ABSTRACTS

2016 Annual and Scientific Meeting

Resident Paper Competition Abstracts

October 28, 2016
Farmington Marriott Hotel

The Stamford Hospital is accredited by the Connecticut State Medical Society to sponsor continuing medical education for physicians. The Stamford Hospital designates this educational activity for a maximum of 8.0 AMA PRA Category I Credit(s)™. Physicians should only claim credit commensurate with the extent of their participation in the activity.

The purpose of this meeting is to provide attendees with a forum for the latest information regarding clinical practice and research in the field of surgery. Surgical Residents have a continued need to improve the research skills and a forum to present their research. Rural surgeons have a need to learn about emerging technologies. There is an on-going need to enhance patient safety and quality of patient care.

All Sessions are open to all meeting attendees.

Uniting Surgeons to Advance Patient Care in Connecticut
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<tr>
<td>Trauma</td>
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<td>Clinical Oncology</td>
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<td>Bariatric Surgery</td>
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<td>Quality/NSQIP &amp; ERAS</td>
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</table>
Map of the Farmington Marriott

**Pool Level**
General Surgery 1: ................. Boston
General Surgery 2: ................. Providence
Bariatric/Cancer/Quality:........... Springfield

**Main Floor**
Trauma: ................................. Vermont
Plastic: ................................. New Hampshire
Specialty Surgery: ................. Rhode Island

Continental Breakfast will be served in the Grand Ballroom

**Directions to Meeting Rooms**
Main Floor, Grand Ballroom and & Hall of States (MA, NH, RI, VT) are in Main Building off of the Lobby

*Pool Level Rooms (Boston, Providence and Springfield) From Ballroom area head to Lobby and make a Right – go to the End of the Hallway and take a Left to the end where you will see an elevator – Take the elevator down 1 Level to “P”. Go straight down the Hallway to your right – Meeting Rooms are on your right.
## Order of Presentation - Summary

**2016 CTACSPA Annual Resident Paper Competition**  
Order of Presentation - Competition 10/28/2016 9:45AM - Listed by Category and Presenter Name

### Bariatric/Quality/Cancer - Springfield

<table>
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<tr>
<th>Name</th>
<th>Hospital/University</th>
<th>Presentation Title</th>
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</thead>
<tbody>
<tr>
<td>Ann-Kristin Friedrich, MD</td>
<td>Saint Mary's Hospital</td>
<td>Impact of Compromised Pulmonary Function on 30-Day Outcomes after Bariatric Surgery</td>
</tr>
<tr>
<td>Jennifer Hubbard, MD</td>
<td>Saint Mary's Hospital</td>
<td>Correlation of Breast Density with Breast Cancer Prognosis</td>
</tr>
<tr>
<td>Marissa Novack, MD</td>
<td>Stamford Hospital</td>
<td>Diagnosing Muir-Torre Syndrome in a Patient with Non-Hodgkin’s Lymphoma</td>
</tr>
<tr>
<td>Jeanna Romer, MD</td>
<td>Hartford Healthcare</td>
<td>Title: The Gynecologist’s Role in Breast Cancer Survivorship: Increasing K</td>
</tr>
<tr>
<td>Hebroon Obaid, MD</td>
<td>Stamford Hospital</td>
<td>Endoscopic Revision of Laparoscopic Gastrectomy: A Novel Approach</td>
</tr>
<tr>
<td>Rachel Scott, DO</td>
<td>Danbury Hospital</td>
<td>Microlaparoscopic Sleeve Gastrectomy is Safe in the Community Setting</td>
</tr>
<tr>
<td>Olajemisi Ajayi-Lamanna, MD</td>
<td>University of Connecticut</td>
<td>Massive Transfusion Protocol in a Community Non-Trauma Setting: Is It Bi</td>
</tr>
<tr>
<td>James Berry, MD</td>
<td>UCHC</td>
<td>Implementation of ERAS for Colorectal Surgery at HOCC: A Six Month Co</td>
</tr>
<tr>
<td>Gopi Utkani, MD</td>
<td>St. Mary’s Hospital</td>
<td>Antibiotic-driven Antibiotic Selection Supersedes National Guidelines</td>
</tr>
<tr>
<td>Natalie Pozzi, MD</td>
<td>Saint Mary’s Hospital</td>
<td>Decreased Hospital Length of Stay with use of Exscal TAP block in Color</td>
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### General Surgery 1 - Boston Room

<table>
<thead>
<tr>
<th>Name</th>
<th>Hospital/University</th>
<th>Presentation Title</th>
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</thead>
<tbody>
<tr>
<td>Rachel Scott, DO</td>
<td>Danbury Hospital</td>
<td>Giant Inguinal Hernia: A Case Report of Progressive Preoperative I</td>
</tr>
<tr>
<td>Rima Ahmad, MD</td>
<td>Danbury Hospital</td>
<td>Primary Small Bowel Volvulus in a Patient Without Prior Abdominal Surg</td>
</tr>
<tr>
<td>Gregory Ricketts, MD</td>
<td>Waterbury Hospital</td>
<td>Robotic Left Sided Colon Surgery in a Community Hospital: A Retrospect</td>
</tr>
<tr>
<td>Dardan Begrij, MS4</td>
<td>University of Connecticut SOM</td>
<td>Extragenital Endometriosis as a Cause of Acute Appendicitis: Case Repor</td>
</tr>
<tr>
<td>Devin Gillispie, MD</td>
<td>Yale School of Medicine</td>
<td>Total bilirubin trend as a predictor of common bile duct stone in acute c</td>
</tr>
<tr>
<td>Clinton Ingersol, BS</td>
<td>Frank H Netter School of Medicine</td>
<td>Small Bowel Perforation by Grill Brush Wire: A Case Series</td>
</tr>
<tr>
<td>Hoytche Cho, MD</td>
<td>University of Connecticut</td>
<td>Early Small Bowel Obstruction Post Transmesenteric Percutaneous Endo</td>
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<thead>
<tr>
<th>Name</th>
<th>Hospital/University</th>
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</thead>
<tbody>
<tr>
<td>Benefesha Mohammad, MD</td>
<td>Danbury Hospital</td>
<td>Microlaparoscopic Appendectomies: A Single Surgeon’s Experience</td>
</tr>
<tr>
<td>Daniel Ricarte, MD</td>
<td>UCONN SOM</td>
<td>Characterization Of Human Esophageal Epithelial Cells Before and After</td>
</tr>
<tr>
<td>Michael Jaronczyk, MD</td>
<td>St. Francis</td>
<td>Robotic Assisted Laparoscopic Cholecystectomy: Is It a Viable Alternative?</td>
</tr>
<tr>
<td>Virginia Parker, MD</td>
<td>Saint Mary’s Hospital</td>
<td>Early Results from Enhanced Recovery for Complex Abdominal Wall Rec</td>
</tr>
<tr>
<td>Adam Mitchell, PhD</td>
<td>UConn Health</td>
<td>The differentiation of induced pluripotent stem cells (iPSCs) to a distal ai</td>
</tr>
<tr>
<td>Benefesha Mohammad, MD</td>
<td>Danbury Hospital</td>
<td>Anterior Spinal Cord Injury in a 77 year-old Male After a Right Hemic</td>
</tr>
<tr>
<td>Mansi Sanghi, MBBS</td>
<td>Yale School of Medicine</td>
<td>Laparoscopic Surgery for Emergency Colorectal Surgery: Less Morbidity:</td>
</tr>
<tr>
<td>Laura Lamb, MD</td>
<td>Saint Francis Hospital</td>
<td>Immediate Tube Feeding After Percutaneous Endoscopic Gastroscopy P</td>
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### John D. MacArthur, MD, FACS Trauma Competition - Vermont Room

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<tr>
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<th>Hospital/University</th>
<th>Presentation Title</th>
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<tbody>
<tr>
<td>Laura Lamb, MD</td>
<td>Saint Francis Hospital</td>
<td>Cost Analysis of Direct Oral Anticoagulants Compared to Warfarin in Pat</td>
</tr>
<tr>
<td>Mansi R Sanghi, MBBS</td>
<td>Yale School of Medicine</td>
<td>CT After Chest X-Ray in the SICU, Useful Intervention or Excessive Radiat</td>
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<td>Michael DeWane, MD</td>
<td>Yale School of Medicine</td>
<td>Duration of Pre-Operative Symptoms Correlates with Duration of Post-C</td>
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<td>Kathleen O’Neill, MD</td>
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<td>Amanda W. Harrington, MD</td>
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<td>Factors Associated with Discharge Destination in Geriatric Fall Patients c</td>
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<tr>
<td>Elise McKenna, MD</td>
<td>Stanford Hospital</td>
<td>External Validation of Clinical Criteria for Obtaining Maxillofacial Compu</td>
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### Plastic & Reconstructive Surgery - New Hampshire

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<tbody>
<tr>
<td>Anjum Sultana, MD</td>
<td>Yale University</td>
<td>The Hidden Cost of Cosmetic Surgery Tourism</td>
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<tr>
<td>Samuel Kim, MD</td>
<td>Yale School of Medicine</td>
<td>Mutational Profile of Benign Vascular Tumors - The Yale Experience</td>
</tr>
<tr>
<td>Brandon Sumpio, BA</td>
<td>Yale School of Medicine</td>
<td>Teaching an Old Dog New Tricks: The Composite Extended Paramedian F</td>
</tr>
<tr>
<td>Ramil Al-Aref, MD</td>
<td>Stanford Hospital</td>
<td>A novel technique for spinal wound closure</td>
</tr>
<tr>
<td>Samuel Kim, MD</td>
<td>Yale School of Medicine</td>
<td>Basal Cell Carcinoma? Compliance Issues? How do you proceed?</td>
</tr>
<tr>
<td>Benjamin Chan, PhD</td>
<td>Yale School of Medicine</td>
<td>Niche Reconstruction of Abdominal Wall Defects</td>
</tr>
<tr>
<td>Borna Dabiri, MD, PhD</td>
<td>Stanford Health</td>
<td>Experimental Phage Therapy to Treat a Persistent Pseudomonas aerugin</td>
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<tr>
<td>Andrew McGregor, MD</td>
<td>Yale University</td>
<td>Multiple Xanthogranulomas in the Setting of a Retrospective Silicone Bxi</td>
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### Surgical Specialties - Rhode Island

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<th>Hospital/University</th>
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<tr>
<td>Hoyune Cho, MD</td>
<td>UCONN SOM</td>
<td>Presentation and management of upper extremity ischemia following surgery</td>
</tr>
<tr>
<td>Natalie Pozzi, MD</td>
<td>St. Mary’s Hospital</td>
<td>Heparin Resistance in the Setting of Thrombocytosis: A Challenging Scer</td>
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<tr>
<td>John Calhoun, MD</td>
<td>Stanford Hospital</td>
<td>Intrathoracic Malignant Peripheral Nerve Sheath Tumor Compressing the Lung</td>
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<tr>
<td>Charles Litchfield, MD</td>
<td>St. Mary’s Hospital</td>
<td>Experience with a novel fibrin sealant patch in patients undergoing non-</td>
</tr>
<tr>
<td>Kristin McCoy, MD</td>
<td>Stanford Hospital</td>
<td>Differing methods of periportal flap closure in Laparoscopic trans-abdomor</td>
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<tr>
<td>Muhammad Rishi, MD</td>
<td>Saint Mary’s Hospital</td>
<td>Pushing the limits: Successful deployment of Ovation® Stent Graft result</td>
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<tr>
<td>John Tedesco, MD</td>
<td>Stanford Hospital</td>
<td>Pheochromocytoma Presenting as a Right Index Finger Mass in a Renal 1</td>
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<tr>
<td>Bennett Weinnerman, MS4</td>
<td>UCONN SOM</td>
<td>Epidermal cyst presenting in setting of prior myelomeningocele: A pediatr</td>
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John D. MacArthur, MD, FACS
Trauma Competition

Moderator:
Brendan Campbell, MD, MPH, FACS
Associate Professor of Surgery and Pediatrics,
University of Connecticut School of Medicine,
Hartford, Connecticut,
Chair, Connecticut Committee on Trauma

Judge:
Connecticut Committee on Trauma
Cost Analysis of Direct Oral Anticoagulants Compared to Warfarin in Patients with Blunt Traumatic Intracranial Hemorrhages

Laura C Lamb, James Feeney, Monica Diffiori, Lilla Kis, Vijay Jayaraman, David Shapiro, Stephanie Montgomery
Saint Francis Hospital and Medical Center

Introduction: Direct oral anticoagulants (DOACs) are rapidly gaining popularity as alternatives to warfarin in the prevention of stroke or systemic embolic events due to the simplicity of their dosing and lack of monitoring. Many physicians feared that these novel agents would be cost-prohibitive not only in their administration but also in their sequelae of bleeding given the few reversal agents available. While the medication itself is more expensive than the traditional warfarin, the total cost of a hospital admission has not been compared between DOACs and warfarin for a patient who has sustained a blunt traumatic intracranial hemorrhage (ICH).

Method(s): We conducted a retrospective review of the TQIP database from June 2011 to September 2015 at our Level II trauma center of patients who suffered from intracranial hemorrhages who were on anticoagulation at the time of their trauma. Patients who died or were exclusively on antiplatelet agents were excluded.

Results: Of the 138 patients studied, 80 were on warfarin and 58 were on a DOAC at the time of their presentation for a traumatic ICH. The average charged cost for the hospital stay of a patient with an ICH was significantly higher for patients on warfarin compared to DOACs ($66,911.14 vs. $49,106.53 (p = 0.03)). The average reimbursement rate for the hospital was also significantly higher for those patients on warfarin as compared to those on DOACs ($23,761.70 vs. $14,972.68 (p = 0.01)).

Conclusion(s): DOACs have a significant cost benefit in patients admitted for blunt traumatic intracranial hemorrhages when compared to those on warfarin.

CT After Chest X-Ray in the SICU: Useful Intervention or Excessive Radiation

Sanghvi Mansi R, MBBS; Bhattacharya Bishwajit MD FACS; Schuster Kevin M MD MPH FACS*
Yale School of Medicine

Introduction: A chest CT scan (CTC) exposes patients to 7 mSv of radiation compared to a chest X-ray (CXR) which is 0.1 mSv. CTC is common in the surgical intensive care unit (SICU) when there is suspicion for additional pathology not evident on CXR. Diagnostic benefit from CTC over and above a Chest X-ray in SICU patients is controversial. We hypothesized that in SICU patients a CTC will commonly identify significant pathology and change patient management.

Methods: This was a prospective, observational and single-center study including patients admitted in the SICU between 2013 and 2016. All patients who were admitted to the SICU for more than one day and had a CXR followed by a CTC within 24 hours were included. Data collected include attending physician based indication for the CTC, the additional findings from the CTC and any interventions that occurred based on CTC findings at the discretion of the attending intensivist or surgeon.

Results: One hundred five CTC studies were performed on ninety three patients. Indications for CTC included increased WBC, fever, suspicion of pulmonary infection and signs and symptoms of respiratory distress. We found that CTC added to the findings of CXR in 34 patients (32.0%), of which 13 (12.4%) were pleural fluid, 9 were consolidation/atelectasis (8.6%), 5 (4.8%) were pulmonary emboli or other clot and 7 (6.7%) were other findings. After CTC only 22 (21%) patients had a change in management. Of these management changes 18 (17.1%) occurred in patients where there were no additional findings on CTC and only 4 (3.8%) were based on additional information provided by the CT scan. Of the 4 interventions based on CT findings one was drainage of a previously unknown tracheal perforation, one was draining a pleural effusion, one was initiation of antibiotics and one was extraction of a tooth that had been aspirated.

Conclusion: Although CTC has diagnostic benefit it adds to the pathologic findings of CXR in only a minority of cases. Interventions prompted by the additional information provided by CTC are uncommon. More judicious use of CT scan would likely reduce the radiation exposure of SICU patients without compromising outcome.

The Duration of Pre-Operative Symptoms Correlates with Duration of Post-Operative Ileus in Patients Who Undergo Operative Intervention for Small Bowel Obstruction

Whitney S. Brandt, MD, Joshua Wood, Bishwajit Bhattacharya, MD, FACS, Kevin Pei, MD, FACS
Kimberly Davis, MD, FACS, FCCM, Kevin Schuster, MD, MPH, FACS, FCCM
Yale School of Medicine

Introduction: Small bowel obstruction is an extremely common surgical problem accounting for greater than 300,000 admissions per year in the United States. It appears that patients who fail non-operative management after more than 48 hours are likely have a longer postoperative length of stay and longer duration until return of bowel function. In this study we investigated whether a longer duration of preoperative symptoms, including duration of prehospitalization symptoms, results in a longer recovery and longer time to diet tolerance.

Methods: A retrospective review of 67 consecutive patients who were admitted to a tertiary care teaching center between January 2013 and June 2016 for small bowel obstruction and subsequently underwent operative intervention was performed. Demographic data, duration of symptoms, operative details, and post-operative clinical data were abstracted from the medical record. Comparisons between groups were performed with t-test and chi-square. Multivariable analysis was performed with Poisson regression.

