2013 Annual and Scientific Meeting

Resident Paper Competition Abstracts

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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Map of the Farmington Marriott

Continental Breakfast will be served in the Grand Ballroom

Directions to Meeting Rooms
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.

Trauma & Clinical Oncology: Boston – Pool Level
General Surgery 1: Vermont
General Surgery 2: Rhode Island
Specialty 1: Providence – Pool Level
Specialty 2 & Bariatric: Springfield – Pool Level
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John D. MacArthur, MD, FACS
Trauma Competition

Moderator:
Kimberly Davis, MD, MBA, FACS, FCCM
Professor of Surgery (Trauma); Chief of the Section of Trauma, Surgical Critical Care and Surgical Emergencies; Vice Chairman, Clinical Affairs, Department of Surgery; Trauma Director, Yale-New Haven Hospital; Surgical Director, Performance and Quality Improvement, Yale-New Haven Hospital, New Haven, CT

Judge:
The Connecticut Committee on Trauma

Clinical Oncology Competition

Moderator:
Phillip Roland, MD, FACS, Chair, Committee on Cancer Liaison, Commission on Cancer, Saint Francis Hospital and Medical Center, West Hartford, CT

Judges:
Robert J. Piorkowski, MD, FACS, Surgical Oncologist, Hartford Hospital, Assistant Clinical Professor of Surgery, University of Connecticut Health Center School of Medicine, Hartford Hospital, Hartford, CT

John Borruso, MD, FACS, Western Connecticut Health Network, Danbury Hospital, Danbury, CT
Tranexamic Acid: Current utilization and barriers to use


Waterbury Hospital

Introduction: Globally, traumatic injury is the third leading cause of death and disability. The resulting hemorrhage accounts for a third of trauma related deaths. Recent studies including CRASH-2, and MATTERS, have used medical experience on the battlefield to evaluate the efficacy of tranexamic acid (TXA) and found it to decrease all-cause mortality when given in the appropriate time period. The studies also demonstrated that the drugs utilization in the trauma victim does not significantly increase risk of thrombotic events following its administration. TXA has been available and FDA approved over the counter since 1986, so why is it not being utilized?

Method(s): A prevalence study was performed using an online survey tool to attain a cross-sectional sampling of physicians involved in trauma. 145 physicians ranging in fields from surgery to obstetrics and gynecology to emergency medicine filled out a 10 question survey which highlighted present understanding of the drug and their current utilization habits.

Results: Of those surveyed 29% had experience using the medication where 50.5% had only read about tranexamic acid. 97% of those who had used TXA would suggest it's use to colleagues considering implementing it in their institutions, 87% without modification based on age and 60% without modification based on past medical history. Of the physicians who had never used it 35% would consider it though 29.4% would need more information than the referenced CRASH-2 and MATTERS trials.

Conclusion(s): Tranexamic acid has the possibility to make a profound impact on the morbidity and mortality of trauma. Randomized controlled trials have proven its effectiveness and safety in a cost effective manner. If only 14.4% of physicians are ignorant of TXA why is it not being used when the majority of physicians who have used it would recommend it? Ignorance here can be overcome with evidence based medicine and the implementation of protocols utilizing TXA should be incorporated into trauma resuscitation at institutions where it is not being used.
Elderly Trauma Patients and Dabigatran: Is there enough to RE-LY on?

Ryan Bendl, DO, Christian Cain, MD, Jason Fischel, MD, Lloyd Miller, Kevin Dwyer, MD.

Stamford Hospital, Stamford

**Introduction:** Dabigatran (Pradaxa®, Boehringer Ingelheim) is an oral thrombin inhibitor which earned FDA approval on October 19, 2010. Dabigatran is indicated to reduce the risk of stroke and systemic embolism in patients with non-valvular atrial fibrillation. While Dabigatran offers a viable option in the treatment of atrial fibrillation, its consideration in trauma management poses a new dilemma. Initial studies, prior to Dabigatran’s approval, sought to address this issue. In the RE-LY study, an analysis of 18,113 patients found that the overall bleeding risk was reduced from 3.36% per year while on Warfarin to as low as 2.71% per year in patients on 110 mg Dabigatran. Furthermore, at 2 year follow-up, the incidence of intracranial hemorrhage was reduced from 0.74% for those on Warfarin, to 0.23% and 0.30% on Dabigatran 110 mg and 150 mg, respectively. Data re-examined after the publication of the RE-LY trial suggested that the incidence of major hemorrhage may have been underreported. With trauma contributing to over 40,000 deaths per year in patients over the age of 65, the importance of this topic cannot be overlooked. The difficulty in reversing or monitoring this drug’s effects further complicates these patients.

**Methods:** Using the Stamford Hospital trauma registry, we identified 1,675 patient pre-hospital falls between 10/19/2010 and 6/30/2013. Patient’s charts were retrospectively reviewed. Patients under the age of 65 were excluded as the FDA approval is only for patients with atrial fibrillation who are at least 65 years old and who have a medical comorbidity (diabetes mellitus, coronary artery disease, or hypertension) or those who are 75 years old and without comorbidities. All patients 65 or older had their list of active medications at the time of injury scrutinized. Patients taking Dabigatran at the time of their injury were established. Patient characteristics such as age, height of fall (less than 3 feet, 3 to 15 feet, or greater than 15 feet) and Dabigatran dose (if identified at the time of the injury) were recorded. The primary outcome of intracranial hemorrhage was then identified using a CT scan of the head. Secondary outcome of in-hospital mortality was also sought.

**Results:** Since FDA approval, there have been thirteen patient falls identified by the trauma service at Stamford Hospital. All patients had sustained their injuries by falling less than three feet. Dabigatran doses identified ranged from 75 mg BID to 150 mg BID. There were eight male and five female falls. No patients with intracranial hemorrhage were identified. Nine of the thirteen had at least two CT scans during their hospital course. One patient was evaluated and did not experience head trauma and therefore a head CT was not performed. All patients were discharged from the hospital in stable condition to either home or a rehabilitation facility.

