression of these transporters in humans. We aimed to investigate the topography of intestinal expression of glucose transporters in humans with metabolic syndrome. We sought to evaluate the expression of GLUT2 levels and BMI in the obese range. Further work is needed to elucidate the role of this transporter in the etiology of obesity.

Mo1875
Overexpression of GLO1 Promotes Tumor Invasion in Gastric Cancer
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Complementary DNA (cDNA) microarrays were applied to identify aberrantly expressed genes in patients with gastric cancer. Among the most exuberantly expressed genes Glyoxalase 1 (GLO1) was one that we chose. We assessed whether overexpression of GLO1 was a potential risk factor for gastric cancer. GLO1 mRNA transcripts and protein expression levels were determined by Western blot test and real time quantitative PCR (qPCR). These tests verified that the expression of GLO1 was higher in gastric cancer tissues compared to adjacent noncancerous tissues. Furthermore, Immunohistochemistry were studied in paraffin-fixed sections of gastrectomized specimens of 114 patients. The IHC scores of GLO1 in patients with serosa invasion (T1 and T4) were significantly higher than those without serosa invasion (T1 and T2). Also, the IHC scores of GLO1 were significantly greater in patients with lymph node metastasis than those without metastasis, and were significantly higher in stages III and IV than in stages I and II. Five-year survival of patients with lower expression of GLO1 gene was significantly better than among patients with a higher expression. To investigate the functional significance of GLO1 expression, GLO1 short hairpin RNA (shRNA) expression plasmids were transfected into gastric cancer cell lines. Cancer cells depletion of GLO1 significantly reduced the migration and invasion ability of each cell line. The results point to GLO1 as a prospective prognostic marker for gastric cancer and its role in gastric cancer progression.

Key words: gastric cancer, molecular biomarker, prognostic factor, GLO1.
CONCLUSION: Our study demonstrates that in unselected nonagenarians, cholecystectomy is safe with acceptable perioperative morbidity and mortality even as an emergency. Our data also suggests that cholecystectomy appears to be a neglected condition in this age group. Elective cholecystectomy should be considered even in the very elderly.

CONCLUSION: In patients with bile duct cancer remains poor, adjuvant gemcitabine plus S-1 chemotherapy (GEM + S-1) after surgical resection for bile duct cancer has been shown to improve survival. S-1 is a novel oral fluoropyrimidine combination including tegafur (a prodrug of 5-fluorouracil; 5-FU), dihydropyrimidine dehydrogenase (DPD) inhibitor (5-chloro-2,4-dihydroxy-pyrimidine), and orotate phosphoribosyltransferase (OPRT) inhibitor (oxanomin, potassium oxanomin). To clarify the relationship between intratumoral mutational enzymes related to the metabolism of S-4U and its derivatives and response to adjuvant chemotherapy with GEM + S-1 for bile duct cancer, we evaluated thymidylate synthase (TS), DPD, and OPRT expression immunohistochemically in resected bile duct cancer tissues.

RESULTS: Of 106 patients, 41 (38.7%) received adjuvant GEM + S-1 chemotherapy. In the GEM + S-1 (+) group, overall survival was significantly longer (p = 0.005, 5-year survival 56.8%) and there was a significant difference between the High and Low intratumoral DPD or OPRT expression revealed no significant difference regardless the histological regression model the model of best fit was determined. P-values of 0.05 or less were considered to indicate statistically significant. SPSS for Windows (Version 18.0.0, 2010) version: SPSS Inc.) was used for all analysis. Results: On univariate analysis, multiple comedities were associated with a significantly increased risk of mortality. There are no diagnostic criteria for GC, making it a challenging diagnosis to make pre-operatively. We set out to determine which factors were predictive for GC in order to better identify which patients might benefit from early surgical management.

METHODS: The medical records of 200 patients (76 with gangrenous and 124 with acute, non-gangrenous cholecys-titis) treated at The Mount Sinai Medical Center from March 2003 to September 2009 were retrospectively reviewed. Specifically, presenting symptoms, physical examination, laboratory values, radiographic findings (ultrasonography and computed tomography), preoperative data and pathological findings were recorded. Univariate analysis was carried out with a two-tailed chi-square test for each of the categorical variables, and a two-sample t-test with the Welch correction for the continuous variables. Multivariate analysis was then performed using a binary logistical linear regression model.

New Seventy? Clinical: Biliary

Mo1585
Magnetically Anchored Cautery Dissector Improves Triangulation and Depth Perception During Single Site Laparoscopic Cholecystectomy

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INTRODUCTION: The purpose of this study was to evaluate operative outcomes and workload during Single Site Laparoscopy (SSL) using a Magnetically Anchoring and Guidance System (MAGS) cautery dissector compared to a conventional laparoscopic hook cautery dissector (LAP).

METHODS: Each dissector was used to perform SSL cholecystectomies in non-survival porcine models (n = 6, 3 MAGS, 3 LAP). A single surgeon with a standardized team performed all procedures in a 2-day period. The device used in the first operation was randomized and devices were alternated thereafter. For both MAGS and LAP procedures, an umbilical multiport access device with two 5mm and one 12 mm ports was used. For MAGS cases, the cautery handle was inserted into the umbilical port and was inserted through the umbilical fascial defect, coupled magnetically, and the operating arm was deployed; 2 graspers (1 straight and 1 articulating) and a laparoscope were used for retraction and visualization, respectively. For LAP cases, 2 percutaneous retraction sutures, 1 articulating grasper, a hook cautery dissector, and a laparoscope were used. Operative outcomes and surgeon ratings (scale 1−5, 1 = superior rating) were recorded. Workload was assessed by the surgeon and the assistant using a previously validated NASA-TLX rating tool which assessed mental, physical, temporal, performance, effort, and frustration levels (scale 1−10, 1 = superior rating). Comparisons used Mann-Whitney U tests (p < 0.05 was considered significant).

RESULTS: Pig weight was 54 ± 1.9 kg and compressed abdominal wall thickness for MAGS was 1.8 ± 0.1 cm. Mean operation time was 71 minutes. Histology showed gangrenous cholecystitis in 14 (64%) patients. The mean length of stay was 10 days (4.25±). Two patients (9%) required intensive care following surgery. There were no complications associated with cystic stump leak. One patient died in the postoperative period (4.5%). All patients with an emergency operation were classified as at least ASA III. Conversion rate, percentage of open procedures, percentage of advanced histology, ASA-score and hospital stay were significantly higher when compared to all patients.

CONCLUSION: Our study demonstrates that in unselected nonagenarians, cholecystectomy is safe with acceptable perioperative morbidity and mortality even as an emergency. Our data also suggests that cholecystectomy appears to be a neglected condition in this age group. Elective cholecystectomy should be considered even in the very elderly.

CONCLUSION: These data suggest that using the MAGS device for SSL cholecystectomy results in equivalent or better outcomes and less workload compared to using only laparoscopic instrumentation, since better triangulation and depth perception are afforded. Additional investigations are encouraged.

Mo1586
Prognostic Impact of Thymidylate Synthase Expression in Adjuvant Gemcitabine Plus S-1 Chemotherapy After Surgical Resection for Bile Duct Cancer

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OBJECTIVE: Although the prognosis in patients with bile duct cancer remains poor, adjuvant gemcitabine plus S-1 chemotherapy (GEM + S-1) after surgical resection for bile duct cancer has been shown to improve survival. S-1 is a novel oral fluoropyrimidine combination including tegafur (a prodrug of 5-fluorouracil; 5-FU), dihydropyrimidine dehydrogenase (DPD) inhibitor (5-chloro-2,4-dihydroxy-pyrimidine), and orotate phosphoribosyltransferase (OPRT) inhibitor (oxanomin, potassium oxanomin). To clarify the relationship between intratumoral mutational enzymes related to the metabolism of S-4U and its derivatives and response to adjuvant chemotherapy with GEM + S-1 for bile duct cancer, we evaluated thymidylate synthase (TS), DPD, and OPRT expression immunohistochemically in resected bile duct cancer tissues.

METHODS: Polyclonal antibodies were used to immuno-

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snoostic: Biliary

Mo1587
Magnetically Anchored Cautery Dissector Improves Triangulation and Depth Perception During Single Site Laparoscopic Cholecystectomy

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INTRODUCTION: The purpose of this study was to evaluate operative outcomes and workload during Single Site Laparoscopy (SSL) using a Magnetically Anchoring and Guidance System (MAGS) cautery dissector compared to a conventional laparoscopic hook cautery dissector (LAP).

METHODS: Each dissector was used to perform SSL cholecystectomies in non-survival porcine models (n = 6, 3 MAGS, 3 LAP). A single surgeon with a standardized team performed all procedures in a 2-day period. The device used in the first operation was randomized and devices were alternated thereafter. For both MAGS and LAP procedures, an umbilical multiport access device with two 5mm and one 12 mm ports was used. For MAGS cases, the cautery handle was inserted into the umbilical port and was inserted through the umbilical fascial defect, coupled magnetically, and the operating arm was deployed; 2 graspers (1 straight and 1 articulating) and a laparoscope were used for retraction and visualization, respectively. For LAP cases, 2 percutaneous retraction sutures, 1 articulating grasper, a hook cautery dissector, and a laparoscope were used. Operative outcomes and surgeon ratings (scale 1−5, 1 = superior rating) were recorded. Workload was assessed by the surgeon and the assistant using a previously validated NASA-TLX rating tool which assessed mental, physical, temporal, performance, effort, and frustration levels (scale 1−10, 1 = superior rating). Comparisons used Mann-Whitney U tests (p < 0.05 was considered significant).

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CONCLUSION: Our study demonstrates that in unselected nonagenarians, cholecystectomy is safe with acceptable perioperative morbidity and mortality even as an emergency. Our data also suggests that cholecystectomy appears to be a neglected condition in this age group. Elective cholecystectomy should be considered even in the very elderly.

CONCLUSION: These data suggest that using the MAGS device for SSL cholecystectomy results in equivalent or better outcomes and less workload compared to using only laparoscopic instrumentation, since better triangulation and depth perception are afforded. Additional investigations are encouraged.
CONCLUSIONS: Colonoscopy results in significant ongoing risk of SBO according to the colorectal type of procedure. This risk seems to be similar between laparoscopic and open approach, higher after elective surgery and for patients with previous surgery. Number of readmissions for SBO predicts the need of surgery.

Mo5190 A Critical Analysis of 28 Patients with Metachronous Peritoneal Dissemination from Colorectal Cancer

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PURPOSE: The incidence of metachronous colorectal cancer is high (5-10%) in patients with previous colorectal cancer. The current role of laparoscopic surgery to prevent or treat metachronous colorectal cancer remains controversial. The aim of this study was to assess the outcome and to identify predictive factors for outcome after surgical treatment of patients with metachronous colorectal cancer.

METHODS: The study included all patients with metachronous colorectal cancer who underwent open colorectal surgery between January 2013 and March 2019. Data were extracted from a hospital database. Patients were divided into two groups: RS only group (surgery only) and CRS group (surgical resection and CRS). Univariate and multivariate analyses were performed using Cox proportional hazards regression. A P-value < 0.05 was considered statistically significant.

RESULTS: A total of 28 patients (20 males, 8 females; median age 63 years, range 37-85) were included in the study. The median time from diagnosis of the primary colorectal cancer to diagnosis of metachronous colorectal cancer was 7.7 years. The most common site of metachronous colorectal cancer was the right colon (42.9%) followed by the rectum (28.6%). The median operative time was 280 minutes (range 150-560). The median blood loss was 300 ml (range 0-1500). The median hospital stay was 4 days (range 2-14). The overall mortality rate was 5.7% (2 patients). At a median follow-up of 36 months (range 12-90), 7 patients (25%) had recurrence of colorectal cancer. The most common site of recurrence was the liver (3 patients). The median overall survival was 34.5 months (range 12-90). In the multivariate analysis, age (HR 1.04, 95% CI 1.01-1.07, P = 0.009), stage (HR 4.52, 95% CI 1.24-15.87, P = 0.021) and the type of surgery (HR 3.41, 95% CI 1.04-11.33, P = 0.043) were independent predictors of survival.

CONCLUSIONS: Open colorectal surgery is an effective treatment option for patients with metachronous colorectal cancer. Age, stage and the type of surgery are independent predictors of survival. Further studies are needed to assess the role of CRS in the prevention of metachronous colorectal cancer.

Mo5191 Total Abdominal Colectomy for Refractory Ulcerative Colitis—Evolution in Surgical Treatment

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INTRODUCTION: Total abdominal colectomy (TAC) is considered a valuable treatment option for patients with refractory ulcerative colitis (UC) who have failed medical therapy. The aim of this study was to review the evolution of surgical treatment and to identify predictors of outcome after TAC.

METHODS: We performed a retrospective chart review of all patients undergoing TAC at our institution from January 2001 to August 2019. Data were extracted from a hospital database. Patients were divided into two groups: TAC performed before 2011 (group A) and TAC performed after 2010 (group B). Univariate and multivariate analyses were performed using Cox proportional hazards regression. A P-value < 0.05 was considered statistically significant.

RESULTS: A total of 28 patients were included in the study. The median age was 52 years (range 21-75) and the median follow-up was 6 years (range 1-10). The most common indication for TAC was failure of medical therapy (71%). The median operative time was 280 minutes (range 120-420) and the median blood loss was 200 ml (range 0-1000). The median hospital stay was 5 days (range 2-14). The overall mortality rate was 7.1% (2 patients). At a median follow-up of 3 years (range 1-10), 7 patients (25%) had recurrence of UC. The most common site of recurrence was the liver (3 patients). In the multivariate analysis, age (HR 1.03, 95% CI 1.01-1.05, P = 0.012) and the type of surgery (HR 3.07, 95% CI 1.08-8.89, P = 0.036) were independent predictors of recurrence.

CONCLUSIONS: Total abdominal colectomy (TAC) for refractory UC is a safe and effective treatment option. Age and the type of surgery are independent predictors of outcome after TAC. Further studies are needed to assess the role of preoperative medical therapy and the type of surgery in the prevention of recurrence.
Mo5192
Outcomes of Right Versus Left Colectomy for Colon Cancer
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INTRODUCTION: Colocolonic or colorectal anastomosis perceived as more technically challenging than ileocolic anastomosis. Therefore, right colectomy (RC) is generally believed to be a simpler operation with better outcomes than left colectomy (LC).

OBJECTIVES: Our study was intended to compare outcomes between right and left colectomy in patients with colon cancer and identify factors that increase the risk of developing postoperative abdominal abscess or anastomotic leakage (abcess/leak) in these patients.

METHODS: Using the 2007 Nationwide Inpatient Sample (NIS) database, patients who underwent elective RC and LC (left hemicolectomy or sigmoidectomy) for colon cancer were examined. Patient characteristics, comorbidities, perioperative complications, length of stay (LOS), total hospital charges and in-hospital mortality were evaluated. Regression analysis was performed to identify independent predictors of abscess/leakage.

RESULTS: A total of 50,799 patients underwent elective RC and LC for colon cancer during 2007. RC (63.54%) and LC (36.46%). Overall, 9.63% were performed laparoscopic (RC 9.70% vs. LC 9.47%, p = 0.39). BC patients had more abscesses.

Mo5193
Sacral Nerve Stimulation for Fecal Incontinence: Predictors of Long-Term Success
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PURPOSE: Sacral nerve stimulation (SNS) is effective in the treatment of urinary incontinence and is currently under review by the FDA for the treatment of fecal incontinence (Fi) in subjects who have failed or are not candidates for other treatment. The aim of this study was to analyze the results of the patients with Fi treated with SNS in a large comprehensive clinical trial to identify any potential predictors of therapeutic success 3 years after implant.

METHODS: Patients with ≥50% improvement in Fi episodes and/or days per week during a 10-14 day test stimulation period using the chronic lead were implanted with a multi-electrode stimulator. All patients had ≥2 functional symptoms and delivered irritable bowel syndrome, internal and external anal sphincter defects, prior surgeries, and quality of life.

RESULTS: 66 of the 77 subjects (86%) achieved therapeutic success with a median reduction of 96% in Fi episodes; 31 (40%) patients achieved complete continence. Only 11 patients (14%) did not meet the 250% criterion for success with a median reduction of 30% in Fi episodes. Improvement in FI episodes during test stimulation was greater in subjects with therapeutic success (88%) than in those without success (25%) (p = 0.002). No other differences were noted between the groups.

CONCLUSION: The present analysis indicates that the test stimulation was effective but that the only factor which correlated with success at 3 years was improvement during test stimulation.

Mo5194
Early Postoperative Outcomes After Laparoscopic Segmental Colorectal Resection for Endometriosis: The Impact of Surgical Experience
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BACKGROUND: The aim was to determine the predictors of postoperative complications in women undergoing laparoscopic colorectal resection (LCR) for deep bowel endometriosis.

METHODS: Patients undergoing LCR from 2002 to 2009 were included (n = 720). Demographic and clinical data as well as perioperative details were abstracted. A complication was defined by the presence of any deviation from the normal postoperative course. Records were analyzed retrospectively using logistic regression.

RESULTS: The median patient age was 35 years (IQR 29.36). Significant dischezia (visual analogue scale [VAS] > 5) was the most common symptom (59%) and 360 (50%) women presented a radiological stenosis > 30% Overall, 468 patients (65%) had previous surgery. In 558 (77%) patients a recto-sigmoid resection was carried out whereas a rectal resection and an ileocolic resection were performed in 19% and 3% of cases, respectively. The mean operative time was 300 minutes (IQR 240, 360) with a median blood loss of 200 ml (IQR 130, 460). A temporary ileostomy was performed in 128 cases. Postoperative mortality was nil. 71 (10%) women experienced a complication. The patients were discharged on median day 8 (IQR 7, 10).

The most frequent complication was anastomotic strictures (15%) followed by anastomotic leakage and recurrent vaginal fistula (1%) and anastomotic leakage (1%). At univariate analysis, the presence of a superficial imperforate hymen, an ultra-low ileotransvaginal approach for endometriosis and the number of consecutive operations (≥30 cases), correlated significantly with postoperative complications (odds ratios 2.68, 4.15 and 1.93, respectively, P < 0.05). A number of consecutive operations ≥300 proved to be the only independent predictor of complications, shown through multivariate analysis (odds ratios 2.25, C1 0.91, P < 0.05).

CONCLUSIONS: LCR for endometriosis is a safe procedure having a 10% rate of complications with no mortality. The surgical experience is the only independent predictor of complications after LCR for intestinal deep endometriosis. A low volume center (≤30 cases) had a significant impact on postoperative outcome. Improvement of postoperative outcomes was observed after the first 300 cases. Women affected by deep intestinal endometriosis should be referred to experienced laparoscopic surgeons.

Mo5195
Laparoscopic Colorectal Surgery for Bowel Endometriosis with Transvaginal Resection and Specimen Extraction: Perioperative Results in 40 Consecutive Patients
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PURPOSE: The aim of this study is to evaluate our experience with laparoscopic transvaginal colorectal resection for bowel endometriosis.

METHODS: 40 patients (median age 30 years, range: 26–43) underwent laparoscopic colorectal resection for symptomatic deep infiltrating endometriosis of the rectum or rectovesicouterine, at a referral center. Laparoscopic intracorporeal division of the distal rectum and extramucosal excision of the surgical specimen via a colpotomy incision were performed in order to complete the resection. Transanal mechanical colorectal anastomosis was then carried out. All colorectal resections were performed by the same surgeon. Perioperative outcomes were analyzed.

RESULTS: 19 patients (47.5%) had previous laparotomy and/or laparoscopic surgery for any pathology. All patients underwent laparoscopic removal of multiple implants of deep infiltrating pelvic endometriosis. No hysterecme was necessary in order to properly evaluate the potential benefits of transvaginal versus laparotomic specimen extraction. All patients underwent long-term follow-up with a median duration of 30 months. The most frequent complication was anastomotic leakage (1%) and pelvic infection (1%). Mortality was nil, morbidity was 15%. Three patients developed recto-vaginal fistula and another one an anastomotic leakage.\n
CONCLUSIONS: In the setting of deep infiltrating pelvic endometriosis, colorectal resection with a combined laparoscopic-transvaginal approach, avoiding mini-laparotomy or the extension of port-site incisions, is a viable option. All major complications occurred among the first 15 patients in our series. Additional experience is necessary in order to properly evaluate the potential benefits of transvaginal versus laparotomic specimen extraction evaluating both perioperative and long-term outcomes.
Mo1156
Discoid Resection with Combined Laparoscopic/Endoscopic Approach for Rectal Endometriosis: Perioperative and Long-Term Outcomes
Giacomo Rufii1, Stefano Crippa1,2, Claudia Bonardi3, Stefano Pettalli3, Marco Benini1, Massimo Falconi1,2, Luca Minelli1,2
1Department of Surgery, Ospedale Sacro Cuore Don Calabria, Negrar, Italy; 2Department of University of Verona, Verona, Italy; 3Department of Gynecology, Ospedale Sacro Cuore Don Calabria, Negrar, Italy; Department of Pathology, Ospedale Sacro Cuore Don Calabria, Negrar, Italy; Division of GI endoscopy, Ospedale Sacro Cuore Don Calabria, Negrar, Italy
BACKGROUND: Bowel endometriosis involves the rectum in most cases. In this setting, laparoscopic rectal resections with low colorectal anastomosis are frequently required and are associated with good symptomatic relief but with the risk for major complications. Discoid resections have been proposed in the treatment of small (<2.5 cm) single endometriotic nodule of the rectum without bowel stenosis as an alternative to segmental resection.
METHODS: Between 2004 and 2009, 81 patients (median age 35 years) underwent laparoscopic excisions of endometriosis with full thickness discoid resections of bowel endometriosis using a circular stapler inserted transanally. 32 procedures were performed between 2004 and 2006 (early period) and 49 between 2007 and 2009 (late period). Perioperative and long-term outcomes were analyzed.
RESULTS: Dysmenorrhea, chronic pelvic pain, dyschezia, dyspareunia, rectal bleeding were present preoperatively in 100%, 75%, 78%, 80%, and 2.5% of cases, respectively. No laparoscopic conversion was required and overall median operative time was 180 minutes with median blood loss of 100 ml. Median time of discoid resection was 15 minutes. Temporary ileostomy was required in one patient (1.5%). There was no mortality, overall morbidity was 16%. Median length of stay was 5 days. Rates of intra-abdominal haemorrhages, rectal bleeding, enteric fistula, blood transfusions and reoperation were 2.5%, 6%, 1.5%, 6%, and 6%, respectively. Rectal bleeding from the stapler line were successfully managed using conservative endoscopic management. At pathology, three patients (3.5%) showed a microscopic involvement of the surgical margin of the discoid resection by endometriotic tissue. There was a decrease of median operative time (220 vs 150 min, p < 0.0001), blood loss (200 vs 130 ml, p = 0.105), length of stay (6 vs 5 days, p = 0.07), overall morbidity (28% vs 8%, p = 0.017), haemorrhages (6% vs 0, p = 0.07), rectal bleeding (12.5% vs 2%, p = 0.06), blood transfusions (12.5% vs 2%, p = 0.06) from early to late period reflecting an improved learning curve.
RESULTS: Twenty-two (22) patients at the mean age of 54 ± 5 yrs were diagnosed with primary CDF benign (n = 14) or malignant (n = 8). Benign CDF were due to Crohn’s disease (n = 9) or peptic ulcer disease (n = 5), while malignant CDF was primarily due to colon cancer (n = 7) plus one patient with lymphoma. Indications for operative intervention included intractable symptoms, gastrointestinal bleeding, and malignancy. Complete resection of malignant CDF with negative margins was achieved in half of patients after en bloc resection. Palliative bypass was performed in the remaining patients with unresectable disease. Thirteen patients with benign CDF had resection of the fistula which required a duodenal bypass procedure in 2. There were no perioperative deaths, and the morbidity rate was 38%. Median survival for patients with malignant CDF was 20 months (range 1-150 months). Two patients with malignant CDF had >5 yr survival. All patients with benign CDF who underwent fistula resection had resolution of fistula-related symptoms with one recurrence.
CONCLUSION: Benign CDF is amenable to operative therapy. Complete resection of malignant CDF can impart survival benefit and should be offered to patients.
Mo1598
Use of Hand-Assisted Laparoscopy in a Colorectal Cancer Practice Leads to a Rapid and Safe Adoption of Minimal Invasive Techniques
Celia Robinson, Daniel A. Anaya, Avo Artinyan, Samir S. Awad, David H. Berger, Daniel Albo
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INTRODUCTION: Use of minimally invasive techniques is becoming the standard of care in the treatment of colorectal malignancies. Despite the learning curve related to Laparoscopic Surgery, there is a growing evidence that minimally invasive techniques provide quicker recovery time, reduced hospital stay, and lower complications compared to open surgery. The growing use of minimally invasive techniques in colorectal oncology has not been well described. In this setting, a new technique, hand-assisted laparoscopy, was introduced into a colorectal cancer practice with the aim of reducing the learning curve for this new technique.
METHODS: The use of hand-assisted laparoscopy in a colorectal cancer surgery practice was evaluated prospectively. The changes in the adoption of minimally invasive techniques over time and potential factors for the rapid adoption of minimally invasive techniques were determined. The learning curve was evaluated by comparing operative time, conversion rate, complications including bowel endometriosis recurrence, and short-term outcomes among open cases versus hand-assisted laparoscopic cases. The Fisher’s exact and Mann-Whitney U tests were used, where appropriate, for analysis.
RESULTS: A retrospective analysis of a prospectively maintained colorectal cancer database containing cases prior and subsequent to the adoption of hand-assisted laparoscopy was completed. There was no significant variation in the composition of surgeons in the practice during the study period. The change in distribution of minimally invasive cases over time quantified the rapidity of implementation of minimally invasive techniques. Surrogate markers of the learning curve, including complication rates, conversion rates, and operative times, were similarly evaluated. There was no significant difference in the complication rate (3.3% vs 4.6%, p = 0.618), conversion rate (19.4% vs 19.4%, p = 0.74), length of stay (6 vs 5 days, p = 0.07), overall morbidity (28% vs 24%, p = 0.06), blood transfusions (12.5% vs 2%, p = 0.06) from early to late period reflecting an improved learning curve.
CONCLUSIONS: The use of hand-assisted laparoscopy in this colorectal cancer practice practice leads to an abbreviation of the laparoscopic learning curve with a rapid adoption of minimally invasive techniques, while maintaining patient safety and operative efficiency.
Mo1599
Impact of Preoperative Microsatellite Instability Testing on Surgical Management in Young-Onset Colorectal Cancer Patients: Results from a Reflex Testing Protocol
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PURPOSE: In an effort to capture patients in our surgical practice considered high-risk for Lynch Syndrome because of young age, reflex microsatellite instability (MSI) testing was initiated on all colorectal cancers resected from young patients not tested preoperatively. This protocol provides a unique opportunity to retrospectively compare surgical management in high-risk patients who were tested either preoperatively or postoperatively for MSI. We aimed to determine if MSI status altered surgical management when the result was known preoperatively.

METHODS: Starting in 2003, the pathologist handling the resection specimens ordered MSI testing on all newly diagnosed young-onset CRC (≤50 years old) cases not tested preoperatively for surgery. Patients with inflammatory bowel disease or polyposis syndromes were excluded. We categorized tumors as microsatellite stable (MSS), which included MSI-low tumors, and MSI-high (MSI-H), with or without germ-line mutations. Clinicopathologic features and surgical procedures performed were reviewed.

RESULTS: Between 2003 and 2008, 210 newly diagnosed young-onset CRC patients undergoing surgery had MSI testing. Results of testing were available preoperatively in 103 patients and postoperatively, secondary to the reflex protocol, in 107 patients. MSI-H tumors were found in 16/103 (16%) in the preoperatively tested group and 12/107 (11%) in the postoperatively tested group. Comparison of clinicopathologic features and surgical intervention between groups are listed in Table 1. MSI-H status known preoperatively significantly influenced surgical recommendations of total colectomy compared to patients where status was not known until after surgery (94% vs. 8%, p < 0.001). Hysterectomy was performed in 8/10 women when preoperative MSI-H status was known (one had metastatic disease, one was of childbearing age). There was only one female patient in the postoperative group and she did not undergo hysterectomy. Germ-line mutations were positive in 10/16 (63%) MSI-H patients tested. Two patients had germ-line testing available preoperatively.

CONCLUSION: MSI-H status was found in 13% of young-onset colorectal cancer patients operated at our institution, and 63% of those tested, had germ-line mutations. Knowledge of MSI status preoperatively significantly influenced surgical management with an increase in total colectomy and hysterectomy compared to patients whose MSI-H status was discovered postoperatively. The absence of germ-line testing in MSI-H patients did not appear to influence surgical decision making.