Results: Patients who were taken to the operating room at the time of presentation had an average post-operative ileus of 4.73 days versus 6.88 days for those who underwent a trial of conservative management (p = 0.06). Duration of
nonoperative management after admission to hospital (p = 0.6778) and preoperative nasogastric tube output (p = 0.947) did not correlate to postoperative time to tolerance of diet. However total preoperative time of observation which also included duration of prehospitalization symptoms, correlated with length of time to tolerate diet post-operatively (p = 0.03). On multivariate analysis time to tolerate diet correlated with operative time (p = 0.04), yet total duration of pre-op symptoms including outpatient symptoms, presence of ascites in the operating room, and need for bowel resection were not found to be significant. Length of stay did not correlate with duration of symptoms preoperatively (p = 0.0682).

**Conclusion:** Duration of post-operative ileus after operative intervention for small bowel obstruction is associated with operative time. This may be indicative of the severity of the adhesions. Duration of pre-operative symptoms including duration of symptoms prior to hospital presentation may also correlate with time to ileus resolution post-operatively.

<table>
<thead>
<tr>
<th>Variable</th>
<th>P Value</th>
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<tbody>
<tr>
<td>Duration Pre-Op Symptoms</td>
<td>0.089</td>
</tr>
<tr>
<td>Ascites in OR</td>
<td>0.058</td>
</tr>
<tr>
<td>Bowel Resection</td>
<td>0.181</td>
</tr>
<tr>
<td>Operative Time</td>
<td>0.044</td>
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**Prolonged Post-operative Ventilation is associated with VTE Development in the Critically-III Emergency General Surgery Population**

Michael P. DeWane, Robert D. Becher
Yale School of Medicine

**Introduction:** A complex mix of pre-operative, operative, and post-operative characterizations lead to prolonged intubation (>48 hours) in patients having undergone Emergency General Surgery (EGS) procedures. EGS patients are known to have several factors (pre-operative inflammation, longer operative times, protracted ICU stays) that may potentially increase their risk of post-operative VTE development, an important cause of increased morbidity and mortality. We evaluated rates of prolonged ventilation in the non-emergent versus EGS populations, and its effect on VTE development. We hypothesized that prolonged intubation is a greater independent risk factor for VTE development amongst emergent vs non-emergent patients.

**Method(s):** The American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP) participant user files (PUF) were used to identify patients having undergone 9 different general surgery operations during a five-year period, from 2010 to 2014. Recorded data for these patients, including preoperative characteristics, operative variables and post-operative outcomes were used to assess the risk of prolonged intubation and VTE development. Logistic regression was used to determine independent risk factors for development of study outcomes. Multicollinearity testing was performed to validate results.

**Results:** A total of 508,978 patients were included in the analysis (specified in table I): 373,859 patients underwent non-emergent operations, 135,119 had emergent operations. Overall, the rate of prolonged intubation after emergent operations was 5 times greater than after non-emergent operations (5.1% vs 1.0%). Emergency operative status independently predicted prolonged intubation (Odds Ratio [OR] 2.05, p<0.0001) amongst all patients, as did decreased preoperative functional status (OR 1.64, p<0.0001), sepsis (OR 5.63, p<0.0001), and ASA (American Society of Anesthesiologists) 4 or 5 status (OR 22.5 & 16.83 respectively, p<0.0001). When controlling for risk factors commonly associated with VTE development (such as laparoscopic case, obesity, cancer and operative time), prolonged intubation independently predicted development of VTE to a greater extent among EGS (OR 2.18, p<0.0001) versus non-EGS patients (OR 1.92, p<0.001). Patients undergoing emergency operations were diagnosed with VTE after extubation from prolonged intubation at rates 1.57 greater than those undergoing non-emergent operations (0.93% versus 0.59%). Among both cohorts, prolonged intubation independently predicted death (OR 2.4, p<0.0001 among non-emergent patients and OR 1.31, p<0.0001 among emergent patients). For all analyses multicollinearity effects were analyzed and determined to not have a significant effect on logistic modeling (maximum variance inflation 2.7).

**Conclusion:** Prolonged intubation is an independent risk factor for VTE development in those undergoing emergent general surgery. Additionally, undergoing emergency general surgery independently predicts the need for prolonged intubation which correlates with mortality. This analysis therefore identifies an important synergy in a frequently cared for population of patients within the intensive care unit and may help explain the EGS population’s poorer outcomes.

**Table I:**

<table>
<thead>
<tr>
<th>Operations (both laparoscopic and open operations analyzed)</th>
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</thead>
<tbody>
<tr>
<td>Appendectomy, Cholecystectomy, Colectomy, Small bowel Resection</td>
</tr>
<tr>
<td>Lysis of Adhesions</td>
</tr>
<tr>
<td>Inguinal, Ventral and Umbilical Hernia Repairs</td>
</tr>
<tr>
<td>Soft Tissue Debridement for Necrotizing Soft Tissue Infection</td>
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**Factors Associated with Discharge Destination in Geriatric Fall Patients on Anticoagulation with Head Strike**

Kathleen M. O’Neill MD, Shea C. Gregg* MD, Walter Cholewczynski MD, Alisa Savetamal MD, Roselle E. Crombie MD, Kristen Glasgow MD, Paul P. Possenti PA-C, Roseanne Prunty PT,DPT,GCS, Andrew Stone BS, Andrea Castillo, Nabil Atweh* MD, Bridgeport Hospital-Yale NHH
Yale School of Medicine

**Introduction:** As our population ages, the incidence of trauma in the elderly is expected to grow significantly over the next several decades. Geriatric patients that fall and strike their head while on anticoagulation is an increasingly
common situation facing trauma systems. The aim of this study was to determine factors that could predict where this population would likely be discharged following a fall.

**Methods:** A retrospective trauma registry/medical record review of patients admitted between January 2012 and June 2015 was conducted at our ACS Level II Trauma Center. Screening criteria were age > 65 and presentation after a fall leading to head strike on anticoagulation (including low molecular weight heparins, direct thrombin inhibitors or warfarin). All patients admitted with INR > 3.5 if on warfarin, GCS < 14, external signs of head or face trauma, or focal neuro deficits were included in the study. From this database, odds ratios were calculated to relate disposition to possible risk factors.

**Results:** Over the thirty months reviewed, 251 geriatric patients were admitted. One hundred (40%) were discharged to home with or without visiting nurse services, 135 (54%) were sent to care facilities/rehab (CF/R) and 16 (6%) died. Factors associated with being discharged to home included: falling at home (OR = 1.99, 95% CI: 1.08-3.68) or outside in a public place (OR = 2.15, 95% CI: 1.02-4.55), hospital length of stay (LOS) ≤ 2 days (OR = 5.88, 95% CI: 2.86-12.07), age between 65 and 75 (OR = 3.85, 95% CI: 2.1-7.0), unassisted ambulation (OR = 3.47, 95% CI: 1.27-9.44) and ability to walk 100 feet (OR = 3.68, 95% CI: 1.95-6.95). The presence of other injuries decreased the odds of discharge to home (OR = 0.55, 95% CI: 0.31-0.99). Factors associated with being discharged to an CF/R included: Age ≥ 75 (OR = 2.93, 95% CI: 1.61-5.34), hospital LOS > 2 days (OR = 6.48, 95% CI: 2.97-14.13), coming from CF (OR = 10.31, 95% CI: 3.05-34.83), inability to walk 100 feet on presentation (OR = 3.51, 95% CI: 1.86-6.63) and ambulation with an assistive device (OR = 3.02, 95% CI: 1.11-8.22). The factor associated with mortality was an initial positive head CT (OR = 4.27, 95% CI: 1.24-14.69). Age, direct thrombin inhibitor anticoagulants, the patient came from, length of stay, having other injuries and ambulatory abilities were not statistically significant predictors of mortality.

**Conclusion:** Understanding the factors related to the need for additional services after hospitalization will be key in managing geriatric fall victims. To improve the efficiency of their discharge process, such factors as age, length of stay, and functional capacity should be considered when setting up their discharge destination. Additionally, a positive head CT can help guide the early consultation of palliative care and other supportive services to assist in the care of these challenging patients. Appropriate allocation of resources and early engagement of support services may drive process improvement, ultimately improving outcomes for elderly trauma patients.

**External Validation of Clinical Criteria for Obtaining Maxillofacial Computed Tomography in Trauma**

Amanda W. Harrington, MD, Kevin Pei, MD, Roland Assi, MD, MMS, Kimberly A. Davis, MD, MBA

*Department of Surgery, Yale School of Medicine, New Haven, CT, USA. Section of General Surgery, Trauma, and Surgical Critical Care, Department of Surgery, Yale School of Medicine, New Haven, CT, USA*

**Objectives:** Patients sustaining multisystem trauma are at risk for oral and maxillofacial fractures. To date, no externally validated criteria is available to guide the clinician in obtaining additional cross sectional imaging to evaluate possible facial fractures. Our aim was to externally validate the University of Wisconsin’s Criteria and to report modern practice patterns at a tertiary, academic, Level I trauma center.

**Methods:** A retrospective case study was performed of all patients who had computed tomography of the facial bones (CT face) at a tertiary, academic, Level I trauma center over the 6-month period ending June 30, 2015. The electronic medical record was reviewed for the five University of Wisconsin criteria (bony step off or instability, periportal ecchymosis, malocclusion, tooth absence, and GCS). Final interpretation of CT face findings (facial fractures, intracranial hemorrhage, and cervical spine injury) were also captured. Our modeling was similar to that described by Sitzman, et al. Sensitivity, specificity, negative and positive predictive values with 95% confidence intervals were evaluated. A p< 0.05 was considered significant.

**Results:** The presence of any one or more of the five criteria identified on physical exam resulted in an 81% sensitivity for any facial fracture which is lower than the sensitivity initially described (97%). The absence of all five physical examination criteria had a negative predictive value of 60%, again lower than that initially described (81%).

**Conclusion:** We were unable to validate the University of Wisconsin criteria for predicting facial fractures. These criteria may be institutionally specific and not generalizable to other trauma centers. Further research to refine the criteria for CT of the face is needed to improve resource allocation.

<table>
<thead>
<tr>
<th>Examination Finding</th>
<th>Sensitivity (95% CI)</th>
<th>Specificity (95% CI)</th>
<th>PPV (95% CI)</th>
<th>NPV (95% CI)</th>
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</thead>
<tbody>
<tr>
<td>Bony step-off or instability</td>
<td>51 (2 - 11)</td>
<td>100 (95 - 100)</td>
<td>100 (95 - 100)</td>
<td>42 (35 - 50)</td>
</tr>
<tr>
<td>Pedorral swelling</td>
<td>67 (50 - 75)</td>
<td>63 (51 - 74)</td>
<td>65 (54 - 75)</td>
<td>45 (35 - 55)</td>
</tr>
<tr>
<td>GCS &lt; 14</td>
<td>29 (11 - 59)</td>
<td>71 (59 - 89)</td>
<td>59 (45 - 72)</td>
<td>41 (32 - 50)</td>
</tr>
<tr>
<td>Tooth absence</td>
<td>11 (5 - 19)</td>
<td>100 (90 - 100)</td>
<td>100 (74 - 100)</td>
<td>44 (26 - 51)</td>
</tr>
<tr>
<td>Malocclusion</td>
<td>81 (4 - 151)</td>
<td>100 (95 - 100)</td>
<td>100 (98 - 100)</td>
<td>43 (35 - 50)</td>
</tr>
<tr>
<td>Wisconsin criteria</td>
<td>81 (72 - 87)</td>
<td>41 (30 - 53)</td>
<td>67 (50 - 74)</td>
<td>60 (45 - 77)</td>
</tr>
</tbody>
</table>

**A Contemporary Review of Firearm Fatalities in Connecticut**

Elise McKenna, Heather Clinton, Laura Baumann, Kevin J. Borrup, Garry Lapidus, Brendan T. Campbell

**Stamford Hospital**

**Introduction:** The American College of Surgeons Committee on Trauma emphasizes that the key to successful injury prevention programs starts with accurate, population-based data and the implementation of multidisciplinary, community-based solutions. This study provides a contemporary review of firearm-related deaths in Connecticut.

**Methods:** The National Violent Death Reporting System (NVDRS) online database was used to collect information
on all firearm-related deaths in the state of Connecticut during 2015. Data collected included age, gender, race, manner of death, location of death, and type of gun used. Descriptive statistics and comparisons between groups were calculated using statistical software.

Results: In 2015 there were a total of 189 firearm deaths in the state of Connecticut: 105 suicides, 82 homicides, and 2 accidental deaths. The majority of both homicide (84%) and suicide (92%) were male. The mean age of homicide (33 +/-12 years) and suicide (52 +/-18) victims differed significantly (p<0.05). The majority of individuals who commit suicide are Caucasian (93%), and nearly half of homicide victims (49%) are black. Homicides were concentrated in Hartford, Bridgeport, and New Haven, while suicides were more evenly distributed throughout the state. The majority of firearm-related deaths (59%) are associated with handguns.
General Surgery 1 Competition

Moderator:
Leah Bassin, MD,
Middlesex Hospital & Hartford Hospital

Judge:
Anthy Demestihas, MD FACS
Chairperson of Surgical Services,
St. Vincent’s Medical Center, Bridgeport, CT

Rachel B. Scott DO, Gabriela Szalayova MD, Joseph R. Gordon MD
Danbury Hospital

Giant inguinoscrotal hernias, classically defined as hernias that extend beyond the midpoint of the inner thigh when the patient is standing, are a rare and complex surgical problem. The disease process itself limits patient’s functional capacity and quality of life and presents a challenging surgical repair to the surgeon. Furthermore, they continue to perplex surgeons due to their large size, risk of recurrence, and the possibility of potentially fatal cardiac and respiratory compromise after reduction of hernia contents. In this case report we present the utilization of six weeks of progressive preoperative pneumoperitoneum to facilitate an elective repair of a giant inguinoscrotal hernia.

Our patient is a 64 year-old male with a right-sided giant inguinal hernia of approximately 8 years duration and complete loss of abdominal domain (Figure 1). Because of the size of the hernia and concern for significant pulmonary and cardiac dysfunction, the decision was made to utilize progressive preoperative pneumoperitoneum to increase the intraabdominal cavity size and decrease the risk of abdominal compartment syndrome upon repair.

The patient underwent the placement of an implanted vascular access catheter with subcutaneous reservoir for the administration of the pneumoperitoneum. For six weeks he received insufflations of 450cc to 1250cc of room air every 3 to 8 days depending on the patient’s tolerance of the pneumoperitoneum. At the end of six weeks, he underwent an elective open preperitoneal hernia repair with mesh without incident (Figure 2). At the seven month follow up he was doing well without hernia recurrence and a dramatic increase in his functional level and overall quality of life.

Through our experience we believe that the use of progressive preoperative pneumoperitoneum prior to surgical intervention is both safe and effective for patients with giant inguinal hernias with loss of domain. The use of a tunneled intraperitoneal catheter decreases the risk of infection and other catheter related complications and allows the progressive preoperative pneumoperitoneum approach to be safely utilized on an outpatient basis.

Figure 1: Preoperative Imaging Figure 2: Postoperative Imaging

Decreased Hospital Length of Stay with use of Exparel TAP block in Colorectal Surgery Patients

Natalie Pozzi MD, Kim O’Meara RN, Logan Brady BS, MS, MBA, Philip Corvo MD,MA, FACS
Saint Mary’s Hospital

Introduction: Enhanced Recovery After Surgery (ERAS) protocols have been shown to optimize recovery and reduce hospital length of stay. Adverse effects from long-acting medication such as opioids, sedatives, and hypnotics slow recovery. This study aims to assess the impact of Transversus Abdominis Plane (TAP) block using the long acting nonopioid analgesic Exparel on hospital length of stay among patients undergoing elective colorectal surgery. Exparel has been shown to shown to provide pain control for up to 72 hours with a single dose.

Method(s): A retrospective chart review was performed from May 2015 – July 2016 for all adult patients undergoing general anesthesia and colon resection. Patients who received TAP blocks in addition to general anesthesia were compared to patients who received general anesthesia alone. Length of stay was calculated for each patient from time of admission to discharge from the hospital.

Results: Fifteen patients who were treated with TAP block were compared to 89 patients who received conventional care. Length of stay was 4.9 days for patients who received general anesthesia with a TAP block compared to 7.3 for patients who received general anesthesia only with a significance level of P = 0.004.

Conclusions: A part of the ERAS protocol, TAP blocks using Exparel significantly reduce hospital length of stay in patients undergoing elective colorectal surgery.

Primary Small Bowel Volvulus In A Patient Without Prior Abdominal Surgery

Rima Ahmad MD, Andrew McGregor MD, Rachel Scott DO, Jeraldine Orlina MD
Danbury Hospital

Introduction: Small bowel volvulus is a uncommonly described entity and, when described, tends to be associated with malrotation. Here we describe a case of primary small bowel volvulus treated successfully with surgery, and review the literature.