**Conclusions:** While the RE-LY trial, upon which Dabigatran earned FDA approval, did touch upon the incidence of intracranial hemorrhage, follow up investigations showed that the incidence may have been higher than initially reported. With a growing elderly population, it is important that these potential side effects be fully characterized. We identified thirteen patient falls on Dabigatran. No clinically evident intracranial hemorrhages were identified. Furthermore, no deaths occurred. While this data alone may not significantly alter the current treatment algorithm of elderly patients with non-valvular atrial fibrillation, further research may. We look to continue data collection and share our findings as they become available.
Use Of ACS TQIP to Analyze the Cause of Unplanned Extubation in Trauma Patients

Alph Emmanuel, MD; Coleen Desai, RN, MSN, CEN; Ellen Boucher, CSTR; Sandy Gifford BA, MBA; Scott Ellner DO, MPH, FACS; William Marshall DO

Saint Francis Hospital and Medical Center

Introduction: The unplanned removal of an endotracheal tube is a life-threatening incident. Delirium, pain, anxiety, patient care activities and other factors may contribute to this phenomenon, each of which are frequently encountered in the injured patient. A population of critically ill trauma patients at an ACS-designated urban level II trauma center was evaluated for variables leading to unplanned extubation (UE). Data provided by the American College of Surgeons Trauma Quality Improvement Program (TQIP) was analyzed for reasons for UE in this population.

Method(s): A retrospective evaluation of trauma patients who experienced UE in a surgical critical care setting during a 14-month period was conducted. UE was identified as an unintended, premature removal of an endotracheal tube secondary to dislodgement due to activity, provision of patient care, or self-extubation by the patient. The purpose of the study was to identify the incidence and common factors associated with UE. Variables considered included: time of day, duration, mode and type of ventilation, recent ventilator changes, severity of injury, restraints, analgesics, sedatives, provider-perceived level of pain and anxiety, and the need for reintubation.

Results: A total of 20 cases of UE occurred among 17 patients, with 2 patients having more than one UE, among 144 ventilated patients. This represents an incidence of 4.3 UEs per 100 ventilator days. The analysis of common factors for the UE population identified the following: 19 (95%) had no change to the ventilator settings within the 4 hours preceding UE; 15 (75%) were restrained at the time of extubation; 13 (65%) were perceived to have adequate analgesia; 12 (60%) had no sedation administered within 4 hours of UE; 11 (55%) had no analgesia administered within 4 hours of UE; 8 (47%) had Traumatic Brain Injury (TBI); 4 (20%) did not have any sedation medication ordered; 1 (5%) did not have any pain medication ordered; 1 (5%) was in alcohol withdrawal; time of day, and ventilator settings did not appear to have any significant effect. The average ISS score was 25, APACHE scores were available for 11 patients, with an average of 67. Interestingly, 12 patients (60%) did not require reintubation.

Conclusion(s): Though most patients were perceived to have adequate analgesia by providers, a majority had not had an analgesic administered within the four hours preceding the UE. Additionally, more than half of the patients did not have sedatives administered in the same period. It was the conclusion of the investigators that our currently utilized pain assessment tool may be less accurate in the intubated patient, with providers failing to identify behavioral indicators of anxiety and pain. Delirium and undertreatment of pain may have led to inadvertent self-extubation. The increased number of UE in the trauma population discovered by this study prompted a larger prospective study analyzing the factors leading to UE in the entire ICU population. A new pain assessment scale was utilized based on the findings of this study which is currently in use, and to be reported. Also, most patients had no ventilator changes in the four hour prior to UE, which may indicate the need for a more aggressive initiative to assess readiness for extubation.
TO TRANSFUSE OR NOT TRANSFUSE: That is the question.

Michael Katz, MD, Ilene Staff, PhD, Jacqueline McQuay, RN BSN, MS, D’Andrea K. Joseph, MD.

Hartford Hospital

Introduction: Hypoxia in traumatic brain injury (TBI) caused by anemia and hypotension is known to worsen the outcome of the brain injured patient. Transfusion of blood and blood products can increase the morbidity and mortality in the critically ill patient. The purpose of the study was to identify the impact of red blood cell (RBC) transfusion on patients with severe TBI.

Method: The IRB approved interrogation of the trauma registry was undertaken retrospectively for all patients admitted with brain injury to an 800 bed level one trauma center from January 2009 through December 2011. Charts were interrogated for demographics, use of external ventricular devices (EVD), and hospital length of stay (HLOS), functional independence, disposition and mortality. Information on the oxygen tension of the brain (PbO2) and the presence or absence of RBC transfusion was also recorded. Data were analyzed primarily for patients receiving blood transfusion versus patients who did not using the Wilcoxon Ranked Sum test and then logistic regression analysis. A P value of 0.05 was considered significant.

Results: Four hundred and thirty three patients with TBI were admitted during the study period. Of these, 33 patients with severe TBI, GCS ≤ 8, met criteria for analysis. Twenty two patients underwent red blood cell transfusion while 11 did not. Seventy percent of the patients were male and had an average age of 43±18. There was no significant difference in age, sex or gender in patients who were transfused versus patients who were not transfused. Injury severity score (ISS) was significantly higher in patients receiving blood transfusion versus patients who did not (31±10 versus 22±11, P=0.04). Multivariate logistic regression with ISS and red blood cell transfusion as predictors of HLOS, dichotomized at median of 30 days, confirmed transfusion as an independent predictor among patients who were alive at discharge. Data on PbO2 were present for only 12 patients who had placement of the Licox® brain tissue oxygen monitor (INTEGRA™ New Jersey). There was no apparent difference in oxygen tension before and after transfusion in this group. However, these numbers were too small to form any useful analysis.