Mo1600
Laparoscopic Rectopexy: The Procedure of Choice for Rectal Prolapse to Reduce Surgical Site Infections and Length of Stay
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PURPOSE: Rectal prolapse is commonly seen in patients with significant comorbidities. Multiple approaches have been described, including the use of laparoscopy. The purpose of this study was to determine which surgical approach for repair of rectal prolapse is associated with lower morbidity compared to open approaches.

METHODS: The ACS NSQIP database was queried for patients who underwent laparoscopic or open rectopexy (R) or sigmoid resection and rectopexy (SR+R) between 2005 and 2008. Comorbidities analyzed included diabetes, COPD, hypertension, cardiac (history of congestive heart failure, myocardial infarction, previous percutaneous cardiac intervention or surgery), and neurologic (history of transient ischemic attacks or cerebrovascular accident). Postoperative complications analyzed included surgical site infections (SSI), pneumonia, reintubation, pulmonary embolus, stroke, myocardial infarction, and sepsis. Chi-square or t-test/ANOVAs were used to assess significance for categorical and continuous variables, respectively. Logistic regression analysis was used to determine risk factors for morbidity after rectal prolapse repair.

RESULTS: 685 patients underwent surgical treatment of rectal prolapse. Most patients underwent open SR+R (247 open SR+R, 161 laparoscopic SR+R, 84 laparoscopic R). Patients undergoing all procedures had similar comorbidity profiles, but the patients who had a laparoscopic R were significantly older (mean age 61.4 years) than the other three groups (p = 0.04). Operating time ranged from 128 minutes (open R) to 185 minutes (laparoscopic SR+R vs. R, p < 0.001). Overall, open SR+R and open R were associated with significantly more morbidity than laparoscopic SR+R and R (OR 0.44, 95% CI 0.23-0.84, p = 0.01). Comparing all four procedure types, there was a trend to decreased overall morbidity with laparoscopic R, but it did not achieve statistical significance (OR 0.31, 95% CI 0.07-1.40, p = 0.13). Length of stay and SSI rates were significantly lower with laparoscopic R as compared to the other three procedure types (see table).

CONCLUSIONS: Patients who undergo laparoscopic rectopexy may have a shorter length of stay and lower SSI rate as compared to patients who undergo other abdominal procedures for repair of rectal prolapse. Further study is necessary to determine the long-term outcomes from laparoscopic rectopexy, but in high-risk patients, the laparoscopic approach should be considered to decrease peri-operative risk.
Multiple studies have debated its short and long-term effectiveness. The objective of this study is to review the published data and perform an in-depth statistical analysis of the efficacy of this procedure in the management of GERD.

METHODS: A systematic search of the literature, published to date in English and indexed in MEDLINE and PubMed, was carried out in November 2010 with device and condition specific keywords. Studies were selected on the basis of availability of data on at least two of the following parameters: esophageal manometry, pH study, quality of life indices and medication usage. Exclusion criteria included studies involving children or those with a follow-up less than 3 months. Data were presented as weighted mean values based on the number of patients in each included study so that the analysis represented the mean change in each outcome variable over all patients studied. The meta-analysis consisted of weighted t-tests on the differences between mean pre-Stretta and post-Stretta values of various outcome variables. Analysis was restricted to the reported mean values of outcomes for pre-operative and latest post-operative observations for single Stretta procedures and for results summarized across all patients.

RESULTS: 20 studies, containing 1441 patients, published between 2001 and 2010 met the inclusion criteria. The mean follow-up was 17.1 months (range 4–53 months). Outcome data are outlined in the table. GERD health related quality of life (GERD-HRQL), quality of life reflux and dyspepsia scores, heartburn, and patient satisfaction scores were all significantly improved following the Stretta procedure. Esophageal acid exposure and DeMeester scores were both significantly reduced following Stretta treatment. Lower esophageal sphincter pressure showed a trend towards increased post-treatment pressures, but failed to reach statistical significance in this analysis.

CONCLUSION: Radiofrequency ablation of the lower esophageal sphincter produces significant improvement in both subjective and objective reflux indices. These findings suggest that the Stretta procedure provides significant symptomatic relief for many patients and represents an alternative to medical treatment and surgical fundoplication in select patients.

Mo1602
Radiofrequency Energy Delivery to the Lower Esophageal Sphincter Reduces Esophageal Acid Exposure and Improves GERD Symptoms: A Meta-Analysis

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INTRODUCTION: Several endoluminal approaches to the management of gastroesophageal reflux disease (GERD) have been developed as an intermediate therapy between conservative medical management and the more invasive surgical fundoplication. One such intervention, the Stretta Procedure (Medtronic Therapeutics Inc, Greenwich, CT), utilizes application of radiofrequency energy to the lower esophageal sphincter to control gastroesophageal reflux. Multiple studies have debated its short and long-term effectiveness. The objective of this study is to review the published data and perform an in-depth statistical analysis of the efficacy of this procedure in the management of GERD.

METHODS: A systematic search of the literature, published to date in English and indexed in MEDLINE and PubMed, was carried out in November 2010 with device and condition specific keywords. Studies were selected on the basis of availability of data on at least two of the following parameters: esophageal manometry, pH study, quality of life indices and medication usage. Exclusion criteria included studies involving children or those with a follow-up less than 3 months. Data were presented as weighted mean values based on the number of patients in each included study so that the analysis represented the mean change in each outcome variable over all patients studied. The meta-analysis consisted of weighted t-tests on the differences between mean pre-Stretta and post-Stretta values of various outcome variables. Analysis was restricted to the reported mean values of outcomes for pre-operative and latest post-operative observations for single Stretta procedures and for results summarized across all patients.

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CONCLUSION: Radiofrequency ablation of the lower esophageal sphincter produces significant improvement in both subjective and objective reflux indices. These findings suggest that the Stretta procedure provides significant symptomatic relief for many patients and represents an alternative to medical treatment and surgical fundoplication in select patients.
Mo1605
Trans-Thoracic Approaches to Esophagectomy
Associated with Higher Morbidity
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INTRODUCTION: Esophagectomy is performed through various approaches, both open and minimally invasive (MIE). This study’s aim is to review the perioperative outcomes after all types of esophagectomy while quantifying patients’ preoperative comorbidities.
METHODS AND PROCEDURES: We retrospectively reviewed the charts of 97 patients who underwent either MIE (N = 56) or open esophagectomy (N = 41) between January 2007 and August 2010. Indications for esophagectomy included adenocarcinoma (N = 73), squamous cell carcinoma (N = 11), Barrett’s with high-grade dysplasia (N = 8), end-stage achalasia (N = 3), myopathy (N = 1) and leiomyoma (N = 1). In both groups male predominated (MIE 68%, open 83%) with a similar median age of 66 and 64 years, respectively. Nonadjuvant chemoradiotherpy was administered to 20 (36%) and 19 (46%) patients respectively. All MIE were performed either in a 3-field, trans-sternal, VATS technique (N = 48), or a 2-field, laparoscopic extra-pulmonary technique (N = 8). Open esophagectomy included trans-thoracic techniques: Fig-Leaf (N = 10), thoacocardiologic approach with crural incision (N = 11), and 3-field esophagectomy (N = 8) and extra-pulmonary transhiatal technique (N = 12). Using the Charlson Comorbidity Index, the MIE group had 3 patients categorized as low-risk, 41 as moderate-risk and 12 as high-risk while the open had 13% as low-risk, 77% as moderate-risk and 10% as high-risk patients. Postoperative complications were stratified using the Clavien-Classification system, with minor complications Class I-II, major complications Class I-IV and major complications Class V.
RESULTS: Average operative time for the MIE trans-thoracic was 333 minutes; for the MIE extra-pulmonary was 291 minutes, for the open trans-thoracic was 251 minutes and open extra-pulmonary was 418 minutes. Postoperative complications occurred in 42 MIE patients and 21 open patients; these were major in 19 (34%) MIE and 17 (41%) open (p = 0.53). The predominant in-hospital complications were cardiac, mainly arrhythmias (32% vs. 41%, p = 0.40), pulmonary (34% vs. 44%, p = 0.40), and leaks (13% vs. 10%, p = 1.00). Postoperative 30-day mortalities were 4% in the MIE group and 7% in the open group (p = 0.65). Median length of stay was 8 days (range 5–31 days) for the MIE, 9 days (range 6–38 days) for the open technique. When looking at trans-thoracic versus extra-pulmonary techniques, there were significant differences in major complications (43% vs. 11%, p = 0.01), pulmonary complications (43% vs. 17%, p = 0.032), hoarseness (4% vs. 22%, p = 0.027) and wound infections (4% vs. 22%, p = 0.027).
CONCLUSIONS: This series shows no differences in major complications and mortality between MIE and open esophagogastrectomies in similar patient groups. If the pleural cavity is violated, regardless of approach, there are higher risks of pulmonary complications. Avoiding the pleural cavity however may increase the risk of hoarseness and wound infections.
Mo1606
Obesity Does Not Affect Outcomes in Gastro- Esophageal Cancer
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BACKGROUND: Obesity is a growing epidemic in the United States. The CDC estimates that 25.6% of all adults in the US have a Body Mass Index (BMI) ≥30. Obesity and its associated comorbidities have been associated with increased risk for perioperative complications. The purpose of this study was to compare the rate of complication in normal vs. obese patients undergoing esophageal anastomosis following oncologic resection.
METHODS: We reviewed our prospective 350 patient esophageal-gastric database and found 166 esophageal anastomoses performed for esophageal and gastric cancer from 1994 to 2009, 157 with BMI data available. With informed consent and IRB approval, we compared, clinical pathologic, and outcomes data in the postoperative period between normal patients with BMI<30 and BMI≥30. We then evaluated the presence of complication, severity of complication as indicated by the Clavien-Dindo grading scale, and overall survival. Statistical correlations were calculated with Chi-square (Monte-Carlo), independent t-test, Kaplan-Meier, and log-rank analyses as appropriate.
RESULTS: Of the 157 patients reviewed with a median age of 62 (range 17-94); 120 (76.4%) were men, 37 women, 40 were Obese (25.3%) and 117 were not Obese (74.7%). Of these 157 patients, 62 (39.4%) had neoadjuvant chemotherapy with 59 (37.5%) adjuvant treatment. No statistically significant difference was seen between the obese and non-obese patients regarding development of perioperative complications (72.5% vs. 62.4%, p = 0.30), grade of complication ( p= 0.47), 95% CI (.393 - .549), or anastomatic leak (25% vs. 20.5%, p = .745, 95% CI .637 - .813). Independent variables also showed no significant difference including: estimated blood loss (EBL) (p = .985) need for transfusion (p = .863), number of units transfused (p = .522), number of nodes collected on lymphadenectomy (p = .420). There was a decreased incidence of positive margin after resection in the Obese (2.5%) than non-Obese (12.0%) (p = .079, 95% CI = .075–.180). In the univariate analysis, the following variables showed a decrease toward greater intraoperative transfusion (4.5 vs. 2.4 units, p = .006) and increased number of positive lymph nodes on (8.9 vs. 3.9, p = .024). There was no difference in overall survival in the Obese with median of 16 months (range 0-180 months) and non-Obese 16.5 months (range = 0–180 months), (p = .968).
CONCLUSIONS: Obesity does not affect rate of complication, grade of complication, or rate of anastomotic leak, or overall survival in patients undergoing esophageal anastomosis for oncologic resection. Further investigation is needed to determine the effect of obesity on margin positive resection as a function of procedure-limiting body habitus.
RESULTS: Preoperative frequency/severity scores were: dysphagia = 10/8, regurgitation = 8/6, heartburn = 2/2. Additional trocars were placed in 11 patients (11%), of which 81% were in the first two quartiles; placement of additional trocars decreased in successive quartiles (p = 0.05). Esophagogastrotomy occurred in 3 patients. Postoperative complications occurred in 9%, none specific to Heller myotomy (Table). No conversions to open operations occurred. Length of stay was 1 day. Postoperative frequency/severity scores were: dysphagia = 2-0, regurgitation = 0/0, heartburn = 0/0; scores were similar and less than before myotomy across all quartiles, p < 0.001(Figure). There were no apparent scars, except where an additional trocar was placed.
Mo1607
Defining the Learning Curve of Laparo-Endoscopic Single Site (LESS) Heller Myotomy
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INTRODUCTION: Initial outcomes suggest Laparo-Endoscopic Single Site (LESS) Heller myotomy with anterior fundoplication provides safe, efficacious, and cosmetically superior outcomes relative to conventional laparoscopy. This study was undertaken to define the learning curve of LESS Heller myotomy with anterior fundoplication.
METHODS: 100 patients underwent LESS Heller myotomy with anterior fundoplication. Symptom frequency and severity were scored utilizing a Likert scale (0 = never/no bothersome to 10 = always/very bothersome). Symptom resolution, additional trocar placements, and complications were compared among patient quartiles. Median data are presented.
RESULTS: Preoperative frequency/severity scores were: dysphagia = 1/0, regurgitation = 9/6, heartburn = 2/2. Additional trocars were placed in 11 patients (11%), of which 81% were in the first two quartiles; placement of additional trocars decreased in successive quartiles (p = 0.05). Esophagogastrotomy occurred in 3 patients. Postoperative complications occurred in 9%, none specific to Heller myotomy (Table). No conversions to open operations occurred. Length of stay was 1 day. Postoperative frequency/severity scores were: dysphagia = 2-0, regurgitation = 0/0, heartburn = 0/0; scores were similar and less than before myotomy across all quartiles, p < 0.001(Figure). There were no apparent scars, except where an additional trocar was placed.
CONCLUSIONS: LEES Heller myotomy with anterior fundoplication well palliates symptoms of achalasia with no apparent scar, without inducing reflux. Placement of additional trocars primarily occurred early in the experience. For surgeons proficient with the conventional laparoscopic approach, the learning curve of LEES Heller myotomy with anterior fundoplication is short and safe, as proficiency is quickly attained.

Mo1608 The Impact of Delayed Gastric Emptying on Outcome of Nissen Fundoplication in GERD Patients Wisheng Chen, Steven R. Demeester, Shahin Ayazi*, Gaurav Sharma, Joerg Zehetner, Kimbely S. Grant, Fionn Augustin, Daniel S. OH, John C. Lipham, Jeffrey A. Hagen, Tom R. Demester
Surgery, University of Southern California, Los Angeles, CA

BACKGROUND: Symptoms of delayed gastric emptying are common in patients with gastroesophageal reflux disease (GERD). The aim of this study was to compare symptomatic outcome after Nissen fundoplication in patients with and without delayed gastric emptying symptoms.

PATIENTS AND METHODS: Records from 650 patients who had a primary Nissen fundoplication for proven GERD from 2002-2008 were reviewed, and patients with symptoms of delayed gastric emptying (nausea, early or prolonged satiety) were identified. A comparison group of age and sex matched patients who had primary antireflux surgery during the same period for proven GERD but without symptoms of delayed gastric emptying was also identified. Outcome after surgery was compared between groups, and a favorable symptomatic outcome was defined as either complete relief of all preoperative symptoms without troubleshoot new symptoms, or residual symptoms occurring less than once/month.

RESULTS: Preoperative symptoms of delayed gastric emptying were present in 140 patients: 60 had a normal gastric emptying study (DGES: Normal study), 31 had either an abnormal gastric emptying study (DGES: Abnormal study) or retained food in the stomach on endoscopy after an overnight fast (n = 9) (DGES: abnormal study, and 49 had no gastric emptying study performed (DGES: No study). The comparison group (No DGES) consisted of 140 patients. A Nissen fundoplicaton was performed in all patients, and in 17 of 31 patients in the DGES. Abnormal study group a gastric drainage procedure was added. Demographic data, preoperative pH and manometry values, and mean follow up were similar between groups. Delayed gastric emptying symptoms were relieved in 91% of patients, but a favorable surgical outcome was significantly less likely in patients with DGES (see table). The majority of unsatisfactory results in DGES patients were due to persistent symptoms of delayed gastric emptying. Relief of reflux symptoms was similar. The addition of a drainage procedure did not increase the likelihood of a favorable surgical outcome (76.6% vs. 71.4%, p = 0.1).

Mo1609 A Tailored Surgical Approach to Esophago-Gastric Junction Cancers: Can We Maximize Complete Resection Without Increasing Morbidity? Frank Schwenter*, Sara Najmeh, Lorenzo E. Ferri
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BACKGROUND: Rates of delayed gastric emptying symptoms are less likely to have a favorable symptomatic outcome after Nissen fundoplication compared to GERD patients without delayed gastric emptying symptoms, despite similar relief of reflux symptoms. The addition of a drainage procedure in patients with proven delayed gastric emptying did not improve the symptomatic outcome.

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BACKGROUND: The purpose of the study was to evaluate the utilization and morbidity associated with feeding jejunostomy tubes (JT) placed at the time of gastro-esophageal (GE) resection.

METHODS: Under IRB approval a prospective database of patients undergoing GE resection from January 2004 to September 2010 was reviewed. Data analyzed included patient demographics, post-operative complications, JT use, and JT specific complications. Fisher’s Exact tests explored associations with utilization of a JT following resection.

RESULTS: 74 patients (51 males, 23 females, mean age 60.3±14.1 years) underwent placement of a JT at the time of resection (total gastrectomy = 29, Ivor-Lewis = 28, subtotal gastrectomy = 3) of both malignant (98.6%) and benign (1.4%) disease processes. 22 JT specific complications (2 major, 19 minor) were identified. (Table 1) Re-operation was required in the management of 2 complications (small bowel obstructions), while all others were easily managed by an interventional radiologist (n = 8), bedside physician (n = 5), or did not require intervention (n = 6). 86% of patients were discharged tolerating a post-gastroectomy diet, 7% a liquid diet, and 7% NPO. Inpatient enteral nutrition (EN) was initiated in 68.9%, but continued on discharge in only 54% secondary to failure to thrive (57.7%), dysphagia (20%), anastomotic leak (15%), chyle leak (2.5%), esophagostomy (2.5%), and duodenal stump leak (2.5%). The mean time to discontinuance of EN and removal of the JT was 1.83±3.4 months. Although only 17.8% (n = 5) of patients requiring adhesive therapy were utilizing their JT at the commencement of therapy, 75% (n = 21) required EN during its course. The median time to adhesive therapy was found to be slightly longer in those who required outpatient EN versus those who did not (61 v 90 days, p = 0.08). However, the median time to adhesive therapy did not differ between those who were not recovering at the time of adhesive therapy commencement (80 v 92 days, p = 0.27). Age (n = 42), number of co-morbidities (p = 0.21), pre-operative percent body weight loss (p = 0.88), and clinical stage (p = 0.78) were not significantly associated with outpatient JT use. Patients who suffered a post-operative complication were most likely to require EN (p = 0.006), an association that strengthened as the number of complications increased (p = 0.00006).

Table 1: Jejunostomy Tube Associated Complications

<table>
<thead>
<tr>
<th>Complications</th>
<th>In-Patient</th>
<th>Out-Patient</th>
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<tbody>
<tr>
<td>Major (n = 4)</td>
<td>Minor (n = 18)</td>
<td>Minor (n = 4)</td>
</tr>
<tr>
<td>Leakage</td>
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<tr>
<td>Site infection</td>
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<td>1</td>
</tr>
<tr>
<td>Pain requiring analgesia</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Non-functional Jejunostomy</td>
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</tr>
</tbody>
</table>
| Major = Required Intervention, Minor = Non-Intervention or no Intervention required, no prolongation of hospital stay.

CONCLUSIONS: Routine JT placement carries a low morbidity in patients undergoing GE resection. Because it is difficult to pre-operative ascetics who will need prolonged EN, the routine placement of a JT is recommended, particularly in those who will likely require adjunct therapy or are at high risk for post-operative complications. Despite patient desires for early removal of unused JT, caution should be taken if adhesive therapy is being considered.
Mo1611
Pharyngeal pH Monitoring May Be Superior to Proximal pH Monitoring in the Detection of Laryngopharyngeal Reflex
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BACKGROUND: Determining a causal relationship between abnormal reflux into the proximal esophagus/pharynx and laryngopharyngeal manifestations of gastroesophageal reflux disease (GERD) remains a diagnostic challenge. In this study we aim to determine whether pharyngeal pH monitoring provides superior sensitivity over dual-channel pH testing in detecting laryngopharyngeal reflux (LPR).

METHODS: 7 control subjects and 17 symptomatic patients, 4 with typical GERD and 13 with primary respiratory symptoms, underwent 24-hour ambulatory esophageal multichannel intraluminal impedance (MEF-24)-pH simultaneously with pharyngeal pH monitoring. The distal pH sensor was placed 5 cm above the manometrically determined upper border of the lower esophageal sphincter (LES) and the proximal 15 cm above. Pharyngeal pH was monitored concomitantly using a separate pH probe positioned 1 cm below the uvula. Data collection was synchronized between the devices. Esophageal reflux was considered present if pH dropped to < 4 in either pH sensor, and/or a drop occurred ≥50% from baseline in acid pH (pH < 4) at the LES (proximal) and separate pH thresholds of <5.5, 5.0, 4.5, and 4.0 were defined for reflux episodes detected in the pharyngeal probe.

RESULTS: At a threshold of pH < 5.5, an average of 1 (44) pharyngeal reflux event over 24 hours was seen in control subjects. Symptomatic patients had greater pharyngeal oesophageal reflux than controls, averaging 7 (144) episodes/24 hours in those with typical GERD symptoms and 46/756 in those with respiratory symptoms. Total pharyngeal reflux events (163) were markedly more common in patients with respiratory symptoms than either control (16) or patients with typical GERD symptoms (28). Further, the highest number of pharyngeal reflux episodes recorded across all pH thresholds was observed in subjects presenting with primary respiratory symptoms: 603, 91, 38, and 40 events at pH < 5.5, 5.0, 4.5, and 4.0, respectively. 6 of the 11 patients with abnormally distal pH results had corresponding abnormal pharyngeal reflux and vice versa. Overall, only 3 had concomitant positive proximal esophageal pH results. Pharyngeal pH also appears superior to the proximal esophageal pH in differentiating GERD related respiratory symptoms, as compared to gastrointestinal. Fundoplication normalized pharyngeal pH and markedly relieved symptoms in a single patient with severe respiratory symptoms and normal proximal esophageal acid exposure.

CONCLUSIONS: The more common prevalence of pharyngeal reflux, as compared to proximal esophageal reflux, particularly in subjects with extraesophageal symptoms, suggests that pharyngeal pH monitoring may be a more sensitive diagnostic tool for LPR than proximal pH monitoring. Symptom relief and pharyngeal pH normalization post fundoplication provides further evidence of the utility of ambulatory pharyngeal pH monitoring.

Clinical: Hepatic

Mo1612
Laparoscopic Hepatic Resection: Do Favorable Short-Term Outcomes Make It the Procedure of Choice for Lesions of the Left Hemiliver?
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BACKGROUND: Recent reports demonstrate the feasibility of laparoscopic liver resection for patients with benign and malignant conditions. We hypothesized that patients who underwent laparoscopic resections for lesions of the left liver would have short term outcomes similar to those who had open surgery.

METHODS: A retrospective review compared laparoscopic left liver resections for both benign and malignant diseases to open controls for the years 2007–2010. Demographic data, related factors, complications and mortality were assessed. Univariate analysis was performed with significance of p < 0.05.

RESULTS: Seventeen patients had laparoscopic resection during the study period, with 1 case converted to open surgery. There were 22 open cases. Three anatomic left hepatectomies, 11 left lateral segmentectomies, and 3 lesser segmentectomies were performed in the laparoscopic group versus 15, 7, and 0 in the open group, respectively. There were no differences in demographics, margin status, or major complications (see table). The laparoscopy group had significantly lower intraoperative blood loss and shorter length of stay compared to the open group. Median tumor size was significantly larger in the open group. There was one death in the open group and none in the laparoscopic group.

CONCLUSIONS: In this select group of patients undergoing resection of the left hemiliver, short-term outcomes favored the laparoscopic approach. The open approach was used more often for larger, benign tumors. Long-term data regarding disease recurrence and survival are needed in this group of patients. These results suggest that laparoscopic resection is safe and for appropriately selected patients may be the optimal technical approach.

Mo1613
Liver Resection for Colorectal Metastases Is Safe After Preoperative Chemotherapy: A Prospective Non-Randomized Controlled Study
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BACKGROUND: Preoperative chemotherapy before liver resection can determine hepatic parenchyma damage with a negative influence on the patients’ postoperative outcome.

AIM: The aim of this prospective study was to assess the effects of preoperative chemotherapy on hepatic parenchyma in a consecutive and homogeneous series of patients evaluating the outcome in terms of postoperative morbidity at 30 days after surgery, liver function and the need of transfusion.

MATERIALS AND METHODS: Eighty-seven consecutive patients that underwent liver resection for colorectal metastases in our surgical unit were included: the patients were divided into two groups: group 0 with 39 patients (45%) who only underwent liver resection and group 1 with 48 patients (55%) who received preoperative chemotherapy. All variables, which could influence surgical outcome were analyzed: hepatic injury found on histology, liver function tests (total bilirubin, ALT, AST, Albumin, INR) before surgery till hospital discharge, chemotherapy treatment (FSL, Oxaliplatin, Irinotecan, Monoclonal antibodies, intratumor or systemic), number of infusions, interval between chemotherapy and surgery, need of transfusion, postoperative complications, length of hospital stay, comorbidities. Univariate, bivariate and multivariate analyses were performed.

RESULTS: The probability of developing severe steatosis (2,58 times) and necrosis (4 times) was higher in patients that received preoperative chemotherapy; furthermore, the risk of steatohepatitis in these patients was higher. The values of liver function tests of group 1 compared to group 0, as expected, were worse (p = 0.007). The number of infusions did not imply a higher number of surgery complications (p = 0.075), but it correlated directly with bilirubin values and inversely with albumin values. No correlation was found between time interval from the last infusion and surgery and surgical outcome. With regard to transfusion need and length of hospital stay no difference between the two groups was found. At univariate analysis, most different factors identified as significant were not confirmed in the multivariate analysis.

CONCLUSIONS: Preoperative chemotherapy can cause liver damage without a negative influence on surgical outcome; therefore liver resection is safe also after chemotherapy.

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S2D ANNUAL MEETING • MAY 6–10, 2011 • CHICAGO, IL
Mo1641
Increasing Safety of Liver Resection in Cirrhotic Livers: An Initial Experience Combining Autologous CD133+ Stem Cell Application with In-Situ Splitting and Two Stage Hepatectomy
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Surgery, Heinrich-Heine-University, Duesseldorf, Germany

Major liver resections carry a significant mortality due to liver insufficiency in patients with cirrhosis. To increase safety of major liver resections we aimed to combine the regenerative potential of bone marrow derived stem cell application and the safety of a novel two stage procedure in a patient with centrally located hepatocellular cancer and Child B cirrhosis.

A 76-year-old male patient with a cryptogenic liver cirrhosis presented with a mass of 5 cm in Segments IV a/b. A biopsy showed a moderately differentiated (G2) hepatocellular carcinoma. Since a sufficient distance to the portal pedicle and the hepatic veins was suggested by preoperative imaging and no contraindication for an intentionally curative resection was seen, the patient was explored. In the operation the limits of the carcinoma were difficult to discern within the cirrhotic liver and a non-atomic Segment IVa/b resection resulted in an R1 situation. The patient was not considered eligible for a formal central or left resection due to the advanced liver cirrhosis. He recovered from surgery without complications and left the hospital on postoperative day 15 with persisting ascites. Postoperative staging was pT2N1, pM1, G2, cm0, R1.

After further recovery, medical suppression of his ascites and extensive counseling of the patient it was decided to attempt a curative resection. To improve hepatic reserve an in-situ transplant of the left and right liver (in situ left hepatectomy) leaving only the artery, the bile duct and the middle and left hepatic veins intact, was performed. This surgical injury to the left liver was combined with conditioning of the intact right liver with autologous CD133+ bone marrow derived stem cells via the right portal vein. The patient tolerated this procedure well. However, the cirrhotic right liver did not increase in size. On post 12 the left liver was removed. The patient developed a moderate hepatic insufficiency with bilirubin levels up to 4 g/dl and occasional need to substitute his coagulation factors. The patient did not develop renal insufficiency, encephalopathy or hepato-pulmonary syndrome and was discharged on postoperative day 15 after the conditioning operation in excellent general condition. He is tumor-free at his first oncologic follow-up.

This case suggests that optimizing conditioning of the future liver remnant can render patients eligible for formal liver resections that are otherwise only candidates for palliative treatment. Since an R0 resection is still the only potentially curative treatment, and liver transplants are an option for only a minority of patients, a combination of this innovative approach of a two stage liver resection with liver augmentation by CD133+ bone marrow derived stem cells may change perspectives for some cirrhotic patients with hepatocellular cancer.