Case: A 60 year old man with no prior history of abdominal surgery presented acutely with abdominal pain, nausea and emesis of sudden onset. His workup included CT imaging that demonstrated a classic “whirl” sign. He was taken urgently to the operating room for exploratory laparotomy and was found to have an ischemic section of volvulized small bowel. This was resected and he underwent primary anastomosis. Postoperatively, he recovered well, with resumption of bowel function and discharged from the hospital on postoperative day 5.

Discussion: Small bowel volvulus is a rare condition, reported at 1-15% of all cases of small bowel obstruction. Although associated with malrotation, prior surgeries or
malignant disease, a significant proportion of patients will have primary small bowel volvulus. CT findings of a whirl sign are highly specific, and provide the most accurate diagnostic indicator. Operative exploration and detorsion of the bowel mesentery is time sensitive and results in better morbidity and mortality than non-operative management.

**Conclusion:** Patients with high clinical suspicion for small bowel volvulus or positive CT findings should be considered for early operative intervention.

**General Surgery 1**

Extragenital Endometriosis as a Cause of Acute Appendicitis: Case Report

Dardan Beqiri MS4, Hoyune Cho MD, Susan Parker MD, Noubar Kevorkian MD
UCONN School of Medicine

**Introduction:** Acute appendicitis is a common diagnosis, mainly caused by obstruction of the appendiceal lumen by a fecalith, resulting in an inflammatory cascade, edema, and venous congestion. Endometriosis is an inflammatory condition defined by presence of endometrial glands and stroma outside the uterine cavity, most often within the pelvis. We present a rare case of acute appendicitis caused by advanced stage endometriosis.

**Case Report:** A few days after menses, a healthy 29 year old female was admitted with a one day history of periumbilical abdominal pain that became localized to the right lower quadrant. The pain was associated with bloating and anorexia, but no fevers, chills, nausea, vomiting, or dysuria. The patient had normal vital signs, a softly distended abdomen, with tenderness at McBurney’s point and a positive Rovsing’s sign. She had a mild leukocytosis and radiologic evidence of a right adnexal cyst with a thickened distal appendix suggestive of acute appendicitis. Upon entering the abdomen, hemoperitoneum was encountered in the pelvis with no identifiable trocar insertion injury. Multiple foci of endometriosis were noted over the anterior abdominal wall. The left ovary was normal in size with small endometriomas while the right ovary was enlarged with a 4 cm ruptured chocolate cyst. A mass-like dark spherical structure was budding from the appendiceal tip, that had curled upon itself and was inflamed. The appendix was dissected and removed in the standard laparoscopic fashion. An intraoperative gynecologic consult was obtained and the patient underwent right ovarian cystectomy and cauterization of endometriosis located on the bilateral pelvic sidewalls, posterior cul-de-sac and the anterior abdominal and pelvic wall. Pathology revealed extensive appendiceal serosal endometriosis and neutrophilic infiltration of the appendix pathognomonic for acute appendicitis. No malignant or atypical cells were noted. The patient recovered uneventfully and was discharged home on post-op day one.

**Discussion:** Although endometriosis affects 6-10% of women of childbearing age, the reported rate of appendiceal endometriosis remains extremely rare (less than 1% of extragenital endometriosis). It is unclear whether inflammation due to endometriosis or the

**Robotic Left Sided Colon Surgery in a Community Hospital: A Retrospective Analysis of Outcomes**

Greg Ricketts MD, Rakesh Hegde MD, Daniel Ricaurte MD, John Zhang MD, PhD, FACS
Waterbury Hospital

**Introduction:** Since the approval of the DaVinci Surgical systems in human subjects in 2002 the robotic approach to colorectal surgery has increased dramatically 1. One of the areas where colorectal surgeons feel there is a distinct advantage with the robot is during left sided colon surgery where you are working in the pelvis. The objective of this Retrospective Review is to determine if the advantage that is felt by the operating surgeons translates to an advantage in the data including complications, operating time, oncologic safety and efficacy, length of stay, conversion to open surgery, and a cost.

**Method(s):** Using the Electronic Medical Record (EMR) the data was retrospectively gathered from all patients having undergone Robotic Left sided Colectomies from July 2015 to August 2016 at Waterbury Hospital including Robotic Sigmoid Resection, Robotic Low Anterior Resection Robotic Hartman’s reversal and Robotic Abdominal Perineal Resections. Clinical outcomes evaluated included operating time, room time, conversion rates, length of hospital stay, wound infections, leak rates, oncologic specimen that include circumferential margin (crm) and proximal and distal margin and lymph node harvest and overall cost.

**Results:** A total of 62 total Left Colon Resections, including 40 Sigmoidectomies, 20 LARs, and 2 APRs, were performed at Waterbury Hospital during this time period. The average operative time for a Robotic Assisted Sigmoidectomy was 226 min ranging from (134-400 min). Console time of 73 min (36-247 min). The average LOS was 3.175 d (1-10 d). The Robotic Assisted LARs and APRs had an average operative time of 226 min (134-400 min). The console time averaged 97 min (26-170 min). The average LOS was 3.7 d (1-7 d). We had 3 conversions to open procedures. We had no major intra-operative complications with the use of the robotic platform during this series of patients.

**Conclusion(s):** The use of the DaVinci Surgical system for left sided colectomy, in addition to all the advantages that it provides for minimally invasive surgery, aids in precise dissection of the pelvis thus preventing pelvic nerve injuries, reduced bleeding, and better visualization of anatomy. The use has also reduced the patient’s length of stay and with good practice the operative time has been reduced to an acceptable time.
mechanical kink caused by the endometrioma was the precipitant of the inflammatory cascade towards appendicitis. The patient was diagnosed and both conditions treated in a timely fashion. It is worth considering endometriosis as a cause of acute appendicitis in females of childbearing age.

**Total Bilirubin Trend As A Predictor Of Common Bile Duct Stone In Acute Cholecystitis And Symptomatic Cholelithiasis**

Devin B Gillaspie MD, Kevin M Schuster MD, MPH
*Yale School of Medicine*

**Introduction:** The presence of bile duct stones at the time of cholecystectomy is estimated at 4-20%. Biliary stones which are not addressed carry a significant morbidity, potentially causing cholangitis, pancreatitis, or biliary colic. Biochemical markers independently or in conjunction with imaging studies are used in the initial diagnosis of choledocholithiasis. However, few have discussed the use of biochemical marker trends to guide further treatment or diagnostic testing. We hypothesized that trends in total bilirubin in the context of cholecystitis and symptomatic cholelithiasis could be used to guide further diagnostic testing.

**Methods:** A single institution retrospective review of patients who presented to the Emergency Room from January 1, 2010 through December 31, 2015 with the diagnosis of acute cholecystitis, choledocholithiasis, or biliary colic was performed. We included patients with an elevated total bilirubin with at least two levels drawn prior to any procedural intervention. We excluded those with gallstone pancreatitis, ascending cholangitis, or elevated total bilirubin secondary to malignancy or other chronic disease. Statistical analysis was performed using the t test and logistic regression to determine if the trend of the total bilirubin level could predict the presence of common bile duct stones. Sensitivities and specificities were calculated as were areas under the receiver-operator characteristic ROC curve to assess the various tests.

**Results:** Of the 1481 patients, 59 patients met criteria and were included in the study. The mean age was 61.2 (range 17-95), 34 (57.6%) were female, and the average BMI was 28.95. The average total bilirubin level at presentation was higher in patients with a common bile duct (CBD) stone at 3.74, versus 2.28 in patients without a CBD stone (p=0.005). The average total bilirubin level over the first 24 hours in patients with and without CBD stones were 3.72 and 2.4, respectively (p=0.009); and 2.41 and 1.47 over the first 48 hours (p<0.001). Average total bilirubin level over 1.68 was 90% sensitive for CBD stones. Bilirubin was more predictive of the presence of CBD stones the longer it was monitored with increasing area under the ROC curve. Bilirubin trends, however, were not predictive of CBD stones.

**Conclusion:** In patients with acute cholecystitis and symptomatic cholelithiasis, an elevated total bilirubin at the time of presentation is suggestive of the presence of a common bile duct stone and persistent elevation over time becomes more predictive. A mean bilirubin over 1.168 over the first 48 hours of hospitalization suggests the need to definitively assess for CBD stones. The need to monitor bilirubin over two days does limit the usefulness of this finding.

**Time point** | **Best Combined Sensitivity** | **Max Best Combined Specificity** | **90% Sensitivity** | **Area Under ROC curve**
--- | --- | --- | --- | ---
Initial Total | 90% | 45% | 1.103 | 0.6244
Mean Total, over 24hr | 57% | 74% | 1.161 | 0.6892
Mean Total, over 48hr | 88% | 55% | 1.168 | 0.7400

**Small Bowel Perforation by Grill Brush Wire: A Case Series**

Clinton Ingersoll BS1, Gene Kim BS1, Edward Hannoush MD2, Aziz Benbrahim MD1,2
1Quinnipiac University Frank H. Netter School of Medicine, 2Midstate Medical Center

**Introduction:** Accidental foreign body ingestion is common. While over 80% of foreign bodies pass without intervention, serious morbidity can occur. Only twenty-two cases of inadvertent ingestion of bristles from wire grill brushes have been reported since 1952.

**Methods:** Case series.

**Results:**

**Case 1:** A 68-year-old male with a history of chronic renal failure, polycystic kidney disease, and liver cysts had been undergoing cardiac workup approximately 10 days prior to presenting to the hospital with tachycardia, dyspnea, diaphoresis, and worsening left upper quadrant abdominal tenderness with rebound. Plain abdominal x-ray showed a linear metallic foreign body in the midline near the umbilicus. Computed tomography (CT) demonstrated a needle-like metallic object in the duodenum near the Ligament of Treitz with intra- and extra-peritoneal portions and possible hemoperitoneum. Patient history subsequently confirmed recent ingestion of food cooked on a grill cleaned by wire brush. V/Q scan was negative for pulmonary embolism and abdominal ultrasound was negative for hepatic vein thrombosis. The patient was taken to the operating room for laparoscopic cholecystectomy and foreign body removal. Laparoscopic examination of the small bowel showed dilation throughout and peritonitis, at which time the operation was converted to an open laparotomy. No metallic object was identified on visual inspection of the bowel or on endoscopy up to the ileum. C-arm fluoroscopy located the object embedded in the retroperitoneum at the root of the mesentery near the superior mesenteric artery, and the wire was removed. Post-operatively, the patient’s course was complicated by a prolonged inpatient hospital stay & pulmonary embolism, but the patient ultimately recovered well.

**Case 2:** A 51 year old female with past history of restless leg syndrome presented with epigastric pain followed by 3 to 4 days of left upper quadrant pain superior to the umbilicus, without nausea, vomiting, fever, or chills. CT revealed a 2 cm foreign body in the fourth portion of the duodenum near the ligament of Treitz with significant surrounding inflammation and no abdominal free air. Intraoperative endoscopy and fluoroscopy were prepared and the patient was taken to the operating room where laparoscopic...
exploration of the duodenum showed mild inflammation near the ligament of Treitz. A 2.3 cm black wire was removed from this area under direct laparoscopic visualization, and no further intervention was needed. The patient did well post-operatively and was discharged on post-operative day 2.

**Conclusion:** We are only aware of 22 cases of metal brush wire ingestion reported in the literature, the majority of which have involved the oropharynx, neck, or esophagus. Only one other case of abdominal involvement has been reported. Both of our cases involved the duodenum at the ligament of Treitz. Although never previously reported, this location may represent a site of increased risk for impaction for thin and sharp foreign bodies, given the acute angle of the duodenum at that area. Successful treatment in these cases was facilitated by awareness of wire brush ingestion as a potential hazard, which allowed the surgical team to anticipate this cause of pain and activate additional resources needed for successful retrieval of the foreign body.

We therefore make the following recommendations in cases of suspected foreign body ingestion. First, a careful history is vital and should include questions about recent consumption of foods cooked on a brush-cleaned grill. CT imaging studies have proven useful in identifying such objects and should be obtained prior to surgical intervention. In cases of abdominal involvement, surgical removal of the object should begin with laparoscopic exploration of the abdomen. If the object cannot be visualized, endoscopy may be performed intra-operatively. If the object is still not detected, fluoroscopy may also be used for intraoperative localization of the foreign body.

**Early Small Bowel Obstruction Post Transmesenteric Percutaneous Endoscopic Gastrostomy: A Rare Complication**

Hoyune Cho MD, Noubar Kevorkian MD

**UCONN School of Medicine**

**Introduction:** Percutaneous endoscopic gastrostomy (PEG) is a method of endoscopically assisted percutaneous feeding tube insertion into the gastric lumen. PEG tube placement is one of the most common endoscopic procedures performed in the US, with an estimated 100,000-125,000 cases performed annually. We describe a rare complication of a PEG tube causing small bowel obstruction (SBO) due to small bowel mesenteric penetration during insertion.

**Case Report:** A 76 year old male with Alzheimer’s disease, was admitted to the hospital with sepsis due to aspiration pneumonia and found to have swallow mechanism dysfunction. A PEG tube was placed using standard endoscopic technique, with no apparent peri-procedural complications. A week later, the patient presented with abdominal pain, distension, nausea, and vomiting. CT abdomen revealed high grade proximal SBO with a transition point in the left mid abdomen, around the site of the PEG tube.

The patient was taken to the OR for abdominal exploration. The PEG tube was noted to be traversing the small bowel mesentery adjacent to the mesenteric border of a mid jejunal loop, with indentation of the bowel wall but no full thickness injury. The jejunal loop was tethered to the abdominal wall with the PEG tube, resulting in a kink and mechanical obstruction. No additional findings were noted upon complete exploration. The PEG tube was removed, the iatrogenic mesenteric defect was primarily closed, and a new GJ tube was inserted through the same gastrotomy. The patient recovered uneventfully, and was discharged home.

**Discussion:** Procedure-related complications of PEG placement are common; a large meta-analysis reported morbidity of 9.4% and mortality of 0.53%. Most series report morbidity rates between 9% and 17%, although major complications occur in only 1%-3% of cases. Commonly reported complications are aspiration, hemorrhage, peritonitis, gastric ulcer, fistulous tract, ileus, stomal leak, infection, buried bumper, visceral perforation, accidental removal, and tumor implantation.

We found a few case reports with SBO as a late complication of PEG tubes, mostly due to migration of the internal bumper. We are aware of only 1 other case report depicting a similar presentation. Complete elimination of procedural complications may be very difficult, but in high risk patients, pre procedure abdominal imaging for better anatomic delineation might have a role.
General Surgery 2 Competition

Moderator:
Royd Fukomoto, MD, FACS
Western Connecticut Health Network, Danbury Campus, Danbury, CT

Judge:
Kathleen LaVorgna, MD, FACS
Private Practice, Norwalk, CT
Microlaparoscopic Appendectomies: A Single Surgeon’s Experience.

Benefsha Mohammad MD, Rachel Scott DO, Keith Zucca MD
Danbury Hospital

Introduction: Laparoscopic appendectomy has traditionally been performed with the use of 5mm instruments. Our aim was to evaluate the feasibility of microlaparoscopic appendectomy (MLA) using 3mm instruments in patients eligible for standard laparoscopic surgery and to demonstrate that it is a comparable alternative to the standard laparoscopic technique.

Method(s): Between January 2008, and December 2012, we examined all appendectomies performed by a single surgeon using a microlaparoscopic technique. This technique entailed the use of two 3mm trocars and a 12mm Hasson umbilical incision, which was widened for specimen extraction. With IRB approval, a retrospective review of these cases was performed. We excluded cases where handports, 5mm trocars or a laparotomy incision was the initial approach to the operation.

Results: One hundred and seventy-four patients underwent MLA for appendicitis. Conversion rate, trocar upgrade rate, need for additional trocar, postoperative hospital stay, postoperative complications and operative times were all comparable to historical controls. The conversion rate to open was 0%, trocar upgrade occurred in 2.87% cases, and need for additional trocar rate was 0.57%. Postoperative hospital stay average was 1.1 days, average postoperative pain was 3.4 on a standard pain scale, and 30-day postoperative complication rates were similar to previously reported literature.

Conclusion(s): MLA is safe and feasible when performing appendectomies for appendicitis including complicated appendicitis. Outcomes are comparable to standard laparoscopy and single incision laparoscopic surgery without a steep learning curve or the need to deviate from standard techniques. We hope that our encouraging results will enhance the development and use of microlaparoscopic instruments in laparoscopic surgery in the future.