Conclusion: Lower oxygen tension in the brain has been associated with a poorer outcome. Transfusion of RBC has been suggested as an option to increase PbO2. In our study, the transfusion of blood in patients with severe TBI was associated with a significant increase in HLOS. In a smaller subset of patients for whom data were available there was no difference in the PbO2 before or after the transfusion of red blood cells (RBC). Further studies are necessary to determine the trigger point and significance of RBC transfusions on patients with severe TBI.
Ultrasound vs. Palpation Guided Radial Artery Catheterization: A Randomized Controlled Trial

Lucy Ruangvoravat MD, Tobias Zingg MD, Matthew Band PA-C, Christopher Erb MD, Peter Marshall MD MPH, Linda Maerz MD FACS, Michael Ditillo MD, Kimberly Davis MD MBA FACS FCCM, Kevin Schuster MD FACS FCCM

Yale-New Haven Hospital

Introduction: Catheterization of the radial artery (CRA) is a common bedside procedure in the critical care setting. Most commonly this procedure is done via a "blind" method with palpation of arterial pulse guiding puncture. Ultrasound guidance may improve success and reduce the number of necessary attempts. Use of ultrasound outside of the critical care setting for radial artery catheterization has had mixed results. We hypothesized that ultrasound guidance would increase success in CRA and decrease time to CRA.

Methods: We conducted a prospective randomized trial of ultrasound guided CRA between July 2012 and August 2013 in the Surgical and Medical Intensive Care units of a tertiary care academic medical center. Decision for radial artery catheter placement was at the discretion of the attending intensivist caring for the patient. Patients were randomly assigned to either the palpation-guided (PP) or the ultrasound-guided (US) method. Operators included mid-level providers, residents, and fellows caring for the patient. The operator chose the side of radial artery puncture independently. Each attempt was defined as time from skin puncture to appearance of an arterial waveform on the monitor or withdrawal from the skin. After three attempts without success the operator would switch to the alternate method for three additional attempts on the same or contralateral extremity. After six failed attempts the procedure was either aborted or attempted by a more experienced rescue operator. Data collected included pre-procedure qualitative pulse quality, blood pressure, presence of and risk factors for vascular disease, body mass index (BMI), requirement for vasopressors, and post-procedure complications. Analysis was with Fisher’s exact test and Wilcoxon rank sum test with p<0.05 significant.

Results: Forty one patients were enrolled; 2 withdrew after randomizing. Of the remaining 39, 23 randomized to US and 16 to PP. There were no differences between groups with respect to BMI, use of vasopressors, anticoagulation, peripheral edema or pulse quality (all p>0.05). Pulse was weak or absent in 69.6% of US patients and 56.3% of PP patients. The average time for US CRA was 280.7s and 196.98s for PP. Thirty percent in the US group were successful on the first attempt and 25% in the PP group. In the PP group 50.0% successfully catheterized in 3 attempts compared to 82.6% in the US group (p=0.04). There were an average of 2.7 attempts in the US group compared to 3.1 in the PP group (p=0.363). Of those that failed PP and converted to US 62.5% were successful on the first US attempt. Of PP crossing over to US 75% (6/8) were successful compared with 0% (0/4) of US crossing over to PP (p=0.061). All rescue catheterizations were by US; 83.0% were successful. Only one complication, a hematoma, occurred in the US group.

Conclusions: US is the preferred method for CRA in critically ill patients. With a limited number of attempts US is more likely to result in successful CRA. Trends toward longer operating time and higher rescue rates were observed with US.
Management of Afferent Loop Obstruction from Recurrent Metastatic Pancreatic Cancer Using a Venting Gastrojejunostomy

Debbie Bakes MD, Christian Cain MD, Michael King MD, Xiang Da (Eric) Dong MD

Stamford Hospital

Introduction: Pancreatic cancer is the fourth leading cause of cancer in the United States, with the Whipple procedure as the mainstay of treatment for resectable disease at the head of the pancreas. Recurrent disease, which manifests frequently as peritoneal metastases, may lead to various different complications, such as bowel obstruction, pancreatitis, sepsis, and cholangitis due to biliary obstruction. A unique type of obstruction occurs at the retrocolic jejunal limb of the afferent loop, which can lead to stasis of the biliary, intestinal, and pancreatic secretions. We present here a case of afferent loop obstruction caused by recurrent peritoneal metastases from pancreatic cancer.

Case Report: This is a 70-year-old female who first presented with painless jaundice leading to the diagnosis of pancreatic cancer. She underwent a pancreaticoduodenectomy at an outside institution, followed by adjuvant chemotherapy and radiation. Her post-operative course was complicated by an episode of small bowel obstruction, development of a small enterocutaneous fistula, along with a large ventral hernia. Patient then presented to our hospital with clinical signs of cholangitis. Preoperative imaging with a CT scan showed a severely dilated afferent limb in the right upper quadrant, with lack of significant biliary dilatation, which precluded the use of interventional radiology techniques to percutaneously manage her cholangitis. Therefore, the patient underwent surgical exploration for management of her afferent loop obstruction. Intraoperative findings showed the obstruction to be secondary to a tight stricture at the jejunal limb as it traversed the mesentery of the colon, secondary to a biopsy-proven peritoneal recurrence. The patient underwent decompression of the afferent limb as well as the biliary tree using a venting gastrojejunostomy. She had an uneventful post-operative course, with eventual resolution of her elevated bilirubin level. The patient eventually succumbed to her metastatic pancreatic cancer 4 months later.

Results: A venting gastrojejunostomy represents a novel surgical approach for management of afferent loop syndrome after a pancreaticoduodenectomy.

Conclusion: Afferent loop syndrome is an unusual and uncommon complication following a pancreaticoduodenectomy. Treatment can be classified as both surgical or non-surgical, with surgical intervention deemed as an appropriate, successful method in establishing a lasting decompression of the dilated Roux limb.
Clinical Impact of Biopsy Method on the Quality of Surgical Management in Melanoma

Sameer Kaiser MD\textsuperscript{1}, Rashida Vassell MD\textsuperscript{2}, Richard G Pinckney MD MPH\textsuperscript{3}, Todd Holmes MD\textsuperscript{3}, Ted A James MD FACS\textsuperscript{2}

\textsuperscript{1}Department of Surgery, Danbury Hospital, Danbury, CT, \textsuperscript{2}Department of Surgery, University of Vermont, Burlington, VT, \textsuperscript{3}Department of Medicine, University of Vermont, Burlington, VT

Introduction: Despite guidelines recommending excisional biopsy for diagnosing suspected melanoma, partial biopsy techniques (shave, punch) are commonly performed. Partial biopsies run the risk of underestimating the true Breslow depth and subsequently altering surgical management. This study aims to assess patterns of biopsy choice by specialty, as well as determine the clinical impact of biopsy method on the surgical management of melanoma.