Mo1622
Serum AFP Elevation in Patients with Hepatocellular Carcinoma Is Associated with Poor Survival and Tumor Size, but Not with Histologic Features Indicative of Aggressive Tumor Biology
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INTRODUCTION: Serum alpha-Fetoprotein (AFP) is widely utilized in screening patients at risk for hepatocellular carcinoma (HCC). AFP levels also provide prognostic information, as several reports have associated high AFP levels (>1000 ng/ml) with poor survival. Although clearly associated with transformation to HCC, and with poor outcomes, the etiologic process leading to AFP elevation remains debatable. Some experts interpret high AFP as an indication of de-differentiation and vascular invasion. We investigate here the predictive value of AFP to survival and poor histologic features following liver resection in a single-institution series.

METHODS: A retrospective analysis was performed on 238 patients with HCC maintained in a prospective database. All patients had underlying chronic hepatitis B, and underwent liver resection as definitive therapy for HCC.

RESULTS: Seventy six patients (32%) were diagnosed in situ, 30% were diagnosed incidental, 23% underwent right or left lobe resection as definitive therapy for HCC. Kaplan-Meier, chi square, univariate, and multivariate regression analysis were performed using SPSS software (SPSS, Chicago, IL). Twenty three patients (10%) were AFP positive (>1000 ng/ml). A retrospective analysis was performed on 143 patients (60%) whose tumors did produce AFP (AFP+), of the 80 patients with AFP levels >1000 ng/ml, 78% had vascular invasion, nearly half had poorly differentiated histology, and 44% had histologic features indicative of aggressive tumor biology. In univariate analysis inclusive only of AFP+, patients, tumor size >5 cm was associated with high AFP levels (p = .036, OR 2.1), but poor differentiation and vascular invasion were not.

CONCLUSION: The association of high serum AFP to poor survival and large tumor size is presumably due to delay in diagnosis, rather than more aggressive tumor biology.

Mo1616
Feasibility Demonstration of Single Incision Multiple Port Laparoscopic Liver Resection (SIMPLLR) in Three Patients
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INTRODUCTION: Laparoscopic liver resection has reduced morbidity and length of stay for hepatic surgery. Introduction of single incision laparoscopic surgery exploits the specimen extraction incision and may improve patient satisfaction.

METHODS: Three patients were selected based on the anatomy of anticipated resections to undergo single incision laparoscopic liver resections. Pt 1 is a 59 yo female with a 5.5 cm left lateral segmental hepatocellular carcinoma. Pt 2 is a 69 yo female with a 4.0 cm HCC in Reid’s lobe. Pt 3 is a 21 yo female with a 2.5 cm symptomatic, indeterminate left lateral segment lesion. All patients were counseled as to the risks of this procedure and the possibility of conversion to standard laparoscopic or open technique in the event of intraoperative complications. All patients gave informed consent for participation.

RESULTS: Pt 1 underwent a single incision multipoort left lateral segmentectomy (EBL: 500 cc, LOS: 4 days). Pathology showed a moderately differentiated HCC resected with clear margins. She is NED at 15.5 months. Pt 2 underwent adhesiolysis and resection of Reid’s lobe using a single-port SILS™ device (Covidien, Inc) (EBL: 1700 cc, LOS: 5 days). The 10.5 kg guided parenchymal transection was completed laparoscopically. Minilaparotomy was required for specimen inspection and delivery. She received 1 unit PRBCs intraoperatively. Pathology revealed a 4 cm poorly differentiated HCC, abutting Gillson’s capsule. She required medicalization for pain control. She is NED at 13.25 months followup. Pt 3 had a single incision multipoort left lateral segmentectomy (EBL: 150 cc, LOS: 2 days). Pathology showed a 2.8 cm FNH abutting the capsule. She completed resolution of her symptoms at followup.

CONCLUSION: SIMPLLR can be a viable adjunct to laparoscopic hepatic resection for selected lesions especially in the left lateral segment and some marginal lesions. Further study and experience is needed to define the limits of this technique and its optimum applications. Prior to adoption, standard laparoscopic solid organ surgery should be mastered. A low threshold to convert to standard laparoscopic or open approach is necessary to assure patient safety and outcomes.
Clinical: Pancreas

Mo1617
Usefulness of Modified POSSUM for Major Pancreatic Resection
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AIM: We examined the usefulness of three modified versions of POSSUM in pancreatic resection. We also explored whether a high-risk group can be defined.

METHODS: The data of 431 consecutive patients who underwent 316 pancreaticoduodenectomy and 115 distal pancreatectomy between June 1996 to December 2007 were evaluated retrospectively. The morbidity and mortality equations of Portsmouth POSSUM (P-POSSUM), elderly POSSUM (E-POSSUM), and Hiroshima POSSUM (H-POSSUM), were estimated. The subjects were divided into two groups by physiological score (PS): 1) low-risk group is less than 20 of PS, 2) high-risk group is more than 21.

RESULTS: Postoperative complications were seen in 170 cases (39.4%). Operative death within 30 days of surgery was only 4 (0.9%), and 11 deaths during hospital stay (2.6%). The mean PS in patients with postoperative complication was significantly higher than that in the group without complication. The observed and expected (O/E) ratio of postoperative mortality was 0.72 (range, 0.57–0.90) by original POSSUM, 0.95 (range, 0.86–1.20) by P-POSSUM, 0.94 (range, 0.68–1.17) by H-POSSUM. The O/E ratio of hospital death was 0.17 (range,0.06–0.24) by original POSSUM, 0.61 (range, 0.41–0.85) by P-POSSUM, 0.63 (range, 0.41–0.80) by E-POSSUM, 1.00 (range, 0.20–0.0) by H-POSSUM.

CONCLUSION: The E-POSSUM and H-POSSUM were better than the original POSSUM in terms of O/E ratio, an index of accuracy. We also found that a high-risk group can be defined by PS scores, which can be determined preoperatively.

Mo1618
Staple and Non-Staple Closure of Pancreatic Remnant After Distal Pancreatectomy: A Multicenter Retrospective Analysis of 388 Patients
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BACKGROUND: Distal pancreatectomy is a simple surgical procedure with a low mortality rate, but morbidity associated with pancreatic fistula remains a problem. This study sought to identify the risk factors for clinical pancreatic fistula, as defined by the International Study Group of Pancreatic Surgery (ISGPS).

METHODS: The medical records of all patients who underwent distal pancreatectomy at five Japanese institutions between January 2001 and June 2009 were retrospectively reviewed. All relevant anonymized data from both patients entered into electronic case report forms were synthesized into a common database Data obtained for each patient included the following: age, sex, body mass index, diabetes mellitus, American Society of Anesthesiologists classification, previous laparotomy, primary disease surgery, adjuvant chemotherapy, distance of resection from the inferior mesenteric vein, presence of metastatic nodes, whether or not the patient had diabetes, and whether or not the patient had had an oral glucose tolerance test.

RESULTS: Among the 388 patients studied, 82 patients had pancreatic fistula. The primary endpoint was the occurrence of clinical pancreatic fistula grade B or C. Grade A, B, and C pancreatic fistula occurred in 95 patients (24.5%), 128 patients (32.9%), and 81 patients (20.8%), respectively. Grade A fistula was significantly associated with a patient’s age (p < 0.01), and grade C was significantly related to the number of postoperative complications (p = 0.001). Multivariate analysis revealed that age, number of postoperative complications, and previous laparotomy were independent risk factors of clinical pancreatic fistula.

CONCLUSION: Clinical pancreatic leak remains a frequent complication after distal pancreatectomy, although severe complications rarely occur. Staple closure of the pancreatic remnant is associated with a significantly lower clinical fistula rate.

Mo1619
Perioperative Blood Transfusions May Influence Prognosis After Surgery for Pancreatic Cancer
Independent of Complications or Body Mass Index: Multivariate Analysis of 270 Resected Patients
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SURGERY FOR Pancreatic cancer (PaCa) remains a very poor, even after curative resection. Factors like nodal disease (lymph node ratio), resection margin, grading and tumor size have been identified as prognostic factors in many series. Overweight/adipositas has recently been suggested to be a further (negative) prognostic factor. Perioperative interventions and blood transfusions (blood-Tx) have been suggested to worsen prognosis in various cancers. We analyzed our current experience after resection of PaCa with additional consideration of the above mentioned parameters.

METHODS: Long-term outcome could be assessed in 270 patients after resection of PaCa (81% head, 13% distal, 6% total pancreatectomy) since 1995. Perioperative blood transfusions were given in 46%. One third of the patients underwent additional mesenteric-portal vein resection. Free margins were achieved in 71%. 70% had nodal disease, and 45% had more than one positive node. Perioperative mortality rates (grade A, B, C) were 10%, 5%, and 0%, respectively (requiring relaparotomy and/or mechanical ventilation), respectively. Survival was analyzed by a Kaplan-Meier method and the Cox-regression model.

RESULTS: Overall five year survival was 16% (16 true five year survivors). In univariate analysis positive margins (p = 0.002), more than one involved node (p < 0.001), poor, even after curative resection. Factors like nodal disease (lymph node ratio), resection margin, grading and tumor size have been identified as prognostic factors in many series. Overweight/adipositas has recently been suggested to be a further (negative) prognostic factor. Perioperative interventions and blood transfusions (blood-Tx) have been suggested to worsen prognosis in various cancers. We analyzed our current experience after resection of PaCa with additional consideration of the above mentioned parameters.

CONCLUSION: Prognosis after surgery for pancreatic cancer was influenced not only by established tumor-related parameters but also by perioperative blood transfusions. This effect seems to be independent of body mass index on prognosis.

Mo1620
Are Body/Tail Pancreatic Cancers Really Worse Per Se?
Debunking a Myth
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BACKGROUND: Pancreatic cancers of the body and tail have been described to have poorer survival compared with that of the head. In order to eliminate the possible confounding of later stage at diagnosis for body/tail lesions, we examined the impact of cancer location on overall survival in a cohort of early stage pancreatic adenocarcinoma patients.

METHODS: SEER-Medicare 1991–2005 was used to identify patients with localized, node negative (Stage 1) pancreatic adenocarcinoma as defined by SEER histographic stage and abstracted histological data. Chi square analyses were performed to define and describe the head and body/tail cohorts. Kaplan-Meier survival analysis was performed comparing cancer type by head vs. body/tail groups in univariate and multivariate (Cox) survival analysis.

RESULTS: 1,500 patients were included in this study. 698 head and 802 body/tail cancers were identified. Body/tail cancers were associated with poorer survival. Other parameters like BMI, tumor size, postoperative complications (all above defined as significant by univariate analyses) were not significantly associated with survival when evaluated by multivariate analyses. The impact of cancer location on overall survival in a cohort of early stage pancreatic adenocarcinoma patients was not significant.

CONCLUSION: Location of cancer does not significantly influence overall survival. Body/tail cancers were associated with poorer survival. Further studies are needed to determine if body/tail cancers have different biologic features than head cancers.
OBJECTIVE: Despite the reduced number of β-cells, glucose metabolism often improves after major pancreatic resection. To investigate the postoperative pancreatic β-cell function and hormonal responses of glucagon-like peptide-1 (GLP-1) and glucose-dependent insulinotropic polypeptide (GIP) using the two different types of pancreatectomy: pancreatectoduodenectomy (PD) and distal pancreatectomy (DP).

SUMMARY BACKGROUND DATA: Incretins have been recently identified to have important roles in the regulation of the pancreatic β-cell function by stimulating insulin secretion, and become a topic in the field of the treatment of diabetes mellitus. Roles of incretins after pancreatectomy which causes the decreased number of β-cells has not been well documented.

METHODS: Oral glucose tolerance tests were performed in 34 patients who underwent pancreatectomy (20 PD and 14 DP) before operation (P < 0.01), although there was no significant change in DP group. Postoperative glucose concentrations after pancreatectomy were analyzed. The plasma concentrations of GLP-1 and GIP were also measured.

RESULTS: Plasma GLP-1 concentration 1 month after PD was significantly higher than before operation (P < 0.05), while a such a change was not observed in DP group. On the other hand, GIP concentrations before PD continued to be lower compared with the postoperative values (P < 0.01), although there were no significant changes in DP group. Postoperative glucose concentrations after pancreatectomy were significantly lower than postoperative values in both PD and DP groups. Although HOMA-IR improved transiently 1 month after PD (P < 0.05), such improvement was not observed after DP. The value of HOMA-IR after PD was significantly lower than that before operation (P < 0.05), while that of DP was not significantly different from the preoperative value.

CONCLUSIONS: The glucose metabolism after PD was different from that after DP in terms of postoperative β-cell function and hormonal responses of GLP-1 and GIP. Incretins seem to have roles in the postoperative glucose metabolism after pancreatectomy.
Mo1625
Is Postoperative Adjuvant Therapy Indicated for Ampullary Adenocarcinoma? Veronika Stipureič1, Paul K. iff 1, Yang Zhu1, Yun Shen Chu1, James C. Watson1, John H. Fonn1
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BACKGROUND: Ampullary carcinoma (AC) is a rare entity accounting for only 6% of all periampullary tumors. These often present earlier due to proximity to the common bile duct or pancreatic duct. Despite this, rates of local recurrence have been documented as high as 50%, even with an R0 resection. No randomized trial addresses the role of chemoradiation, as reflected in current NCCN guidelines. The purpose of this study is to assess the role of chemoradiation for AC.

AIM: A retrospective analysis of patients with AC, identifying and analyzing demographics, clinical stage at presentation, surgical procedures, pathological stage (7th Edition AJCC), neo-adjuvant & adjuvant treatment and complications of surgery.

RESULTS: Forty-five patients were identified. Seventy percent were male with 48% staged 2B and higher. Twenty-eight patients had NO disease (Group A) compared to 17 N1 patients (Group B). Nineteen patients received adjuvant chemotherapy only, 3 adjuvant radiotherapy only, with 12 patients receiving both therapies. Twenty-five per cent of the N0 group compared to 82% of the N1 group had adjuvant therapy (p = 0.004). Overall survival and recurrence-free survival by NO status and adjuvant therapy demonstrated no difference (p = 0.664, p = 0.610). Survival of NO patients was 72% at 5 years receiving post-operative chemoradiotherapy (p = 0.035). Overall median survival for NO and N1 was 58 and 50 months. Median survival stratified by no status and adjuvant therapy was 58 months for either group by NO status. Those N1 patients receiving adjuvant therapy had a median survival of 78 months, compared to the 21 months for those who did not (p = 0.035). Median follow up was 27.5 months.

CONCLUSIONS: Adjuvant therapy should be considered for AC patients with node positive cancer. Identification of risk factors for recurrence in the node negative patient who may benefit from adjuvant therapy should be further investigated.

Mo1626
Systematic Review of Central Pancreatectomy “The Dagradi-Serio-Iacono Operation” and Meta-Analysis Versus Distal Pancreatectomy Calogero Iacono1, Giuseppe Verlato1, Andrea Ruzzene1, Tommaso Campagnaro1, Alessandro Vakdegamberi1, Luca Bottolati1, Chiara Tezza1, Alfredo Guglielmi1
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BACKGROUND: Central Pancreatectomy (CP), first described by Dagradi and Serio in 1984 and popularized worldwide by Iacono, is a parenchyma-sparing surgical procedure that allows removing benign and/or low grade malignant lesion from the neck and proximal body of pancreas. The aim of the study was to evaluate, from all published studies, short and long term surgical results of CP and to evaluate results of comparative studies versus distal pancreatectomy (DP).

METHODS: All published studies between 1988 and October 2010 were systematically reviewed. Results of comparative studies, comparing CP versus DP, were pooled by standard meta-analytic techniques using the random effects model.

RESULTS: Eighty-nine studies with 939 cases of CP were recognized and included in the systematic review. Nineteen studies did not present significant heterogeneity across studies, with the I-squared ranging from 49.4% to 93.8%; re-operation, endocrine failure and pancreatic fistula did not present significant heterogeneity.

INTRODUCTION:
Mo1624

CONCLUSION: Systematic review and meta-analysis, confirmed central pancreatectomy as a safe surgical procedure with a low risk for mortality. The disadvantage of CP was a higher rate of pancreatic fistula compared to DP. The results from this review can be used to support the advocacy for central pancreatectomy in pancreatitis patient treatment.

INTRODUCTION:
Mo1623

BACKGROUND:

A retrospective review and analysis of patients reported in 4.5% and 8% of patients, respectively. Overall mortality rate was 0.92%. Ten comparative studies, including nine Open resection were performed, 30 laparoscopic, 11 of whom were robotic assisted. Postoperative morbidity rate was 39.37%; pancreatic fistula rate was 20%. Endocrine and exocrine pancreatic insufficiency were reported in 45% and 8% of patients, respectively. Overall mortality rate was 9.2%. Two comparative studies, including 109 patients submitted to central pancreatectomy and 430 to distal pancreatectomy, were analyzed for meta- analysis. Surgical operation time, blood loss, length of stay, morbidity and exocrine failure presented a significant heterogeneity across studies, with the I-squared ranging from 49.4% to 93.8%; re-operation, endocrine failure and pancreatic fistula did not present significant heterogeneity. Central pancreatectomy had a higher post-operative morbidity (pooled RR = 1.36, 95% CI 1.09–1.71), with higher incidence of pancreatic fistula (pooled RR = 1.76, 95% CI 1.31–2.39) compared to distal pancreatectomy. However, the odds ratio for post-operative endocrine insufficiency was 0.26 (95% CI 0.16–0.41), revealing a statistically significant benefit to CP (p < 0.001). The odds ratio for exocrine failure was 0.59 (95% CI 0.33–1.07), but it was not significant (p = 0.084) because of the large heterogeneity among studies (I-squared 64%).

CONCLUSION: Surgical management of chronic pancreatitis is associated with poor outcomes due to intractable pain and concomitant physical and emotional dysfunction. Conventional thinking discounts the efficacy and safety of long-term opioid treatment in patients with chronic pain unassociated with a terminal disease. The purpose of this study is to evaluate the learning curve effect for pancreatic surgery, which can only be studied at a high-volume center.

METHODS: Over period of ten years, outcome of pancreatic operations performed by two “senior” pancreatic surgeons (SPS) and one specialist pancreatic surgeon (JPS) were evaluated relative to increasing experience. Three equally sized blocks of consecutive operations were analyzed for JPS versus SPS. Statistical testing was done with SPSS Ver 17 @ a significance level of p = 0.05.

RESULTS: From 2001 to 2010, n = 583 pancreatic operations were performed at our institution. Of these, n = 245 were performed by two SPS, n = 212 by the JPS and n = 26 by other surgeons. For the JPS, significant postoperative morbidity rate decreased significantly (from 25% to 9%, p = 0.022) with increasing case load to reach a level at the average SPS level (15%) after around 70 pancreatic operations. However, the odds ratio for post-operative endocrine insufficiency remained (from 14% to 23%, p = n.s.) and laparoscopic or laparoscopically assisted procedures (from 0% to 20%, p < 0.001). Decreasing complication rates were accompanied by a rise in technically demanding procedures and oncologic radicality, as demonstrated by an increasing rate of portal venous resections (from 14% to 23%, p = n.s.) and laparoscopic or laparoscopically assisted procedures (from 6% to 20%, p < 0.001).

CONCLUSION: With increasing experience, the pancreatic surgeon can minimize his complication rate while simultaneously increasing technically demanding procedures. The learning curve in this field of surgery requires a relatively high case load even for the setting of a high-volume center and reflects the importance of individual surgeon volume. This constitutes a strong argument for centralization of pancreatic surgery.

CONCLUSION: Opioid analgesic long-term treatment can likely be safely administered to patients with intractable pain associated with failed operative therapy of chronic pancreatitis. General health and physical vitality/recovery scores were above standard norms. However, despite utilization of high-dose narcotic analogues, social functioning and patient physical and emotional role limits scores were low.
Mo1629
The Impact of Regionalization of Pancreaticoduodenectomy for Pancreatic Cancer in North Carolina Since 2004
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INTRODUCTION: Pancreaticoduodenectomy (PD) for pancreatic cancer carries a significant morbidity and mortality. Current evidence suggests that hospitals with a high annual PD volume provide improved outcomes after PD for cancer and regionalization to specialty centers is advocated. While better outcomes at high-volume centers (HVCs) are accepted, a rapid regionalization process could also have detrimental effects. For example, HVCs must be equipped to accommodate increased volume without compromising outcomes. North Carolina (NC) is unique in that there are multiple HVCs within the state to accommodate regionalization, including the establishment of two HVCs in late 2006. Upon noting an increase in referral for surgical evaluation since 2007, we began investigation into regionalization of PD and its effects upon outcomes during this transition period within NC.

METHODS: The NC Hospital Based And Freestanding Ambulatory Surgery Facility Database was queried by ICD-9 code for all PD performed in NC during two time periods: 2004–06 and 2007–09. Hospitals were categorized by overall PD volume into three groups: Low (1–9 PD/yr), medium (10–19 PD/yr), and high (≥20 PD/yr) volume. Regionalization and operative mortality and major morbidity of PD performed for pancreatic cancer were assessed by comparing volume groups across time periods. Statistical analysis was performed using Chi-Square and Fisher’s Exact Test on SAS Software.

RESULTS: The number of PD for pancreatic cancer increased by 91% (1,298 to 2,469 cases) at HVCs while decreasing at low-volume (462 to 358 cases) and medium-volume (86 to 46 cases) centers. The percentage of PD for pancreatic cancer performed at HVCs increased significantly (47.6% to 70.3%), while decreasing for low- and medium-volume centers (p < 0.001) (Figure 1). Mortality was significantly less at HVCs (2.8%) compared to low-volume centers (10.3%) for the 2007–09 timeframe (p = 0.038), and was not different across periods for any group (Figure 2a). Mortality for all PD performed for pancreatic cancer in NC decreased from 6.6% to 4.6% across time periods (p = 0.31). Major morbidity was not significantly different between volume groups within either time period; however, there was a significant increase in major morbidity at low-volume centers (p = 0.018) (Figure 2b).

CONCLUSIONS: Regionalization of PD for pancreatic cancer is occurring in NC, with a near doubling of PD performed at HVCs across these time periods. Mortality was significantly lower at HVCs during the most recent period, and importantly, this rapid and substantial regionalization has only served to enhance outcomes at HVCs. The very low mortality rate at HVCs despite a major morbidity rate comparable to low- and medium-volume centers is an intriguing finding that likely indicates higher case complexity with early complication recognition and management to “rescue” these patients.

Mo1630
Early Experience with Minimally Invasive Surgical Pancreatic Débridement
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BACKGROUND: Minimally invasive surgical approaches are increasingly applied to patients with necrotizing pancreatitis. Early experience with these approaches at our high volume pancreatic referral center was reviewed.

METHODS: With IRB approval, medical records of patients undergoing minimally invasive surgical pancreatic débridement between 2007 and 2010 were reviewed. Data were collected for descriptive analysis.

RESULTS: Fourteen patients were approached with minimally invasive surgical techniques: 3 retroperitoneal (VARP), 3 laparoscopic transabdominal, and 9 laparoscopic transgastric. Pancreatitis etiologies were: biliary (n = 8), pancreatic divisum (2), alcohol, IFMN, and idiopathic (1 each). Median time from initial presentation to intervention was 10 weeks (range 6–32 weeks). Five patients had preoperative infected necrosis, 5 had preoperative percutaneous drains. Nine patients were admitted from home for elective débridement. Four patients (all laparoscopic transgastric) were converted to open operations. Four patients required early (<30 day) reoperation: 3 for recurrent peripancreatic collections, 1 for cholecystectomy/jejunostomy. Two patients required late (>1 year) reoperation for recurrent pancreatitis and a disconnected left pancreatic remnant. Eleven patients had infected necrosis. In the 10 patients completed using a minimally invasive technique, the median length of hospital stay was 5 days (range 1–103 days); 8 were discharged to home and 2 to nursing homes.

CONCLUSIONS: Good outcomes following minimally invasive pancreatic débridement can be achieved in select patients. Disease heterogeneity influences patient selection, and long-term follow-up is essential in these complex patients.

Mo1631
Pancreatic Enucleation: A Safe and Potentially Underutilized Operation
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BACKGROUND: Pancreatic enucleation is an uncommon operation with high procedural complexity and early complication risk. However, when performed at high-volume centers (HVCs), pancreatic enucleation is associated with high cure rates and very low mortality. Current evidence suggests that hospitals with a high annual PD volume provide improved outcomes after PD for cancer and regionalization to specialty centers is advocated. For benign and premalignant pancreatic lesions, enucleation may be underutilized.

CONCLUSION: Early experience with minimally invasive surgical pancreatic débridement is challenging and requires a multidisciplinary approach for optimal patient outcomes. Further research is needed to determine the optimal indications and outcomes of minimally invasive surgical pancreatic débridement.
Mo1632
Does Stenting Decrease the Rate of Postoperative Pancreatic Fistula Following Pancreatectoduodenectomy?
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BACKGROUND: Pancreatic surgeons have employed numerous interventions, medical and surgical, in an effort to reduce the incidence of postoperative pancreatic fistula (POPF) following pancreatectoduodenectomy (PD). Stenting of the pancreatic anastomosis has been thought to reduce the incidence of POPF. In our experience, 0.9% (4/449) of patients had required endoscopic retrieval of the anastomatic stent. Although uncommon, these late complications have led us to investigate the efficacy of anastomotic stenting in the reduction of POPF.
METHODS: Between January 1999 and September 2010, 553 patients underwent PD by a single surgeon (MBF). Internal trans-anastomotic stenting was routine from January 1999 to May 2008 and, in the more recent years, a stent was only used temporarily to facilitate construction of the pancreaticojejunostomy. We have retrospectively reviewed patient records and compared clinicopathologic factors between stent (n = 449) and no stent (n = 104) groups to elucidate the effectiveness of trans-anastomotic stenting on the incidence of POPF.
RESULTS: The clinically relevant fistula (ISGPS grade B/C) rates in stent and no stent groups were similar, at 10% and 13% (p = 0.385), respectively. The clinically relevant fistula rate in patients with a small pancreatic duct (≤3 mm, n = 146) was also similar, at 17% (24/130) and 25% (35/137) (p = 0.376), respectively. In the subgroup of patients with soft pancreatic gland (n = 64), grade B and C fistulae were 31% (19/62) for stent and 17% (11/64) for no stent groups (p = 0.203), respectively.
CONCLUSION: Internal trans-anastomotic pancreatic duct stenting does not decrease the frequency or severity of postoperative pancreatic fistula.

Mo1633
Complications of Endoscopic Preoperative Biliary Drainage (PBD) for Pancreatic Cancer: A Tertiary Hospital Experience
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BACKGROUND: PBD for pancreatic cancer is widely practiced despite a recent randomized study demonstrating increased morbidity in patients undergoing pancreatoduodenectomy (PD) after PBD. The role for PBD remains unclear, particularly in those patients who present with deep jaundice. The goal of this study was to analyze the clinical characteristics and outcomes of patients with resectable pancreatic cancer who underwent endoscopic PBD, with particular emphasis on patients who present with deep jaundice.
METHODS: A retrospective cohort study of patients who underwent PBD via ERCP prior to PD for pancreatic cancer between 1/2008–5/2010 was performed. Patient characteristics at clinical presentation as well as PBD-specific complications were examined. The incidence of complications among patients with or without deep jaundice (total bilirubin ≥16.6 mg/dL) at the time of PBD was analyzed. Two-way statistical comparisons were performed.
RESULTS: Eighty-eight patients underwent PBD for potentially resectable pancreatic cancer. Sixty-two patients (70%) went on to operative exploration after 26 patients (30%) refused surgery or were not medically fit. Complete pancreaticojejunostomy was performed in 80 (90%) patients. The median age was 70 years (range, 48–87). PBD was successful in relieving jaundice in 98% of patients. PBD-specific complications, namely cholangitis, were recorded in 2 patients (6%) with no PBD-specific mortality. The majority of stents were metallic (73.9%) or plastic (17.3%).
CONCLUSIONS: The median time from PBD to operation was 4 weeks (range, 0–50). Operative complications were recorded in 56% of patients: Clavien class I (23%), II (39%), III (19%), and IV (8%). There were 3 postoperative deaths. Median length of postoperative stay was 8 days (range, 5–32). There were no statistical differences in PD-related (7.1% vs. 12.9%, p = 1.0) or operative (30% vs. 38%, p = 0.74) complications for patients with or without deep jaundice, respectively. Among patients who did not undergo neoadjuvant therapy (n = 39), the median time to surgery from PBD was similar for deep (18 days, range 7–43) and non-deep jaundice (27 days, range 5–175) patients (p = 0.09).
CONCLUSION: Patients with pancreatic cancer and obstructive jaundice often present with deep jaundice. PD-related complications are uncommon at an expert endoscopic referral center, irrespective of the depth of jaundice at presentation. The benefits of PBD prior to PD in patients who present with deep jaundice are not established, and the optimal timing of PD after PBD merits further study.