Characterization of Human Esophageal Epithelial Cells Before and After Conditional Reprogramming: A Novel Approach To Autologous Stem Cell Tissue Engineering

Jeremy Carroll BS, Todd Jensen MHS, Christine Finck MD
1 Department of Pediatrics, University of Connecticut Health Center 2 Department of Surgery, Connecticut Children’s Medical Center

Introduction: Herein we describe the novel use of conditional reprogrammed culture (CRC) to expand non-diseased human esophageal epithelial cells (HEECs) obtained from pediatric patient biopsies for potential translational applications. Numerous studies have shown that epithelial cells proliferate in CRC and exhibit stem-like properties. Upon removal of CRC, epithelial cells will exhibit normal phenotype. Herein we specifically investigate whether HEECs obtained during routine endoscopy and cultured in CRC will proliferate, display stem like markers CD49f/Integrinα6 and TP63, and on removal of CRC express normal epithelial phenotype.

Method(s): Esophageal biopsies were obtained under informed consent and IRB approval (CCMC# 13-094) from two non-diseased pediatric patients undergoing routine endoscopy. Utilizing a previously described protocol, we cultured the non-diseased esophageal mucosal biopsies in CRC to expand the cells. CRC utilizes irradiated mouse embryonic fibroblast feeder cells and a Rho kinase inhibitor (1 ug/ml). Cells were passaged onto 0.1% gelatin and fibronectin/aminin (1ug/cm²/protein/well). Feeder cells were removed first using differential trypsinization followed by the HEECs and the cells were then processed for RNA and protein analysis. Cells were analyzed after 24 hours in CRC, 24 hours after removal from CRC and 7 days after removal from CRC. We utilized a combination of flow cytometry and qRT-PCR to assess gene and protein expression.

Results: Conditionally reprogrammed HEECs demonstrated high levels of expression of esophageal epithelial stem cell marker CD49f/Integrinα6 and high levels of TP63 gene expression. Expression levels of CD49f/Integrinα6 and TP63 gene expression significantly decreased 24 hours after HEECs were removed from CRC and continued to decrease after 7 days out of CRC. HEECs demonstrated increased expression of mitotic protein Ki67, indicating proliferation during CRC, but decreased expression after being removed from CRC for 24 hours and 7 days. Expression levels of epithelial cell adhesion molecule (EpCAM) increased after CRC removal, suggesting epithelial re-differentiation. There was no significant difference in TP63 gene expression between cells on gelatin or those on fibronectin/aminin.

Conclusion(s): Our results confirm that HEECs can be expanded using CRC on gelatin or fibronectin/aminin and the changes in protein expression during that process are reversible 24 hours after being removed from CRC. This technique presents a promising approach to expanding large numbers of HEECs from small esophageal biopsies as an autologous cell source for seeding biomimetic scaffolds for potential implantation in conditions requiring esophageal resection.

Robotic Assisted Laparoscopic Cholecystectomy: Is It a Viable Alternative at a Community Hospital?

Daniel Ricaurte MD, Rakesh Hegde MD, Greg Ricketts MD, John Zhang MD, PhD, FACS
Waterbury Hospital
**Introduction**: The robotic approach to cholecystectomies has been proposed as a safe and comparable alternative to the laparoscopic technique. Though most surgeons currently agree on the safety of this technique, its critics argue this approach is both time consuming and cost prohibitive.

We present our experience with robotic assisted laparoscopic cholecystectomies at a community hospital in Waterbury, CT, USA.

**Method(s)**: Data was retrospectively acquired utilizing the Electronic Medical Record for all robotic assisted laparoscopic cholecystectomies performed from June 2015 to June 2016 at Waterbury Hospital, Waterbury, CT. Clinical outcomes evaluated included operative time, conversion rates, and hospital LOS.

**Results**: From June 2015 to June 2016, 108 robotic assisted laparoscopic cholecystectomies were performed at Waterbury Hospital. Average LOS was 0.45d (o-5d); the average operative time was 75.8min (43-190min). No cases had to be converted to open, and no major intra-operative complications were encountered.

**Conclusion(s)**: Robotic assisted laparoscopic cholecystectomy has gained gradual interest and popularity in the recent years. Based on our experience, this minimally invasive technique is comparable to the current gold standard and is a viable alternative in gallbladder surgery.

**Early Results from Enhanced Recovery for Complex Abdominal Wall Reconstruction**

Michael Jaronczyk MD, Vladimir Daoud MD, Ibrahim Daoud MD
Saint Francis Medical Center

**Introduction**: Enhanced recovery pathways have had tremendous support in the colorectal literature. Bariatric surgeons also have published favorable results. Patients are able to leave the hospital earlier and experience less pain. They return to diet and activities quicker as well. It is not clear that complications are improved, but there are less hospital re-admissions. We hypothesize that an enhanced recovery protocol can be extended into other surgical fields, such as complex hernia repair. Complex abdominal wall reconstruction routinely requires large incisions, extensive lysis of adhesions and manipulation of the bowel. The procedures are typically several hours long with extended inpatient hospital stays.

**Method**: At our institution, we have prospectively collected data on all complex abdominal wall reconstruction from a single surgeon at a single institution. These complex reconstructions include cases where a component separation is planned. Pre-operatively, we initiate patient education and perform routine testing. On the day of surgery, we follow guidelines recommended from pathways in other fields, such as bariatric and colorectal. Our repairs typically are performed open in a typical Rives-Stoppa fashion with Phasix mesh and either an endoscopic external oblique release or a transversus abdominis release. Post-operatively, our patients are given early enteral nutrition and are required to ambulate. The patients are discharged when tolerating a diet and ambulating with pain controlled on an oral regimen.

**Results**: We changed our treatment algorithm in July, 2015 and we have been introducing more guidelines into the program as the program matures. Our newest component has been a pre-operative transversus abdominis block with liposomal bupivacaine. We have enrolled 26 patients in the past 13 months. Our narcotic medication requirement has decreased, our in-patient hospital stay has decreased and our patients are able to tolerate a diet sooner. Only one patient experienced a minor complication, which was a surgical site infection. There have been no mortalities or major morbidities.

**Conclusion**: We have shown early success with our enhanced recovery pathway with complex abdominal wall reconstruction. 25 of our 26 patients had benign post-operative courses. We have not experienced any recurrences at this point, but the follow-up has been short-term. We have been able to mimic findings seen in studies from other surgical disciplines, such as colorectal and bariatric.

**Prolonged Post Operation Ileus, Does Hypocalcemia Play a Role?**

Virginia Parker, MD; Logan Brady, MBA; Alexander Palesty, MD, FACS
Saint Mary’s Hospital

**Introduction**: Despite several advancements in surgical technique and perioperative care, postoperative ileus (POI) continues to be one of the most common and expected aspects of abdominal surgery. POI is defined as the disruption of normal coordinated propulsive motor activity of the gastrointestinal tract resulting in obstipation and intolerance of oral intake. Despite its pervasiveness, the pathogenesis of POI remains poorly understood. Hypokalemia has long been accepted as the major electrolyte abnormality associated with POI. However, if one appreciates the large role of calcium at the cellular level of gastrointestinal motility it could be postulated that changes in calcium levels could potentially affect the normal physiological activity. The main focus of this retrospective study was to identify patients with POI and determine if there is a correlation between POI and hypocalcemia.

**Methods**: Using the NSQIP database, we selected patients from April 2013 –January 2016 who underwent small bowel, colon or appendix resection. The patients required having an albumin level drawn during that admission. Inclusion criteria was documented post operative ileus, operative day to discharge day greater than 4 days, documented intolerance of oral diet on post operative day 4 or radiological confirmation of an ileus. Exclusion criteria were...
return to the operating room during the hospital admission, death, readmission to the hospital 30 days prior or after the operation, or if the surgery was palliative in nature. The trends of the calcium and albumin level of each patient was charted and averaged. The return of bowel function was also identified by documentation. We also documented if the patient was currently receiving TPN or had received any blood transfusions. Each patient’s calcium level was corrected using the pre-operative albumin and post-operative albumin. We also trended the albumin levels throughout the hospital stay for each patient.

**Results:** From the chart review, 9 patients were selected for complete analysis of their laboratory work. The average change in albumin from the pre-operative to post-operative was 1.85 g/dL. The calcium corrected with post-operative albumin vs. the pre-operative albumin had an average difference of 1.10 mg/dL, with the pre-operative albumin calcium lower compared to the pre-albumin calcium.

**Conclusion:** Our null hypothesis was to identify if POI was associated with hypocalcemia. During the data collection, we appreciated a drop in albumin levels from the pre-operative lab work vs. the post-operative lab work. Additionally when comparing pre-operative vs. post-operative albumin corrected calcium levels, we saw a correlation of a low/normal level of calcium in the adjusted calcium using the pre-operation albumin level vs. a higher corrected calculation in the post-operative albumin. This change in albumin pre vs. post operatively with correlating changes in calcium may impact clinicians approach to replacing calcium. We plan to expand this study and use ionized calcium levels vs. the corrected calcium level to appreciate any difference or similarity. Furthermore, we are puzzled with the unusual drop in albumin post operation and are looking at possible sources for this change. Lastly, we plan to expand our patient numbers to increase the power of this study and determine if this change is clinically significant.

**The Differentiation Of Induced Pluripotent Stem Cells (iPSCs) To A Distal Airway Phenotype For Use In Regenerative Lung Therapies**

Adam Mitchell PhD, Charles Drinnan PhD, Todd Jensen MSc, Christine Finck MD
*UCONN School of Medicine/Connecticut Children’s Medical Center*

**Introduction:** Lung diseases in adults and infants are highly prevalent and cause significant morbidity and mortality. Many current treatments alleviate symptoms but do not address the underlying causes. Stem cell therapies using iPSCs offer the promise of reparative personalized treatments. Since the advent of iPSCs, protocols for the production of distal airway cells have undergone continuous evolution. The aim of this study was to draw upon previous work to create a reproducible and efficient protocol for the production of distal airway cells.

**Methods:** Human iPSCs were derived from neonatal foreskin fibroblasts using a non-integrating Sendai virus method by the UConn Health Stem Cell Core. iPSCs were directed to differentiate through a step wise process to definitive endoderm (DE), anterior foregut endoderm (AFE), lung bud progenitors and finally mature distal airway cells in a manner mimicking lung embryogenesis. At each developmental period the status of differentiation was assessed using flow cytometry, immunofluorescent staining and quantitative real time polymerase chain reaction.

**Results:** Cells tested positive for the relevant markers at each developmental time point; uninduced iPSCs were positive for pluripotent markers, SOX2, OCT4, TRA-1-60 and SSEA4. cells at DE were ~90% CXCR4+EpCAM+, and cells at AFE were ~60% FOXA2+SSEA4+. Lung bud progenitors were positive for the early lung epithelial marker TTF1. Finally, distal airway cells were positive for SPC indicative of type 2 alveolar cells and AQP5, indicative of type 1 alveolar cells (figures below).

**Discussion:** The developed protocol resulted in a population of cells that were over 75% positive for markers of cells of the distal airway, specifically, types 1 and 2 alveolar cells. Future experiments will investigate if differentiated cells can either directly engraft or provide paracrine support to induce regeneration and repair of injured lungs. We are also interested in using Raman spectroscopy to monitor the differentiation process as such an approach would be entirely non-invasive expediting the use of such cells in a clinical setting.

**Immunofluorescence, flow and qRT-PCR data from iPSCs following 28 days of differentiation**

**Anterior Spinal Cord Infarction in a 77 year-old Male After a Right Hemicolectomy: a case report**

Benefsha Mohammad, MD, Emilia Krol, MD, Charles B. Walsh, MD
*Danbury Hospital*

**Introduction:** Spinal cord infarction is a rare condition with severe neurological symptoms and poor prognosis. This presentation accounts for only 1% of all strokes1. Aside from a few retrospective studies and case reports, this condition has not been investigated as thoroughly. It has been most commonly described as a complication of aortic intervention and spinal cord hypoperfusion2-3.
Case Presentation: A seventy-seven year-old man underwent an exploratory laparotomy and right hemicolectomy for bowel ischemia. An etiology that has been investigated was hypotension leading to hypoperfusion. Intraoperatively, the patient experienced hypotension with a decline in mean arterial pressure from 150mmHg to 30mmHg for a duration of 20 minutes. Postoperatively the patient had another episode of hypotension with a decline in mean arterial pressure from 80mmHg to 55mmHg for a 15 minute period. On post-operative day three the patient was paraplegic with spinal cord infarction seen on magnetic resonance imaging from Tio to the conus medullaris. The blood supply to this region appeared unobstructed on imaging and therefore it is likely that intermittent hypotension was associated with insufficient blood flow to this region.

Conclusion: The artery of Adamkiewicz is the largest segmental artery arising from the aorta at variable sites and supplies the lower two thirds of the spinal cord via the anterior spinal artery. Anterior spinal cord injury secondary to ischemia of the lower thoracic and lumbosacral region is rare. The most common etiologies leading to anterior spinal cord syndrome are direct injury to the artery, thromboembolic phenomena and hypoperfusion. In our patient it was likely a synergistic effect from transient hypotension and severe atherosclerotic disease that lead to anterior spinal cord injury.

Laparoscopic Surgery for Emergency Colorectal Surgery: Less Morbidity and Shorter Length of Stay

Mansi Sanghvi MBBS, Adrian Maung MD FACS, Kimberly Davis MD FACS, Kevin Schuster MD MPH FACS; Yale School of Medicine

Introduction: Fewer complications and shorter lengths of stay have been demonstrated for laparoscopic as compared to open approaches in elective colorectal operations. This experience has been expanded to include the use of laparoscopy for urgent or emergent colorectal conditions, despite a paucity of supporting evidence. We hypothesized that post-operative outcomes would be improved with a laparoscopic approach in emergency colorectal operations.

Methods: All NSQIP urgent or emergent targeted colectomy cases from 2012 to 2014 were reviewed. Outcomes included 30-day mortality and morbidity including: surgical site infection, anastomotic leak, other infectious complications, cardiovascular complications, renal failure, venous thromboembolism prolonged ileus, reoperation and length of hospital stay. Demographics, comorbidities, pre-operative lab results, wound class, ASA class and pre-operative functional status were assessed for risk adjustment. To assess the effect of attempting laparoscopy compared to an initial laparotomy, laparoscopy and laparotomy were included in the laparoscopy group. Logistic and log-linear models were constructed to assess outcomes.

Results: There were 4877 patients in the laparotomy group and 809 in the laparoscopy group, 435 of which were laparoscopies converted to laparotomy. Unadjusted mortality was lower in the laparoscopic group (4.6% vs 14.2%; p<0.001), however after adjustment for confounders, a laparoscopic approach was no longer significantly associated with mortality (OR 0.698; 95% CI 0.45-1.09; p=0.115). After adjustment overall thirty day morbidity was lower although anastomotic leak was higher (table). Hospital stay was approximately 1 day shorter with laparoscopy. The type of surgical approach chosen did not impact the incidence of surgical site infection, prolonged post-operative ileus and reoperation rates.

Conclusion: Laparoscopic surgery in emergency colorectal operations appears to have comparable outcomes compared to laparotomy with shorter length of hospital stay. Laparoscopy may be associated with a higher leak rate, but lower overall morbidity when considering all cardiovascular, pulmonary and renal complications. Additional studies should investigate the impact of laparoscopy on anastomotic leak in emergency colorectal surgery.

<table>
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</table>

Table 1: Comparison of outcomes with laparoscopy compared to open surgery.

Immediate Tube Feeding after Percutaneous Endoscopic Gastrostomy Placement: Early Return to Goal Tube Feeds without Added Complications

Vijay Jayaraman, Laura C. Lamb, Affan Umer, Stephanie C. Montgomery, James M. Feeney; Saint Francis Medical Center

Background: Percutaneous endoscopic gastrostomy (PEG) tubes are often placed for delivery of enteral nutrition (EN) in critically ill patients. Tube feeding initiation is often delayed to varying degrees to prevent procedure related complications despite evidence that any EN interruption results in worse outcomes, including increased infection rate and multiple organ failure (Marik PE). We reviewed our experience with tube-feed initiation immediately after PEG insertion in the intensive care unit (ICU).

Material and Methods: A retrospective chart review was performed on patients who received a PEG and at least 24 hours of EN. Demographic and outcomes data including hospital length of stay (HLOS), ICU length of stay (ICULOS), mechanical ventilation days, time to goal rate and procedure related complications such as wound infection, and increased residuals were collected. Patients were stratified according to time to tube-feed initiation: immediate (<1 hour), early (1-4 hours), and delayed (4-24 hours).

Results: The three groups were similar with respect to demographics, comorbidities and 30-day mortality. There was no difference in mean HLOS, mean ICULOS, and mean mechanical ventilation days. There were 14 complications in the immediate group compared to 12 in the early and 9 in the delayed group (p =0.7). Sixty-one percent of patients...
were advanced immediately to the goal tube feeding rates in the immediate group compared to 24% and 18% in the early and delayed groups, respectively (p<0.0001).