Methods: Retrospective chart review of the University of Vermont Cancer Registry. All patients diagnosed with a single, primary cutaneous melanoma from 1/02 – 6/12 were identified.

Results: Complete records on 853 lesions were identified. Mean Breslow depth on biopsy was $1.01 \pm 1.34$mm. Dermatologists perform 62.6\% of biopsies and favor shave biopsies; surgeons favor excisional biopsies (48\%), and primary care doctors favor punch biopsies (44.8\%), ($p < 0.001$). Final Breslow depth was upstaged in 107 (12.5\%) cases. Only 23 (2.7\%) cases displayed a Breslow depth discrepancy great enough to change surgical recommendations. All 23 cases were melanomas diagnosed with partial biopsies ($p < 0.001$). There was no statistically significant relationship with presence of ulceration, high Clark level, features of regression, or high mitotic index. Recurrence rates were not different in these cases.

Conclusion: Partial biopsy techniques are commonly performed in diagnosing melanoma; especially among dermatologists, who perform most of the biopsies. Partial biopsies were less accurate in determining Breslow thickness; however, they appear to rarely compromise the quality of surgical management of melanoma. Predictive features could not be determined to identify the few cases where a Breslow discrepancy was clinically relevant.
Metastatic succinate dehydrogenase-deficient gastrointestinal tumor in a young adult male

Elijah Min MD, Tal Oren MD, Xiang (Eric) Dong MD

Stamford Hospital

Introduction: SDH-deficient gastrointestinal stromal tumors (GIST) are a rare gastrointestinal tumor which has only recently been described in the literature. It is found primarily in the pediatric population with predominance in females. The tumor is most commonly multifocal, located in the stomach with a wild type genotype for cKIT and PDGFRA.

Method(s): A 22 year old male was admitted for GI bleed after presenting to an outside institution with dizziness, melena and anemia with hemoglobin of 5.39/dL. He had a one year history of intermittent melenotic stools. An upper endoscopy revealed multiple submucosal nodules and ulcerations. CT of the chest/abdomen/pelvis demonstrated an ulcerated lobulated mass in the gastric antrum, as well as multiple indeterminate liver lesions and 2 partially calcified nodules in the left lung. The patient underwent a subtotal gastrectomy with Billroth II reconstruction for symptomatic gastric bleeding.

Results: The patient had a benign post-operative course and was discharged on post-operative day 4. Pathology of the specimen revealed epithelioid GISTs with numerous serosal and submucosal lesions ranging from 0.3 to 4.5 cm in size. Mitotic index was 4/50 HPF. Further workup suggested that the patient has a rare subset of GIST known as SDH-deficient GIST, which was confirmed by the National Cancer Institute as SDHB-deficient GIST. A PET scan revealed 4 areas of high uptake in the liver suspicious for metastatic disease. He underwent a CT-guided biopsy of the liver lesions, which confirmed metastatic GIST. Following consultations with multiple oncologists, the patient elected close monitoring with serial CT scans for management due to the slow progression of this disease.

Conclusion(s): Gastrointestinal tumors are generally considered benign if less than 5 cm or have a mitotic index of < 5/50 HPF. Treatment is surgical resection with 1 cm margin followed by imatinib. However, SDH-deficient GIST is a distinct clinical entity with a variable clinical course. It is unresponsive to imatinib and frequently multifocal. There is a known association with pheochromocytoma as well as pulmonary chondromas known as Carney’s triad. While it generally has an indolent clinical course, as this case demonstrates, SDH-deficient GIST can be malignant even when it does not meet histopathologic criteria.
Adrenal Insufficiency after Unilateral Adrenalectomy for Adrenocortical Carcinoma: a Case Report and Review of the Literature

Heather Player, MD, Xiang (Eric) Dong, MD

The Stamford Hospital

Introduction: Subclinical Cushing’s syndrome (SCS) among patients with incidentally discovered adrenal masses has been well demonstrated in the literature. This population does not exhibit the classic signs of Cushing's syndrome, but nonetheless present with postoperative adrenal insufficiency after unilateral adrenalectomy of nonfunctioning incidentalomas. Further, the results of extensive preoperative testing does not relate to postoperative hypoadrenalism with adequate sensitivity. This trend highlights the importance of regimented postoperative cortisol level monitoring and subsequent cortisol repletion among patients with adrenal incidentalomas. However, such standards for unilateral adrenalectomy for non-functioning adrenocortical carcinoma (ACC) have not been established. Lack of guidelines for these patients leaves creates a serious risk for postoperative complications of hypoadrenalism.

Method(s): This is a single patient case report.

Results: This patient is an 84-year-old man, with a significant past medical history, who presented with vague complaints of abdominal pain and fatigue. CT demonstrated an interval increase in the size of his left adrenal gland. The patient had no evidence of hypothalamic-pituitary-adrenal axis dysfunction based on history, physical exam, and preoperative testing. Thus, the lesion was presumed non-functioning and was excised. Pathology confirmed a diagnosis of ACC. On post-operative day 1, the patient exhibited hypotension and hypoglycemia, with a cortisol level of 0.3ug/dL. The patient responded to solucortef, supporting the presumed diagnosis of hypoadrenalism.