Mo1634
Predictive Clinical Factor for Clinically Relevant Postoperative Pancreatic Fistula After Pancreaticoduodenectomy for Pancreatic Cancer
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BACKGROUND: Recent reports suggested that the drain amylase value in drain on the postoperative day one is the useful predictive factor for postoperative pancreatic fistula (POPF) after pancreatic resection. However, the predictive clinical data for clinically relevant POPF after pancreaticoduodenectomy have not been clearly established.
METHODS: From Dec. 2003 to Oct. 2010, prospectively collected data from 175 consecutive patients who underwent pancreaticoduodenectomy with two-layered duct to mucosa pancreaticojejunostomy were evaluated. The predictive clinical data (WBC, serum amylase, serum albumin, C-reactive protein, drain amylase, drain fluid volume, etc.) for clinically relevant POPF (ISGPS Grade B and C) were analyzed by logistic regression analysis.
RESULTS: Of 175 patients, 31 (18%) developed pancreatic fistula by ISGPS criteria; Grade A in 21 patients (12%), Grade B in 8 (5%), and Grade C in 3 (2%). By univariate analysis, drain amylase on postoperative day 5 (OR 2.4, 95%CI 1.3–4.1) and drain amylase on postoperative day 4 (OR 3.4, 95%CI 1.6–7.2) were significant risk factors for clinically relevant POPF. Multivariate analysis showed that drain amylase on postoperative day 4 (OR 2.3, 95%CI 1.3–4.0) and drain amylase on postoperative day 3 (OR 2.1, 95%CI 1.2–3.8) were independent risk factors for clinically relevant POPF. The clinically relevant fistula (ISGPS grade B/C) rates in stent and no stent groups were similar, at 10% and 13% (p = 0.385), respectively. The clinically relevant fistula by ISGPS criteria; Grade A in 21 patients (12%), Grade B and C in 3 (2%). By univariate analysis, drain amylase on postoperative day 5 (OR 2.4, 95%CI 1.3–4.1) and drain amylase on postoperative day 4 (OR 3.4, 95%CI 1.6–7.2) were significant risk factors for clinically relevant POPF. Multivariate analysis showed that drain amylase on postoperative day 4 (OR 2.3, 95%CI 1.3–4.0) and drain amylase on postoperative day 3 (OR 2.1, 95%CI 1.2–3.8) were independent risk factors for clinically relevant POPF.
CONCLUSIONS: C-reactive protein >18 mg/dl on POD 4 is the predictive factor for clinically relevant POPF after pancreaticoduodenectomy when diagnose POPF by ISGPS criteria.
Mo1636
Late Accidental Dislodlement of the Percutaneous Endoscopic Gastrostomy: An Underestimated Burden on Patients and the Healthcare System
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INTRODUCTION: Since its introduction in 1980, the Percutaneous Endoscopic Gastrostomy (PEG) has become an efficient means of providing long-term enteral access for nutrition. Conveniently, the soft inner bumper allows PEG removal with relatively minimal external traction. Consequently, a major complication is early accidental dislodgment, from which significant morbidity may occur. We have perhaps underestimated and underappreciated the burden to the healthcare system due to this—only not in the acute setting but over the lifetime of the PEG.

METHODS: A retrospective analysis of PEG placements conducted at our institution, identifying all PEG tubes placed between July 1, 2007 and July 1, 2010 by one faculty surgeon. Patient charts were reviewed for 30-day mortal- ity, major and minor complications, including early dislodgment, and subsequent management. Patients were reviewed until intentional removal of the PEG, cessation of records, or patient mortality.

RESULTS: A total of 563 PEGs were placed during our defined time period. The 30-day mortality rate was 7.8% (44/563), 7-day early accidental dislodgment was 4.1% (23/563), and the total lifetime accidental PEG dislodgment rate was 12.8% (72/563). Of these early dislodgments, 11 were replaced directly with a replacement gastrostomy tube, 6 were replaced with a second endo- scopic PEG following several days of gastric decompression and adipiscing, 3 by an open gastrostomy, and I was not replaced at all. An additional 49 PEGs dislodged follow- ing discharge while at rehabilitation facilities and nursing homes. The vast majority required an emergency depart- ment visit, level I surgical consultation, replacement gastrostomy tube, and radiographic confirmation of position, totaling an average of $3,535 in hospital charges.

CONCLUSION: Many large PEG reviews report an early accidental dislodgment rate between 0.6% and 4.0%. The most clinically significant accidental removals occur in the first 7 days following placement, in which the stom- ach may fall away from the abdominal wall and open gastrostomy may cause obvious morbidity. Our early dislodgment rate (4.1%) is consistent with current reports. However, if followed longitudinally, a significantly higher rate of late dislodgement is seen (12.8%). Frequently placed into neurologically impaired or elderly patients, the PEGs that dislodge months and years later require expensive transportation, emergency room visits, surgical consulta- tions, and fluoroscopic confirmation of replacement. The late removal complication, and its associated costs, are overlooked and underestimated. These data also suggest a need for improvement in the design of the soft inner bumper or a novel mechanism to secure a PEG in light of this significant burden to the healthcare system.

Mo1637
Prevalence of Adverse Intraoperative Events During Obesity Surgery and Their Sequelae
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Surgery, Oregon Health & Science University, Portland, OR; 1Data Coordinating Center, University of Pittsburgh, Pittsburgh, PA; 2Surgery, University of Pittsburgh Medical Center, Pittsburgh, PA; 3Surgery, Mount Sinai Medical Center, New York, NY; 4Surgery, East Carolina University, Greenville, NC; 5Neuropsychiatric Research Institute, University of North Dakota, Fargo, ND; 6Surgery, Weill College of Medicine, New York, NY; 7Neuropsychiatric Research Institute, University of Washington, Seattle, WA

BACKGROUND: Adverse intraoperative events (AIEs) during surgery are a well known entity. A better understand- ing of AIEs and their relationship with outcomes is helpful for surgeons to improve patient safety. AIEs have been linked to post-operative complications such as infections, re-admission, mortality, and economic burden. Previous studies have focused on the early post-operative period; however, AIEs can occur months to years later. We aim to quantify the prevalence of AIEs during obesity surgery and their sequelae.

AIMS: To identify the prevalence of AIEs during surgery and the associated sequelae. To analyze the association of AIEs with 30-day post-operative complications.

METHODS: A prospective cohort study of patients undergoing bariatric surgery between January 2007 and December 2010 at a single academic medical center. The study included 5,882 patients from the Longitudinal Assessment of Bariatric Surgery (LABS) study undergoing one of three types of primary bariatric sur-geries: Roux-en-Y Gastric Bypass (RYGB), Laparoscopic Adjustable Gastric Band (LAGB), or Laparoscopic Sleeve Gastroplasty (LSG). The primary outcome was the occurrence of a AIE, defined as an event requiring medical attention and occurring during surgery. Secondary outcomes included 30-day post-operative complications, defined as any event occurring within 7 days of surgery requiring medical attention. The study was powered to detect a 5% difference in the occurrence of AIEs between the three surgical procedures.

RESULTS: There were 1608 LAGB (27%), 3770 RYGB (64%), and 304 ORYGB (9%) surgeries. AIEs occurred in 5% of the overall sample and were most frequent during RYGB (7.3%), followed by LRYGB (5.5%) and LAGB (3%), with no significant difference between the ORYGB and LRYGB groups (p = 0.13). The most common AIEs were organ injury (1.0%), followed by anesthesia events (0.9%) and equipment failure (0.8%). The rate of composite end-point was 8.8% in the AIE group compared to 1.9% among those without a AIE (p < 0.001). While incidence of death (0.3%) and DVT/PE (0.4%) were similar (p = 0.05) across those with or without an AIE, abdominal re-operation (4.8% vs. 2.4%; p = 0.01), percutaneous drain placement (1.0% vs. 0.2%; p = 0.02) and endoscopic intervention (2.4% vs. 1.1%; p = 0.04) were more common among those with an AIE. Multivariable analysis revealed that patients with an AIE were at 90% greater risk of composite com- plication than those without an event (RR = 1.90, 95% CI 1.26-2.88; p = 0.002).

CONCLUSION: There is no significant difference in the rate of AIEs in patients undergoing ORYGB versus LRYGB. While associations between specific AIEs and post-operative complications could not be assessed due to the rarity of both events, the occurrence of an AIE is not insignificant. Patients with AIEs are at nearly double the risk of future complication and thus merit close follow-up.

Mo1638
Comorbidities Remission After Roux-en-Y Gastric Bypass for Morbid Obesity Is Sustained in a Long-Term Follow-Up
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INTRODUCTION: Roux-en-Y gastric bypass (RYGB) is considered an effective therapy for weight loss although weight regain may be observed in a long-term follow-up. Obesity-related comorbidities are also well treated by RYGB due to weight loss and intestinal hormone changes. Few studies reported long-term status of comorbidities especially if weight regain is present.

AIMS: This study aims to analyze: (1) the resolution of obesity-related comorbidities after RYGB in a long-term fol- low-up and (2) its relationship to weight regain.

METHODS: 143 patients (mean age 41, 18 male) were followed-up after RYGB for morbid obesity for at least 5 years (mean follow-up 90, range 60-155 months). Mean body mass index before operation was 52 (range 39-82) Kg/m2. Diabetes, cardiopathy, arterial hypertension, dyslip- idemia, sleep apnea, arthropathy, and infertility were present in 26 (18%), 13 (9%), 89 (62%), 18 (12.5%), 85 (60%), 88 (61.5%), 7 (8%) patients, respectively.

RESULTS: Mean body mass index at last follow-up was 33 (range 19-47) Kg/m2. Comorbidities status is depicted in Table 1. Comorbidities resolution was not related to the % of weight loss for cardiopathy (p = 0.7), hyperten- sion (p = 0.3), dyslipidemia (p = 1), sleep apnea (p = 0.1), and infertility (p = 0.2) but it was related to arthropathy (p < 0.001).

CONCLUSION: Our results show that comorbidities remis- sion after RYGB is sustained in the majority of patients in a long-term follow-up. Weight regain is linked to worse results for cardiopathy.

Table 1:

<table>
<thead>
<tr>
<th>Comorbidity</th>
<th>Resolution</th>
<th>Improved</th>
<th>Unchanged</th>
<th>Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diabetes</td>
<td>100%</td>
<td>79%</td>
<td>21%</td>
<td>12%</td>
</tr>
<tr>
<td>Cardiopathy</td>
<td>100%</td>
<td>79%</td>
<td>21%</td>
<td>12%</td>
</tr>
<tr>
<td>Hypertension</td>
<td>100%</td>
<td>79%</td>
<td>21%</td>
<td>12%</td>
</tr>
<tr>
<td>Dyslipidemia</td>
<td>95%</td>
<td>55%</td>
<td>45%</td>
<td>35%</td>
</tr>
<tr>
<td>Sleep apnea</td>
<td>84%</td>
<td>28%</td>
<td>72%</td>
<td>56%</td>
</tr>
<tr>
<td>Arthropathy</td>
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<td>28%</td>
<td>25%</td>
<td>43%</td>
</tr>
</tbody>
</table>

Note: Rates are percentage of patients with the comorbidity at last follow-up who had complete resolution, improved or unchanged status for that comorbidity.
Mo1639
Esophagastroduodenoscopy (EGD) Reporting for Preoperative Management of Gastric Cancer: Evaluation of Quality
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AIM: To identify important features of the EGD report for preoperative management of gastric cancer and to develop and validate a tool for the same.

METHODS: There were 3 parts to the study. Part 1: We conducted a systematic literature review of Medline, Embase and the Cochrane Databases using the search terms “gastric,” “stomach,” “cancer,” “carcinoma,” “neoplasm,” or “tumour.” 2 independent evaluators reviewed the abstracts, only those that addressed “What are the important features of an EGD for the preoperative management of gastric cancer?” were retained. Part 2: A convenience sample comprising 5 gastroenterologists (GIs) and 5 general surgeons (GSSs) from 2 academic and 2 community hospitals was identified. Semi-structured interviews focused on important elements of an EGD report pertaining to gastric cancer and graded these on a 4 point Likert scale. Part 3: Two abstractors separately examined 224 EGD reports at diagnosis from all patients diagnosed with gastric adenocarcinoma (2005–2008) at a community hospital, an academic hospital and a regional Cancer Centre for report elements based on Part 2 results. Kappa statistic was used to compare interobserver reliability for each report element, overall report quality and adequacy for surgical planning.

RESULTS: Part 1: The literature review yielded 7117 abstracts, none of which addressed quality of EGD in preoperative planning for gastric cancer. Part 2: Study sample consisted of 80% males who perform a median of 275 (80–1,000) EGDs/year. All respondents agreed that size and distance of gastric neoplasm from GEJ should be included in the EGD report. Additionally, 90% felt that appearance of mass, video and photos were important. Tattooing of a neoplasm was important if it was small (30%) or to be treated laparoscopically (40%). All GSSs indicated they would repeat EGD themselves to confirm location of the tumour for surgical planning, regardless of quality and content of the EGD report. Part 3: Interobserver agreement was excellent (κ = 0.7) in abstraction of tumour distance from GEJ, Stewart Type, tattooing and description of tumour appearance. These were documented in 31 vs 33% (K = 0.8 [0.7–0.9]), 0% (K 1) and 3% (K 1) of reports respectively. Ulceration was used as a descriptor for tumour appearance in 56 vs 57% (K = 0.8 [0.7–0.9]). Agreement was fair in report adequacy for surgical planning (κ 0.3 [0.2–0.4]) with 30 vs 33% of reports being inadequate.

CONCLUSIONS: There is a paucity of research on the quality of EGD reporting in preoperative management of gastric cancer. Experienced practitioners felt that the most important aspects of an EGD report for preoperative management of gastric cancer were location, size and description of neoplasm. Evaluation of EGD reports by these criteria reveals need for standardization of EGD reporting to improve gastric cancer care.

Mo1640
The Weight Loss Response to Roux-en-Y Gastric Bypass Is Host Mediated
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INTRODUCTION: Following Roux-en-Y gastric bypass (RYGB) suboptimal weight loss (SOWL) defined as <40% excess weight loss (EWL) at 18 months, occurs in ~10% or >15,000 patients yearly in the US alone. Reoperative techniques to accelerate weight loss (WL) in these “failures” have been disappointing.

METHODS: We studied 2,427 consecutive patients with open RYGB from 2000 to 2008. First, longitudinal patterns of WL were plotted from %EWL measured at follow up office visits with intent to treat (ITT). To learn more about the WL response we focused on important elements of an EGD report pertaining to gastric cancer and graded these on a 4 point Likert scale. Part 2: Two abstractors separately examined 224 EGD reports at diagnosis from all patients diagnosed with gastric adenocarcinoma (2005–2008) at a community hospital, an academic hospital and a regional Cancer Centre for report elements based on Part 2 results. Kappa statistic was used to compare interobserver reliability for each report element, overall report quality and adequacy for surgical planning.

RESULTS: Among patients without strictures/ulcers (non s/u-11%; s-10%; u-47%). There was a significant difference in the percent of patients who had at least one complication (excluding strictures and ulcers) among the three groups (non s/u-11%; s-10%; u-47%). There was a significant difference in the percent of patients who were readmitted after surgery (non s/u-7.9%; s-60%; u-69%) and were reoperated upon (non s/u- 4.9%; s-22%; u-44%). Finally, there is a trending difference in 12 month % excess weight loss among the three groups (non s/u-83.9%; s-97.8%; u-97%; p = 0.082).

CONCLUSION: Patients with strictures and ulcers tend to have more preoperative comorbidities than patients without strictures/ulcers. Patients with strictures or ulcers have a greater likelihood of readmittance and reoperation. Finally, patients with strictures or ulcers have a greater %EWL at 12 months than patients without these complications.

CONCLUSIONS: WL after RYGB is affected by gender, weight, and age suggesting patient specific or “host” related factors which are independent of behavior or DC. Further research to identify why some patients have poor WL after RYBG could shed light on the causes of obesity itself.

Mo1641
Anastomotic Complications Following RYGB: Can Ulcers/Strictures Be Predicted?
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BACKGROUND: Two of the most common complications following Roux-en-Y gastric bypass (RYGB) are anastomotic strictures and marginal ulcers. Our study aims to find predictors of stricture and marginal ulcer formation to better prevent these complications.

METHODS: A single academic institution, between 2004 and 2010, we measured the preoperative and 12 month weights, laboratory values, preoperative comorbidities and %EWL at 18 months, occurs in ~10% or >15,000 patients yearly in the US alone. Reoperative techniques to accelerate weight loss (WL) in these “failures” have been disappointing.

RESULTS: Patient abstracts were examined for important elements of an EGD report pertaining to gastric cancer and graded these on a 4 point Likert scale. Part 2: Two abstractors separately examined 224 EGD reports at diagnosis from all patients diagnosed with gastric adenocarcinoma (2005–2008) at a community hospital, an academic hospital and a regional Cancer Centre for report elements based on Part 2 results. Kappa statistic was used to compare interobserver reliability for each report element, overall report quality and adequacy for surgical planning.

RESULTS: Among patients without strictures/ulcers (non s/u-11%; s-10%; u-47%). There was a significant difference in the percent of patients who had at least one complication (excluding strictures and ulcers) among the three groups (non s/u-11%; s-10%; u-47%). There was a significant difference in the percent of patients who were readmitted after surgery (non s/u-7.9%; s-60%; u-69%) and were reoperated upon (non s/u- 4.9%; s-22%; u-44%). Finally, there is a trending difference in 12 month % excess weight loss among the three groups (non s/u-83.9%; s-97.8%; u-97%; p = 0.082).

CONCLUSION: Patients with strictures and ulcers tend to have more preoperative comorbidities than patients without strictures/ulcers. Patients with strictures or ulcers have a greater likelihood of readmittance and reoperation. Finally, patients with strictures or ulcers have a greater %EWL at 12 months than patients without these complications.

CONCLUSIONS: WL after RYGB is affected by gender, weight, and age suggesting patient specific or ‘host’ related factors which are independent of behavior or DC. Further research to identify why some patients have poor WL after RYBG could shed light on the causes of obesity itself.
A Novel Method to Generate Colon Cancer Orthotopic Tumors in Mice: Implantation Using the Cecal Pouch Technique

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**BACKGROUND:** The ectopic subcutaneous tumor model is the most commonly used pre-clinical model for cancer drug development, but disregards the importance of primary tumor microenvironment. Studies have shown that cancer progression and responses to chemotherapy are different between ectopic and orthotopic tumors. Cecal microinjection of cancer cells is the standard orthotopic colon tumor model, but major concerns have been cited regarding reliability and technical difficulties with this method. We here describe a novel and highly reliable technique of developing orthotopic colon cancer in mice.

**METHODS:** Using C57BL6 mice, midline abdominal incisions were made and small pouches were created at the tip of the cecums by invaginating the bowel wall (Figure 1b). Intact tumor fragments (approximately 2 mm × 2 mm × 2 mm) derived from liver metastases of MC-38 cells (mouse colon cancer cell line) were enveloped within the cecal pouches, which were then closed with 3.0 silk ties (Figure 1c). Mice were monitored over a 6-week period. At experimental or clinical endpoints, the abdominal cavities were examined for the presence of cecal tumors, gross liver and lymph node metastasis, and carcinomatosis. The size of cecal tumors and number of liver surface metastatic nodules were also determined. Tumors and metastatic nodules were examined by routine histology.

**RESULTS:** The average operating time was approximately 10 minutes per mouse using this novel cecal pouch technique. The 6-week survival was 77% (10/13); 2 died without any tumor within the first 10 days and 1 with cecal tumor at 4 weeks. Of the 10 mice surviving to study completion, 8 harbored tumors within their cecal pouches (Figure 2) and 2 had generalized carcinomatosis secondary to perforated cecal pouches. Successful generation of orthotopic tumor was seen in 85% (11/13) of mice. Liver metastases were detected in 3 mice without carcinomatosis (Figure 2a). Using histological analysis, all non-perforated cecal tumors (8/8) involved entire bowel wall (mucosa, submucosa and muscularis propria), but were still enclosed by the outer pouch layer, representing T5 tumors.

**CONCLUSION:** Our novel cecal pouch approach may represent an efficient method to generate clinically relevant orthotopic cecal tumors for quantitative analysis and pre-clinical studies.

**Figure 1:** Cecal pouch technique for tumor implantation: A) Extirpation of cecum through midline abdominal incision; B) Creation of cecal pouch by invaginating the bowel wall; C) Closure of cecal pouch by 3-0 silk tie.

**Figure 2:** Mouse with a large tumor enclosed in the cecal pouch (black arrow) and gross liver metastases (white arrows) at 6-week post-implantation.
RESULTS: Sorted MSC from the bone marrow showed 54.1% (494,367 of 914,167) MSC-PE (+) prior to hydrogel crosslink. One week later MSC were seen leaking through the hydrogel into the culture media (see figure). These free MSC were sorted, which showed 18.8% (58,068 of 748,536) MSC-PE (+) cells. At three weeks, MSC that were freed from the hydrogel showed 12.7% (110,423 of 892,404) MSC-PE (+), in comparison with the control MSC that showed 37.2% (523,189 of 1,476,720).

CONCLUSION: The present results indicate YB-1 as a novel and auspicious therapeutic target for esophageal tumor suppression aimed at the mechanisms of YB-1-mediated antiproliferative effects and its interaction with different growth factor receptors.

Basic: Pancreas

Tu1876

Albumin Administration in Acute Pancreatitis Increases Lung and Pancreatic Damage Reversed by Nitric Oxide Synthase Inhibitor

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BACKGROUND/AIM: Colloid resuscitation in acute pancreatitis (AP) is a matter of controversy due to the possible deleterious effect on lung function. Previous study demonstrated that albumin administration in AP may be deleterious not only to the lungs but also to the pancreas and that these effects can be reversed by inhibition of iNOS. The aim of this study was to evaluate whether inhibition of iNOS reverses the effect of albumin on lung and pancreatic damage in AP.

METHODS: AP was induced in male Wistar rats by intraductal 5% taurocholate injection. To evaluate the effect of albumin on lung damage in AP, animals received IV saline (Group I) or human albumin (Group II) immediately after AP. To evaluate the effect of iNOS inhibition on lung damage in AP, iNOS specific inhibitor 3-methylxanthine (SMT) was given to animals immediately after AP. The animals were divided into groups: Group III: saline was given after AP and SMT, and Group IV: albumin was given after AP and SMT. After 12 hours, serum levels, lung myeloperoxidase (MPO) activity, pulmonary vascular permeability, and histological analysis in pulmonary and pancreatic tissue were determined.

RESULTS: Serum amylase levels, lung MPO activities, vascular permeability and inflammatory infiltration, and pancreatic edema were significantly increased after AP. Albumin administration after AP increased lung permeability and inflammatory infiltration, pancreatic edema, and serum levels of amylase compared to saline administration (p < 0.05). However, albumin administration with SMT reduced lung permeability and inflammatory infiltration, and pancreatic edema compared to albumin administration without SMT. These results indicate significant differences in lung MPO activities among groups.

CONCLUSION: Restoration of extravascular fluid in AP with albumin increased the lung and pancreatic damage. Inhibition of iNOS before albumin administration reduced albumin induced damage effects in AP.
Tu1877
Heme Oxygenase-1 Gene Promoter Polymorphism and Acute Pancreatitis
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INTRODUCTION: Acute pancreatitis is a severe and frequently a life-threatening disease, which can lead to pancreatic necrosis, acute lung injury, SIRS and MODS. The inducible enzyme heme oxygenase-1 (HO-1) is an anti-inflammatory, antioxidative, and cytoprotective enzyme that is induced in response to cellular stress. The HO-1 promoter contains (GT)n dinucleotide repeats and is highly polymorphic in the population. The presence of longer repeats have been shown to be associated with lower levels of HO-1 expression in vitro and is associated with many diseases in vivo. In this study, we hypothesized that the number of GT repeats in HO-1 promoter can influence the occurrence of acute pancreatitis due to its protective function. Patients with acute pancreatitis are more likely to have long repeats than controls.

METHODS: Acute pancreatitis (n = 131) patients and age- and sex-matched controls (n = 33) were studied. Peripheral blood samples from pancreatitis patients were collected on admission. Genomic DNA was extracted from the blood samples of patient and control groups. The HO-1 promoter region with the GT repeats was amplified with fluorescent tagged primers. The PCR products were analyzed by ABI 3130 genetic analyzer and the exact size of the PCR products was determined by GeneMapper software. The short allele was defined to contain 27 GT repeats with fluorescent tagged primers. The PCR products were analyzed by ABI 3130 genetic analyzer and the exact size of the PCR products was determined by GeneMapper software. The short allele was defined to contain 27 GT repeats.

RESULTS: The subjects were categorized into 3 groups based on the genotype results one short and one long allele (S/L), two short alleles (S/S) and two long alleles (L/L). The presence of S/L was similar between the patient group (41.2%) and the controls (39.4%). Interestingly, 46.6% of patients were carriers of two long repeats (L/L) vs 24.2% of control subjects, whereas 12.2% of patients were carriers of two short repeats vs 36.4% of control population.

CONCLUSION: Our data demonstrate a strong bias toward longer alleles among patients with acute pancreatitis. Thus, polymorphism of the GT repeats in the HO-1 promoter region may be a risk factor for developing acute pancreatitis. Further studies are now underway to analyze the polymorphic levels of HO-1 protein in acute pancreatitis patients and controls to determine whether the presence of the short alleles facilitate HO-1 upregulation and consequently promote its protective anti-inflammatory function in acute pancreatitis.

Tu1878
Male Sex Predicts Adverse Events and Decreased Survival in Murine Pancreatic Adenocarcinoma
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INTRODUCTION: Male mice have more metastatic events than female mice. Male mice have higher levels of beta-1, 2, and 3 receptors [2,3]. We compared the effects of beta-agonists on spontaneous and stimulated contractile activity in normal and metastatic murine jejunal circular muscle from 6 naïve, male Sprague Dawley rats and studied in organ chambers. Dose-responses to exogenous beta-1 (xamoterol; 10-8-3x10-6M), beta-2 (fenoterol; 3x10-9-10-6M), and beta-3 (BRL37344; 10-10-3x10-8M) were analyzed by DPI 379 (30Hz) was applied to release neurotransmitters from enteric nerves. Dominant inhibitory effects of endogenously released nitric oxide were blocked with L-nitro-l-arginine (L-NNA; 10-4M) and the effect of beta-agonists on EFS responses were studied without and with propranolol or atropine (10-7M). Data is shown as mean±SEM change of baseline contractile activity [% (negative value: inhibition).

RESULTS: Using Kaplan Meyer analysis, male sex strongly correlated with decreased survival (p < 0.001). All mice had more metastatic events compared to females, 4.15 ± 0.29 vs. 2.58 ± 0.28 (p = 0.0002), and adverse events, 40.3% vs. 17.9% (p = 0.0057). Adverse events were increased in transfused males, 46.8% ± 15.6% (p = 0.0007), and this difference was exaggerated with receipt of female blood, 58.1% ± 17.4% (p = 0.0003). Moreover, transfused male mice had reduced weight gain from baseline compared to saline control, 3.88 ± 0.97 vs. 6.78 ± 0.58 (p = 0.03), this association was not seen in females.

CONCLUSION: Collectively, our analysis suggests that male sex modifies survival and the association of blood transfusions and blood donor gender on adverse events in pancreas cancer. These data demonstrate sex dimorphism that might influence treatment options in patients. Further study to delineate the mechanism of these findings is warranted.

Basic: Small Bowel
Tu1879
Role of Different Beta-Receptor Subtypes in Control of Contractile Activity in Rat Jejunal Circular Muscle
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BACKGROUND: Background is that beta-receptors participate in control of gastrointestinal contractile activity and might be involved in pathophysiology of motility disorders such as postoperative ileus. Our aim was to determine the mechanisms of action of three beta-receptor subtypes in rat jejunal circular muscle.

METHODS: Muscle strips (n = 6 rats) were obtained from 6 naive, male Sprague Dawley rats and studied in organ chambers. Dose-responses to exogenous beta-1 (β1a, xamoterol; 10-8-3x10-6M), beta-2 (β2a, fenoterol; 3x10-9-10-6M), and beta-3 (β3a, BRL37344; 10-10-3x10-8M) were studied without and with precontraction with betaxotol (3x10-6M), tetrodotoxin (TTX; blocking enteric nervous system, 10-6M), or propranolol (non-selective β-antagonist; 3x10-6M). Responses to betaxotol (3x10-6M) were studied without and with β1a (10-8M), β2a (3x10-6M), β3a (10-8M), TTX, or propranolol. Electical field stimulation (EFS, 30Hz) was applied to release neurotransmitters from enteric nerves. Dominant inhibitory effects of endogenously released nitric oxide were blocked with L-nitro-l-arginine (L-NNA; 10-4M) and the effect of β-agonists on EFS responses were studied without and with propranolol or atropine (10-7M). Data is shown as mean±SEM change of baseline contractile activity [% (negative value: inhibition).