**Conclusion:** Immediate feeding after PEG tube insertion can help contribute to the maximum amount of time patients are at goal tube feeding rates without an observed increase in the number of complications.
Clinical Oncology Competition

Moderator:
Amanda Ayers, MD
Colon and Rectal Surgeons of Greater Hartford, Bloomfield, CT
Chair, Connecticut Commission on Cancer

Judges:
Connecticut Commission on Cancer

Bariatric Surgery Competition

Moderator:
Geoffrey Nadzam, MD, FACS, FASMBS
Professor, Site Director, Bariatric Surgery,
Yale School of Medicine, Saint Raphael Campus, New Haven, CT

Judges:
Aziz Benbrahim, MD, FACS, FASMBS,
Meriden Surgical Specialists, Meriden, CT,
President, CT Chapter ASMBS and
Matthew Hubbard, MD, FACS, Assistant Professor of Surgery,
Yale School of Medicine, New Haven, CT

Surgical Quality, NSQIP and ERAS
Sponsored by the CT Surgical Quality Collaborative

Moderator:
Philip Corvo, MD, MA, FACS
Chairman, Stanley J. Dudrick Department Surgery and
Director of Surgical Critical Care at Saint Mary’s Hospital, Waterbury, CT
President, CT Surgical Quality Collaborative

Judges:
Jonathan Blancaflor, MD, FACS
Director, Videoscopic Surgery Center, Middlesex Hospital
Private Practice, Shoreline Surgical Associates, Middletown, CT

Alan Meinke, MD, FACS
Private Practice, Surgeons of Westport, Westport, CT
Clinical Oncology

Impact Of Compromised Pulmonary Function On 30-Day Outcomes After Breast Cancer Resection.

Ann-Kristin U. Friedrich MD, Vladimir Coca-Soliz MD, Jennifer L. Hubbard MD, Kevin P. Baratta MD, J. Alexander Palesty MD FACS, Beth A. Sieling MD
Saint Mary’s Hospital

Introduction: Pulmonary comorbidities have been associated with inferior outcomes after many surgical interventions. To identify the impact of compromised pulmonary function, defined as active smoking status and underlying lung disease, on 30-day outcomes after resection of breast cancer, we queried the American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP).

Methods: All patients who underwent resection for invasive breast cancer between 2007 and 2012 were identified in the NSQIP database using Current Procedure Terminology (CPT) and International Classification of Diseases, Version 9 (ICD-9) codes. Pulmonary compromise was defined for all patients with a history of COPD, active smoking status, preoperative ventilator dependence and concurrent pneumonia. Active smoking status in NSQIP is defined as having smoked any number of cigarettes within one year prior to surgery. Outcome variables were compared between groups and adjusted for patient age, body mass index and procedure type.

Results: A total of 71,294 patients who met inclusion criteria were identified. Of these, 10,855 patients (15.2%) had compromised pulmonary function. There were 9,594 active smokers and 1,986 patients with a history of COPD. Twelve patients had concurrent pneumonia, and ten patients were ventilator dependent preoperatively. Average number of packyears in this group was 28.2 (SD 28.7; range 0-200). Overall complications after resection for breast cancer were low in the dataset (3.321 patients, 4.6%). After adjusting for BMI, age and type of procedure, patients with pulmonary compromise had higher postoperative risk of superficial surgical site infection (2.6 vs 1.7%, OR=1.6, P<0.001), wound dehiscence (0.7 vs 0.3%, OR=2.3, P<0.001), wound infection (1.0 vs 0.6%, OR=1.6, P<0.001), pneumonia (0.2 vs 0.1%, OR=2.6, P<0.001), reintubation (0.2 vs 0.1%, OR=2.6, P=0.001), failure to wean from a ventilator (0.1 vs 0.0%, OR 2.8, P=0.005), flap failure (0.5 vs 0.3%, OR 1.7, P=0.001), sepsis (0.5 vs 0.3%, OR 1.7, P=0.003) and septic shock (0.1 vs 0.0%, OR 3.1, P=0.001). Overall 30-day morbidity was increased by 43% among patients with pulmonary compromise (6.2 vs 4.4%, OR 1.4, P<0.001). There was no significant difference in risk of death between groups (0.18 vs 0.12%, P=0.17).

Conclusion: Pulmonary disease has a significant impact on postoperative morbidity of patients undergoing resection for breast cancer, especially on infectious and pulmonary complications. Meticulous attention to improved preoperative planning and early smoking cessation may help to optimize outcomes.

Correlation of Breast Density with Breast Cancer Prognosis

Jennifer L. Hubbard MD, Ann-Kristin U. Friedrich MD, Alina Guseynova BS, J. Alexander Palesty MD, Beth A. Sieling MD
Saint Mary’s Hospital

Introduction: Breast density has been proposed as an independent risk factor for breast cancer. However, limited data is available as to the exact correlation of breast density to breast cancer pathology and prognosis. In order to better understand the prognostic value of breast density we performed a retrospective analysis of 72 patients who underwent breast cancer resection at Saint Mary’s Hospital from 2009 to 2013.

Methods: A data base was created for all patients who underwent breast cancer resection between 2009 and 2013 at Saint Mary’s Hospital using Current Procedure Terminology (CPT) and International Classification of Disease, Version 9 (ICD-9) codes. Saint Mary’s Electronic Medical Records (EMR) and patients’ office notes were reviewed and data was collected concerning the patients’ lymph node status, lymphatic invasion status, vascular invasion status, and cancer stage. These variables were then compared against the patients’ pre-operative Breast Density Score (BDS), defined based on the Breast Imaging-Reporting and Data System (BI-RADS) atlas.

Results: Of the 72 patients who underwent resection of breast cancer, 37.50% of patients had a positive lymph node status, 51.39% had no lymph node involvement, and 11.11% had an indeterminate lymph node status. Histological evidence of lymphatic invasion was seen in 23.61% of patients, 48.61% of patients had no lymphatic invasion, and 27.78% of patients had an indeterminate lymphatic invasion status. Vascular invasion was seen in 22.22% of patients, 47.22% of patients had no vascular invasion, and 30.56% had an indeterminant vascular invasion status. In terms of staging, 18.06% of patients had stage 3 cancer, 23.61% of patients had stage 2 cancer, 36.11% of patients had stage 1 cancer, 11.11% of patients had stage 0 breast cancer, and 11.11% of patients had an indeterminate cancer stage. When analyzing the distribution of BDSs amount each subgroup, a statistically significant distribution was seen in the lymph node status, lymphatic invasion, and vascular invasion group, with a p-values of 0.025, 0.031, and 0.006 respectively. There was no statistically significant distribution of BDSs in the cancer staging group, with a p-value of 0.10.

Conclusion: There was no statistically significant association between breast density and breast cancer staging. However, the distribution of BDSs were statistically significant when compared to the patients’ lymph node, lymphatic invasion, and vascular invasion status. This may suggest an association of breast density to breast cancer’s invasion of lymphatics and vasculature and may have an association with lymph node status. This may indicate a need for more aggressive breast cancer screening or surgical resection for individuals of specific breast densities.
Diagnosing Muir-Torre Syndrome in a Patient with Non-Hodgkin’s Lymphoma and Sebaceous Carcinoma

Marissa Novack, M.D., Elidia R. Volpicelli, M.D. FCAP, Marissa DeFreese, M.D.
Stamford Hospital

Introduction: Muir-Torre Syndrome is a rare genetic disorder of an autosomal dominant inheritance pattern with approximately 200 cases reported. It is a subtype of Lynch Syndrome, otherwise known as hereditary non-polyposis colon cancer. Characteristically, it presents with a cutaneous lesion, commonly a sebaceous neoplasm or keratoacanthoma, with a concomitant visceral malignancy. Genes that have been associated with this syndrome include mismatch repair proteins MLH1, MSH2, MSH6, and PMS2.

Methods/Discussion: This is a case report of a 62 year old female with a past medical history of Non-Hodgkin’s lymphoma, hypercholesterolemia, insulin-dependent diabetes, and H. Pylori who presented to the surgical clinic for removal of a biopsy-proven invasive carcinoma of a scalp lesion. The patient underwent surgical excision of the lesion and the final pathology revealed sebaceous carcinoma. Immunohistochemical studies were performed which showed loss of expression of the DNA mismatch repair proteins HMSC-2 with partial loss of HMSC-6, consistent with a diagnosis of Muir-Torre Syndrome.

Conclusion: Given the rarity of Muir-Torre Syndrome and its propensity to cause additional malignancies, it is important to recognize this syndrome early so that a proper screening program can instituted for both the patient and family in order to decrease associated morbidity and mortality.

The Gynecologist’s Role in Breast Cancer Survivorship: Increasing Knowledge of Lymphedema Dx and Mgt

Romer JL, Brady E, Sauter ER
Hartford Healthcare

Introduction: There are currently 5 million US survivors of breast cancer, a number expected to double by 2036. While alive, survivors suffer the sequelae of cancer therapy, including lymphedema. The gynecologist serves as the primary care physician for many survivors, providing surveillance for cancer recurrence and maximizing quality of life (QOL). Essential to this role is a working knowledge, including approaches to its diagnosis and management, of breast cancer related lymphedema (BCRL). Upper extremity assessment for BCRL may include comparison arm circumference measurement, water displacement, or Bioimpedence Spectroscopy (L-Dex). L-Dex is the most sensitive of the three methods of BCRL detection. Early referral to a physical therapist is generally recommended once BCRL is detected. Routine evaluation for BCRL should occur after axillary lymph node removal (LNR) or axillary radiation.

Methods: Data was collected using L-Dex, a method of lymphedema assessment currently in use by some physicians to detect BCRL before clinically evident. Participant results were categorized based on whether the baseline L-Dex was before or after LNR. Referral patterns and response to therapy were assessed.

Results: 36 patients underwent L-Dex measurements; 6 had pre- and postoperative measurements while 30 had only postoperative measurements (Table 1). The average number of measurements per patient was 5; 3 patients were lost to follow-up. 66.7% of patients with a preoperative L-Dex measurement developed BCRL (by L-Dex criteria), and all who received physical therapy had L-Dex return to normal after treatment. In patients who no baseline preoperative measurement, 19/30 (63.3%) were found to have BCRL at their first postoperative measurement or subsequently developed BCRL. 15/19 (78.9%) had measurements return to normal after therapy. In total, L-Dex identified 63.9% of patients as having abnormal L-Dex values postoperatively, with 82.6% of abnormal values returning to normal after physical therapy.

<table>
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<th>Table 1: L-Dex Data</th>
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Conclusions: Gynecologists play a vital role in the care of breast cancer survivors, and should understand how to screen for BCRL and refer when appropriate. We are unaware of a study which has specifically targeted gynecologists to assess their knowledge, understanding of current diagnostic modalities, and preferred intervention for BCRL. There is increasing evidence that early identification and management of BCRL may increase the ability to treat it. However, in current practice lymphedema is often not diagnosed until it is visually apparent. In our study, 82.6% of patients diagnosed with subclinical lymphedema by L-Dex had improvement to normal values after physical therapy. This supports the idea that periodic monitoring of women at high risk for BCRL, and intervening early when detected, may reduce the incidence of permanent lymphedema.

We have submitted a protocol to our IRB to conduct a brief survey of board certified/eligible gynecologists to assess their BCRL knowledge, identification and referral patterns. Given the increasing number of breast cancer survivors and the role gynecologists play in their survivorship care, identifying how they currently assess patients for BCRL is an important first step to determine how to optimize the care of their patients who have undergone axillary evaluation/treatment for breast cancer.

Clinical Oncology, Bariatric Surgery & Surgical Quality. NSQIP and ERAS
Bariatric Surgery

Revision Of Sleeve Gastrectomy Using Endoscopic Technique

Hebroon Obaid, MD, Mohamad Zanbrakji, MD, James Bonheur, MD
Stamford Hospital

Introduction: Obesity is a relatively common disease affecting over 66% of the US adult population. Extreme obesity, often presents with comorbid conditions such as diabetes, hypertension, or heart disease, has a relatively high prevalence of 6.3% in US adults. However, with the advent of sleeve gastrectomies, the ability of surgeons to augment the health of their patients has increased. There is no paucity of data that demonstrate the health benefits of sleeve gastrectomies, however, as with any surgical procedure, it is important to consider possible complications, including the need for re-operation to correct the remnant gastric pouches which could cause dysphagia, nausea, vomiting, or a decrease in percentage weight loss. While standards of revision would include resection or converting the procedure to ather bariatric operation such as a Roux en Y gastric bypass, a novel endoscopic revision approach, was performed with good results.

Case: The patient is a 68-year-old female who underwent a laparoscopic sleeve gastrectomy successfully. However, roughly one year after her laparoscopic sleeve gastrectomy, she began to complain of nausea, reflux, and epigastric pain. Her workup included an esophagram that showed no contrast passing through the distal stomach, although there were no obstructions in flow proximally. As this was concerning for a distal stomach stricture, an EGD was performed by the operating surgeon and a large gastric pouch was noted proximal to a narrowed aspect of the stomach. At this time, the narrowed area was dilated and the patient was scheduled for revision of the sleeve gastrectomy given the pouching, which had been impacted with foodstuff and likely augmented the reflux and nausea.

The patient was brought back to the operating room for planned endoscopic revision of her sleeve gastrectomy, which had resulted in a large distal stomach pouch. After an EDG was done and the pouch was re-identified, dilation of the outflow tract up to 16cm in diameter was performed to ease with food passage. At this time, an endoscopic stitching device was used to place four full thickness sutures to obliterate the gastric pouch. It was noted at this time that the stomach formed a more usual tubular structure often noted after a sleeve gastrectomy. Given the anatomy now more closely approximated that of the normal postoperative sleeve gastrectomy and the patient’s symptoms greatly improved, she was discharged home. She has done quite well and her complaints have resolved.

Conclusion: It is important to keep in mind, with the increasing popularity of laparoscopic sleeve gastrectomies in the United States among bariatric surgeons, the associated complication of the surgical procedure have also increased. These risks include leaks, hemorrhage, surgical site infections, and need for re-operation. Given the obvious drastic change to anatomy with the sleeve gastrectomy, it is important to investigate certain postoperative complications with esophagrams. If strictures are suspected, it is also important to perform an endoscopy to identify any pathologies of the remnant stomach, so that the patient may still receive the utmost benefit from the original surgery. While the standard in those cases has been to resect the affected remnant of stomach or change to a different weight loss procedure, e.g. sleeve gastrectomy converted to a gastric bypass, this case demonstrates the novel technique of revision of laparoscopic sleeve gastrectomies using an endoscopic device. This was performed by placing full thickness sutures and re-creating a gastric sleeve. This method decreases the morbidity associated with taking the patient to the operating room and trying to resect a margin of the remnant stomach or changing the patient’s altered anatomy to a gastric bypass, which could be quite complicated given the prior surgery. In this case, we were able to demonstrate the feasibility of using this novel therapy in the revision of gastric surgeries. While the EndoSleeve is currently being used to create new gastric sleeves, the above case demonstrates its efficacy in revision of a laparoscopic sleeve gastrectomy and the potential this technique has to offer for complications associated with sleeve gastrectomies.

Microlaparoscopic Sleeve Gastrectomy is Safe in the Community Setting: A Single Surgeon’s Experience

Rachel B Scott DO, Rima Ahmad MD, Randy L Tigue MD, Keith A Zuccala MD
Danbury Hospital

Introduction: Microlaparoscopic or “mini” laparoscopic instruments have been utilized in urology and obstetrics and gynecology for almost two decades. The use of such instruments correlates to decreased postoperative pain, decreased narcotic use and faster return to daily activities. In the field of general and bariatric surgery the use of such instruments is still in its early stages. Through this study we hypothesize that the utilization of microlaparoscopic trocars and instruments, defined as instruments 3mm in diameter or less, is a safe and effective method for sleeve gastrectomies in the bariatric population.

Methods: A single institution and surgeon retrospective study was conducted looking at laparoscopic sleeve gastrectomies from July 2008 until July 2015. Only microlaparoscopic procedures, defined as the utilization of three 3mm ports and one 15mm port for stapling and specimen extraction, were included in this study. Patient demographics, intra and postoperative complications, operative details and postoperative course were recorded for all patients.

Results: One hundred and eighty-six microlaparoscopic sleeve gastrectomies were conducted over the study period. There were 132 women and 54 men in the study group. The average age and body mass index was 45.5 and 46.8 respectively. There were no intraoperative complications or return to OR within 30 days in any patients. 3.7% of all patients had readmission to the hospital within 30 days.
Conclusions: The utilization of microlaparoscopic instruments is safe and effective in the bariatric population for sleeve gastrectomies. Length of stay, postoperative complication rates and readmission to the hospital are unaffected by the use of these instruments.

Surgical Quality, NSQIP and ERAS

Massive Transfusion Protocol in a Community Non-Trauma Setting: Is Blood Product Wastage Avoidable?