Conclusion(s): Adrenocortical carcinoma (ACC) is a rare and aggressive tumor, with only 300 documented cases per year in the United States. Thus, there is a paucity of data related to pre- and postoperative treatment. As one-third present as non-functional tumors, recommendations for these may be borrowed from literature on non-functioning incidentalomas for post-surgical care until further research establishes guidelines. Our experience with acute hypoadrenalism after unilateral adrenalectomy in the setting of ACC suggests routine postoperative testing of cortisol levels.
General Surgery I Competition

Moderator:
David Shapiro, MD, FACS
Associate Director of Surgical Critical Care
Academic and Research Office, Dept. of Surgery
St. Francis Medical Group, Hartford, CT

Judge:
Kathleen LaVorgna, MD, FACS,
Private Practice, Norwalk CT
Diverticulitis With Perforation Into The Retroperitoneum Leading To Left Flank And Thigh Necrotizing Fasciitis: A Case Report And Review Of The Literature

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Department Of Surgery, Hartford Hospital, Hartford, CT

Introduction: There have been a few reports in the literature of diverticulitis with perforation into the retroperitoneal space. Patients with retroperitoneal perforations may have delayed presentations with unusual findings, including severe low back pain with lumbar abscess, pneumomediastinum, or necrotizing fasciitis of the leg. In this case report, we describe a case of perforated diverticulitis in the retroperitoneum resulting in necrotizing fasciitis in an otherwise healthy 73-year-old female. The purpose of this study is to increase surgeon awareness of the rare extra-abdominal complications of perforated diverticulitis.

Method(s): We present a case report in which a 73-year-old female presented to the emergency department with a two week history of abdominal discomfort. On examination, she was tender to palpation in the left lower quadrant of her abdomen as well as her left flank and thigh. Further work-up with CT scan of her abdomen and pelvis revealed perforated diverticulitis with gas present in her retroperitoneal space extending from the mid-abdomen to her left inguinal region. She was emergently taken to surgery for exploratory laparotomy and underwent a left hemicolectomy with an end-colostomy with a washout of her left retroperitoneum. Postoperatively she was transported to the intensive care unit in guarded condition.

Results: Despite broad-spectrum antibiotics, the patient developed septic shock with oliguria, acute respiratory failure, and hypotension despite being on multiple vasoactive drips. The patient proceeded to develop necrotizing fasciitis of her left flank and upper thigh. The patient's condition continued to deteriorate and she expired on hospital day four from cardiopulmonary arrest as a consequence of septic shock with necrotizing fasciitis following perforated diverticulitis.

Conclusion(s): Extra-abdominal infections that result from extra-peritoneal perforations of gastrointestinal structures are exceptionally rare and are only sporadically reported in the literature. There are a number of reports of necrotizing fasciitis that occurred in the setting of appendiceal rupture, while only a few have been documented in patients with diverticulitis. The diagnosis of retroperitoneal perforation of sigmoid diverticulitis often occurs late because patients lack signs of peritonitis and because it may be confused with other conditions including inguinal abscess, thrombophlebitis, gas gangrene, or even hip fractures. Retroperitoneal perforated diverticulitis is a rare condition and the symptoms are less prominent than intraperitoneal rupture. This leads to a delay in presentation, and advanced stage of disease with significant feculent spillage and purulence. In addition, physical exam findings can be subtle, and patients may not present with peritonitis, as the peritoneal cavity has not been violated. Early treatment is essential, which requires a high index of suspicion, intravenous antibiotics, and prompt source control with resection and washout.
A Rare Source of Infection After Perforated Diverticulitis

Leah Bassin, MD, Merissa De Freese, MD, Robert Zucker
Stamford Hospital

Introduction: There are many bacteria that live in human beings. Perforation of the gastrointestinal tract with contamination of the peritoneal cavity may lead to infection. The bacteria *Dysgonomonas*, formerly known as CDC group DF-3, is found in the intestine. There have been case reports of it causing infection in immunocompromised patients. Presenting symptoms of infection are diarrhea and abdominal pain. There have not been any reports of the bacteria causing intra-abdominal infections or sepsis after bowel perforation. We are presenting a case of an elderly woman who developed an intra-abdominal infection with *Dysgonomonas*.

Results/Case Report: This is an 89 year old female who lived at home with a 24-hr heath aide that helped her with all activities of daily living. Per the aide the patient was in her usual state of health until earlier that day when she started having increasing abdominal pain and feculent vomiting. She was also found to be cachectic with a BMI of only 13.7. On physical exam the patient was diffusely tender with rebound and guarding and her CT demonstrated free air. She was taken emergently to the operating room and underwent an emergent Hartmann’s procedure with colostomy creation for a perforation of the sigmoid colon. On pathology, the patient had a perforated diverticulitis and no malignancy.

Immediately post-operatively, the patient was in the ICU, intubated, hypotensive and tachycardic. She required both vasopressin and levophed. Antibiotics were started, Zosyn, for the perforated diverticulitis. She was able to be weaned off her pressors however did had a slowly increasing leukocytosis. Her white blood cell count went from 11 and rose to 31. A CT scan at this time revealed no intra-abdominal fluid collections. Intra-operative cultures at this time were growing the bacteria *Dysgonomonas*. The antibiotic regimen was then tailored for the sensitivities of this specific bacterium with imipenem. The patient slowly improved, her white blood cell count decreasing to <10 on her last day of imipenem. She was also able to get extubated after her sepsis resolved.

Conclusion(s): This case demonstrates an interesting case with a rare source of intra-abdominal infection leading to sepsis. The most common presentation of *Dysgonomonas* is diarrhea, but there have been reports of infection in soft tissue causing an abscess. *Dysgonomonas* has usually been found in subjects with conditions that compromised their immune systems including leukemia, chemotherapy, diabetes, and HIV or had severe diseases like inflammatory bowel disease or ulcerative colitis. Our patient did not have any of the above listed illnesses but was at the extremes of age and did have malnutrition which may have contributed to her condition. *Dysgonomonas* is relatively new bacteria that usually resides in the intestines of humans. There appears to be no reports of *Dysgonomonas* infection following bowel perforation in the literature and case reports of *Dysgonomonas* infection in the soft tissue are also uncommon and occur in those with severe disease or are immunocompromised. There is still much research to be done about the genus *Dysgonomonas* and its interactions with humans however once diagnosed should be treated as can be a source of sepsis.
Perioperative Culture, Organizational Behavior and Patient Outcomes