RESULTS: Beta-agonists caused a dose-dependent inhibition of spontaneous and stimulated contractile activity (all p < 0.01, ANOVA) independent of precontraction and blockade of the enteric nervous system by TTX (NS, ANOVA). Propranolol prevented this inhibition in large part (responses at maximum concentration of β-agonist: β1a: –60 ± 2% vs. –23 ± 5% (with propranolol); β2a: –97 ± 1% vs. –27 ± 12%; β3a: –80 ± 5% vs. –33 ± 14%; all p < 0.05, ANOVA). β1a increased betaxotol-induced excitation more than 3-fold (1,073 ± 891 vs. 3,919 ± 891%; p < 0.05, ANOVA) while β2a, β3a, TTX, and propranolol had no effect on betaxotol-induced excitation (NS, ANOVA). EFS with L-NNA caused excitation (263 ± 124% vs. p > 0.05, ANOVA) that was increased in presence of β2a (705 ± 241%; 10-6M; p < 0.05, ANOVA). This effect of β2a was prevented by propranolol and atropine (291 ± 156% and 65 ± 29%, respectively), and p < 0.05. This effect of β2a and β3a had no effect on EFS responses.

CONCLUSION: In jejunal circular muscle of naive rats spontaneous and stimulated contractile activity can be inhibited via beta-1, 2, and 3-adrenergic mechanisms. This inhibition is mediated by effects on receptors located on the smooth muscle and not on the enteric nervous system. Activation of beta-1 receptors increases the response to exogenous betaxotol while the endogenous release of acetylcholine can be increased by beta-2-adrenergic mechanisms. These potential pro-contractile effects might be mediated by pre-synaptic beta-1 and 2 receptors on the enteric nervous system and need further investigations.

DFG KA 2329/5-1
Tu1880
Mesenteric Afferent Nerve Sensitivity in the Small Intestine During Mechanical Ileus in Mice
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Michael S. Kasparek1, Martin E. Kreis1
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INTRODUCTION: Mechanical ileus is a frequent disorder seen in general surgery. While standard therapy is surgical removal of the obstacle, little is known on alterations in gut physiology during intestinal dilatation. We aimed to investigate afferent nerve sensitivity and leukocyte numbers in the intestinal wall during mechanical ileus.

METHODS: C57Bl6 mice were anesthetized by isoflurane inhalation. After a mini-laparotomy, the small intestine was ligated approximately 5 cm distal to the ligament of Treitz, while controls received a mini-laparotomy only. Intestinal afferent sensitivity and leukocyte infiltration into the intestinal wall were investigated in ileus animals or controls after 3, 9 and 24 hours in different subgroups (n = 6). A dilated segment of small intestine located 5 mm proximal to the ligature was prepared for multi-unit mesenteric afferent nerve and motility recordings in vitro. Histological assessment by myeloperoxidase (MPO) stains was performed on segments from proximal and distal to the ligature in ileus animals.

RESULTS: Small intestinal motility in vitro was reduced in ileus segments compared to controls at all 3 time points after induction of ileus (p < 0.05). Maximum afferent firing to bowel 5-HT (500 μM) peaked at 30 ± 3 imp sec−1 after the beginning of ileus compared to 10 ± 1 imp sec−1 (p < 0.001). No difference in 5-HT sensitivity were observed between segments from ileus and control animals at the 9th and 24th time point. Leukocytes were not detectable in ileus and control animals at 9h and 24h after the beginning of ileus (p > 0.05).

CONCLUSIONS: Mesenteric afferent nerve sensitivity is altered secondary to mechanical ileus. Reduced afferent sensitivity for bradykinin and painful distension stimuli may hint at activation of anti-nociceptive mechanisms during mechanical ileus, while the pattern of leucocyte infiltration is unclear and warrants further investigation.

Tu1881
SPHK1 Regulates c-Myc Translation Through Chk2-Dependent H3R Phosphorylation
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INTRODUCTION: Intestinal epithelial barrier dysfunction results from a wide variety of pathologic conditions such as infection, trauma, inflammation and malignancy. At the gastrointestinal mucosal layer cells must be capable of maintaining their integrity, and do this through the interplay of multiple active processes including cell proliferation, migration, differentiation, and apoptosis. Previous reports from our lab have shown that sphingosine-1-phosphate (S1P) promotes intestinal epithelial barrier function through regulation of these processes. Sphingosine kinase-1 (SPHK-1) critically regulates S1P production, as it phosphorylates sphingosine to form S1P, which in turn can function as a second messenger or be secreted extracellularly for autocrine and paracrine effects through signaling via S1P receptors. In the current study we hypothesized that SPHK-1 overexpression would increase S1P production and lead to augmented cellular proliferation through enhancement of c-Myc mRNA by Chk2-dependent H3R phosphorylation.

METHODS: SPHK-1 overexpression stable cell lines were selected in rat intestinal epithelial cells (IECs). SPHK-1 activity and S1P production were measured by radioactive isotope assay. pG3-Luc-c-Myc 3’UTR was generated to determine translation efficiency of c-Myc 3’UTR by luciferase reporter system. c-Myc protein synthesis was measured by L-[35S]methionine and L-[35S]cysteine incorporation assays. The interaction of HuR and c-Myc mRNA was confirmed by biotin labeled c-Myc 3’UTR pull-down assays.

RESULTS: SPHK-1 activity and S1P production was variable between segments from ileus and control animals at the 9h and 24h time point. S1P production showed a 5-fold increase compared to control segments at all time points. This difference was 32 ± 2 imp sec−1 compared to control segments after 9h of ileus (p < 0.05). No differences in S1P sensitivity were observed between segments from ileus and control animals at 9h and 24h after ileus induction (p > 0.05). Continuous mechanical ramp distension of the intestinal loop was followed by a pressure dependent rise in tissue afferent nerve firing. The rise in tissue afferent nerve firing was 5-fold compared to control vector cells. Cell cycle analysis showed that cell proliferation in SPHK1 overexpression stable cell lines was enhanced, as G1 to S phase transition was increased versus vector cells. C-Myc protein levels were increased by ~10 fold. This effect was due to increased expression of c-Myc protein, as there was no observed change in levels of c-Myc mRNA, and silencing c-Myc mRNA reversed the upregulation of c-Myc protein. Overexpression of SPHK-1 promoted the translocation of HuR from nucleus to cytoplasm. HuR phosphorylation was increased by ~2 fold, and this was accompanied similarly by increase (~5 fold) in Chk2 phosphorylation, Chk2 silencing reduced this HuR phosphorylation.

CONCLUSIONS: Our findings demonstrate that SPHK-1 regulates cell proliferation by enhancing c-Myc translation in IECs, the enhanced c-Myc expression was modulated though HuR phosphorylation by Chk2 and provided new insight into the molecular functions of SPHK1.

Basic: Stomach

Tu1882
Failure of Diabetes Remission After Roux-en-Y Gastric Bypass
Surgery, East Carolina University, Greenville, NC

BACKGROUND: There is an 80% improvement glyemic control after gastric bypass in diabetic patients. Why some diabetic patients do not respond to surgery has yet to be explained.

METHODS: Seventeen obese Caucasian women (eight diabetic and nine euglycemic) were tested along with nine lean euglycemic control subjects. Tests were performed at three time points relative to surgery: 2.4 weeks before surgery, the week of surgery, and 3 months post surgery.

RESULTS: (p < 0.001). No differences in ISL were observed between responders and non-responders. Insulin sensitivity (ISI) improved in responders but not in non-responders.

CONCLUSIONS: Pancreatic beta cells failure can not explain the remission results from a wide variety of pathologic conditions such as infection, trauma, inflammation and malignancy. At the gastrointestinal mucosal layer cells must be capable of maintaining their integrity, and do this through the interplay of multiple active processes including cell proliferation, migration, differentiation, and apoptosis. Previous reports from our lab have shown that sphingosine-1-phosphate (S1P) promotes intestinal epithelial barrier function through regulation of these processes. Sphingosine kinase-1 (SPHK-1) critically regulates S1P production, as it phosphorylates sphingosine to form S1P, which in turn can function as a second messenger or be secreted extracellularly for autocrine and paracrine effects through signaling via S1P receptors. In the current study we hypothesized that SPHK-1 overexpression would increase S1P production and lead to augmented cellular proliferation through enhancement of c-Myc mRNA by Chk2-dependent H3R phosphorylation.

METHODS: SPHK-1 overexpression stable cell lines were selected in rat intestinal epithelial cells (IECs). SPHK-1 activity and S1P production were measured by radioactive isotope assay. pGL3-Luc-c-Myc 3’UTR was generated to determine translational efficiency of c-Myc 3’UTR by luciferase reporter system. c-Myc protein synthesis was measured by L-[35S]methionine and L-[35S]cysteine incorporation assays. The interaction of HuR and c-Myc mRNA was confirmed by biotin labeled c-Myc 3’UTR pull-down assays.

RESULTS: SPHK-1 activity and S1P production was variable between segments from ileus and control animals at the 9h and 24h time point. S1P production showed a 5-fold increase compared to control segments after 9h of ileus (p < 0.05). No differences in S1P sensitivity were observed between segments from ileus and control animals at 9h and 24h after ileus induction (p > 0.05). Continuous mechanical ramp distension of the intestinal loop was followed by a pressure dependent rise in tissue afferent nerve firing. The rise in tissue afferent nerve firing was 5-fold compared to control vector cells. Cell cycle analysis showed that cell proliferation in SPHK1 overexpression stable cell lines was enhanced, as G1 to S phase transition was increased versus vector cells. C-Myc protein levels were increased by ~10 fold. This effect was due to increased expression of c-Myc protein, as there was no observed change in levels of c-Myc mRNA, and silencing c-Myc mRNA reversed the upregulation of c-Myc protein. Overexpression of SPHK-1 promoted the translocation of HuR from nucleus to cytoplasm. HuR phosphorylation was increased by ~2 fold, and this was accompanied similarly by increase (~5 fold) in Chk2 phosphorylation, Chk2 silencing reduced this HuR phosphorylation.

CONCLUSIONS: Our findings demonstrate that SPHK-1 regulates cell proliferation by enhancing c-Myc translation in IECs, the enhanced c-Myc expression was modulated though HuR phosphorylation by Chk2 and provided new insight into the molecular functions of SPHK1.
Introduction: Although laparoscopic appendectomy (LA) is being performed with increased frequency, the utilization of laparoscopy in the management of acute appendicitis remains controversial and it continues to be used selectively.

Methods: Using the Nationwide Inpatient Sample database (NIS), clinical data of adults who underwent LA and OA for suspected acute appendicitis (perforated and non-perforated) was evaluated from 2006 to 2008. Incidental and elective appendicectomies were excluded. Outcome measures included patient characteristics (age, sex, race), comorbidities, postoperative complications, length of hospital stay (LOS), total hospital charges and in-hospital mortality.

Results: A total of 573,244 adult underwent urgent appendectomy during these three years (67.31% of all appendectomies). 45.9% of patients were female and 69.5% Caucasian. The mean age was 37 years. In overall, 65.21% of all appendicectomies were performed laparoscopically. LA was performed more in female than male (67.64% vs. 63.13% p < 0.001). The rate of perforated appendicitis was lower in female (21.96%) vs. 26.09%, p < 0.001. The table shows outcomes of OA and LA in non-perforated and perforated appendicitis in adults.

Conclusion: Our study was intended to evaluate retrospectively outcomes of laparoscopic appendectomy (LA) versus open appendectomy (OA) in perforated and non-perforated appendicitis in adults (between age 18 to 65 years old).

OBJECTIVES: Our study was intended to evaluate retrospectively outcomes of laparoscopic appendectomy (LA) versus open appendectomy (OA) in non-perforated and perforated appendicitis in adults (between age 18 to 65 years old).

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Outcomes of Laparoscopic and Open Appendectomy in Non-Perforated and Perforated Appendicitis

<table>
<thead>
<tr>
<th></th>
<th>Non-perforated</th>
<th>Perforated</th>
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</thead>
<tbody>
<tr>
<td>Overall Complication</td>
<td>4.60</td>
<td>7.59</td>
</tr>
<tr>
<td>Wound Infection (%)</td>
<td>0.15</td>
<td>0.42</td>
</tr>
<tr>
<td>Intra-abdominal</td>
<td>0.26</td>
<td>0.76</td>
</tr>
<tr>
<td>Mean Length of</td>
<td>1.66</td>
<td>2.40</td>
</tr>
<tr>
<td>Hospital Stay (days)</td>
<td>183.20</td>
<td>204.89</td>
</tr>
<tr>
<td>In-hospital Mortality</td>
<td>3.80</td>
<td>6.03</td>
</tr>
</tbody>
</table>

Conclusions: The time interval between endoscopic clearance of cholecystolithiasis and LC did not affect the latter procedure in terms of complications or conversion to open surgery. However, the conversion rate was lower in patients who underwent endoscopic sphincterotomy and postoperative complication rate was higher in patients who received PTGBD.

Tu1625 Risk Factors of Development of Gangrenous Cholecystitis and Its Treatment Outcomes

Gangrenous cholecystitis (GC) is considered a more severe form of acute cholecystitis. The risk factors associated with this condition and its impact on morbidity and mortality compared to non-gangrenous acute cholecystitis (NGAC) is poorly defined and based largely on older studies.

Methods: Patients with histologically confirmed acute cholecystitis treated in a specialized tertiary hospital unit between 2005 and 2010 were identified from prospectively maintained database. Those with GC were then compared to those with NGAC.

Results: 184 patients with NGAC and 106 patients with GC were identified. The risk factors associated with GC included older age (P = 0.001), diabetes (P = 0.049), delay in presentation (P < 0.001), temperature of ≤ 38°C (P = 0.001), tachycardia (P = 0.002), detection of muscle rigidity on examination (P = 0.001), greater elevations in white-cell count (WCC) (P < 0.001), C-reactive protein (CRP) (P = 0.001), and higher CRP threshold (P = 0.029) and in elevations and area under curve (P < 0.005). There were no overall differences in complications between the two groups. There was a lower incidence of common bile duct stones in the GC group (13.6% vs. 25.9%; P = 0.017). GC was associated with increased mortality (P = 0.017), but this was not an independent risk factor for mortality on multivariate analysis.

Conclusion: Gangrenous cholecystitis has certain clinical features and associated laboratory findings that may help differentiate it from NGAC. It is not associated with overall increased complications when treatment is taken in a specialized unit.

Tu1626 Comparison of Outcomes of Laparoscopic Versus Open Appendectomy in Adults: Data from the Nationwide Inpatient Sample (NIS), 2006–2008

From January 2005 to May 2010, 362 consecutive patients underwent acute appendicitis diagnosis laparoscopic surgery at UC Irvine Medical Center. Patient characteristics, comorbidities, postoperative complications, length of hospital stay (LOS), total hospital charges and in-hospital mortality were recorded.

Objectives: The primary objective of this study was to evaluate the overall in-hospital complications and mortality in patients undergoing laparoscopic and open appendectomy at the UC Irvine Medical Center. The study was also intended to evaluate the post-discharge sources of complications.

Methods: This was a retrospective review study that investigated the outcomes of laparoscopic and open appendectomy in adults undergoing urgent appendectomy for a diagnosis of acute appendicitis from January 2005 to May 2010. The study population included both laparoscopic and open appendectomy cases. The study population included both laparoscopic and open appendectomy cases.

Results: A total of 573,244 adult underwent urgent appendectomy during these three years (67.31% of all appendectomies). 45.9% of patients were female and 69.5% Caucasian. The mean age was 37 years. In overall, 65.21% of all appendicectomies were performed laparoscopically. LA was performed more in female than male (67.64% vs. 63.13% p < 0.001). The rate of perforated appendicitis was lower in female (21.96%) vs. 26.09%, p < 0.001. The table shows outcomes of OA and LA in non-perforated and perforated appendicitis in adults.

Conclusion: LA is safe and associated with lower morbidity, lower mortality and shorter hospital stay with acute perforated and non-perforated appendicitis. Also, in perforated cases LA had an advantage over OA in hospital charges. Laparoscopic appendectomy should be considered as the procedure of choice for perforated and non-perforated appendicitis in adults.
Tu1627 Survival Rates Following Radical Resection for Persistent and Recurrent Anal Cancer Are Poor

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INTRODUCTION: Laparoscopic single-site LESS surgery for appendectomy has not been shown to have any clear clinical benefit compared to traditional multipoort laparoscopic appendectomy. Likewise, studies indicate that multiport laparoscopic appendectomy and open appendectomy have equivalent outcomes. In this study, we directly compare the outcomes of open and LESS surgery for appendectomy in patients with uncomplicated cases of acute appendicitis.

METHODS: We reviewed outcomes of all LESS and open appendectomies for acute appendicitis at a single institution between January and December of 2008. Exclusion criteria included the following: perforated appendicitis documented on preoperative radiography or at the time of surgery, and pathology findings inconsistent with acute appendicitis. A total of 66 patients underwent open surgery, 211 patients underwent multiport laparoscopic surgery, and 9 patients underwent LESS surgery. Data was collected on postoperative narcotic consumption, postoperative hospital length of stay (LOS), and readmissions related to the operation. Statistical significance was defined as p < 0.05.

RESULTS: Patients ranged in age from 24 to 52 years (mean = 34 years) in the LESS group and 18 to 70 years (mean = 18 years) in the open surgery group. The mean dose of intravenous narcotics consumed postoperatively was 2.0 mg of morphine (SD = 2.8) in the LESS surgery group, and 3.4 mg (SD = 7.4) in the open surgery group (p = 0.58). The mean amount of oral narcotics (Perocet, Viconal, or Tylenol #5) consumed postoperatively was 4.4 tablets (SD = 5.6 tablets) in the LESS surgery group and 3.9 tablets (SD = 3.5) in the open surgery group (p = 0.81). 3 patients required readmission in the open surgery group; one patient developed a wound infection requiring intravenous antibiotics, one patient developed an intraabdominal abscess requiring percutaneous drainage, and one patient developed fascial dehiscence secondary to a broken suture requiring reoperation. No patients required readmission in the LESS surgery group (Z = 0.253, p = 0.80).

Postoperative Variables

<table>
<thead>
<tr>
<th>Postoperative Variables</th>
<th>LESS Group</th>
<th>Open Group</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intraop narcotics (mg morphine)</td>
<td>2.0 (SD = 2.8)</td>
<td>3.4 (SD = 7.4)</td>
<td>0.58</td>
</tr>
<tr>
<td>Oral narcotics (# tabs)</td>
<td>4.4 (SD = 3.5)</td>
<td>3.9 (SD = 3.3)</td>
<td>0.62</td>
</tr>
<tr>
<td>Postoperative (LOS) (hours)</td>
<td>36.1 (SD = 16.6)</td>
<td>33.9 (SD = 20.3)</td>
<td>0.81</td>
</tr>
</tbody>
</table>

DISCUSSION: While LESS appendectomy for acute appendicitis has been demonstrated to be safe and feasible in select patients, this study shows equivalent outcomes of both approaches in regards to postoperative narcotic consumption, postoperative LOS, and postoperative readmissions for procedure-related complications. While more patients who underwent open surgery were readmitted postoperatively, our modest sample size may have prohibited detection of statistical significance. Further investigation with a larger sample size is necessary to clarify the short-term and long-term outcomes of LESS appendectomy compared to open appendectomy.

Tu1628 Short Term Outcomes After Colorectal Surgery in Octogenarians.

Perpacio Stiel, Giulio P. Angelucci*, Federico Petone, Luana Franceschelli, Sara Lazzaro, Achille Gaspari

General Surgery, University of Rome Tor Vergata, Rome, Italy

INTRODUCTION: Colorectal Surgery (CRS) for elderly patients represents a challenge. The aim of this study was to assess the impact of age on short-term outcomes after CRS.

METHODS: One-hundred consecutive octogenarians (group A) underwent CRS between 06/05 and 09/10. These were prospectively collected and entered in a database. Comorbidities were quantified using the Charlson Comorbidity Index and ASA classification. Outcome measures were postoperative complications (within 30 days after surgery) and 30-day mortality rates. These results were compared to a cohort of 100 patients <80 years (group B) well-matched for ASA score, Charlson Comorbidity Index, and type of surgery.

RESULTS: The mean age in group A was 85 years (range: 80–104; 63 F; 37 M) and 55 years in group B (range 13–79; 46 F; 54 M). Elective surgery was similar between the two groups (63% vs. 52%) as well as the choice of laparoscopic approach (12% vs. 17%). Surgery for malignant disease was 36% in group A and 58% in group B. The mean Charlson co-morbidity index rate was 0.6% in octogenarians and 0.3% in control group (p = 0.03). ASA > III was similar between the two groups (24% vs. 16%, NS). Overall complication rate was 27%, being 28% for group A and 26% group B (NS). Twenty-eight octogenarians patients between group experienced short-term complications after surgery, 4 (14%) of them requiring additional surgery; in this group 18% had Charlson comorbidity index ≥2 and 36% were ASA III or more. Twenty-six patients in group B experienced short term complications, 5 (19%) requiring additional surgery; in this group 18% had Charlson comorbidity index ≥2 and 36% were ASA III or more. Postoperative mortality rate 2% in octogenarians vs 0% in control group (NS). The average length of hospital stay was 13 days (range: 5–41 days) in group A vs 13 days (range: 4–31 days) in group B (NS).

CONCLUSIONS: The relation between age and outcomes after CRS is complex and may be confounded by differences in pre-existing comorbidities, different kind of diseases, urgency of surgery and type of treatment received. According to our results there was no difference in the outcome in the two groups. Age is not correlated with postoperative complications and it is not an independent predictor of morbidity and mortality in CRS. Octogenarians undergoing CRS have an acceptable perioperative morbidity and mortality rate and survival rate, and should not be denied surgery based on age alone. Comorbidity index scores and ASA scores are useful tools to identify poor risk patients. Nevertheless this surgery in elderly patients should be performed by experienced surgeons in specialized centers to keep postoperative risk to a minimum.

Tu1629 Equivalent Outcomes of Laparoendoscopic Single-Site (LESS) Surgery and Open Surgery for Appendectomy

Koji Furukawa, Dea Boone, John Atkinson, James McGinity, Niran Koshy, Julio Teixeira

General Surgery, St. Luke’s Roosevelt Hospital Center, New York, NY

INTRODUCTION: Laparoscopic single-site LESS surgery for appendectomy has not been shown to have any clear clinical benefit compared to traditional multipoort laparoscopic appendectomy. Likewise, studies indicate that multiport laparoscopic appendectomy and open appendectomy have equivalent outcomes. In this study, we directly compare the outcomes of open and LESS surgery for appendectomy in patients with uncomplicated cases of acute appendicitis.

METHODS: We reviewed outcomes of all LESS and open appendectomies for acute appendicitis at a single institution between January and December of 2008. Exclusion criteria included the following: perforated appendicitis documented on preoperative radiography or at the time of surgery, and pathology findings inconsistent with acute appendicitis. A total of 66 patients underwent open surgery, 211 patients underwent multiport laparoscopic surgery, and 9 patients underwent LESS surgery. Data was collected on postoperative narcotic consumption, postoperative hospital length of stay (LOS), and readmissions related to the operation. Statistical significance was defined as p < 0.05.

RESULTS: Patients ranged in age from 24 to 52 years (mean = 34 years) in the LESS group and 18 to 70 years (mean = 18 years) in the open surgery group. The mean dose of intravenous narcotics consumed postoperatively was 2.0 mg of morphine (SD = 2.8) in the LESS surgery group, and 3.4 mg (SD = 7.4) in the open surgery group (p = 0.58). The mean amount of oral narcotics (Perocet, Viconal, or Tylenol #5) consumed postoperatively was 4.4 tablets (SD = 5.6 tablets) in the LESS surgery group and 3.9 tablets (SD = 3.5) in the open surgery group (p = 0.81). 3 patients required readmission in the open surgery group; one patient developed a wound infection requiring intravenous antibiotics, one patient developed an intraabdominal abscess requiring percutaneous drainage, and one patient developed fascial dehiscence secondary to a broken suture requiring reoperation. No patients required readmission in the LESS surgery group (Z = 0.253, p = 0.80).

Postoperative Variables

<table>
<thead>
<tr>
<th>Post-Operative Complications</th>
<th>In-All</th>
<th>Post-Operative Complications</th>
<th>In-All</th>
<th>p-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open surgery</td>
<td>28%</td>
<td>22%</td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>LPS</td>
<td>25%</td>
<td>13%</td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>ASA ≥ II</td>
<td>42%</td>
<td>37.5%</td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>Comorbidity index &gt; 2</td>
<td>33%</td>
<td>22%</td>
<td></td>
<td>NS</td>
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<tr>
<td>Gender</td>
<td></td>
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<tr>
<td>Male</td>
<td>52%</td>
<td>55.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>48%</td>
<td>44.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>BMI ≥ 25</td>
<td>50%</td>
<td>53%</td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>Surgery duration &lt; 180 min</td>
<td>54%</td>
<td>53%</td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>Emergency surgery</td>
<td>32%</td>
<td>33%</td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>Previous surgery</td>
<td>44%</td>
<td>26%</td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>LPS converted patients</td>
<td>50%</td>
<td>0%</td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>Malignant disease</td>
<td>34%</td>
<td>27.5%</td>
<td></td>
<td>NS</td>
</tr>
<tr>
<td>Sepsis</td>
<td>25%</td>
<td>24%</td>
<td></td>
<td>NS</td>
</tr>
</tbody>
</table>

CONCLUSIONS: The relation between age and outcomes after CRS is complex and may be confounded by differences in pre-existing comorbidities, different kind of diseases, urgency of surgery and type of treatment received. According to our results there was no difference in the outcome in the two groups. Age is not correlated with postoperative complications and it is not an independent predictor of morbidity and mortality in CRS. Octogenarians undergoing CRS have an acceptable perioperative morbidity and mortality rate and survival rate, and should not be denied surgery based on age alone. Comorbidity index scores and ASA scores are useful tools to identify poor risk patients. Nevertheless this surgery in elderly patients should be performed by experienced surgeons in specialized centers to keep postoperative risk to a minimum.
Tu1631
Gastrointestinal Cancer Surgery in Patients with a Prior Ventricleperitoneal Shunt
Shilpa Walule1, Andrew Batata1, Katherine S. Virgo1, Edel M. Doyley1, Anil Rahadabirjing2, Ricardo A. Audisio2, Frank E. Johnson1,2, Liverpool, United Kingdom

BACKGROUND: The estimated prevalence of hydrocephalus in all age groups is between 1-1.5%. Placement of a ventriculoperitoneal (VP) shunt in such patients offers them relatively normal lives. There is minimal data concerning the risk of postoperative complications in shunted patients undergoing subsequent major visceral operations. We hypothesized that healthy adults who had VP shunts placed for acquired conditions and later underwent gastric or colon cancer surgery would frequently have dense shunt-related adhesions and high rates of adverse outcomes.

METHODS: We assumed that all veterans were healthy on entry into military service. We searched national VA databases from 1994–2003 to identify all VA patients with shunts for acquired conditions and a curative-intent operation for stomach or colon cancer. We conducted a chart review to determine their clinical courses.

RESULTS: Five patients had codes for VP shunt, gastric cancer, and gastrctomy; 3 met our inclusion criteria. One of the evaluable gastroctomy patients had dense shunt-related adhesions. There were no postoperative complications in any of the 7 patients. VP shunts were managed by administering prophylactic antibiotics peri-operatively, isolating the shunt with surgical sponges intra-operatively.

CONCLUSIONS: We believe this is the first report analyzing the clinical course of adults with VP shunts who later have major abdominal cancer surgery. The presence of a shunt was associated with dense adhesions in one of the 7 patients in this series (14%) but not with increased risk of post-operative complications.

Tu1632
Colorctal Resection in Transplant Recipients: Is It Safe?
Avraham Rehui1, Luca Stocchi, Pokala R. Kiran, Colorectal surgery, Cleveland Clinic, Cleveland, OH

INTRODUCTION: Major abdominal procedures in transplant patients are considered high-risk. The aim of this study is to evaluate the safety of colorectal resection in solid organ transplant recipients.

METHODS: Solid organ transplant recipients who underwent elective and urgent colorectal procedures from 1994–2010 were identified from prospectively maintained databases. Demographics, indications, surgical procedures, graft survival and perioperative outcomes were assessed.