Olayemi Ajayi-Lamanna, MD, Sharon Weintraub, MD, Rekha Singh, MD, Noubar Kevorkian, MD
UCONN School of Medicine

Introduction/Purpose: Massive Transfusion Protocol (MTP) intending to resuscitate patients in life threatening hemorrhage (LTH), could be associated with excessive blood product (BPlr) wastage in a community non-trauma center. Once released, the life expectancy of BPlr is short if not preserved in Temperature Controlled Coolers (TCC) or returned in a timely fashion for recycling. The purpose of this pilot study is to provide a standard approach to BPlr resuscitation of patients with LTH, improve efficiency, and minimize wastage.

Methods: In March of 2016, we modified our MTP and renamed it Rapid Transfusion Protocol (RTP), which followed the principle of 1:1:1 BPlr replacement. The Blood Bank (BB) automatically released 6 units of each packed cells (RBC), plasma (FFP), and platelets now delivered in TCC. Communication was then mandated between the BB and resuscitating team regarding the decision to discontinue or proceed. We retrospectively reviewed all cases of LTH 5 months pre and post implementation of RTP, and performed comparison of BPlr usage and recycling between the 2 groups.

Results: Over the study period, 6 MTP and 6 RTP were activated in 11 patients, involving the release of 187 units of BPlr. LTH was due to gastrointestinal, post partum, or surgical hemorrhage. Gender, age (65.8 vs. 60.8 years), hemoglobin (7.2 vs. 6.8 g/dL), and mean arterial pressure (74 vs. 79 mmHg) were comparable between the 2 groups. MTP was associated with higher number of BPlr release per activation (17.1 vs. 13.8 units). Of the BPlr returned to the BB, there was a trend of less RBC wastage [5/13 (38.5%) vs. 0/8 (0%); P=0.037] and significantly less FFP wastage [18/22 (81.8%) vs. 10/18 (0%); P<0.001] with the RTP group.

Conclusion: Successful resuscitation of LTH in a community non-trauma acute care hospital setting requires a standardized approach. Release of the BPlr in TCC significantly reduces wastage and improves efficiency. This pilot study demonstrates that significant differences in product wastage, despite comparable utilization, can be achieved with a Rapid Transfusion Protocol.

Implementation of ERAS for Colorectal Surgery at HOCC: A Six Month Comparison of Outcomes

James Berry MD, Cynthia Ross-Richardson MS RN CNOR, Christine Bartus MD FACS FASCRS, Sharon Weintraub MD MPH FACS, Rekha Singh MD FACS
Hospital of Central Connecticut

Introduction: ERAS is a bundle of perioperative management principles designed to speed postoperative healing, decrease ileus, and expedite return to baseline state. There is no single ERAS protocol per se, but rather each institution implementing ERAS chooses their bundle based on their institution’s needs. The overarching concepts with ERAS for colorectal surgery are preoperative counseling, shortening the “NPO time” before surgery, decreasing intraoperative fluid load, minimizing perioperative narcotics, and early oral intake and mobilization. We hypothesized that implementation of our own ERAS protocol would result in decreased length of stay as well as a potentially decreased complication rate. We also considered that it would not increase readmission rate.

Methods: Our hospital began collecting data on our new ERAS protocol on 1/19/2016. We currently are looking at data from 1/19/2016 to 7/15/2016 and have 65 cases during that period. This data was compared to our pre-ERAS cohort of 27 cases from 2015.

Results: When compared to the pre-ERAS data from 2015 (n=27), the post-ERAS patients (n=65) had a decreased length of stay. The pre-ERAS group had an average length of stay of 4.8 days, while the post ERAS group had an average length of stay of 3.7 days. Preliminary data on complication rate demonstrated noninferiority to the pre-ERAS group, as well as no apparent change in the distribution of complication type.

Conclusions: Looking at our initial cohort of 65 patients during our early ERAS implementation, we are already finding advantages to this bundle. Continued use of our ERAS protocol and honing of our protocol to meet our facilities unique needs may offer further benefits. Data generated secondary to ERAS implementation will drive constant improvement of the system.

Antibiogram-Driven Antibiotic Selection Supersedes National Guidelines In Prevention Of Surgical Site Infections

Gopi Ukani MD, Logan Brady MBA, Kim O’Meara RN, J. Alexander Palesty, MD FACS, Philip Corvo MD MA FACS
Saint Mary’s Hospital

Introduction: Surgical site infections (SSIs) are one of the most common type of healthcare-associated infection (HAI). Accounting for nearly 30% of all HAIs, SSIs affect more than half a million patients annually. Although multiple
measures contribute to the prevention of SSIs, preoperative antibiotic selection sits at the forefront of these measures. This study provides evidence-based proof that preoperative prophylactic antibiotic selection based on local antibiograms supersedes national guidelines.

**Background:** In a 2014 study, at a single institution, local antibiogram analysis found that nearly 80% of microbes isolated from SSIs were resistant to the SCIP (Surgical Care Improvement Project) approved antibiotic given. Through antibiogram analysis, it was determined that adding gentamicin to the preoperative antibiotic regimen would result in a significant increase in bacterial coverage. Utilizing this data, a modified preoperative prophylactic antibiotic regimen was set in place for the upcoming year.

**Methods:** Using the data from the aforementioned retrospective study, a prospective study was initiated. During the calendar year of 2014, 19 of 90 elective colorectal surgeries were complicated by SSIs; 15 of which grew bacteria resistant to preoperative antibiotic given. Analysis of specific microbe antibiotic susceptibility demonstrated that the addition of gentamicin would greatly increase bacterial coverage. An adjusted, local antibiogram-driven, preoperative antibiotic protocol was set in place for all elective colorectal surgeries during the fiscal year of 2015.

**Results:** In 2015, 43 elective colorectal surgeries received SCIP recommended antibiotics plus one preoperative dose of gentamicin 5mg/kg/IV (adjusted for IBW and CrCl). Of the 43 patients in the study, only 1 patient had a SSI; a 2% SSI rate; compared to 21% the previous year. With a Chi² Fisher’s Exact Test p value of 0.0036, the results of this study are not only statistically significant; but also, clinically staggering.

**Conclusion:** As demonstrated in this study, evidence-based medicine dictates that preoperative antibiotic selection should be guided by local antibiogram analysis. At our own institution, antibiogram-driven modifications have been extended to the preoperative protocols of orthopedic and gynecological surgery. While national guidelines provide an important framework; moving forward, it is essential that independent institution-driven data be utilized in determining the optimal preoperative prophylactic antibiotic regimen. A universal paradigm shift is imminent.
Plastic and Reconstructive Surgery

Moderator & Judge:
Ibrahim M. Daoud, MD, FACS
Director, Minimally Invasive Surgery Center,
Saint Francis Hospital and Medical Center,
Private Practice, Connecticut Surgeons, LLC, Hartford, CT
The Hidden Cost of Cosmetic Surgery Tourism

Olayemi Ajayi-Lamanna, MD, David Lam, BA, Andrew Chen, MD
UCONN School of Medicine, John Dempsey Hospital, UCONN Medical Group

Introduction: There has been a recent increase in rates of cosmetic tourism in the United States and with this an increase in complications of having these procedures done abroad. This calls for the need to evaluate possible solutions to this new burden on our health care system. Through analysis of cases that have presented to the Emergency Department at UConn Health we hope to initiate a discussion and provide a greater sense of literacy to the general public about the potential risks and perils of seeking cosmetic surgery abroad. The intent of this review is not to belittle the quality of care of international caregivers but to simply demonstrate the potential pitfalls and complications that arise from receiving care beyond domestic borders.

Method/Case Description: The first patient is a 42-year-old Hispanic female who presented to the tertiary care facility status post abdominoplasty and gluteal fat augmentation in the Dominican Republic, 5 weeks prior to admission. She previously presented a month before due to “pain” associated with lower abdominal and lower back swelling with no associated infection. The swelling was due to post-operative seromas and the patient was seen by Interventional Radiology for drainage. Subsequently she was seen in the office by a plastic surgeon at UConn Health due to a recollection of fluid.

She then re-presentation to the Emergency Department at UConn Health reporting that the drain was not functioning and she started to have “pain and swelling” in her lower abdomen. The patient was once again worked up and showed no signs of infection. Upon further history taking the patient reported that she had her procedures done abroad because “it was cheap and fast”. She also stated that she was told to present with pain and swelling to receive post-operative treatment in the United States. She was told it was unlikely she would be unable to find a surgeon for post-operative care in the United States and she did not intend to fly back to the Dominican Republic for appointments. Once her work up was completed in the Emergency Department her seromas were once again drained and plans were made to follow up with the plastic surgeon in office.

Result/Conclusions: With the continuous rise in healthcare costs, Americans have consequently adjusted by seeking alternative routes to receive treatments for both medically necessary and elective procedures. Though the goal is to lower their healthcare cost due to inability to follow up with primary surgeon and complications due to difference in standards and expectations abroad. These patient have now caused an increase in healthcare cost for all and a burden on our system. They often are told to present to our Emergency Departments and even told what to say to receive treatment. Restricting free choice to seek medical care is not within the ethical rights of medical professionals. However, what can be done is ensuring better standards in cross-border care. Moreover, there must be additional regulations on advertisements in combination with public service announcements to ensure those that are giving care, are actually qualified to do so. Patients should become familiar with relevant laws for which they are traveling abroad. These efforts must be created in collaborated with multiple organizations both domestically and abroad to not only retain patients with a competitive global market, but more importantly for their general well-being.

Plastic and Reconstructive Surgery

Mutational Profile of Benign Vascular Tumors – The Yale Experience

Samuel Kim MD, Brandon Sumpio MD, Young H. Lim MD, Keith A. Choate MD, Deepak Narayan MD
Yale School of Medicine

Introduction: Vascular tumors are common neoplasms in infants and children and include benign infantile hemangiomas, congenital tufted angiomas (TAs), kaposiform hemangioendotheliomas (KHEs), and childhood lobular capillary hemangiomas/pyogenic granulomas (PGs). 5-10% of newborns present or develop these lesions within the first three months of life. While most of these lesions are benign infantile hemangiomas which typically regress by five years of age, TAs, KHEs, and PGs can become locally invasive and resistant to pharmacologic intervention. These lesions can cause significant problems in a growing child. Activating mutations in HRAS, KRAS, NRAS, GNAQ, and GNA11 have previously been identified as drivers of tumorigenesis in certain types of these vascular tumors. We share our experience of discovering recurrent somatic activating mutations in GNA14 and RAS.

Methods: We studied a cohort of congenital vascular tumors including 4 TAs and 3 KHD and 63 LCHs/PGs arising in childhood. The study protocol was approved by the Yale Human Investigation Committee, and subjects’ written consent was obtained prior to participation. We screened blood and tissue samples using whole-exome and Sanger sequencing performed by the Yale Center for Genomic Analysis. We screened for mutations across all exons of HRAS, KRAS, NRAs, BRAF, GNAQ, GNA11, and GNA14.

Results: We found somatic activating GNA14 c.614A>T (p.Q205L) mutations in one KHE, one TA, and one PG and a GNA11 c.547 C>T (p.R183C) mutation in two PG lesions. Additionally, we found a heterozygous KRAS c.35G>A (p.G12D) mutation, a heterozygous NRAS c.181C>A (p.Q61K) mutation, and heterozygous HRAS mutations (c.182A>G [p.Q61R], c.145G>A [p.E49K], c.37G>A [p.G13S]) across several PGs. By examining mutation pathobiology via expression of mutant GNA14 or GNA11 in primary human endothelial cells and melanocytes, we observed that GNA14 and GNA11 mutations upregulated the MAPK pathway which induced changes in cellular morphology and rendered cells growth-factor independent. Additionally, RAS is already known to interact with the MAPK pathway and is associated with angiogenesis and vascular proliferation.

Conclusion: Our findings identify GNA14 and RAS mutations as a cause of childhood vascular tumors and offer insight
Teaching an Old Dog New Tricks: The Composite Extended Paramedian Forehead Flap – A Cadaveric Study and Clinical Applications

Sabrina Pavri MD MBA\(^1\), Brandon Sumpio BA\(^1\), Alain Kaldany BA\(^1\), Ajul Shah MD\(^1\), Andrew McGregor MD\(^1\), Faith Muchemwa MD\(^2\), Godfrey Muguti MD\(^3\), Flora Levin MD\(^3\), Deepak Narayan MD\(^4\)

\(^1\)Yale University School of Medicine, Department of Surgery, Section of Plastic and Reconstructive Surgery
\(^2\)University of Zimbabwe, Department of Surgery
\(^3\)Yale University School of Medicine, Department of Ophthalmology and Visual Sciences

Introduction: The classic paramedian forehead flap is one of the most commonly used pedicled flaps for nasal reconstruction. Variations in the size and shape of the classic paramedian forehead flap have been described extensively, including a version that included the galea distally to recreate the nasal lining in lower third nasal defects. However, all existing descriptions have limited the lateral extension of the flap to its cutaneous footprint.

Previous anatomical studies have found that the supratrochlear artery traverses the supraorbital rim and divides quickly into deep and superficial branches. It has been demonstrated that the periosteum and the frontalis-galea layer of the forehead can remain independently vascularized from an anterior (supraorbital/supratrochlear) pedicle as long as the dissection remains at least 10mm cephalad to the supraorbital rim.

Methods: Six cadaver heads were used to analyze the vascularity of the composite extended paramedian forehead flap. In four of the cadaver heads, following flap dissection methylene blue was injected into the internal carotid artery to confirm perfusion of the frontalis and periosteum outside of the cutaneous footprint (Figure 1 and 2). In the remaining two cadaver heads, following flap dissection the internal carotid artery was injected with a mixture of Omnipaque and gelatin and the heads were imaged with a microCT scan to confirm the vascular anatomy.

Three selected patients of the senior author underwent the reconstructive use of the composite extended paramedian forehead flap for reconstruction of an orbital exenteration, a heminasal Mohs defect, and a total rhinectomy defect.

Results: Methylene blue injection confirmed vascular flow to the lateral frontalis and periosteum of the extended composite forehead flap. They will be evaluated by microCT to confirm our hypothesis on imaging studies.

Our senior author has used the composite extended paramedian forehead flap in three separate clinical cases with successful results. Intraoperative dissection of one of the flaps used is shown in Figure 3. The use of indocyanine green assisted imaging was used in two of the three cases to confirm viability of the extended lateral portion of the flaps. There was no evidence of any flap complications in the selected cases.

Conclusion: The composite extended paramedian forehead flap can be used successfully in single stage reconstruction of large nasal and orbital defects that would otherwise require several staged procedures or free tissue transfer.

A Novel Technique For Spinal Wound Closure

Basil Nwaoz MD, Rafael Magana MD
Stamford Hospital

The objective of our study is to introduce a modified technique for paraspinal muscle flap surgery used to salvage infected hardware and to prevent and treat wound infections. Infected posterior spine wounds can present a difficult problem following spinal surgery with hardware implantation. The treatment of this condition can be challenging for reconstructive surgeons and re-infection with further complications can occur if the complication is not well managed initially. Retaining the hardware is of utmost importance since it maintains stability of the spine and decreases wound healing complication rates.

Our technique involves the lateral release of the paraspinal muscles while maintaining its vascular pedicle and avoiding ligating any perforators. We use a modified component separation technique, release the paraspinal muscles laterally and advance the muscles medially. We then use a Lembert closure technique (commonly seen in hand sewn bowel anastomosis) to approximate the muscles for imbrication and closure of the midline dead space. We believe that the classic technique (Wilhemi et al) which involves ligation of the medial paraspinal muscle perforators followed by elevation, advancement, and simple interrupted closure of the medial portion of the muscle leads to failure of hardware salvage and increased incidence of recurrent infection.

Our study currently includes a sample of 8 patients who underwent spinal surgery with instrumentation. All subjects underwent wound closure with bilateral paraspinal flaps using the above described technique. Duration of surgery, wound healing complications, and length of hospital stay were evaluated.

There were no incidences of recurrent wound infections, wound dehiscence, post op bleeding, or hardware failure noted. Operation times were comparable to the classic technique and did not show any significant difference. In conclusion, our modified paraspinal flap closure technique is an excellent choice for spinal wound closure and reconstruction, wound infection control and spinal hardware salvage. Operative time was comparable to the classic technique.
**Basal Cell Carcinoma? Compliance Issues? How do you Proceed?**

Rami Al-Aref MD, Jennifer Bishop MD, Kevin Dwyer MD
Stamford Hospital

**Introduction:** The annual incidence of non-melanoma skin cancers (NMSC) which includes both Basal and Squamous Cell Carcinoma (BCC and SCC) easily exceed one million cases per year in the United States with the ratio of BCC to SCC being approximately 4:1. The increasing incidence of NMSC requires prompt diagnosis and effective treatment to maximize patient safety. BCC is the most common skin cancer and generally presents on areas that are consistently exposed to sun-light or UV Radiation. Derived from epithelial cells, these tumors have multiple histological subsets and can manifest with varying clinical presentation and severity.