Lindsay A Bliss, MD; Cynthia B Ross-Richardson, MS, BSN, CNOR; Laura J Sanzari, BSN, RN; Scott J Ellner, DO, MPH, FACS

University of Connecticut Health Center, Farmington, Connecticut; Saint Francis Hospital and Medical Center, Hartford, Connecticut

Introduction: The perioperative period requires complex interactions between numerous parties to coordinate safe and efficient patient care. The nature of these relationships and exchanges is largely influenced by institutional culture. Although explicit decisions regarding organizational structure and human resource allocation impact perioperative care delivery, informally developed organizational behaviors color each interpersonal interaction within the perioperative services. The attitudes and behaviors of personnel as well as group dynamics established over time determine the institutional culture. We hypothesized that these cultural factors influence the staff perceptions and patient outcomes.

Method(s): During the period of 2009 to 2013, institutional efforts were made to improve the culture around patient safety at a 600 bed tertiary care facility in the Northeast. Organizational behavior was changed via educational sessions, leadership changes within the surgical service line and quality improvement initiatives. Perioperative personnel participated in team-based communication training and a safe surgery checklist was adopted in all cases. Institution-specific data regarding perioperative culture was collected using the Agency for Healthcare Research and Quality (AHRQ) Hospital Survey on Patient Safety Culture. The survey was administered to health center personnel in 2009 and 2013. Department of Surgery responses were compared between the two time periods, addressing overall perceptions of patient safety culture as well as specific dimensions of culture that impact patient safety. Responses were compared using chi-square tests. Patient outcomes were evaluated using 30-day morbidity and mortality included in the American College of Surgeons (ACS) National Surgical Quality Improvement Program (NSQIP) database. The chi-square test for trend was used to analyze changes in mortality, overall morbidity and specific morbidity types from 2009 to 2013.

Results: Between 2009 and 2013, the number of respondents to the voluntary AHRQ Hospital Survey on Patient Safety Culture rose from 165 to 444 of approximately 700 personnel within the surgical service line, approximately 24% and 63% respectively. During this period, the percentage of personnel who believed the overall patient safety grade was failing or poor decreased from 20% to 6% (p<0.0001) and the percentage who believed the grade was very good or excellent increased from 56% to 63% but this change was not statistically significant (0.1120). Over the same period, surgical mortality, based on NSQIP data, decreased from 1.83% to 0.22% (p<0.0001). Patients experiencing any post-operative morbidity decreased from 12.97% to 9.19% (p=0.002).

Conclusion(s): The strategic modification of perioperative services organizational behavior at this 600 bed tertiary care facility improved the surgical staff perception of patient safety. These changes, as well as the implementation of safe surgery checklist and formal team-based communication training, decreased 30-day morbidity and mortality during a four year period. These findings support culture of safety-specific improvement efforts as part of a larger organizational effort to decrease perioperative adverse outcomes.
Rendezvous Endoscopic Retrograde Cholangiopancreatography for the Treatment of Choledocholithiasis

Nicholas Dugan, MD, Monica Gustafson, MD, Stanton Smith, MD, Ibrahim Daoud, MD, FACS

University of Connecticut School of Medicine, St. Francis Hospital and Medical Center

Introduction: Current treatment options for choledocholithiasis include cholecystectomy with concomitant common bile duct exploration (CBDE) and staged procedures using a combination of cholecystectomy and endoscopic retrograde cholangiopancreatography (ERCP) for clearance of the duct. The vast majority are treated with ERCP followed by laparoscopic cholecystectomy, however, 4 to 18% of ERCPs are unsuccessful. This is almost always due to inability to intubate the papilla, with the most common anatomic abnormality being periampullary diverticula. ERCP also has inherent risk of bleeding, pancreatitis and perforation. The laparoscopic surgeon should be facile at cholangiography and should be aware of other treatment options in the case that ERCP is unavailable or unsuccessful. We describe the rendezvous ERCP as a management option for choledocholithiasis after unsuccessful ERCP and laparoscopic CBDE.

Method(s): Our patient is a 77 year old male who presented with acute cholecystitis and choledocholithiasis. An ERCP was attempted, however was unsuccessful due to a periampullary diverticulum precluding cannulation of the ampulla. Surgery was consulted 5 days into his hospital stay and laparoscopic cholecystectomy with cholangiogram and CBDE was performed the following day. Although multiple stones were retrieved, the duct could not be completely cleared and rendezvous ERCP was planned. After transection of the cystic duct, a 4 French cholangiocatheter was passed percutaneously into the cystic duct stump through to the duodenum. It was secured at the cystic duct with two endoscopic clips and at the skin with nylon suture. A closed suction drain was placed in close approximation with the cystic duct stump. Upper endoscopy was repeated using a multichannel side-viewing endoscope. The catheter was visualized exiting the papilla and was used to guide wire-cannulation of the CBD. A catheter was placed over the wire and cholangiopancreatography performed demonstrating filling defects. A sphincterotomy was performed and the duct swept, retrieving sludge. The cholangiocatheter was removed during ERCP and the drain was removed when there was no evidence of a bile leak. The remainder of his hospital course was uneventful and the patient was discharged home on postoperative day 3 with down-trending liver enzymes and bilirubin.

Results:

Conclusion(s): ERCP followed by cholecystectomy is a widely employed strategy for the management of choledocholithiasis, however literature quotes an ampullary cannulation failure rate of 4 to 18%. In the instance that ERCP and/or CBD exploration has failed, rendezvous ERCP is a viable management option. It even has utility as the initial procedure instead of preoperative ERCP if the surgeon is trained in cholangiography and CBDE. Should CBDE fail to clear the duct, rendezvous ERCP can be performed and the 4 to 18% ampullary intubation failure rate is eliminated. Most patients will thus undergo a single procedure and even those with complicated anatomy will undergo two at most. In addition, laparoscopic cholecystectomy with CBDE has a reported 4% lower rate of overall morbidity and mortality compared to ERCP followed by cholecystectomy. One example is post-ERCP pancreatitis, for which difficult ampullary intubation and prolonged procedure time is a predictor. Rendezvous ERCP has been shown to decrease the incidence of procedure related pancreatitis from 3.6% to 2.2%. A reduction in the number of procedures required as well as procedure associated complications can potentially translate into decreased hospital stay and overall expense. In the case of our patient, if cholecystectomy, cholangiography and CBDE were performed initially, his hospital stay could have been reduced from 9 days to 4 days. In conclusion, rendezvous ERCP is a safe and effective technique biliary surgeons should be familiar with for the management of choledocholithiasis.