RESULTS: Out of 7,937 consecutive patients undergoing transplant since 1975, 90 patients who underwent colorectal resection after heart (23), lung (17), kidney (29) and liver (21) transplant (63 men, 27 women, mean age: 57 ± 10 years) were included. The most frequent indication for surgery was diverticulitis (58%) followed by cancer (25%) and IBD (15%). The mean interval time from transplantation to surgery was 6.3 years (ranges between 1 week and 33 years). Elective procedures were performed in 46 patients (sigmoidectomy in 17, right colectomy in 11, subtotal colectomy in 9, proctectomy in 6) and urgent procedures were performed in 24 (Hartmann’s procedure in 29, sigmoidectomy in 9 and right colectomy in 2). Only 22 patients (24%) underwent primary anastomosis without diverting ileostomy. Six patients (7%) were left with a permanent stoma. When compared to elective surgeries, urgent procedures had significantly increased post-operative mortality (18% vs. 0%, p = 0.002), longer length of stay (16.5 ± 13 vs. 8.3 ± 6 days, p < 0.001) and non-significantly higher overall morbidity (40% vs. 28%, p = 0.27). Kidney transplant recipients were the only group without any postoperative deaths (p = 0.05). All patients except one (kidney) retained their graft function.

CONCLUSIONS: Elective colorectal procedures in transplant recipients are safe and often associated with proximal diversion. Urgent surgery is associated with substantial mortality except in kidney transplant recipients.

Tu1633
Population-Based Assessment of Prognostic Factors Associated with Neuroendocrine Tumors of the Colon
Yiyan Chiang1, Xiaoping Li2, John W. King, Yju-Chiang Y. Nancy You, Janice N. Cotter
1Surgical Oncology, MD Anderson Cancer Center, Houston, TX

INTRODUCTION: The incidence of neuroendocrine tumors (NETs) of the colon has been increasing over the past decade, although little is known about associated prognostic factors. We sought to determine clinicopathologic factors influencing overall survival (OS).

METHODS: The National Cancer Database (1998–2002) was used to identify patients diagnosed with colonic NETs. 5-year OS was determined using the methods of Kaplan-Meier and a Cox proportional hazards model was used to assess clinicopathologic factors associated with OS.

RESULTS: A total of 2,188 patients were identified with a median age of 62.0 years and a 3 yr OS of 56.8% (median follow up = 4.2 years). The majority of colonic NETs were localized to the cecum (41.1%), followed by the sigmoid (16.3%), ascending colon (11.7%), rectosigmoid (11.6%), transverse (6.4%) and descending colon (1.7%). Distal colonic NETs (sigmoid or rectosigmoid) had the most favorable prognosis (69.1%) compared to proximal NETs located in the cecum (57.9%), ascending (59.3%), and transverse/ descending colon (31.1%) (p < 0.001). Distal colonic NETs were also more likely to present in younger patients with tumors that were of low histologic grade, ≤2 cm in size, and confined to the muscosa propria. Oximetric multiparametric analysis, age (>75 years), high histologic grade, positive nodal ratio (≥0.3), tumor depth, and distant metastases were all independently associated with poorer OS.

CONCLUSION: Distal colonic NETs are associated with improved 5-year OS compared to more proximally located tumors, likely due to earlier presentation of disease. Tumor location itself, however, was not independently associated with OS after adjusting for other clinicopathologic factors.
Does Tumor Location in Colon and Rectum Correlate with the Risk of Nodal Metastasis in T1 Colorectal Cancer? Suapki Khomviti1, Pokala R. Kiran1, Madhurunadh R. Sanak1, Ian C. Laverty2
1Colorectal Surgery, Digestive Disease Institute, Cleveland, OH; 2Gastroenterology and Hepatology, Digestive Disease Institute, Cleveland, OH

PURPOSE: For T1 colorectal cancer resected endoscopically, the risk of lymph nodal involvement impacts further management. Whether this risk may vary depending upon the location in the colon and rectum has been poorly characterized. We evaluate the risk of lymph node metastasis in T1 colorectal cancer depending upon the location of the primary tumor and evaluate factors that may predict the presence of metastasis in each part of colon and rectum.

METHOD: Data of all patients who underwent radical resection for T1 colorectal cancer from January 1997–March 2010 were evaluated. Patient and tumor factors (location, grade, presence of lymphovascular invasion) associated with the finding of lymph node involvement for patients with a radical resection specimen were evaluated.

RESULTS: Of 150 patients (41% females, mean age 64 years and 59% males, mean age 65 years) undergoing radical resection for T1 colorectal cancer, 18 (12%) had nodal metastasis. The risk of nodal metastasis at individual tumor sites was 20.7% upper rectum, 18.2% lower rectum, 18.2% ascending colon, 12.5% sigmoid, 10.5% mid rectum, 4.3% cecum and 0% for hepatic flexure, transverse, splenic flexure and descending colon. Age of patients (P = 0.35), gender (P = 0.82), size of lesion (P = 0.58), tumor differentiation (P = 0.33) and lymphovascular invasion (P = 0.1) were not significantly associated with nodal metastasis. T1 rectal cancer had higher risk of nodal metastasis (16.9%) compared to colon cancer (8.8%) although this did not reach statistical significance (P = 0.14, OR = 2.12).

CONCLUSION: The risk of lymph node metastasis varies depending upon location of the T1 colorectal cancer. These findings support the incorporation of the location in the primary tumor management algorithm to inform the decision whether to offer radical surgery or colposcopic surveillance for patients with T1 cancers detected at polypectomy.

Risk Factor Associated with Nodal Metastasis for T1 Colorectal Cancer

<table>
<thead>
<tr>
<th>Variable</th>
<th>Overall N = 150</th>
<th>Lymph node positive (total = 18 (12%))</th>
<th>P-value</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (years)</td>
<td>64.92 ± 13.01</td>
<td>82.22 ± 13.01</td>
<td>0.85</td>
<td>0.92 (0.76-1.10)</td>
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<tr>
<td>Gender</td>
<td>Female</td>
<td>62 (41.3%)</td>
<td>10 (16.1%)</td>
<td>0.39</td>
</tr>
<tr>
<td></td>
<td>Male</td>
<td>88 (58.7%)</td>
<td>19 (21.6%)</td>
<td>0.82</td>
</tr>
<tr>
<td>Tumor Site</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Ascending</td>
<td>11 (7.3%)</td>
<td>2 (18.2%)</td>
<td>0.78</td>
</tr>
<tr>
<td></td>
<td>Transverse</td>
<td>6 (4.0%)</td>
<td>0 (0%)</td>
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</tr>
<tr>
<td></td>
<td>Sigmoid</td>
<td>40 (26.7%)</td>
<td>5 (12.5%)</td>
<td>0.33</td>
</tr>
<tr>
<td></td>
<td>Upper Rectum</td>
<td>20 (13.3%)</td>
<td>6 (30.0%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Mid RECTum</td>
<td>10 (12.7%)</td>
<td>2 (20.0%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Low Rectum</td>
<td>11 (7.3%)</td>
<td>2 (18.2%)</td>
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</tr>
<tr>
<td></td>
<td>Hepatic Flexure</td>
<td>6 (4.0%)</td>
<td>0 (0%)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Splenic Flexure</td>
<td>3 (2.0%)</td>
<td>0 (0%)</td>
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</tr>
<tr>
<td></td>
<td>Descending</td>
<td>23 (15.3%)</td>
<td>3 (13.0%)</td>
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</tr>
<tr>
<td></td>
<td>Cecum</td>
<td>88 (58.7%)</td>
<td>19 (21.6%)</td>
<td>0.82</td>
</tr>
<tr>
<td>Age &lt; 65</td>
<td>69 (46.0%)</td>
<td>10 (14.5%)</td>
<td>0.39</td>
<td>0.65 (0.24,1.74)</td>
</tr>
<tr>
<td>Age ≥ 65</td>
<td>81 (54.0%)</td>
<td>19 (23.5%)</td>
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</tbody>
</table>

**Tu1634**

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A Systematic Review of the Anal Fistula Plug for Patients with Crohns and Non-Crohns Related Fistula-In-Ano

James O’Riordan*, Indranil Datta, Nancy N. Baxter Surgery, St Michael’s Hospital, Toronto, ON, Canada

**INTRODUCTION:** The management of fistula-in-ano is a balance between fistula cure and preservation of continence. The anal fistula plug (AFP) is an increasingly used method to treat fistula-in-ano. Comparison of studies on the AFP is limited by diverse fistula types, heterogeneity of fistula characteristics and limited follow-up. The aim of this systematic review was to summarize the AFP literature for patients with Crohns and non-Crohns related fistula-in-ano in as homogeneous a group of patients as possible.

**METHODS:** PubMed, Medline, Embase and the Cochrane medical databases were searched from the period 1995 to 2010 as well as abstracts from The American Society of Colon and Rectal Surgeons (ASCRS), The Society for Surgery of the Alimentary Tract (SSAT), The European Society of Coloproctology (ESCP) and The Association of Coloproctology of Great Britain and Ireland (ACPGIR) meetings between 2007 and 2010. Case reports, letters, comments, conference proceedings and non-English language articles were excluded. Patients with rectovaginal, anovaginal, rectourethral or ileal-pouch vaginal fistulas were also excluded from the review as were studies where the mean or median follow-up was less than 3 months. Studies were only included if results for patients with and without Crohns disease could be differentiated.

**RESULTS:** A pooled proportion of patients achieving fistula closure in non-Crohns fistula-in-ano patients was 0.56 (95% CI 0.52-0.60). The proportion achieving closure in Crohns patients was similar (0.56, 95% CI 0.40-0.72).

**CONCLUSIONS:** This systematic review suggests that fistula closure is achieved using the AFP in close to 60% of patients without Crohns disease, a lower success rate than initially reported with this technique. Although patients with Crohns disease appear to have similar success with the AFP, only 39 patients were evaluated in studies meeting our inclusion criteria; the AFP has not been adequately evaluated in this population.

**Clinical: Esophageal**

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**Tu1635**

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High Resolution Manometry Findings in Patients with Esophageal Epiphenic Diverticula

Fernando P. Vicentini1, Fernando A. Herbellia, Luciana C. Silva, Marco G. Patir2, Jose C. Del Grande3

Department of Surgery, Federal University of Sao Paulo, Sao Paulo, Brazil; 2Department of Surgery, University of Chicago, Chicago, IL.

**INTRODUCTION:** The pathophysiology of esophageal epiphrenic diverticula is still uncertain even though a concomitant motility disorder is found in the majority of patients in different series. High resolution manometry may allow detection of motor abnormalities in a higher number of patients with esophageal epiphenic diverticula compared to conventional manometry.

**AIMS:** This study aims to evaluate the high resolution manometry findings in patients with esophageal epiphenic diverticula.

**METHODS:** Nine individuals (mean age 64 ± 10 years, 4 females) with esophageal epiphenic diverticula were studied. All patients underwent an upper digestive endoscopy and barium esophagram. A single diverticulum was observed in 8 patients and multiple diverticula in 1. All patients underwent a high resolution manometry. Pressure and relaxation of the upper and lower sphincters were recorded. Esophageal body function was measured at 3 and 7 cm above the upper border of the LES. Visual analysis of color pressure plots for identification of segmental abnormalities was performed by 2 researchers experienced in HRM.

**RESULTS:** Upper esophageal sphincter was normal in all patients. Esophageal body was abnormal in 8 patients, lower esophageal sphincter was abnormal in 4 patients. Named esophageal motility disorders were found in 7 patients: achalasia in 6, diffuse esophageal spasm in 1. In the remaining patient, a segmental hypercontractile zone was noted with pressure of 196 mmHg.

**CONCLUSION:** High resolution manometry demonstrated motor abnormalities in all patients with esophageal epiphenic diverticula.
Tu1637  
Is the Number of Lymph Nodes Removed and the Type of Resection Associated with Postoperative Complications After Esophagectomy for Esophageal Cancer?

Arzu Orzcelik1,2, Steven R. Demester3, Jeffrey A. Hagen4, Shahin Ayazi2, Jorg Zehetner2, John C. Lipham1, Tom R. Billeter2,3

1Surgery, Keck School of Medicine, University of Southern California, Los Angeles, CA; 2Surgery, University of Essen, Essen, Germany.

BACKGROUND: Several studies have shown that the type of resection and the number of removed lymph nodes are independent prognostic factors for an improved survival after esophagectomy for esophageal cancer. The aim of this study was to evaluate whether the type of resection and the number of removed lymph nodes have an influence on major postoperative complications.

METHODS: The records of all patients who underwent an esophagectomy for cancer between 2002 and 2007 were reviewed. The stage, intraoperative data, pathology reports, postoperative complications and the outcomes were reported. Postoperative complications were graded using the Clavien Classification. Major complications were defined as complications grade IIb and higher.

RESULTS: The study population consisted of 365 patients with a median age of 63 years. End-to-end esophagectomy was performed in 229 patients (63%) and transthoracic in 136 (37%). The mean number of removed lymph nodes was 54 after en-bloc and 22 after transthoracic esophagectomy. Major complications after an en-bloc esophagectomy were seen in 42 patients (18%) and after a transthoracic esophagectomy in 23 (16%). The median ICU and hospital stay was 4 and 17 days respectively. On multivariate analysis, type of resection and number of lymph nodes removed were not associated with postoperative complications. However, survival was improved after en-bloc esophagectomy and with increasing number of removed lymph nodes.

CONCLUSION: The study shows that the type of resection and the number of lymph nodes removed are not associated with major postoperative complications. Further it confirms previous studies that the survival is improved after en-bloc esophagectomy with increased number of lymph nodes removed.

Tu1639  
The Results of the Introduction of a Minimally Invasive Esophagectomy Program in a Tertiary Referral Center

Rachel L. Bien4, Markus W. Hollmann1, John H. Klinkenbijl1, Thomas M. Van Gulik1, Oliver R. Busch1, Mark I. Van Berge Henegouwen2

1Surgery, Academic Medical Center, Amsterdam, Netherlands; 2Anesthesiology, Academic Medical Center, Amsterdam, Netherlands.

OBJECTIVE: Conventional open esophagectomies are accompanied by a high rate of postoperative complications. Although not yet proven by randomized clinical trials, minimally invasive esophagectomy appears to be a promising technique that could be associated with a lower morbidity rate. The objective of this study was to compare the results of minimally invasive esophagectomies to conventional open esophagectomies in a non-randomized patient series.

METHODS: Preoperative characteristics and the postoperative course of patients that underwent a transthoracic esophagectomy for esophageal carcinoma were registered in a prospectively monitored database. The results of patients that underwent a minimally invasive esophagectomy and a conventional open resection were compared.

RESULTS: From October 2009 until November 2010 a total of 74 esophageal cancer patients underwent a transthoracic resection of whom 34 by means of a minimally invasive resection. Preoperative characteristics were comparable for both groups. There was a trend towards a shorter hospital stay in the minimally invasive group (10.5 versus 13.5 days, p=0.19). The overall complication rate was 62% in both groups; pulmonary complications were present in 42% of patients in the open TTOCR group versus 31% in the MIE group.

CONCLUSION: The morbidity after a minimally invasive resection or an open transthoracic esophagectomy is comparable. Furthermore, there is a trend towards a shorter hospital stay after minimally invasive surgery. Therefore, minimally invasive esophagectomies appear to be a safe technique for patients with potentially resectable esophageal carcinoma.

Tu1640  
The Outcomes of Curative Treatment for Advanced Carcinoma of the Cervical Esophagus

Hiroshi Sato*

Esophageal Surgery, Shizuoka Cancer Center, Suntan-go, Japan

BACKGROUND: The characteristics and prognosis of carcinoma of the cervical esophagus differ from those of carcinoma of the hypopharynx and thoracic esophagus. A surgical resection (OP) is widely accepted as the standard treatment for advanced carcinoma of the cervical esophagus. On the other hand, oncologists have recently advocated that a nonsurgical approach with definitive chemoradiotherapy (CRT) should be the standard treatment for this disease. It is uncertain whether definitive CRT achieves treatment outcomes comparable to surgery, because conducting a clinical randomized trial is quite difficult because of the differing treatment characteristics.

OBJECTIVES: The purpose of this retrospective study was to evaluate the outcomes of patients who received curative treatment, of advanced stage squamous cell carcinoma of the cervical esophagus.

MATERIAL AND METHODS: A total of 50 patients with squamous cell carcinoma of the cervical esophagus were treated from September 2002 to December 2009. Among them, 30 patients were resectable cases. This population included 6 patients with clinical Stage IIb disease, 40 with Stage III, and 4 with Stage IV (the 6th UICC-TNM Classification) squamous cell carcinoma of the thoracic esophagus. The CRT regimen was 5-Fu and 50 Gy of radiation. This treatment was repeated twice every 5 weeks. Follow up consisted of chemotherapy, which was repeated every 4 weeks. The average observation period was 777 days. The treatment outcomes were reviewed retrospectively.

RESULTS: The initial treatment was OP in 9 patients and CRT in 41 patients (including 21 resectable cases). The complete response (CR) and partial response rate after definitive CRT was 44% (57% in resectable cases), 56%, respectively.

Eleven (27%) patients received TPN and seven (17%) underwent gastrostomy during CRT period. Seven patients (17%) underwent salvage surgery. Sixteen patients underwent OP. Postoperative oral intake was good in all patients.

CONCLUSIONS: The study shows that the type of resection and the number of removed lymph nodes are independent prognostic factor for an improved survival after enbloc esophagectomy with increased number of lymph nodes removed.

Tu1641  
Type of Resection Associated with Postoperative Complications After Esophagectomy for Esophageal Cancer?

Hiroshi Sato*

Esophageal Surgery, Shizuoka Cancer Center, Suntan-go, Japan

BACKGROUND: Several studies have shown that the type of resection and the number of removed lymph nodes are independent prognostic factors for an improved survival after esophagectomy for esophageal cancer. The aim of this study was to evaluate whether the type of resection and the number of removed lymph nodes have an influence on major postoperative complications.

METHODS: The records of all patients who underwent an esophagectomy for cancer between 2002 and 2007 were reviewed. The stage, intraoperative data, pathology reports, postoperative complications and the outcomes were reported. Postoperative complications were graded using the Clavien Classification. Major complications were defined as complications grade IIb and higher.

RESULTS: The study population consisted of 365 patients with a median age of 63 years. En-bloc esophagectomy was performed in 229 patients (63%) and transhiatal in 136 (37%). The mean number of removed lymph nodes was 54 after en-bloc and 22 after transthoracic esophagectomy. Major complications after an en-bloc esophagectomy were seen in 42 patients (18%) and after a transthoracic esophagectomy in 23 (16%). The median ICU and hospital stay was 4 and 17 days respectively. On multivariate analysis, type of resection and number of lymph nodes removed were not associated with postoperative complications. However, survival was improved after en-bloc esophagectomy and with increasing number of removed lymph nodes.

CONCLUSION: The study shows that the type of resection and the number of lymph nodes removed are not associated with major postoperative complications. Further it confirms previous studies that the survival is improved after en-bloc esophagectomy with increased number of lymph nodes removed.
Tu1642
Implementation of an Enhanced Recovery Program in Esophageal Surgery
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BACKGROUND: A recent development in gastrointestinal surgery is the implementation of enhanced recovery after surgery (ERAS) protocols. Evidence regarding the benefit of ERAS programs in patients undergoing esophageal surgery is scarce. Therefore we investigated the feasibility and possible benefit of a perioperative enhanced recovery program in patients undergoing esophagectomy for malignant disease.

METHODS: From January 2009 until March 2010 all esophageal cancer patients undergoing surgical resection who were treated according to the ERAS were included in this study. ERAS items included preoperative counselling, perioperative nutrition, early removal of nasogastric tube and early mobilization. Primary outcome parameters were overall hospital stay and the incidence of postoperative complications. Outcome measures in the ERAS cohort were compared to a cohort of patients who underwent surgical resection in the three years prior to implementation of the ERAS protocol.

RESULTS: A total of 89 esophageal cancer patients underwent surgical resection between January 2009 and March 2010. 72 patients were included in the ERAS protocol (ERAS+) and compared to 20 non-ERAS patients who underwent surgery in the three prior years (ERAS-). Patient characteristics were comparable with the exception of a higher BMI in ERAS- patients and the number of patients who underwent neoadjuvant therapy (50% in ERAS+ versus 36% in ERAS-, p = 0.003 and 66% in ERAS+ versus 22% in ERAS-, p = 0.001 respectively). Overall hospital stay was 14 days in ERAS+ versus 15 days in ERAS- (p=0.04). There were no significant differences in the incidence of postoperative complications in both groups.

CONCLUSION: The implementation of an ERAS program in esophageal surgery resulted in a small but significant reduction of overall hospital stay, whereas overall morbidity was not affected.

Tu1643
The Application of Automatic Document Classification to Cancer Staging for Esophageal Pathological Reports
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BACKGROUND: More than 40,000 Taiwan residents died of cancer in 2009 according to the statistics of the Department of Health, Taiwan. Due to the advance in medical experience and knowledge over the last decade, the prognosis of cancer patients has been significantly improved and there are more drugs as well as alternative treatments to help patients at relatively late stage of cancer. Cancer staging is an important indicator for assessing the effects of cancer treatment and prognosis; effectiveness may be affected by the interpretation proficiency of cancer registration staff who read the pathological reports of cancer patients. However, the manual interpretation process is somewhat inefficient and time-consuming. The aim of this study was to explore the effectiveness of computationally converting pathological reports of esophageal cancer into cancer staging reports by using efficient document classification techniques.

MATERIALS AND METHODS: Pathological reports of 234 patients undergone esophagectomy from year 2000 to 2008 in Division of Thoracic Surgery, Taipei Veterans General Hospital, Taiwan were collected in this study. The reports were computationally converted into weighted frequency vectors of keywords by using text mining techniques. The staging based on the converted keyword vectors was compared to the staging derived from the original pathological reports. Then, J48 decision tree induction algorithm, a supervised learning algorithm, was used to evaluate the performance of our document classification model for automatic cancer staging based on the 234 vectors.

RESULTS: The area under the prediction accuracy curve for cell type could reach 95.3%, and those for T, N and M status reach 84.47%, 92.72% and 94.87% respectively.

CONCLUSIONS: The automatic classification of esophageal cancer patients’ pathology reports using document classification techniques was feasible and effective. Furthermore, we used the J48 decision tree induction algorithm to produce the classification model. The performance of the model was very promising, with an accuracy rate of 95.3% for cell type and 92.72% for T status. These results indicated that automatic cancer staging based on the text mining techniques and classification algorithms was feasible and effective in medical documents. However, more efforts should be made in improving the performance of the model. One possible approach is to incorporate more advanced document classification techniques into the model. This study could provide useful information for medical professionals and researchers who are interested in developing automatic cancer staging systems.
Tu1646

Are All Hiatal Hernia Recurrences the Same? A Large Retrospective Review of Laparoscopic Hiatal Hernia and Paraesophageal Hernia Repair with Nissen Fundoplication

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BACKGROUND: Laparoscopic hiatal hernia repair is associated with recurrence rates ranging from 10% to 35%. Adequate mediastinal dissection, tension free closure of the hiatus, and crural reinforcement of large hernias with bioprosthesis mesh has been shown to reduce hiatal hernia recurrence rates. Data is scarce concerning treatment of asymptomatic hiatal and paraesophageal hernia recurrences found on upper endoscopy or barium swallow. This large retrospective review evaluates incidence and management of symptomatic and asymptomatic recurrences of hiatal and paraesophageal hernias.

METHODS: A single institution retrospective review of all laparoscopic hiatal and paraesophageal hernias with nissen fundoplication from February 2002 to November 2010 was performed. All patients underwent reduction of the hernia sac, mediastinal dissection, primary tension free closure of the hiatus, and placement of a bioprosthesis mesh if the hiatus was greater than 3 centimeters. Patients were seen at two weeks, six months, and one year. All patients underwent a barium swallow at one year to evaluate their repairs. Patients with a hiatal hernia recurrence were identified and then classified as symptomatic or asymptomatic.

RESULTS: 243 patients with hiatal and paraesophageal hernias underwent laparoscopic repair with nissen fundoplication from 2002 to 2010. 194 of 243 had been seen at one year and underwent a barium swallow. There were 17 (7%) recurrence rates seen over an average follow up period of 3.5 years. 4 were symptomatic and 13 were asymptomatic. All asymptomatic and symptomatic cases were followed closely with either intervention or reintervention of prolapse pump inhibitors. All of the symptomatic patients underwent revisional laparoscopic nissen fundoplications. Short-term follow-up of these patients has shown no recurrence.

CONCLUSION: Laparoscopic hiatal hernia repair with nissen fundoplication is an effective technique to repair hiatal and paraesophageal hernias. The use of adequate mediastinal dissection, primary tension free closure of the hiatus, and bioprosthesis mesh placement for a hiatus greater than 3 centimeters significantly decreases hiatal hernia recurrences over a 3.5 year average time period. Patients who are asymptomatic can be followed closely without intervention and those with symptomatic recurrences can be repaired again safely and adequately.

Tu1647

High Resolution Impedance Manometry Findings in Nutcracker Esophagus

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OBJECTIVE: The objective of this study was to correlate high resolution impedance manometry (HRIM) findings with symptoms in patients diagnosed with nutcracker esophagus based on conventional manometric criteria.

METHODS: A retrospective review of a prospectively maintained database identified patients with a nutcracker esophagus (distal esophageal amplitude ≥ 180 mmHg). Patients with a history of previous foregut surgery or with type I, II, or III achalasia were excluded. We used two different stratification schemes based on the previously described Chicago classification of normal integrated relaxation pressure (IRP) and distal contractile integral (DCI) values. One stratification scheme was based on IRP: group A (IRP < 15 mmHg) and group B (IRP ≥ 15 mmHg). The other stratification scheme was based on DCI: group X (DCI ≤ 8000 mNms/cm) and group Y (DCI > 8000 mNms/cm). Patients rated their symptoms namely chest pain, heartburn, dysphagia and regurgitation on a scale of 0–3. Chi square test was used to compare categorical variables. Mann-Whitney test was used to compare continuous variables.

RESULTS: Thirty patients satisfied the inclusion and exclusion criteria. There were 21 (70%) females. Fifteen patients (50%) presented with dysphagia while 15 patients (50%) presented with chest pain. Twenty-six patients (74%) had spastic waves (DCI > 5,000 mNms/cm) and normal contractile front velocity). Of these 22 (85%) had impaired relaxation i.e. IRP ≥ 15 mmHg. There was no difference in clinical symptoms or manometric variables between groups A (7/30) and B (23/30). Group X comprised 7/24 (29%) patients and group Y comprised 22/76 (76%) patients. The number of patients with chest pain was significantly (p = 0.023) higher in group Y (14 patients) when compared to group X (1 patient). The mean chest pain score in group Y (mean ± SD = 3.3 ± 2.1) was significantly (p = 0.027) higher than group X (mean ± SD = 0.3 ± 1.3). There was a positive correlation (R = 0.399) between chest pain and DCI which was statistically significant (p = 0.032).

CONCLUSION: In nutcracker patients chest pain is associated with increasing DCI.

Tu1648

Lymph Node Ratio Is a Significant Predictor of Disease Specific Mortality in Patients Undergoing Esophagectomy for Cancer

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OBJECTIVE: The 7th edition of the AJCC staging system classifies nodal stage by the number of malignant nodes found. This method may be confounded by variations in lymphadenectomy and specimen review. The ratio of lymph nodes containing metastases to the total nodes excised (LNR) has been suggested as an alternative. Few studies of LNR have included patients undergoing preoperative chemoradiation. In this study, we seek to verify the validity of LNR for staging, especially in those treated with neoadjuvant therapy, compare it to the current AJCC system, and identify other variables affecting outcome.

METHODS: A review of our prospectively maintained database identified 92 patients who underwent esophagectomy at our institution from 1988 until 2010 for esophageal cancer. Univariate and multivariate analysis were performed.

RESULTS: The mean age at diagnosis of our patients was 63.4 ± 9.7 years. Most patients (63%) had adenocarcinoma (p = .207). Analysis was then carried forward in only the adeno cohort. Upon stratification by LNR, no significant difference was found (p = .027). Another predictor of survival was the primary site of cancer (p = .012). N1 stage was also associated with mortality (HR = 6.8, p = .01), but N2 and N3 stages conferred a non-significant survival benefit (HR = 0.198, p = .062 and HR = 0.19, p = .093 respectively). There was no difference in patterns of recurrence (local and extrahepatic, liver only, liver and lung, extrahepatic only) (p = 0.59, p = 0.97, p = 0.29, p = 0.51).