**Method(s):** Case Report

**Results:** This case was unique with its presentation of BCC in a patient who has struggled with compliance issues. Our patient was a 58-year-old gentleman with a past medical history that included psoriasis, poorly-controlled diabetes, chronic renal insufficiency, pulmonary embolus, and heroin abuse. He noted a wound that had developed on his forearm that was not healing and decided to clean the wound using sand-paper. The patient was eventually referred to our wound clinic where the lesion was evaluated per a routine work-up which included a biopsy. Pathology revealed that our patient’s non-healing wound was nodular basal cell cancer. Treatment options were discussed and we determined that surgical excision with a Limberg or rhombdoid rotational flap for closure of the remaining defect was the most appropriate plan. After medical optimization and clearance were obtained, the patient was taken to the operating room where we proceeded to excise the lesion with approximately 8 mm of normal appearing skin circumferentially. The final wound measured 4.5 cm x 4 cm. These measurements were then extrapolated and marked 4.5cm x 4.5 cm to create our rhombdoid rotational flap using the adjacent skin on his medial forearm. The tissue underlying the flap was undermined with the subsequent flap being rotated into place followed by dermal reapproximation and definitive closure.

**Conclusions:** Nodular BCC is one of the most common subtypes of BCC and tends to initially present with “peary papules”. With time, the centers of these lesions will ulcerate and the edges will begin to roll giving the appearance of what is known as “rodent ulcers”. Given their ulcerating centers, they can easily be mistaken as wounds by patients. Moreover, from a clinical perspective, these lesions can also be confused with psoriasis or other eczematous lesions due to their pink and scaly nature. This becomes exceptionally important in the context of our patient with a history of psoriasis and delineates the importance of careful examination of all lesions. Our decision to use the Limberg flap to close our defect was based on the unique versatility of this flap. It provides a random pattern flap that can arise from any corner of the rhombdoid that affords tissue with similar thickness and color along with good vascularity and minimal tension. Our patient’s complicated medical history partnered with his difficulties with compliance afforded us the opportunity to create an effective closure without potential complications associated with a full-thickness skin graft.

**Niche Reconstruction of Abdominal Wall Defects**

Samuel Kim MD, Gloria R. Sue MD, Samuel Buonocore MD, Deepak Narayan MD
Yale School of Medicine

**Introduction:** Reconstruction of complex abdominal wall defects presents a major surgical challenge due to surgical morbidity and high rates of recurrence, infection, and failure. We present novel surgical techniques for niche reconstruction of complex abdominal wall defects along with case presentations. These techniques include a novel technique for underlay mesh placement (figure 1), a deepithelialized flap closure (figure 2), a prelaminated tensor fascia lata myofascial flap (figure 3), and a retroverted tensor fascia lata flap.

**Methods:** A series of 19 patients aged 23 to 84 years underwent reconstruction for complex abdominal defects using one of the aforementioned techniques at Yale-New Haven Hospital between October 2009 and September 2015. The defects were from various causes (e.g. motor vehicle accident, cancer, diverticulitis, inflammatory bowel disease, etc.) and many had prior failed reconstructions.

**Results:** All patients who underwent reconstruction using the aforementioned techniques had no major postsurgical complications. The most common complication was seroma at the donor or surgical site which was treated with drainage. All patients continued to have stable repairs after surgery without recurrence, infection, or reoperation over a mean follow-up of 15 months. Some patients reported subjective improvement in performing activities of daily living based on the Likert scale.

**Conclusions:** While a wide spectrum of reconstructive techniques exists, there is no standard approach to the repair of complex abdominal wall defects. Every reconstruction must be individually tailored to each patient while considering all surrounding factors. The novel surgical techniques described above provide viable options for complex abdominal wall defect reconstruction while minimizing recurrences and complications.
Experimental Phage Therapy to Treat a Persistent Pseudomonas aeruginosa Infection Associated with an Aortic Dacron Graft

Benjamin Chan PhD1, Paul E. Turner PhD1,2,3, Samuel Kim2, Hamid R. Mojibian MD4, John Elefteriades MD5, Deepak Narayan MD
1 Department of Ecology and Evolutionary Biology, Yale University
2 Program in Microbiology, Yale School of Medicine
3 Department of Surgery, Section of Plastic Surgery, Yale School of Medicine
4 Department of Radiology, Yale School of Medicine

Introduction: Pseudomonas aeruginosa infections are notoriously difficult to manage due to their intrinsic antibiotic resistance and ability to form biofilms. Due to frequent failure of conventional antibiotics, alternative strategies are urgently needed. One such strategy, ‘phage therapy,’ is the application of lytic bacteriophages (phages) for the eradication of bacteria. We recently identified phage OMKO1 that utilizes the outer membrane protein M of the mexAB- and mexXY- multidrug efflux systems of P. aeruginosa, forcing bacteria to trade acquisition of phage resistance for increased antibiotic sensitivity (Figure 1). We present our study on the use of OMKO1 to treat biofilm-associated Pseudomonas infections on sections of Dacron graft as well as a case presentation of its use in vivo.

Methods: Biofilms were grown on sections of Dacron using cultures of P. aeruginosa isolated from our case patient. The sections of Dacron were then exposed to LB medium containing purified OMKO1, ceftazidime or ciprofloxacin at 2 x MIC, antibiotic at 2 x MIC + OMKO1, or blank control. Dacron sections were then removed and cell density measured with an automated spectrophotometer.

Results: Addition of phage OMKO1 to either ciprofloxacin or ceftazidime eliminated biofilms grown on Dacron sections (p = 0.001, ciprofloxacin and p = 0.007, ceftazidime) and was, itself significantly different than no treatment (p = 0.001). However, neither ciprofloxacin nor ceftazidime at 2 x MIC was sufficient to eliminate 72 hour biofilms (p = 0.074, ciprofloxacin; p = 0.063, ceftazidime).

Case Presentation: An 81-year old male with a chronic P. aeruginosa infection of his aortic arch Dacron graft with fistulization to the chest wall was treated with topical application of OMKO1 and ceftazidime through his chest wall fistula. The Food and Drug Administration and Yale University Human Investigation Committee gave their approval for the use of OMKO1 as an investigational new drug. The patient went on receive emergency surgery for partial removal of his Dacron graft for bleeding from an aorto-cutaneous fistula. Cultures of the Dacron graft only revealed growth of Candida, and the patient has remained off antibiotics post-surgery without evidence of recurrent infection.

Conclusion: The application of phage OMKO1 in conjunction with antibiotics could aid in the removal of P. aeruginosa biofilms resistant to traditional antibiotic treatment. As alternative therapies are considered to combat antibiotic resistant bacterial infections, phage therapy may provide a promising future.

Plastic and Reconstructive Surgery

Multiple Xanthogranulomas in the Setting of a Retropectoral Silicone Breast Implant

Borna D. Dabiri MD, PhD, Kostantinos Poulikidis, MD, MA, Zandra H. Cheng, MD, Leif O. Nordberg MD, Elgida R. Volpicelli, MD, FCAP
Stamford Hospital

Introduction: In 2011, the FDA identified a possible association between breast implants and the development of anaplastic large cell lymphoma (ALCL). This has led to a heightened awareness among surgeons in evaluating a mass in a patient with breast implants. Here we report the case of a 29 year old Hispanic female with retropectoral silicone breast implants with a palpable, enlarging right breast mass and was found to have multiple xanthogranulomas (XGs) in the capsule surrounding the right implant. XGs represent a rare subset of histiocytic cell disorders that consist of reactive non-Langerhans cells. There are two main types: juvenile XGs, which typically occur as cutaneous lesions usually arising in the first 5 years of life, and multiple XGs in adults, either in the setting of an inflammatory process or malignancy, usually hematologic.

Methods: Case report and search of the literature on extracutaneous xanthogranuloma.

Results: In 2014, the patient palpated a right breast mass in the upper outer breast. Initial breast ultrasound evaluation revealed three nodules in the right breast that exhibited an interval increase in size over the course of 1.5 years. These nodules ranged from 0.5 x 0.3 x 0.1 cm to 2.0 x 1.8 x 0.4 cm and reported to have an imaging appearance consistent with a benign breast lesion. They were located directly anterior to the silicone breast implant and due to their growth, a surgical biopsy recommendation was made. However, on physical exam, it was not clear that the palpable lesion of concern was within the breast parenchyma. Therefore, additional diagnostic imaging including mammography and ultimately, breast MRI demonstrated the lesions to be within the capsule of the retropectoral implant. Due to the potential for a malignant process (i.e., ALCL), an oncologic and plastic surgeon team approach was planned. Intraoperatively, three yellow-colored masses were identified in the anterior capsule (retropectoral) and excised. Moreover, a similar, pedunculated nodule was found and excised from the chest wall in the posterior capsule. Given the overall benign...
appearance of the lesions, a new implant was placed and the wound closed, with clinical management to be directed by final pathology. Initial histologic evaluation revealed that all four lesions were identical demonstrating a “sea” of histocytes, numerous admixed lipidized histocytes, and rare Touton giant cells. Immunostains of representative sections from the specimens were focally positive for S100 and diffusely positive CD163, a histiocytic marker. Diffuse positivity for CD13, CD4, and CD11c with negativity for clusterin confirmed the diagnosis of a non-Langerhans cell histiocytosis. Taken together, these results confirmed the diagnosis of XG, which of note, was found to be closely associated with an area of synovial metaplasia. The complete surgical resection of the lesions was therefore an adequate treatment.

Conclusions: With the increasing number of elective, cosmetic breast implant procedures being done worldwide, the evaluation of an enlarging breast mass in this population must be performed with careful attention to the location of the mass relative to both the implant and native breast tissue with careful surgical planning for possible malignant and benign etiologies. Breast MRI is often helpful in this patient population over conventional breast imaging in its ability to demonstrate the lesion relative to the implant, chest wall, and breast tissue. To our knowledge, only one other case report has described XG in the setting of a silicone breast implant where the implant had ruptured. No frank rupture was evident in our patient, although minimal leakage was identified.

Clinical Value of SPECT for Sentinel Lymph Node Identification in Melanoma

Andrew McGregor MD1, Samuel Kim MD1, Deena Abbate RN BSN1, Antonio Obando MD2, Deepak Narayan MD1
1 Yale University School of Medicine, Department of Surgery, Section of Plastic and Reconstructive Surgery
2 Yale University School of Medicine, Department of Nuclear Medicine
3 West Haven VA Hospital, Department of Surgery.

Introduction: Sentinel lymph node biopsy is indicated for melanoma thickness greater than 0.75mm. Lymphoscintigraphy and blue dyes have remained the gold standard for identifying sentinel lymph nodes. Single photon emission computed tomography (SPECT) has been used as an adjunct imaging modality for identification of sentinel lymph nodes. With this study, we aim to demonstrate the limited clinical value of SPECT in melanoma patients undergoing sentinel lymph node biopsy.

Materials and methods: A retrospective chart review was performed at the West Haven VA hospital. Inclusion criteria for our review were melanoma with a thickness greater than 0.75mm and SPECT use prior to operative sentinel lymph node excision. Exclusion criteria were clinically palpable lymph nodes, evidence of distant metastatic disease, and melanoma in situ. SPECT imaging and operative reports for lymph node biopsy were obtained. Results of SPECT and operative excisions were compared for accuracy of identification of sentinel lymph nodes.

Results: 24 patients between 2011-2015 met criteria. The anatomic locations of melanomas are listed in table 1. One merkel cell carcinoma of the arm was included. Average depth of melanoma was 2.14mm. Operative sentinel lymph node excisions were performed on all patients. There was no change to operative plan for the sentinel lymph node excision after SPECT. SPECT correlated with sentinel node biopsy in 20 of 24 cases. Of the 4 SPECTs that did not correlate, one misread the location of a sentinel node and three failed to have uptake of radiotracer in the scan. All cases of operative sentinel lymph node excision correctly identified the sentinel lymph node. 6 patients underwent formal lymphadenectomy after sentinel lymph node biopsy.

Conclusion: SPECT offers limited clinical value as an adjunct imaging modality for identification of sentinel lymph nodes in patients with melanoma.

References

Table 1

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<td>Arm and Hand</td>
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Specialty Surgery

Moderator:
Kevin Pei, MD, FACS, Assistant Professor of Surgery
Yale School of Medicine, New Haven, CT

Judge:
Richard Weiss, MD, FACS
Associate Professor of Pediatrics, Surgery,
Traumatology and Emergency Medicine,
University of Connecticut School of Medicine;
Associate Professor of Surgery and Pediatrics,
Frank H. Netter MD School of Medicine, Quinnipiac University;
Connecticut Children’s Medical Center, Hartford, CT
Presentation And Management Of Upper Extremity Ischemia Following Self-Injection Of Crushed Oral Medication: A Case Series And Review Of The Literature

Nicholas Dugan MD, Hoyune Cho MD, Christopher Scola MD, Zendee Elaba MD, Alan Babigian MD
UCONN School of Medicine, Hartford Hospital

Introduction: Extremity ischemia following accidental injection of crushed oral medications is a rare event. However, morbidity is significant with amputation rates approaching 40%. Treatment regimens contain a wide variety of modalities all of which include anticoagulation. Successful treatment has been observed to be dependent on rapid diagnosis and initiation of treatment, usually within 14-24 hours after injection. Diagnosis can sometimes be difficult because of how rare it occurs and symptoms may mimic other disease processes such as soft tissue infections or vasculitis. We present a case series of accidental intra-arterial injection of crushed oral drugs causing upper extremity ischemia.

Methods: Cases at Hartford Hospital involving upper extremity ischemia following injection of crushed oral medications, were reviewed from 2006-2016. Three cases were identified. Presentation, management and outcomes were compared to previously reported cases and case series in the literature.

Results: Case 1: A 35 year old male with no history of drug abuse who presented with right hand pain, erythema, and cyanosis. Pulses were intact, CT angiography demonstrated normal vasculature, and the patient denies drug abuse. After consults to hand surgery, vascular surgery, rheumatology, and infectious disease, a diagnosis of vasculitis vs soft tissue infection was made. He was treated with antibiotics and steroids with some improvement. However he would return soon after discharge with worsening of his symptoms and ulcerations on his fingertips. Pathology from a punch biopsy revealed crystals within a arterial thrombus within the dermis. He eventually admitted to injecting crushed oral Zofran when taking it by mouth did not relive chronic nausea he was being treated for. He was treated with pain control and was told to follow up for debridement vs amputation once demarcation occurred. He was lost to follow up.

Case 2: A 51year old female who presented with pain in right upper extremity immediately following self-injection of crushed Dexedrine pills into the antecubital fossa. She presented with severe pain, swelling, motting, and dusky discoloration of the right forearm and hand. She had decreased sensation to the hand and no motor ability. Hand was cool to touch. The patient was taken to the operating room urgently for an attempt at limb salvage. Angiography demonstrated vascular spasm throughout the forearm and thrombus with severely limited flow within the deep and superficial arch. She was treated with a heparin drip, catheter directed TPA, and papaverine. Therapy has limited results and she would require a fasciotomy of the forearm and hand. The extent of soft tissue damage would progress despite therapy and amputation of the distal forearm was required.

Case 3: A 54 year old female presented approximately 12 hours after admitting to injecting crushed Percocet into her left antecubital fossa. She complained of pain in her left forearm, on exam it was swollen and tense, fingers had decreased sensation, and pain was elicited on passive motion. Ct angiogram demonstrated patent vasculature. An emergent volar forearm fasciotomy was performed for compartment syndrome. On discharge the patient had sensation and improved motor function, she was discharged with wound care but was lost to follow up.

Conclusion: Extremity ischemia caused by accidental arterial injection of crushed oral medications is a rare event. Diagnosis can be difficult without an admission of injection. Because early treatment is important, clinicians should include accidental arterial injection in their differential diagnosis despite a normal angiogram and lack of drug use history. Multiple treatment regimens have been used however permanent injury remains prevalent. Steroid therapy has shown some promise of improving outcomes however no significant studies have been performed.