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Single-site robotic cholecystectomy: Outcomes and safety analysis in comparison to laparoscopic cholecystectomy.


The Stanley Dudrick Department of Surgery, Saint Mary’s Hospital, Waterbury, CT.

**Background:** Since its introduction in 1997, robotic surgery has become an increasingly popular alternative to traditional laparoscopic surgery in General Surgery. The technique of single-site robotic assisted (SS RAS) cholecystectomy has further contributed to the popularity of this approach when managing patients with cholecystitis, symptomatic cholelithiasis and biliary dyskinesia. Better cosmesis and a potentially safer technique are attractive to both patients and surgeons alike. This study aims to prove that the operative times for SS RAS cholecystectomy performed by an experienced surgeon will not differ significantly from a traditional laparoscopic cholecystectomy and that both techniques are comparable and safe. Furthermore, it will be shown that the SS RAS cholecystectomy will have higher post-operative pain due to increased associated tissue trauma.

**Methods:** A retrospective analysis was conducted to compare outcomes and safety of single-site robotic cholecystectomy versus a conventional laparoscopic approach in an elective patient population. Outcomes and complications were analyzed for both groups. Only cases performed by experienced surgeons were considered.

**Results:** Data of 50 patients who underwent cholecystectomy in 2013 as an elective outpatient procedure were considered. Of these, there were 39 women and 11 males. Average age was 49.8 years. 25 people underwent laparoscopic cholecystectomy, 25 patients had SS RAS cholecystectomy. Twenty percent of the single site patients (5 patients) presented to the emergency department postoperatively with complaints of abdominal or chest pain versus five percent (one patient) in the laparoscopic group.

**Conclusion:** Single-site robotic assisted cholecystectomy is an efficacious and safe method of performing a cholecystectomy with superior cosmesis. It is, however, a procedure that potentially can cause more pain and is associated with increased cost. Morbidity and mortality for the procedure are the same as with a traditional cholecystectomy. With further penetration of this technique into the general surgery marketplace, cost and operative times should decrease, with SS RAS cholecystectomy eventually supplanting traditional laparoscopic cholecystectomy as the standard of care.
Compliance with SCIP Core Measures and the Impact on Surgical Site Infections: Using ACS-NSQIP to Evaluate Patient Outcomes and Reimbursement Guidelines

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Saint Francis Hospital and Medical Center, University of Connecticut Health Center

Introduction: There have been strict guidelines imposed on hospitals across the nation to comply 100% with certain perioperative quality measures. No matter the surgical outcome, surgical site infection (SSI) or not, reimbursement from the Center for Medicare and Medicaid Services is now being reduced by 2% if compliance with quality measures is less than 100%. Our institution joined the NSQIP database in 2007. The objective of this retrospective study was to determine our compliance with Surgical Care Improvement Program (SCIP) measures 1 and 2 (timely antibiotic administration and appropriate antibiotic selection) and then determine if compliance resulted in a reduction of SSI. Our primary endpoint is the development of an SSI.

Method: The American College of Surgeons’ National Surgical Quality Improvement Project (ACS-NSQIP) is a validated, risk-adjusted database. Patient data was collected by our ACS-NSQIP trained personnel. Two hundred and fifteen patients were selected from the ACS-NSQIP database and evaluated for this study from May 2011 to October 2012. This patient population included all elective and non-elective colorectal surgical cases entered into the database according to the ACS-NSQIP guidelines. The SPSS statistical software package was used for data analysis.

Result: In our study, there were 40 out of 215 patients who developed an SSI, making our rate of SSI 18.6%. There was no significant difference in compliance between the SSI group versus the non-SSI group when patients were given antibiotics within one hour, 77.5% and 85.1% respectively (p = .171). Also, compliance with administering the correct combination of antibiotics was not significantly different between the SSI and non-SSI group, 70% and 76% respectively (p = .274). The SSI rate when both the selection and timing were in compliance with SCIP quality measure 1 is 18%. When either the selection or administration of antibiotics were not in compliance, the SSI rate is 9.1% and 13.3%, respectively.

Conclusion: Increased compliance with SCIP core measure 1 at our institution did not reduce the complication of SSI in our patient population. Measures for hospital reimbursement may need to be focused on patient outcomes like SSI instead of process measures that do not necessarily affect patient outcome.
Deletion of FLK-1 and MAPkinase-2 Impairs Neovascularization and Perfusion in a Murine HindLimb Ischemia Model: Kinase Gene Knockout study

Salim Abunaja, MD., Vaithinathan Selvaraju, Ph.D., Mahesh Thirunavukkarasu, Ph.D., Joshua Tagore, BS., Lulu Rahaman, MD, Alexander Palesty, MD., Juan A Sanchez, MD., Nilanjana Maulik, Ph.D, FAHA.

Saint Mary's Hospital / UCONN

Introduction: Therapeutic angiogenesis is a potential viable strategy in the treatment of peripheral vascular disease (PVD). Vascular endothelial factor (VEGF) induces angiogenesis by activating Fetal Liver Kinase-1 (Flk-1 or VEGFR-2), a transmembrane tyrosine kinase present in endothelial cells. Studies have shown that VEGF/Flk-1 affect endothelial cell through phosphorylation of the p38MAPK substrate MAPKAPKinase2 (MK2). We studied heterozygous Flk-1+/− and homozygous MK2−/− knockout mice to determine their impact on angiogenesis in a hindlimb ischemia model.