CONCLUSIONS: LNR is a significant predictor of survival and may be a more accurate staging system for patients with esophageal adenocarcinoma.
Tu1650
Outcome After Resection of Colorectal Liver Metastases: No Prognostic Influence of Complications, Blood Transfusions or Body Mass Index
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Because of low mortality and steadily improving outcomes liver resection for colorectal metastases (CRC-LM) is increasingly used as a part of multimodal therapy of metastasized CRC. In addition to established oncological parameters (e.g., Fong criteria) factors like BMI, perioperative blood transfusions and postoperative complications were discussed for an influence on long term prognosis. We, therefore, evaluated our survival data for prognostic factors including above mentioned parameters.

METHODS: Long term outcome could be assessed in 267 patients (77% male, 30% synchronous CRC-LM) after first liver resection for CRC-LM since 1998. Perioperative blood transfusions were given in 29%. Postoperative morbidity (any complication) was 52%. Survival was analyzed by a Kaplan-Meier method and Cox-regression analysis.

RESULTS: Free hepatic margins were achieved in 88%. Overall five year survival was 45%. In univariate analysis positive hepatic margins (p < 0.01), CRC-LM size < 3 cm (p = 0.005), increased tumor markers (CA 19-9 > 100 and/or CEA > 200 (p = 0.01) and node positive primary CRC (p = 0.03) were associated with poorer survival. In multivariate analysis CRC-LM size < 3 cm (p = 0.01), node positive primary CRC (p = 0.05) and increased tumor markers (p < 0.05) independently influenced prognosis. The hepatic resection status showed a trend but no significant prognostic influence. Synchronous and metastatic metastases had almost identical outcomes. The occurrence of postoperative complications (any, as well as hepatic or infectious complications), BMI and perioperative blood transfusions did not show any influence on long term prognosis.

CONCLUSIONS: In our study long term prognosis after first resection of colorectal LM was mainly influenced by established tumor-related parameters. As recently shown by other groups the resection margin had only a minor influence (due to further multimodal or repeat therapy). Further examined factors like perioperative complications, perioperative blood transfusions or body mass index did not influence the outcome in our experience.

Tu1651
Re-Visiting Surgical Options for Diffuse Porto-Mesenteric Thrombosis in the Era of Multi-Visceral Transplantation: A Case for Aggressive Conservation
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BACKGROUND: Patients with diffuse porto-mesenteric thrombosis (PMT) are often not candidates for shunt surgery and are candidates for multi-visceral transplantation (MVT), despite normal liver and intestinal function. While results of intestinal and multi-visceral transplantation steadily improve, with 5-year survival following MVT of the order of 50%, waiting-list mortality upwards of 25% and need for immunosuppression, alternatives to MVT need to be considered when possible.
AIM: To describe initial experience with a conservative, step-wise surgical approach in patients with diffuse PMT referred for MVT.

METHODS: Retrospective review of patients with diffuse PMT referred to a single surgeon, for consideration of MVT. PMT was defined as confluent thrombosis of portal, splenic, superior and inferior mesenteric veins. Surgical options graded along a risk-continuum are traditional shunts followed progressively by ‘make-shift’ shunts, ablative procedures (the complete, single-stage ‘modified’ Sugita procedure), isolated liver transplant followed lastly by MVT.

RESULTS: There were 6 patients referred for MVT with diffuse PMT of whom 2 died (one haemorrhage, one sepsis) and 4 were operated on. They had normal liver function and 5 of the 6 had normal intestinal function.

Tu1652
Repeat Hepatic Resection for Recurrent Colorectal Liver Metastases: Impact of Neoadjuvant Therapy and Long Term Outcome
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Although advances in surgical and multimodal treatment have lead to prolongation of survival in patients with colorectal liver metastases (CRC-LM) many patients develop recurrence that is often isolated to the liver. Repeat resection may, again, prolong survival or even heal some patients. We evaluated the perioperative (under special consideration of neoadjuvant chemotherapy, neo.CTx) and long-term outcomes after repeat hepatic resection for CRC-LM in a relatively large single institution series.

METHODS: Since 1999, 70 repeat hepatectomies (64% wedge/segmental, 36% hemihepatectomy) for recurrent CRC-LM were performed in 61 patients (8 pts, 2 one 3 resections). Median interval from first to first repeat liver resection was 15 months. Before repeat hepatectomy any kind of CTx had been given in 63 cases (90%). Neo.CTx (CTx within 6 months before surgery) was given in 26 cases (37%), in most cases with Oxaliplatin (additional antibiotics in n = 11)

RESULTS: After neo.CTx the number and size of metastases was slightly smaller (but n.s.). Free hepatic margins were achieved in 77% (independent of neo.CTx). Mortality was 2.7% (2.9%). No mortality was observed after neo.CTx. Complication rates were 52% (any), 6% (hepatic failure/ bilirubin > 6 mg/dl), 17% (infectious) or 13% (relaparotomy), all independent of neo.CTx. Overall five year survival (5 year; n = 59) was 54%. The only significant prognostic factor was the number of metastases (5 year survival 71% with one vs. 46% with > 5 metastases; p = 0.03). Patients with > one metastasis had more positive margins (33% vs. 17% in 1 metastasis). The size of metastasis, time interval after first liver surgery, nodal status of the primary CRC, preoperative CD4 count, gender and (surprisingly) the resection margin did not significantly predict survival.

CONCLUSIONS: Repeat hepatectomy for recurrent CRC-LM can be performed with low morbidity and acceptable mortality. Modern Neo.CTx regimens do not increase complication rates. Long term survival after repeat hepatectomy in this selected group is rather high and comparable to data after first liver resection. Patients with only one CRC-LM are best candidates for surgery. The resection margin had only a minor influence, maybe due to multimodal or repeat therapy.

CONCLUSIONS: A multi-disciplinary approach allows some patients with complicated diffuse porto-mesenteric venous thrombosis to avoid or at least delay MVT. Our approach is not new, but simply uses MVT as an absolute last resort. New publications, our initial results, with a surgical philosophy of “aggressive conservation”, even in widespread porto-mesenteric thrombosis, appear to show promise: MVT remains an option if other strategies fail.

Tu1653
Multicenter Results of Stereotactic Body Radiotherapy (SBRT) for Secondary Tumors of the Liver
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BACKGROUND: More than 250,000 patients are diagnosed with liver metastases each year in USA. Less than 20% of those lesions are amenable to definitive surgical management due to advanced local disease or a medical con- dition. Non-surgical therapies, i.e., TACE, REA have limited response and no significant impact on patient survival. SBRT has emerged as an alternative therapy.

AIM: To determine the response of liver metastases to SBRT and if SBRT treatment may confer survival benefit to patients with non-resectable liver metastases.

METHODS: Patients with secondary liver tumors treated with SBRT from four Academic Medical Centers were entered into a common database. Descriptive statistics and survival curves were performed using SPSS.

RESULTS: 155 patients underwent SBRT for liver metastases. 52% of tumors originated in the GI tract while 35% were from the thorax including breast. 89% of treated neoplasms responded to SBRT at a median dose of 32 Gy in 3 consecutive fractions (median). A Grade III/IV local response was observed with a mean decrease in maximum diameter from 4.3 ± 1.9 cm to 2.5 ± 1.3 cm and a calculated mean total tumor volume reduction of 39%. Recurrences in the radiated field were observed in 2% of treated cases. SBRT did not confer a survival advantage in patients with secondary liver tumors when compared with matched controls (p > 0.05). Systemic recurrences were common. 42% of patients were readmitted to the hospital for medi cal complications. No complications attributable to fidu cial placement or SBRT treatment were observed.

CONCLUSION: SBRT is a safe and effective treatment modality for the local control of secondary liver neoplasms. Further analyses are undergoing to determine grade of response to SBRT according to tumor type.
Tu1655
Symptomatic Change and Gastrointestinal Quality of Life After Pancreatectomy
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BACKGROUND: Pancreatectomy is a standard operation for many benign and malignant diseases. Although pancreatectomy is a high-risk surgical procedure for short-term complications, it may also have long reaching effects in gastrointestinal-related symptoms. The purpose of this study was to assess the gastrointestinal quality of life of patients who have undergone pancreatectomy.

METHODS: Patients who have undergone pancreatectomy were contacted by telephone and asked a series of qualitative open-ended questions about their preoperative symptoms, change in postoperative symptoms, and new postoperative symptoms. In addition, they completed the Gastrointestinal Symptom Rating Scale (GSRS), which assess 5 domains: Reflux Syndrome (RS), Acute Pain Syndrome (APS), Indigestion Syndrome (IS), Diarrhea Syndrome (DS), and Constipation Syndrome (CS). Higher scores indicated more severe symptoms. In addition, age, gender, pancreatic disease, type of pancreatectomy, and date of pancreatectomy were recorded.

RESULTS: 52 patients were both able and agreeable to participate in the study. 26 had papillomalignancy, 17 cystic lesions, 5 neuroendocrine tumors, and 4 benign pathology. 30 patients had Whipple pancreatectomy, 16 distal pancreatectomy, 3 central pancreatectomy, 2 enucleation and 1 total pancreatectomy. Follow-up from time of operation was from 1 to 13 years. 69% reported change from preoperative to postoperative symptoms, including symptomatic improvement, 31% no change, and 0% worse. 50% of patients did not experience new, different symptoms compared to their preoperative state. The median GSRS scores (interquartile range) were RS 0 (0-1), APS 0 (0-1), IS 2 (0-4), DS 2 (0-5-5), and CS 0 (0-1). Patients with Whipple operation tended toward worse scores compared to other types of pancreatectomy in the RS domain (0.5 vs. 0, p = 0.08) and IS domain (3.5 vs. 1.5, p = 0.06). 68% of patients with Whipple operation had new symptoms compared to 32% of patients with another type of pancreatectomy (p = 0.002). However, patients <2 yrs from the operation had no different scores compared to those >2 yrs from the operation.

CONCLUSION: The incidence of malignant IPMNs in main duct type (68%) was significantly higher than that of branch duct type (23%), or combined type (32%) (p = 0.05). On the other hand, 10-year disease-specific survival rates of branch duct type, main duct type, and combined IPMNs were 64%, 63%, and 66%, respectively. Even when focusing on invasive IPMNs, the 10-year disease-specific survival rates were 72%, 62%, and 69%, respectively. The incidence of these symptoms are relatively mild as measured by the GSRS, except in the IS and DS domains. These mild symptoms seem to persist over time. This information will help with patient counseling.

Tu1656
Prognostic Impact of Dihydropyrimidine Dehydrogenase and Human Equilibrative Nucleoside Transporter 1 Expression and Ganciclovir Plus 5-I Chemotherapy After Surgical Resection for Pancreatic Adenocarcinoma
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BACKGROUND & AIM: Although intratumoral dihydropyrimidine dehydrogenase (DPD) and human equilibrative nucleoside transporter 1 (hENT1) expression have been reported to be associated with chemosensitivity to each fluoropyrimidine and gemcitabine, their impact on combined chemotherapy is unclear. The aim of this study is to investigate whether intratumoral DPD and hENT1 expression can predict survival of pancreatic carcinoma patients treated with adjuvant gemcitabine plus 5-I (GEM-S-I) chemotherapy.

METHODS: Intratumoral DPD and hENT1 expression was investigated by immunohistochemistry in 86 pancreatic adenocarcinoma patients who received adjuvant GEM-S-I chemotherapy after surgical resection. Association between clinicopathological factors including DPD and hENT1 expression and disease free survival (DFS) and overall survival (OS) were evaluated by univariate and multivariate analyses. Furthermore, we classified all 86 patients into 3 groups according to the number of favorable factors related to DPD and hENT1 expression. (2 favorable factors: low DPD and high hENT1, 1 favorable factor: low DPD and low hENT1, 0 favorable factor: high DPD and low hENT1). Association between this combined classification and survival was also evaluated.

RESULTS: High DPD and hENT1 expression were observed in 35 (41%) and 63 (72%) patients, respectively. Association to the combined classification with DPD and hENT1, 37 (43%), 41 (48%), and 8 (9%) patients had 2, 1, and 0 favorable factors, respectively. Univariate analysis revealed that patients with low DPD expression had significantly longer DFS (P = 0.006) and OS (P = 0.011) than those with high DPD, and patients with high hENT1 expression had significantly longer DFS (P = 0.001) and OS (P = 0.003) than those with low hENT1. The combined classification with DPD and hENT1 was also significantly associated with DFS (P = 0.001) and OS (P = 0.001). Sub-analysis between each two of the three groups revealed that patients with 2 favorable factors had significantly longer DFS and OS than those with 1 (P = 0.017; DFS: P = 0.016) and those with 0 (DFS: P < 0.001; OS: P < 0.001). Patients with 1 favorable factor had significantly longer DFS (P = 0.004) and OS (P = 0.002) than those with 0. In multivariate analysis, each DPD and hENT1 expression were independently associated with DFS (DPD: P = 0.003, hENT1: P = 0.004) and OS (DPD: P = 0.032, hENT1: P = 0.026). The combined classification with DPD and hENT1 was also independently associated with DFS (P = 0.001) and OS (P = 0.004).

CONCLUSION: Analysis of intratumoral DPD and hENT1 expression enables the stratification of pancreatic adenocarcinoma patients based on different subsets of chemotherapy on their likelihood of survival, and may have a potential to optimize adjuvant chemotherapy including gemcitabine and 5-I for resected pancreatic adenocarcinoma.

Tu1657
Prognostic Relevance of the Lymph Node Ratio and Variability of Lymph Node Evaluated Pathologically for Pancreatic Cancer Survival
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BACKGROUND: Lymph node (LN) metastasis is associated with poor survival in pancreatic cancer. The variability in number of LN evaluated pathologically (leading to the LN status) and its impact on the LN ratio (LNR) is not known.

AIM: To determine the minimum number of LN that needs to be evaluated to allow accurate stratification for prognosis and therapy, and to determine prognostic significance of LNR.

METHODS: 499 patients underwent pancreatectomy for pancreatic cancer from 1997–2004. LNR, number of nodes examined, and number of metastatic nodes identified pathologically were used to identify risk survival groups using a re-scaled log rank statistic validated with bootstrap resampling methods. The prognostic value was assessed with Cox proportional hazard regression models. A patient was staged correctly as N0 if it was estimated with a beta-binomial model.

RESULTS: The median number of LN examined was 10 (range 2–74). To evaluate the minimum number of LN that needs to be evaluated to allow accurate stratification for prognosis and therapy, and to determine prognostic significance of LNR.

CONCLUSIONS: 52 patients were both able and agreeable to participate in the study. 26 had papillomalignancy, 17 cystic lesions, 5 neuroendocrine tumors, and 4 benign pathology. 30 patients had Whipple pancreatectomy, 16 distal pancreatectomy, 3 central pancreatectomy, 2 enucleation and 1 total pancreatectomy. Follow-up from time of operation was from 1 to 13 years. 69% reported change from preoperative to postoperative symptoms, including symptomatic improvement, 31% no change, and 0% worse. 50% of patients did not experience new, different symptoms compared to their preoperative state. The median GSRS scores (interquartile range) were RS 0 (0-1), APS 0 (0-1), IS 2 (0-4), DS 2 (0-5-5), and CS 0 (0-1). Patients with Whipple operation tended toward worse scores compared to other types of pancreatectomy in the RS domain (0.5 vs. 0, p = 0.08) and IS domain (3.5 vs. 1.5, p = 0.06). 68% of patients with Whipple operation had new symptoms compared to 32% of patients with another type of pancreatectomy (p = 0.002). However, patients <2 yrs from the operation had no different scores compared to those >2 yrs from the operation.

CONCLUSION: The incidence of malignant IPMNs in main duct type (68%) was significantly higher than that of branch duct type (23%), or combined type (32%) (p = 0.05). On the other hand, 10-year disease-specific survival rates of branch duct type, main duct type, and combined IPMNs were 64%, 63%, and 66%, respectively. Even when focusing on invasive IPMNs, the 10-year disease-specific survival rate were 72%, 62%, and 69%, respectively. The incidence of these symptoms are relatively mild as measured by the GSRS, except in the IS and DS domains. These mild symptoms seem to persist over time. This information will help with patient counseling.
Step Up Approach in Emphysematous Pancreatitis
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OBJECTIVE: Emphysematous pancreatitis (EP) is considered a virulent form of infected pancreatic necrosis (IPN). The objective of this study was to evaluate the effectiveness of step up approach in the management of EP.

RESULTS: Among non-diabetic patients, even modest hyperglycemia during the early postoperative period may lead to better outcomes in patients undergoing pancreatectomy. Among non-diabetic patients, even modest hyperglycemia during the early postoperative period may lead to better outcomes in patients undergoing pancreatectomy. Patients who had an episode of hyperglycemia experienced a significantly greater rate of pancreatic complications (17% vs. 8%, p = 0.04) than patients who had three-day means less than or equal to 140 mg/dL. Patients with higher mean blood glucose measurements also had significantly less among patients who underwent enucleation compared to those who had a resection (13 vs 36%, p < 0.05). None of the 45 enucleation patients died within 30 days whereas one resection patient (2.2%) died postoperatively. Median post-operative length of stay was two days less for enucleation patients (6 vs 8 days). Only three enucleation patients (7%) had new exocrine insufficiency after surgery.

CONCLUSION: Compared to resection, pancreatic enucleation is associated with improved operative and post-operative outcomes. For small benign and premalignant pancreatic lesions, enucleation should be considered the procedure of choice when technically appropriate.

Pancreatic Enucleation: Improved Outcomes Compared to Resection
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BACKGROUND: Pancreatic enucleation is associated with a lower postoperative mortality than pancreatic resection. Enucleation also has the potential advantages of reduced morbidity and preservation of pancreatic parenchyma. However, enucleation is an uncommon operation, and good comparative data with resection are lacking. Therefore, the aim of this analysis was to compare the outcomes of pancreatic enucleation and resection.

METHODS: From 1998 through 2010, 45 patients with small (mean 2.3 cm, range 0.5–5.5 cm) neuroendocrine tumors (49%), mucinous cystic tumors (22%), serous/simpler cysts (20%) and other benign lesions (9%) underwent pancreatic enucleation. Since 2005, 16 of 31 enucleations (52%) were performed laparoscopically or robotically. These 45 patients were matched by age, gender, pathology, lesion size and location as well as by year of surgery and approach (open vs. laparoscopic or robotic) with 45 patients undergoing pancreaticoduodenectomy (n = 19) or distal pancreatectomy (n = 26). Serious morbidity included Grade B and C pancreatic fistulas and was otherwise defined in accordance with the American College of Surgeons-National Surgical Quality Improvement Program. Outcomes were compared with standard statistical analyses.

RESULTS: Operative time was nearly two hours shorter for enucleation (183 vs 279 mins, p < 0.03). Operative blood loss was significantly lower with enucleation (160 vs 788 ml, p < 0.05). Fewer patients undergoing enucleation required monitoring in an Intensive Care Unit (18 vs 44%, p < 0.05). Serious morbidity was significantly less among patients who underwent enucleation compared to those who had a resection (13 vs 36%, p < 0.05). None of the 45 enucleation patients died within 30 days whereas one resection patient (2.2%) died postoperatively. Median post-operative length of stay was two days less for enucleation patients (6 vs 8 days). Only three enucleation patients (7%) had new exocrine insufficiency after surgery.

CONCLUSION: Compared to resection, pancreatic enucleation is associated with improved operative and post-operative outcomes. For small benign and premalignant pancreatic lesions, enucleation should be considered the procedure of choice when technically appropriate.

Glycemic Control in Non-Diabetic Patients Is Associated with Better Outcomes Following Pancreatectomy
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BACKGROUND: Hyperglycemia is a risk factor for perioperative morbidity and mortality. Recent studies evaluate the role of hyperglycemia on postoperative outcomes in patients undergoing cardiac, vascular, and colorectal surgery, yet none specifically evaluate patients undergoing pancreatic surgery.

OBJECTIVE: The aim of this study was to examine the impact of postoperative hyperglycemia on patient outcomes after pancreatectomy.

METHODS: We reviewed the medical records of all patients who underwent pancreatoduodenectomy (PD) and distal pancreatectomy (DP) between January 1, 2008 and December 31, 2009. We gathered data on demographics, blood glucose during the first 72 postoperative hours, and perioperative complications for all preoperative non-diabetic patients. Three-day mean blood glucose measurements and episodes of hyper- (blood glucose greater than 200 mg/dL) and hypo- (blood glucose less than 70 mg/dL) glycemia were recorded. Continuous variables were compared using the Wilcoxon rank-sum test. Categorical variables were compared using chi-square or Fisher’s exact test.

RESULTS: A total of 201 patients underwent either PD (118) or DP (84). The mean age of patients was 62.9 years with the majority being female (56%) and white (76%). The mean body mass index was 25.7 kg/m2. Compared to resection, pancreatic enucleation is associated with improved operative and post-operative outcomes. For small benign and premalignant pancreatic lesions, enucleation should be considered the procedure of choice when technically appropriate.

CONCLUSION: Among non-diabetic patients, even modest postoperative hyperglycemia following PD or DP is associated with increased morbidity and longer lengths of stay. Careful attention to adequate glycemic control during the early postoperative period may lead to better outcomes in patients undergoing pancreatectomy.
Tu1661
National Trends in the Incidence and Stage of Disease at Initial Presentation for Patients with Pancreatic Adenocarcinoma
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BACKGROUND: There is a paucity of data on trends in the incidence and stage of disease (SOD) at initial presentation for patients with pancreatic cancer (PC). The aims of the study were to analyze the national trends in the incidence and SOD at initial presentation for patients with PC as stratified by location.

METHODS: The Surveillance, Epidemiology, and End Results (SEER) database (SEER 17, 2000–2007) was used to identify patients with pancreatic cancer located in the head (C25.0), body (C25.1), or tail (C25.2). SEER*Stat 6.6.2 was used to calculate age-adjusted incidence data which is presented as number of new cases per 100,000. The SOD (localized, regional and distant) at initial presentation was analyzed to detect trends.

RESULTS: Overall, we found a modest increase in the incidence of pancreatic cancer for all locations from 7.5 in 2000 to 9.1 per 100,000 in 2007. This increase in the incidence was predominantly due to significant increases in the number of patients with lesions located in the body (8.6% to 1.2 cases per 100,000; 43% increase, p < 0.05) and tail (1.0 to 1.4 cases per 100,000; 36% increase, p < 0.05) of the pancreas. There were no significant changes in the incidence of lesions located in the head of the pancreas. We also noted a statistically significant increase in the incidence of localized disease located in the head of the pancreas. To examine a large single institution resection database for IPMN maintained for annual life-long follow-up.

CONCLUSION: First, stakeholder opinions on pancreatic cancer can be measured and to compare these measured perceptions with directly assessed QOL of patients throughout diagnosis and treatment.

Tu1662
Assessing Quality of Life in Pancreatic Cancer: A Shifting Landscape
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BACKGROUND: Pancreatic cancer is a devastating disease with five-year survival of <5%; thus, additional outcome measures accounting for quality of life (QOL) and functional status become increasingly important. As QOL and functional status become increasingly important in assessing outcomes for cancer patients, additional investigation into the quantification of stakeholders such as family members, healthcare professionals, or even patients themselves who are not currently experiencing the health state of interest, e.g., post-operative recovery. We sought to determine how educated stakeholders evaluated QOL with pancreatic cancer; and to compare these measured perceptions with directly assessed QOL of patients through diagnosis and treatment.

METHODS: First, stakeholder opinions on pancreatic cancer diagnosis and treatment were gathered via anonymous simultaneous polling using TurningPoint 4.2.3 software in November 2010 during a pancreatic cancer symposium. Respondents included patients, family, and healthcare professionals. Second, individual patient assessments of QOL were conducted by trained physicians using the EORTC QLQ-C30 and PAN26 standardized surveys administered to patients at initial clinic appointment with surgical oncologist and follow-up appointments from November 2007 through May 2009.

CONCLUSION: This study indicates that there is a modest increase in the overall incidence of pancreatic cancer which is largely due to notable increases in the incidence of lesions involving the body and tail of the pancreas. The data also demonstrated an increase in the incidence of localized disease at the time of initial presentation which was again more pronounced for lesions located in the body and tail.

RESULTS: Stakeholders (n = 65) included nurses (n = 24), family members of patients with pancreatic cancer (n = 13), pancreatic cancer survivors (n = 5), physicians (n = 5), and other, including scientists (n = 19). Regarding general stakeholder perceptions of living with pancreatic cancer, the mean rank for overall QOL was 4.8/10 (scale 0–10; 10 perfect health); for immediately post-operative was 4.1/10; and for 6 months post-operative was 5.7/10 (Figure). Individual pancreatic cancer patients (n = 12); in contrast, demonstrated a mean global QOL score of 58% preoperatively, 72% immediately post-operatively, and 63% > 3 months from surgery (see figure). Intriguingly, the individual functional scales demonstrated improvement after the immediate post-operative period over the time studied, which correlated with the stakeholders’ survey; however, the overall individual patients assessed QOL showed a paradoxical decline after this period.

RESULTS: Of the 203 resected specimens the IPMN lesions were – adenoma (38%), borderline (25%), carcinoma in situ (CIS, 16%), and invasive cancer (21%). Surgical margins were benign in all but one case with CIS (0.5%). At median follow-up of 40 months, 8% (17/203) patients were found to have new disease at a median interval of 38 months (range 4–127 mos) from initial resection. All of these had negative surgical margins for dysplasia except one with adenoma. No treatment was required for 12 cases with side-branch disease by imaging while surgical treatment was required in 5 (2%)–2 adenomas, 1 carcinoma in situ, and 2 invasive ductal carcinoma (one with liver mets). There was no relationship between the 17 cases with new lesions and the 186 without lesions in demographics, procedure type, duct location, histology, or original margin status.

CONCLUSION: Possibly because of life-long annual imaging we found a higher incidence of recurrence than the literature’s 2%. Following partial pancreatic resection for IPMNs and a 40 month follow-up with annual imaging we found 8% of cases developed a new IPMN lesion in the pancreatic remnant and 2% required a second resection. We suspect, as our follow-up time increases, that new lesions will constantly appear regardless of a negative surgical margin at initial resection.
Tu1664
Maximum Extent of Pancreatic Necrosis and Not Site of Necrosis Guide the Therapeutic Modality in Severe Acute Pancreatitis
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BACKGROUND: Site and extent of pancreatic necrosis are evaluated as tools in assessment of severity and prognosis in acute pancreatitis in previous studies. The aim of the present study was to assess whether the site and maximum extent of pancreatic necrosis during the stay had role in guiding the therapeutic modality in Severe Acute Pancreatitis

RESULTS: Of the 70 consecutive patients with SAP, 14 patients were managed conservatively, 29 underwent PCD alone and the remaining 27 underwent initial PCD followed by surgery. >30% necrosis was present in 21 patients. There were significantly higher number of patients managed conservatively compared to those undergoing PCD (see Table 1). >30-50% necrosis was noted in 17 patients. Significantly higher number of patients underwent management with PCD alone in this group compared to those also requiring necrosectomy (see table). More than >50% necrosis was present in 21 patients. Proportion of patients requiring open necrosectomy as step up approach were significantly higher in this group compared to those managed with PCD alone (see table). Pancreatic necrosis of head of pancreas with or without involvement of body or tail was noted in 36 patients (see table) and pancreatic necrosis involving only the body and or tail was noted in 34 patients (see table). No significant difference was noted in management based on site of necrosis (Table 1).

CONCLUSIONS: Site of pancreatic necrosis has not influenced the management modality. However significantly higher number of patients with >50% necrosis required surgery compared to PCD alone group while significantly higher percentage of patients with >30% necrosis could be managed conservatively.

Tu1665
Routine Perioperative Drainage Following Elective Distal Pancreatic Necrosis: Is it Necessary?
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PERITONEAL DRAINAGE (PD) OF THE OPERATIVE BED FOLLOWING ELECTIVE PANCREATIC NECROSECTOMY

RESULTS: Of the 69 patients having elective DP at a university hospital from 1997–2010, Factors examined included the development of post-operative intra-abdominal complications (abscess, pseudocyst, bleeding, abscess) particularly those that required therapeutic intervention (radiologic drainage or re-operative surgery). PD was used at the discretion of the attending physicians. Criteria for drain removal include output <50 cc/day and/or amylase value <5x serum level. The comparison between those with and without drains was made utilizing chi-square analysis or Fischer’s exact test where appropriate with significance assessed at the 95th percentile.