Intrathoracic Malignant Peripheral Nerve Sheath Tumor Compressing the Trachea in an 18 Year Old Male with a History of Neuroblastoma Status Post Resection, and Chemotherapy

John Calhoun, MD. Michael Bourque, MD. Stamford Hospital

Case Abstract: Malignant peripheral nerve sheath tumors (MPNST) are rare, aggressive sarcomas presenting most commonly in adults over the age of 20, with an incidence of 0.001% in the general public. Nearly half of MPNST’s are found in patients with Neurofibromatosis type-1 (NF-1), and a diagnosis of NF-1 carries with it a markedly increased relative risk. MPNST found in the extremities is most common, followed by the head and neck, and the chest wall. Uncommonly, these tumors are found in the intrathoracic cavity. Generally, treatment requires complete surgical excision of the mass and may be paired with radiotherapy and, in some cases, chemotherapy; however, due to limited treatment and outcome data, each patient must have a carefully designed and unique treatment plan. Even with complete resection, outcomes are typically poor. Reported is the case of an 18 year old male with NF-1 and a history of Neuroblastoma 16 years prior, treated with surgical resection and chemotherapy who presented with exertional chest pain and was found to have a large right sided intrathoracic mass with significant tracheal compression and involvement of other important intrathoracic structures. Preliminary biopsies revealed a spindle cell tumor and the patient ultimately underwent a thoracotomy and macroscopically complete resection of the mass. The location of the mass and the patient’s tenuous respiratory reserve dictated a conscious fiberoptic intubation and a complex and technically challenging dissection. Our patient did well post operatively, pathology confirmed MPNST, and he is currently scheduled to undergo radiotherapy with the medical oncology team. This case represents one of a small number of reported cases of intrathoracic MPNST in an adolescent (with or without NF-1) and describes a complex surgical resection and planned adjuvant radiotherapy that will add another
A Novel Fibrin Sealant Patch In Patients Undergoing Non-Clamped Open Partial Nephrectomy

Charles R. Litchfield¹ John A. Libertino².
¹Dept't of General Surgery, St. Mary’s Hospital, Waterbury, CT, ²Institute of Urology, Lahey Clinical Medical, Burlington, MA

Introduction and Objective: This case series aims to provide the urologic surgeon with experience to support the use of a hemostatic agent previously unused in the field of urology. It will show how this agent can help to achieve safe and effective hemostasis following resection of renal masses presenting particularly complex anatomy.

Methods: 75 patients undergoing open, non-clamped partial nephrectomies by a single surgeon for malignant and benign renal masses over 14 months were included. Hemostasis of large vessels was performed with suture ligation and augmented with the use of a hemostatic agent composed of an oxidized reduced cellulose scaffold interwoven with polyglactin 910 and a combination of lyophilized human fibrinogen and thrombin impregnated onto the scaffold. Each case was evaluated for multiple operative parameters including a nephrometry score.

Results: The average blood loss among all cases was 1054cc (±1145 95% CI) owing to the large variation in complexity of each case. 52 out of the 75 cases required no transfusion, and among the cases with volume replacement needs there was only one nephrometry score of 7, four of 8, and the remaining eighteen were 9 or 10. Patients required an average of 0.97 units of blood (±1.92 95% CI) units again showing the diversity of cases. The histologies noted were clear cell (61.3%), papillary (16.0%), benign (16.0%), cystic (9.3%), chromophobe (4.0%), and SDH (1.3%). 8% of patients required ureteral stents post-operatively and 14% had peritoneal drainage inconsistent with serum. All cases of leakage from the collecting system were adequately managed conservatively. No post-operative hematoma formation was observed in any case.

Conclusions: This study describes the first experience with a novel hemostatic agent to be used in the field of urology. It has shown safe and effective use as an excellent adjunct to the hemostatic armamentarium of the urologic surgeon.

Differing Methods Of Peritoneal Flap Closure In Laparoscopic Trans-Abdominal Preperitoneal Hernia Repair Affects Post Operative Pain And Narcotic Usage

Kristin McCoy MD, Ryan Duggan MD, Harold Neyra DO
Stamford Hospital

Introduction: The first laparoscopic inguinal hernia repair was performed in 1982 by Ralph Ger. Today, it is reported that more than 600,000 laparoscopic inguinal hernia repairs are performed annually. Two standard techniques exist for hernia repair: transabdominal preperitoneal repair (TAPP) and total extraperitoneal repair (TEP). TAPP repair involves the formation of a peritoneal flap through which the hernia is reduced and a window is created in the preperitoneal space to input mesh. The closure of the peritoneal flap can be accomplished by various methods such as tacking, suturing or stapling. This study targets the comparison of the immediate postoperative pain between two of the aforementioned techniques: suturing and tacking.

Objectives:
1. Analyze immediate postoperative pain in patients who have undergone TAPP inguinal hernia repair
2. Compare postoperative narcotic requirements between peritoneal flap closure with suturing vs. tacking
3. Compare multiple methods of peritoneal flap closure

Hypothesis: Patients who undergo peritoneal flap closure, or TAPP, through suturing method will have decreased immediate postoperative pain and require less narcotic usage compared to tacking

Methods: Patients who underwent TAPP hernia repairs at Stamford Hospital between March and August 2016 were recorded as the study population. Patient’s postoperative pain score was reviewed immediately postoperatively and at 3 hours after surgery using the standardized recovery room pain scale. Narcotic usage in the immediate postoperative period was recorded.

Results: At Stamford Hospital, 13 patients underwent TAPP hernia repairs. Of the 13 TAPP hernia repairs, 3 were bilateral and 8 were unilateral. Suture repair of the peritoneal flap was done in 4 of the patients and tack repair was done in 9. The study population (13) ranged in age from 43 to 88. 11 of the 13 patients underwent transversus abdominis plane (TAP) blocks for postoperative pain control.

After analyzing the data we found the length of hospital stay was found to be similar between the two groups (P<0.05). Postoperative pain immediately after surgery was found to be decreased in the suturing group (p=0.028). Post operative pain at 3 hours after surgery demonstrated no statistical difference. (p=0.343). Narcotic requirements were lower in the suture group. (p=0.048)

Conclusion: Suturing the peritoneal flap is an acceptable method to be utilized during TAPP repair. Suturing demonstrated less narcotic requirement in the immediate post operative setting. Additional research needs to be conducted to determine if suturing is superior to tacking closure of the peritoneal flap. This study will serve as a foundation to analyze patient pain against peritoneal flap closure methodology in long-term postoperative record review at Stamford Hospital, and to ultimately confirm optimal closure technique.

Pushing The Limits: Successful Deployment Of Ovation® Stent Graft Resulting In Complete Exclusion Of An Abdominal Aortic Aneurysm (AAA) With Extremely Challenging Neck Anatomy And A 9 Month Favorable Followup

MT Rishi, G Gersten, A Richi.
Saint Mary’s Hospital
Introduction/Objective: Extreme complex aortic neck anatomies with angulation more than 60 degrees still represent the major limit to the endovascular repair for infra-renal abdominal aortic aneurysm (AAA). Here we report a case in which a patient with a challenging abdominal aortic aneurysm (AAA) neck anatomy with angulation more than 70 degrees underwent an endovascular repair using Ovation® Abdominal Stent Graft Platform.

Methods: A 69 year old male was found to have a large 7.9 cm infra-renal AAA. The aneurysm neck (27 mm in length) demonstrated severe left to right angulation of approximately 70° with minimal intimal calcification. Single widely patent bilateral renal arteries were also noted.

Results: The patient was taken to Operating room where both Interventional Radiology and Surgical Staff prepared for the challenging case. The inferior most renal artery was cannulated via percutaneous brachial artery access. After performing bilateral open groin cut down, both of the femoral arteries were accessed. The main body delivery system for an Ovation device was advanced over the left groin guide-wire. The graft polymer was introduced using auto-injector and left in place for 14 minutes during which time the endoskeleton of the graft was noted to fill with the radiopaque polymer. The delivery systems for both of the limbs were advanced over the groin guide-wires. The final abdominal aortogram demonstrated widely patent bilateral renal arteries, positioning of both O rings within the aneurysm neck, brisk opacification of both graft limbs and the adjacent native iliac arteries, and no evidence of endo-leak. Given the concern for possible graft kink at the level of the severely angulated neck, intra-arterial pressures were measured from the abdominal aorta above the graft and from the left external iliac artery that showed absence of a significant pressure gradient across the stent graft consistent with the absence of a significant kink. Three and nine month follow-up showed complete thrombosis of the aneurysm sac and no evidence of endo-leak.

Conclusion: With the Ovation® Abdominal Stent Graft Platform, we can create a customized seal by filling the graft’s conformable O-rings with polymer, effectively completing the last step of the manufacturing process in vivo.

Phaeohyphomycosis Presenting as a Right Index Finger Mass in a Renal Transplant Patient

Jack Dowdle, MD, Elgida Volpicelli, MD, John Tedesco, MD
Stamford Hospital

Introduction: A 62 year old male with a past medical history of HTN, thoracic aortic aneurysm repair, mechanical AVR, ESRD, and kidney transplant in 2013 presented with a 2 month history of a mass on the dorsum of the right index finger overlying the middle phalanx. He denied any trauma to the area, but did report that over this time the mass had been steadily increasing in size, and that he had some mild aching pain when making a tight fist. With regards to his left hand he reported having an injury to his 5th digit many years ago which required surgical correction. On review of systems, he denied any febrile episodes, weight loss, night sweats, rash, or growths on any other areas. On physical exam he had a large, rubbery, tender mass on the index finger overlying the middle phalanx. Range of motion was intact, and there was no neurovascular compromise. Xray of the right hand revealed a soft tissue shadow along the right index finger but no skeletal abnormalities, and preoperative labs were all normal. The patient was scheduled for the OR for excision of deep soft tissue mass and right index finger and extensor tenolysis. Initial pathology demonstrated exuberant giant cell reaction and diffuse acute inflammation in the setting of pigmented hyphae in tissue, highly suggestive of phaeohyphomycosis. Final pathology with PAS and GMS special stains highlighted numerous hyphae confirming the diagnosis of phaeohyphomycosis. The patient is for a follow up appointment in the next 2 months, and will be monitored closely.

Methods: Review of literature for phaeohyphomycosis and chart review.

Results: Phaeohyphomycosis is a broad fungal category which encompasses over 100 species and 60 genera of fungi in a variety of clinical syndromes. Histologically, it is characterized by septate dark hyphae, pseudohyphae, and yeasts in tissue samples that stain positive with Fontan-Masson. In general, these fungi tend to be found in moist tropical and subtropical environments, and typically grows on decaying vegetation, wood or soil (Kollipara et al.). One common feature among all species of phaeohyphomycosis is the presence of melanin in the cell wall. It gives it the characteristic dark color, and is believed to play an important role in the pathogenesis of infections. One belief is that melanin confers a protective advantage by scavenging free radicals and hypochlorite produced by phagocytic cells during the oxidative burst. Furthermore, additional research shows that melanin is involved in the formation of the fungal appressorium, the structure penetrates host cells (Revankar et al).

Phaeohyphomycosis encompass a variety of clinical syndromes, ranging from keratitis and solitary subcutaneous nodules to fulminant rapidly disseminated disease. Most species are considered opportunistic pathogens and will effect immune compromised patients.
patients. A recent population study of 53 patients from multiple transplant centers reported a 9.4% incidence of phaeohyphomycete infections in liver and heart transplant patients (Husain et al). Interestingly in some rare instances immunocompetent patients have also been affected. Infection is believed to occur when normal barriers are broken (traumatic inoculation/surgery), or when host defenses are weakened. One case report by Chahal and colleagues reported an immunocompetent patient who had undergone a single steroid injection in the region of the A1 pulley of the left middle finger for stenosing tenosynovitis, who then went on to develop a nonspecific mass along the FDP tendon, leading to complete flexor tendon rupture.

Current therapeutic options for disseminated disease include combination therapy with amphotericin B with azoles, but they are typically ineffective with mortality approaching upwards of 80%. For local disease mass excision is curative, but a course of combination therapy may also be indicated in select cases (Husain et al).

Conclusions: Phaeohyphomycosis is typically an opportunistic infection that can effect immunocompromised patients such as transplant patients and patients on chemotherapy. In our case the patient had received a kidney transplant in 2013 and had been on immunosuppression therapy since that time and is at risk for developing such an infection. Our patient denied any trauma to the area, making direct inoculation less likely, and favoring a break down in host defenses due Cellcept immune modulating therapy. Although rare, Phaeohyphomycosis should be in the differential diagnosis in immunocompromised patients presenting with a new onset subcutaneous mass.


Epidermal Cyst Presenting In The Setting Of Prior Myelomeningocele: A Pediatric Case Report

Bennett Weinerman MS; Lawrence Kashat MD MSc; Paul Kanev MD, Christine Finck MD*

*Department of Pediatric Surgery and *Department of Pediatric Neurosurgery, Connecticut Children's Medical Center and the University of Connecticut School of Medicine

Introduction: Epidermal cysts may arise wherever there is squamous epithelium, presumably from sites of previous trauma and or surgery. They may be congenital or acquired. When epidermal tissue is sequestered in the dermis, the tissue undergoes progressive desquamation and keratin breakdown; leading to the commonly found contents of tissue, debris, keratin, water and solid cholesterol.

Case: A 2-year-old Caucasian female with a previous history of a myelomeningocele in the L4-L5 region complicated by hydrocephalus, status post repair and ventriculoperitoneal (VP) shunt 27 months prior to presentation was found to have a large cystic lesion centered in the presacral space on routine follow-up MRI imaging of neuro axis; imaging the brain and spinal cord. Her myelomeningocele was diagnosed in-utero and was repaired conventionally on day 1 of life following elective cesarean-section. Her repair involved trimming the remnants of the meninges and skin directly to the edge of the neural placode. The skin closure at that time was vertical and midline. She had been requiring chronic catheterization as well as Mirilax daily for chronic constipation since her repair; however, her parents had not noticed any changes in behavior or obvious masses. After discussing management options with the patient’s family and consulting with her neurosurgeons, it was decided to resect the mass. Prior to the procedure, complete blood count and Alpha Fetal Protein (AFP) were obtained and found to be within normal limits (AFP 3.6 (Range 0.5-11ng/mL)). MRI with and without contrast revealed a multilobular cystic lesion centered in the presacral space that deviated to the rectum to the right measuring approximately 4.1 x 4.5 x 6.5 (Figure 1a, b).

Multiple internal septations demonstrated enhancement, with no obvious connection to the spinal canal or osseous structures of the sacrum or coccyx.

Preoperatively the differential diagnosis included all presacral cystic masses; however, there was a suspicion for a sacrococcygeal teratoma given the location, predilection for females, as well as the peripheral and septal enhancement on MRI. It is important to note that the MRI did not show any apparent communication between the presacral mass and the subarachnoid space, as anterior sacral meningoceles are associated with dermoid cysts and lipomas. The patient subsequently underwent resection of the presacral mass via a posterior sagittal anorectal approach in the midline along the previous myelomeningocele surgical scar. Pathology revealed a benign epidermoid cyst with chronic inflammation and focal histolytic reaction. The patient made an uneventful recovery and was discharged home on postoperative day 3.

Conclusion: Epidermal cysts, by definition, can occur wherever there is squamous epithelium; however, are more commonly found on the face, trunk, neck, extremities and scalp. These types of cysts may result from previous sites of trauma or surgery. This, to the best of our knowledge, is the first reported case of a presacral epidermal cyst reported in the pediatric population following the resection of a myelomeningocele.
Specialty Surgery

Heparin Resistance in the Setting of Thrombocytosis: A Challenging Scenario in Cardiac Surgery

Natalie Pozzi, MD, Leonidas Tapias, MD, Michael Nolan, PA-C, J. Alexander Palesty, MD, Paul Preissler, MD
Saint Mary’s Hospital

Introduction: Heparin is the anticoagulant of choice for cardiac surgery. It is effective, inexpensive, and easily reversed; however, drawbacks include its variable anticoagulant effect and inconsistencies in monitoring its effectiveness. A small number of patients present with heparin resistance, where appropriate doses of heparin are unable to reach the desired level of anticoagulation. This condition can be multifactorial, but excessive thrombocytosis is one demonstrated mechanism.

Case Presentation: A 72-year-old male was admitted with chest pain and discomfort. He was found to have a non-ST elevation myocardial infarction with triple-vessel disease. The patient was placed on a heparin drip and urgent coronary artery bypass was scheduled for hospital day six. The patient’s blood work was monitored and remained within normal limits with the exception of a known thrombocytosis up to 800,000 platelets per microliter. In order to achieve adequate ACT times the patient required a total dose of 190,000 units of heparin. Fresh frozen plasma was also given to reach the goal ACT. After 2 hours on pump and with completion of the surgery the patient was reversed appropriately with protamine sulfate and returned to baseline anticoagulation levels.

Discussion: The anticoagulant effect (ACT) of heparin is measured using the activated clotting time. The ACT is then used as a measure of adequate anticoagulation for initiation and maintenance of cardiopulmonary bypass. Heparin acts indirectly through binding to antithrombin III, and deficiency of this enzyme is a primary mechanism of heparin resistance. Excessive thrombocytosis is another mechanism of heparin resistance secondary to the role of platelets in neutralizing heparin. Activated platelets release platelet-factor 4 which binds to and neutralizes heparin. A small number of case reports have demonstrated this effect and the treatment options. Treatment options include administering additional heparin, adding alternative anticoagulation medications, supplementation of antithrombin, or proceeding without reaching the goal anticoagulation levels.

Conclusion: The multifactorial nature of heparin resistance and limited studies reporting consistently effective treatment options present a challenge to managing heparin resistance. However, a rational, step-wise approach can still be followed to provide cost-effective treatment and successful establishment of cardiopulmonary bypass in coronary surgery. Further studies are needed to support appropriate patient selection and treatment options.