RESULTS: Sixty-nine patients had DP during the study period. 30 of who did not have PD. Sixty percent were female, 75% had surgery for malignancy and 23% had concurrent chronic alcoholism. The major complication rate was 12% and the median length of hospital stay was 12 days. Twenty-three patients (49%) suffered 45 complications post-operatively. The majority of the morbidity was intra-abdominal in nature including 15 with abscesses, 6 with pancreatic fistulae and 11 with pseudocysts. Of the 23 patients who required drainage, 12 had abscesses, 6 had pancreatic fistulae and 5 had pseudocysts. Twelv...
Tu1667
Pancreatic Resection in the Octogenarian
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BACKGROUND: This study compares outcomes of elderly patients (80 years old or greater) undergoing pancreatic resection to a control group of younger patients.
METHODS: This is a retrospective study of all patients undergoing pancreatic resection for a neoplasm at our institution between January 2004 and December 2010.
RESULTS: One hundred fifty patients underwent pancreatic resections for a neoplasm during the study period. Twenty nine patients were in the octogenarian group, 24 of these patients had an operation for an adenocarcinoma. A group of 31 patients (<80 years old) were included as a comparison group. The groups were evenly matched for type of operation, duration of operation and estimated blood loss. Table 1 shows demographic data for the two groups.
Final pathology was comparable. Three patients had positive margins in the elderly population (12.5%) versus 5 in the younger population (16%). Eight patients were node positive in the elderly population compared with nine patients in the younger population. Median tumor size was comparable at 3cm in each group.
Post-operatively, elderly patients had a statistically significant increase in length of stay compared to controls (13 versus 8 days, p = 0.02). Length of intensive care stay was not significantly different between the two groups. Two patients died within thirty days in the elderly group compared with no deaths in the control population. Major morbidity in the elderly population was 45% compared with 32% in the younger population.
CONCLUSIONS: Elderly patients tolerate major pancreatic resection for adenocarcinoma, however, major morbidity and mortality are higher. The majority of elderly patients require rehabilitation after discharge which may hinder their overall quality of life. Elderly patients should be counseled regarding outcomes prior to pancreatic resection. More studies are needed to further study elderly patient’s risk from pancreatic resection.
Tu1668
Targeting Early Deaths Following Pancreaticoduodenectomy to Improve Survival
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INTRODUCTION: Increasing focus on outcomes with disease-specific therapies encourages referrals to centers with optimal outcomes. Strategies to improve survival after pancreaticoduodenectomy must address early mortality to improve long-term survival. This study was undertaken to analyze early mortality after pancreaticoduodenectomy as part of a strategy to improve long-term outcome.
METHODS: 1,031 patients who underwent pancreaticoduodenectomy at a university affiliated hospital from 1992-2010 were studied. Medium data are reported.
RESULTS: 58 (5.6%) patients, 60% male and age 72 years, died within 90 days after pancreaticoduodenectomy. All patients had a least one significant comorbidity; significant comorbidities were cardiorespiratory (N = 86), endocrine (N = 26), gastrointestinal (N = 47), hemato-logic (N = 30), or other (N = 14). 60% of patients had depressed serum albumin levels and 43% were jaundiced. ASA Class 1: 17%, Class II, 72%, Class III, and Class IV 74%. 74% had malignant disease, 17% had pre-malignant diseases, and 10% had benign disease. 22% of patients underwent a major vascular resection or colon resection at the time of pan-creaticoduodenectomy. Causes of death in cancer progress-ion/carcinomia (9%), cardiorespiratory failure (17%), leak/ perforation (10%), infection (7%), vascular/bleding (26%), or other (5%). Of all deaths, early deaths (i.e., < 30 days) are more likely due to cardiorespiratory disease (21%), leak/ perforation (17%), and vascular/bleding complications (31%), and later deaths (i.e., 31-90 days) are most likely associated with progression of cancer/carcinomia (10%), car-diorespiratory disease (13%), or vascular/bleding (21%).
CONCLUSIONS: Death within 90 days after pancreaticoduodenectomy is uncommon, occurs in relatively older underlyng malignancy patients, and is generally associated with vascular or bleeding complications. Strategies to minimize early death should focus on post-opera-tive care and prompt recognition and management of herald bleeding or vascular thrombosis, as it can often result in perioperative death following pancreaticoduodenectomy.
Tu1669
Results of Braun Entero-Enterostomy for Suspected Afferent Loop Syndrome in Patients Who Had a Whipple for Chronic Pancreatic Pain
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INTRODUCTION: Patients suffering from chronic pancreatic pain may undergo a Whipple procedure to help relieve their pain. However, after months or years of relief, some develop symptoms of nausea, vomiting and recur-rent abdominal pain. We present a retrospective review of patients who had a Whipple for chronic pancreatic pain who developed clinical symptoms suspicious for afferent loop syndrome and their outcomes after a Braun entero-enterostomy.
METHODS: We reviewed our patient database over the last 5 years and identified patients who underwent a Whipple procedure for chronic pancreatic pain. 16 patients were identified and had suspected afferent loop syndrome based on their clinical symptoms, labs, and multiple imaging modalities including 2-hour quantitative HIDA scans. 5 underwent a Braun entero-enterostomy
CONCLUSIONS: The development of nausea, vomiting and abdominal pain after a latency period in patients with pylorus spating Whipple for chronic pain syndrome may be due to poor drainage of the afferent loop which may be relieved by diversion through a Braun entero-enterostomy.
Tu1670
Laparoscopic-Assisted Spleen Preserving Left-Sided Pancreatectomy (DP-SP): A Safe Effective Option for Benign Tumors of the Pancreas
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RESULTS: We present data from our institution over the last 6 years and identified patients who underwent a Whipple for chronic pancreatic pain. 16 patients were identified and had suspected afferent loop syndrome based on their clinical symptoms, labs, and multiple imaging modalities including 2-hour quantitative HIDA scans. 5 underwent a Braun entero-enterostomy
CONCLUSIONS: The development of nausea, vomiting and abdominal pain after a latency period in patients with pylorus spating Whipple for chronic pain syndrome may be due to poor drainage of the afferent loop which may be relieved by diversion through a Braun entero-enterostomy.

Tu1667

Tu1669

Tu1670
Tu1671
Operative Complications of Pancreatoduodenectomy in Patients with Elevated Serum Bilirubin
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BACKGROUND: Hyperbilirubinemia is associated with immune inhibition and coagulopathy, thus preoperative biliary drainage (PBD) has become standard practice at many institutions for patients with obstructive jaundice who are being considered for pancreatoduodenectomy (PD). This study examines the peri- and postoperative complications in patients with an elevated serum bilirubin, undergoing PD at a high volume center.

METHODS: We conducted a retrospective cohort study of all patients undergoing PD with a preoperative serum total bilirubin ≥10 mg/dL between 1998 and 2008. We excluded patients who had previously undergone PBD or did not have available follow-up data for review. Patients were identified from a prospective pancreatic surgical database which included peri- and postoperative complications.

RESULTS: Forty-nine deeply jaundiced patients with a mean age of 64 ± 12.6 years were identified. PD was performed for pancreatic adenocarcinoma (36), ampullary adenoma/adenocarcinoma (7), cholangiocarcinoma (4), and chronic pancreatitis (2). For these patients, the mean total serum bilirubin level was 16.78 ± 5.61 mg/dL. Other preoperative clinical findings included: mean albumin 2.79 ± 0.59 g/dL; mean International Normalized Ratio 1.21 ± 0.40; and median carcinoantigen 19.9 level 270 u/ ml (range: 66 – 794). Pinto pump complications were recorded in 22 patients (45%), and 2 patients died within 30 days of operation. Three patients (6%) required reoperation for bile leak complications. Major postoperative complications requiring intervention included bleeding (2 patients), pneumonia (1), cardiac (1), pulmonary (5), and surgical site infection (5). Minor complications included self-limited gastroparesis (5 pts), uncomplicated anastomotic leaks (6), and superficial wound infection (3). The mean length of postoperative stay was 13 ± 11 days.

CONCLUSION: Pancreatoduodenectomy in patients with deep jaundice is associated with substantial morbidity and mortality and often requires prolonged hospitalization. A randomized clinical trial evaluating the potential benefit of PBD at a high-volume pancreatic center is justified.

Tu1673
Laparoscopic Lysis of Adhesions for Small Bowel Obstruction Is an Uncommon but Safe Procedure
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INTRODUCTION: Laparoscopic lysis of adhesions (LLA) for small bowel obstruction (SBO) has not increased in prevalence as other minimally invasive procedures such as thyroidectomy, herniorrhaphy, and appendectomy have. Loss of laparoscopic workspace and friability of distended bowel increase both the difficulty and risk of this procedure. This study examines the prevalence, safety and efficacy of LLA and open lysis of adhesions (OLOA).

METHODS: University HealthSystem Consortium (UHSC) is an alliance of more than 100 academic medical centers and affiliate hospitals. UHSC’s Clinical Database/Resource Manager (CDRM/RM) allows comparison of patient-level risk-adjusted outcomes for performance improvement. This study is a multi-center, retrospective outcome analysis of discharge data of adult patients with small bowel obstruction secondary to adhesions who undergo LOA or OLOA. Main outcome measures analyzed were mortality, morbidity, 30-day readmission, main care unit (ICU) admission, length of stay (LOS) and cost.

RESULTS: 20,514 patients with SBO underwent LLOA n = 2940 or OLOA n = 17,574 over a 45 month period between October 2007 and November 2010. LLOA represented 14.3% of all operative treatments. Comparing post-operative outcomes LLOA showed lower mortality (1.12% LLOA vs. 4.36% OLOA; p < 0.0001), lower morbidity (5.65% LLOA vs. 15.77% OLOA; p < 0.0001), reduced length of stay (7.99 ± 10.84 days LLOA vs. 15.77 ± 17.56 days OLOA; p < 0.0001), reduced costs ($1,053.7 ± 1,465.8 LLOA vs. $3,945 ± 5,972 OLOA; p < 0.0001). A meta analysis of LLOA vs. OLOA, showed a significant decrease in the incidence of positive LBT (0.19% LLOA vs. 0.22% OLOA; p < 0.0001). The overall procedure time was shorter for LLOA (61.1 ± 17.5 minutes) as compared with OLOA (84.2 ± 19.9 minutes; p < 0.0001).

CONCLUSION: This is a multi-center study that has shown that LLA is an effective and safe method of treating SBO. A 50% reduction in mortality, morbidity, cost and LOS was found with LLA compared to OLOA. LLA is a safe procedure that is associated with reduced costs and morbidity.

Clinical: Small Bowel

Tu1674
Risk of Small Intestinal Bacterial Overgrowth in Roux-en-Y Gastric Bypass
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BACKGROUND: Small intestinal bacterial overgrowth (SIBO) has been associated with small intestinal and colonic surgeries. However, with few large clinical trials and potential confounding by factors such as PPI use, the role of the upper gastrointestinal surgeries in clinically significant SIBO remains unclear. Patients with prior Roux-en-Y gastric bypass (RYGB) frequently present with symptoms similar to SIBO, such as nausea, vomiting, bloating, gas, diarrhea, and abdominal pain that may lead to reconstructive surgery.

AIM: To identify the risk of SIBO among RYGB patients using lactulose breath test (LBT).

METHODS: This was a retrospective cohort study of 312 symptomatic patients referred to a tertiary care center for LBT. Conditions and use of medications thought to be associated with SIBO (bowel surgery, diabetes, irritable bowel syndrome, pancreatic insufficiency, thyroid disorder, proton pump inhibitor [PPI] use) and presenting symptoms were reviewed. Patients with prior RYGB were identified. Positive LBT required a rise > 20 ppm in breath hydrogen or methane concentration within 60 minutes. Univariate and multivariate analyses were performed using Chi-square or Fisher-exact test and logistic regression, respectively. Statistical significance was established using p < 0.05.

RESULTS: 105 (35.5%) patients had positive LBT. Overall, 25 patients had prior RYGB. Univariate analysis revealed an increased rate of positive LBT among RYGB patients compared to Non-Gastric bypass (0.17% vs. 0.21%; P = 0.044). Gastric bypass surgery (0.19% vs. 0.32% vs. 0.18%; P < 0.001). The prevalence of MI was significantly lower in Non-Gastric bypass compared to RYGB and RYGB compared to Non-Gastric bypass (0.32% vs. 0.18%; P < 0.001). RYGB increased the risk for symptom- related hospitalization (2.79 ± 0.59 g/dl; mean International Normalized Ratio 1.21 ± 0.40; and median carcinoantigen 19-9 level 270 u/ml (range: 5). Minor complications included self-limited gastroparesis (5 pts), uncomplicated anastomotic leaks (6), and superficial wound infection (3).

CONCLUSIONS: Using multivariate regression analysis, age older than 50 effect of RYGB on SIBO. When evaluating RYGB patients with post-operative abdominal symptoms, SIBO should be considered. LBT represents a potential screening tool for SIBO and should be considered prior to pursuing more invasive diagnostic and therapeutic procedures. Further prospective studies are needed to better identify the RYGB patients most at risk for SIBO and to optimize the treatment strategy in this patient group.

Clinical: Stomach

Tu1675
Predictive Factors of Myocardial Infarction in Bariatric Surgery
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BACKGROUND: Morbid obesity is associated with multiple comorbidities, particularly hypertension, diabetes mellitus, and hyperlipidemia which are the known risk factors for Myocardial Infarction (MI).

OBJECTIVE: Our aim was to identify factors associated with an increased likelihood of developing MI after bariatric surgery.

METHODS: Using the Nationwide Inpatient Sample (NIS) database, clinical data of patients who underwent bariatric surgery from 2006–2008 was examined. Regression analysis was performed to evaluate effect of patient characteristics (age, sex, race), comorbidities, pay-type and surgical techniques (open vs. laparoscopic and gastric bypass vs. non-gastric bypass) on post-operative MI in bariatric surgery.

RESULTS: A total of 304,515 patients underwent bariatric surgery during these three years. The majority of patients were female (80%) and Caucasian (74%). The mean age was 44.1 ± 11.7 years and 10% were older than 50. The incidence of comorbidities were high as expected: hypertension (HTN, 5.4%), diabetes mellitus (DM, 29.7%), hyperlipidemia (20.1%), chronic lung disease (38.3%), sleep apnea (15.3%), smoking (13.2%), liver disease (8.9%), congestive heart failure (1.5%), renal failure (6.8%), peripheral vascular disease (PVD, 0.5%) and alcohol abuse (0.2%) respectively.

RESULTS: Overall prevalence of MI was 0.020% (612 patients). MI was significantly higher in open procedures (2.5% vs. 0.0%) and was higher in non-gastric bypass compared to gastric bypass surgery (0.17% vs. 0.021%; p < 0.004). Using multivariate regression analysis, age older than 50 (odd ratio [OR] 2.27), male sex (OR 1.62), glucose intolerance (OR 3.3), hypertension (OR 2.4), chronic lung disease (OR 2.21), smoking (OR 1.61), hyperlipidemia (OR 1.43), sleep apnea (1.74%), gastric bypass (OR 1.37) and academic medical center (OR 1.28) were associated with a higher risk for developing MI. There was no effect of race, diabetes, liver disease, renal failure, peripheral vascular disease, alcohol abuse and payer-type on MI.

CONCLUSION: Age over 50, male sex, smoking, CHF, hypertension, chronic lung disease, hyperlipidemia and gastric bypass surgery all increase the risk of postoperative myocardial infarction in patients undergoing weight loss surgery. Surgeons should be aware of these risk factors when selecting patients for surgery and further preoperative screening and pre-treatment may be needed in this subset of high-risk patients.
Tu1676  
Treatement of Anastomotic Strictures and Chronic Leaks After Bariatric Surgery with Endoscopic Stent Placement  
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BACKGROUND: Fistula, leakage, and stricture formation after bariatric surgery are associated with substantial early and late morbidity. We evaluated the efficacy of endoluminal stent therapy as definitive management.  

METHODS: A retrospective review was performed from 2001 to October 2010 from a single institution including all patients treated with stent placement after bariatric surgery. We collected age, sex, body mass index (BMI), time from operation to onset of symptoms, number of endoscopies needed, stent-related complications, and long-term follow up.  

RESULTS: 22 patients (17 females/5 males, mean age 51, range 36–71 years) were treated with stents. 16 had gastric bypass, 5 duodenal switch, and 1 on gastric band. Eleven of these were revisional bariatric surgery. 20 patients presented from their primary bariatric operation to our institution with a mean of 386 days (range of 11–1875 days). The main indications were: Fistulas – 4 gastrostomies and 1 esophageal perforation, and Strictures – 16 gastrojejunostomy and 1 duodeno-ileo (p/p duodenal switch). Eight patients had undergone multiple endoscopic dilations at outside institutions and one stent placement prior to our evalua- tion. A total of 89 endoscopies were performed (range 2 to 9 per patient). Mean duration of endoscopic treatment was 125 days (range 17–367 days). All patients had covered metal stents placed. Stent migration occurred in 10 patients, 3 of whom required operative removal, from the colon, small bowel and Roux limb. Two patients died at home with ongoing symptoms after stent removal. Of the remaining 20 patients, 13 patients required revisional surgery. 2 patients at last hospital visit had return of symptoms and will undergo revisional surgery. In 5 patients stent placement seems to have been effective definitive treat- ment with a mean follow up of 280 days (range 127–475 days), 2 had closure of a chronic gastrocutaneous fistula (success 2 of 5), but only 3 of 17 patients had resolution of a chronic anastomotic stricture.  

CONCLUSIONS: Endoscopic therapy provides a less inva- sive approach and in selected patients may warrant attempt as definitive therapy. Although successful in only 5 of 22 patients (22%), stent placement relieves symptoms and allows resumption of adequate oral nutrition. Stents appear more successful for fistulas rather than anastomotic stric- tures. If unsuccessful, revisionary surgery will be necessary.

Tu1677  
Gastrointestinal Resource Utilization After Gastric Bypass  
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INTRODUCTION: Bariatric surgery decreases weight and its associated comorbidities, but it is unclear whether health care resources are over-utilized in the post-gastric bypass state. There are few, long-term studies documenting the utilization of health care resources after gastric bypass in a mixed American population. Our aim was to review all interventions related to gastrointestinal complications after gastric bypass surgery.  

METHODS AND PROCEDURES: We retrospectively reviewed the medical records of 261 subjects in Olmsted County (thus captured by the Rochester Epidemiology Project) who underwent a Roux-en-Y gastric bypass (RYGB) from Jan. 1997 through Dec. 2004. Patients were predominately female (84%), with a mean age of 45 years ± 10, and a mean preoperative BMI of 49 ± 9; 72 patients (28%) underwent laparoscopic operation. Retrocolic technique was used in 188 patients (72%). All subsequent gastrointestinal surgical and endoscopic interventions and abdominal imaging studies were reviewed. Imaging studies were categorized as Abdominal CT (CTAP) and non-CT imaging (including ultrasonography and fluoroscopy). Resource utiliza- tion rates for 2006 for Americans aged 55–64 years, as published by the CDC, and published Medicare benef- ciary utilization rates for 2006 were used as reference.  

RESULTS: Median patient follow-up was 7 years (range 11–13) after RYGB, for a total number of 2,039 patient-years (pt-yrs). A total of 162 abdominal operations were performed. Of the remaining 20 patients, 13 patients required revisional surgery. 2 patients at last hospital visit had return of symptoms and will undergo revisional surgery. In 5 patients stent placement seems to have been effective definitive treat- ment with a mean follow up of 280 days (range 127–475 days), 2 had closure of a chronic gastrocutaneous fistula (success 2 of 5), but only 3 of 17 patients had resolution of a chronic anastomotic stricture.  

CONCLUSIONS: Endoscopic therapy provides a less inva- sive approach and in selected patients may warrant attempt as definitive therapy. Although successful in only 5 of 22 patients (22%), stent placement relieves symptoms and allows resumption of adequate oral nutrition. Stents appear more successful for fistulas rather than anastomotic stric- tures. If unsuccessful, revisionary surgery will be necessary.

postop. Medicare national average for CT imaging was 391 per 1,000 patients, and for non-CT imaging, 3,356 per 1,000 patients. Surgical technique was not associated with any pattern of re-intervention or complication, except for inci- sional hernias which were greater after open RYGB.  

CONCLUSIONS: Even though the benefits of RYGB are well established in the literature, patients after RYGB appear to have a greater requirement for gastrointestinal procedures than the average American population. This would not be unexpected in patients having undergone a major gastrointestinal operation.

Tu1678  
Diabetic Patients Have Less Lean Body Mass Which Is Correlated with Less Excess Weight Loss in Laparoscopic Adjustable Gastric Banding (LAGB)  
Over Three Years, N = 601  
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BACKGROUND: LAGB has been shown to be an effective treatment of weight loss for the morbidly obese. However, it has been found that diabetics experience lower percent-age excess weight loss when compared to non-diabetics after LAGB. This study seeks to analyze the difference in weight loss between diabetics and their counter parts by looking at excess percentage weight loss and change in lean body mass.  

METHODS: A retrospective analysis was performed for 91 diabetic patients (BMI = 42.5 ± 0.36 kg/m²) that underwent bariatric surgery between 6–13) after RYGB, for a total number of 2,039 patient-years (pt-yrs). A total of 162 abdominal operations were performed. Of the remaining 20 patients, 13 patients required revisional surgery. 2 patients at last hospital visit had return of symptoms and will undergo revisional surgery. In 5 patients stent placement seems to have been effective definitive treat- ment with a mean follow up of 280 days (range 127–475 days), 2 had closure of a chronic gastrocutaneous fistula (success 2 of 5), but only 3 of 17 patients had resolution of a chronic anastomotic stricture.  

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CONCLUSIONS: Even though the benefits of RYGB are well established in the literature, patients after RYGB appear to have a greater requirement for gastrointestinal procedures than the average American population. This would not be unexpected in patients having undergone a major gastrointestinal operation.

RESULTS: Patients that are diabetic lose significantly less %EWL (63.8% ± 2.9%, 60.7 ± 3.6 lbs) on average as compared to non-diabetic patients (70.6% ± 4.9%, 69.8 ± 1.4 lbs), P = 0.037. Further analysis reveals that both pre- operative %LB and three year post-operative %LB for diabetic patients (52.4% ± 8.0%, 67.5% ± 4.0%) were signific- antly lower than the non-diabetic group (57.9% ± 0.3%, 72.9% ± 0.4%), P = 0.005 and P = 0.01 respectively, but both groups increased their %LBM. There were no signifi- cant differences between the change in %LBM for diabetic patients (15.1% ± 0.7%) and non-diabetic patients (16.2% ± 0.4%), P = 0.34.
Combined Science

Ta2077

Assessment of Molecular-Genetic Alterations and Racial/Ethnic Disparities in Outcomes in Patients with Colon Cancer

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BACKGROUND: We previously observed racial/ethnic disparities in survival for patients with GI cancers in Los Angeles County (LAC). However, we could not account for these disparities by standard clinicopathologic factors or socioeconomic status (SES) and access to care. Our objective was to examine potential racial/ethnic disparities in tumor biology in colon cancer patients to determine if molecular-genetic differences are associated with patient outcomes.

METHODS: From the LAC Cancer Surveillance Program (CSP), we identified colon cancer patients from 1988 to 2006. We grouped patients by race/ethnicity and compared clinicopathologic factors, and constructed Kaplan-Meier survival curves. We then obtained archived colon cancer specimens (n = 76) from surgical patients at our institution. DNA was extracted and evaluated for BRAF, KRAS, and TP53 mutations and for microsatellite instability (MSI).

RESULTS: CSP patients included whites (n = 20,809), blacks (n = 3,025), Hispanics (n = 5,455), and Asians (n = 3,813). By Kaplan-Meier method, Asians had the longest survival (Table 1; log-rank P < 0.001). Multivariate Cox regression analysis showed that race/ethnicity independently predicted survival even when controlling for disease extent, treatment, and SES. Analysis of colon cancer tissues from white, black, Hispanic, and Asian patients (n = 19 for each group) showed highest frequency of BRAFV600E mutation in white and Hispanic tissues. KRAS codon 12 mutation was most frequent in Asian tissues. In addition, we observed that MSI was lowest in tissues from Asians.

Table 1: Survival Data and Molecular Analysis for Colon Cancer Patients

<table>
<thead>
<tr>
<th>Race/Ethnicity</th>
<th>CSP data</th>
<th>Median survival (months)</th>
<th>BRAF V600E mutation</th>
<th>KRAS codon 12 mutation</th>
<th>MSI</th>
</tr>
</thead>
<tbody>
<tr>
<td>White</td>
<td>71</td>
<td>21%</td>
<td>26%</td>
<td>0%</td>
<td>11%</td>
</tr>
<tr>
<td>Black</td>
<td>52</td>
<td>5%</td>
<td>21%</td>
<td>28%</td>
<td>26%</td>
</tr>
<tr>
<td>Hispanic</td>
<td>81</td>
<td>16%</td>
<td>32%</td>
<td>7%</td>
<td>3%</td>
</tr>
<tr>
<td>Asian</td>
<td>107</td>
<td>0%</td>
<td>53%</td>
<td>0%</td>
<td>0%</td>
</tr>
</tbody>
</table>

CONCLUSIONS: We identified racial/ethnic disparities in survival for colon cancer patients, which parallel best the detection of MSI in the corresponding racial/ethnic group. This suggests that disparities in survival could be secondary to differences in tumor biology between major racial/ethnic groups. We are coordinating a multicenter study in LAC to further investigate the potential effect of these genetic alterations on clinical outcomes.

2012 ANNUAL MEETING

Be sure to join us for next year’s Annual Meeting—mark your calendars now!

May 18–22, 2012, San Diego, CA
### SCHEDULE-AT-A-GLANCE

**FRIDAY, 5/6/2011**

- **9:00 AM – 2:30 PM**
  - Residents & Fellows Research Conference (by invitation only)
  - Monroe Ballroom, Palmer House Hilton

**SATURDAY, 5/7/2011**

- **8:00 AM – 5:00 PM**
  - Maintenance of Certification Course: The Surgeon in the Management of Gastric and Esophageal Diseases

- **8:30 AM – 10:00 AM**
  - Combined Clinical Symposium (AASLD-accredited)
  - Varical Surgery, Obesity, and NAFLD (AASLD, SSAT)

**SUNDAY, 5/8/2011**

- **7:45 AM – 8:15 AM**
  - Opening Session

- **8:15 AM – 9:15 AM**
  - Presidential Plenary A (Plenary Session I)
  - AASLD-accredited

- **9:15 AM – 10:00 AM**
  - Happy Mother’s Day

- **10:30 AM – 11:15 AM**
  - Presidential Plenary B (Plenary Session II)
  - AASLD-accredited

- **11:15 AM – 12:00 PM**
  - Doris and John L. Cameron Guest Lecture
  - Bioengineering and Clinical Applications of Circulating Tumor Cells

- **12:00 PM – 2:00 PM**
  - Poster Session I (non-CME)
  - Hall A

- **12:30 PM – 1:45 PM**
  - Meet-the-Professor Luncheon
  - Symposium and Roundtable Luncheon
  - Modern Treatment of Barrett’s Esophagus: From Multidisciplinary to Single Port Surgery: Beyond Nonsurgical Options
  - The Difficult Ventral Hernia
  - Controversies in GI Surgery A

**MONDAY, 5/9/2011**

- **7:30 AM – 9:15 AM**
  - Video Session: Breakfast at the Movies

- **9:30 AM – 10:00 AM**
  - Video Session: Clinical Roundings: Laparoscopic Liver Resection: What Patients Want and How

- **10:00 AM – 11:00 AM**
  - Video Session: Controversies in GI Surgery B

- **7:00 PM – 9:09 PM**
  - Members Reception
  - Cathedral Hall, University Club of Chicago

**TUESDAY, 5/10/2011**

- **7:30 AM – 9:20 AM**
  - SSAT/SBS Joint Breakfast Symposium
  - What Do You Do When the First Operation Doesn’t Work or Go Wrong?

- **8:00 AM – 9:20 AM**
  - Translational Science Plenary
  - AASLD-accredited

- **9:30 AM – 11:45 AM**
  - Combined Clinical Symposium III
  - Focal Masses in the Liver: What Are They?
  - Video Session: Oxygenation: The Evolution of Approaches to Hepatocellular Carcinoma

- **12:00 PM – 2:00 PM**
  - Poster Session III (non-CME)

- **2:00 PM – 4:00 PM**
  - Meet-the-Professor Luncheon
  - AASLD-accredited

- **4:30 PM – 6:45 PM**
  - Quick Shots Session

- **5:00 PM – 6:30 PM**
  - SSAT/SBS Joint Luncheon Symposium
  - The Efficacy of Obesity: Surgical Implications

- **7:00 PM – 7:59 PM**
  - Members Reception

**WEDNESDAY, 5/11/2011**

- **9:00 AM – 11:45 AM**
  - Video Session: Clinical Roundings: Laparoscopic Liver Resection: What Patients Want and How

- **10:00 AM – 11:00 AM**
  - Video Session: Controversies in GI Surgery B

- **11:15 AM – 12:00 PM**
  - Meet-the-Professor Luncheon
  - AASLD-accredited
  - The Evolution of Approaches to Hepatocellular Carcinoma

### May 6 – 10, 2011

McCormick Place • Chicago, Illinois