Method(s): Femoral artery ligation was performed in 8-12 week old heterozygous Flk-1+/− (CD1 Background mice) and homozygous MK2−/− (C57BL 6 background mice) knockout mice compared to CD1 and C57BL/6 background wild type (WT) mice. Hindlimb perfusion was measured at 0, 3, 7, 14, 21 and 28 days by laser Doppler imaging and compared to the non-ischemic limb. Muscle immunohistochemistry was performed to determine the extent of neovascularization, fibrosis and expression of anti-apoptotic protein Bcl2.

Results: Both Flk-1+/− and MK2−/− mice showed poor recovery of perfusion in the ischemic limb compared to the respective WT groups (Figure). Flk-1+/− and MK2−/− mice showed decreased capillary density (580.5 vs. 1081 counts/mm² and 454.1 vs. 758.6 counts/mm²; p<0.05), decreased capillary/myocyte ratio (0.8423 vs. 1.636 and 0.8796 vs. 1.393; p<0.05) and increased muscle fibrosis (25.39 vs. 10.42 % and 25.84 vs. 13.57 %; p<0.05) respectively. Immunohistochemical analysis showed decreased expression of Bcl2 in Flk-1+/− mice compared to WT.

Conclusion: Deletion of FLK-1 and MAPkinase-2 impairs neovascularization and recovery of perfusion in a murine hindlimb ischemia model and is associated with downregulation of Bcl2. Gene therapeutic approaches targeting these kinases may an effective adjuncts in the treatment of peripheral vascular disease.

Laser doppler perfusion imaging for mouse hindlimb ischemia studies quantified as the perfusion ratio of ischemic to nonischemic limb. Both Flk-1−/− (A) and MK2−/− (B) mice had poor recovery compared to wild type mice after hind limb ischemia.
1086 month old female with malrotation

Dussel J, Holguin JD, Mazzucco J FACS

Waterbury Hospital

A 90 y/o female presented to the WH ED with complaints of abdominal pain and no bowel function for 10 days. She had a prolonged history of constipation for which she maintained an aggressive bowel regime. A CT scan revealed a 11cm cecum with suspected volvulus and proximal obstruction. She was urgently brought to the operating room where she had an exploratory laparotomy. The extremely dilated cecum was exteriorized through the wound and detorsion was attempted hindered by a very large fibrous attachments from the upper abdomen fixed to the retroperitoneum traversing the right lateral abdominal wall were found, consistent with Ladd’s Bands. This was excised and the cecum and ascending colon were mobilized by freeing the lateral peritoneal attachments. The small bowel was run from the terminal ileum to the duodenum where the ligament of Treitz was found to be right and lateral to its usual position, further evidence of malrotation. A right hemicolectomy with ileocolonic anastomosis was performed and the bowel was run again revealing no further pathology.

Incomplete rotation is an arrest of the normal rotation at 180 degrees rather than the normal 270. The duodenojejunal junction rests to the right of midline instead of rotating posterior and left of the superior mesenteric artery. The cecum fixes to the posterior body wall by Ladd’s bands and the SMA pedicle is narrow. This places the bowel at risk for volvulus (1). Malrotation occurs in less than 1% of the population with 85% being discovered in the two weeks of life (3). 90% are discovered by 12 months. In adults this is extremely rare with 40 documented cases in the last 70 years (2). Acute volvulus, as in this case, can occur proceeded most likely by vague episodic intestinal obstruction and chronic pain. Management is release of the Ladd bands and dextrarotation of the bowel or if nonviable resection of the affected region. Postoperative adhesions and obstructions are common.


Figure 1. Presenting CT scan
General Surgery 2 Competition

Moderator:
Ibrahim M. Daoud, MD, FACS,
Connecticut Surgeons, LLC, Hartford, CT

Judge:
Patrick V. Bailey, MD, FACS,
Private Practice, Phoenix, AZ
An Interesting Case of an Intercostal Hernia with Incarcerated Liver Repaired via an Intra and Extracorporeal Technique.

Michael Hernonm MD

St. Francis Hospital and Medical Center

Intercostal herniation of abdominal contents through a defect is rarely discussed in the literature. We report a case of an intercostal hernia sustained after a remote history of blunt trauma to the right chest wall.

We present a case of a 44 year old gentleman who had a remote history of being struck in the right chest during a karate competition. He presented many years after this initial trauma following an upper respiratory infection with intense pain, swelling, and ecchymosis of his right chest and flank. A CT scan was obtained which revealed a complete separation of the eighth and ninth ribs with incarcerated liver through this lateral wall defect. He was medically optimized and taken to the operating room for repair. He underwent a laparoscopic repair of a lateral abdominal wall hernia with mesh and an open closure and repair of right sided rib fractures and evacuation of an abdominal wall hematoma. The eighth and ninth ribs were reapproximated using heavy extracorporeal sutures while preventing entrance into the peritoneal cavity. After reapproximation of the ribs, intracorporeal placement of a sixteen by twenty one cm composix mesh was placed with excellent overlap and was buttressed in placed using a protacker and a suture passer. The liver had been reduced back into the abdomen atraumatically and the procedure was without complication. His postoperative course was unremarkable and was discharged home on post operative day three.

We present an interesting case of an intercostal hernia with a combination of both an extracorporeal and intracorporeal repair believed to be the first documented in the literature.
Hepatic Encephalopathy and Liver Failure Induced by Small Bowel Obstruction: A Case Report and Review of Literature

Stacie Kahan, M.D., Markus Boesl, Xiang Da (Eric) Dong, M.D., Kevin Dwyer, M.D.

The Stamford Hospital, Stamford CT

Introduction: While it is known that gastrointestinal motility problems such as constipation can incite hepatic encephalopathy (HE), small bowel obstruction as an inciting event is rare and present in the literature only in the form of case reports. Treatment for HE targets clearing ammonia burden through cathartic agents, however in the case of complete bowel obstruction, other modalities need to be considered. This is a case of a cirrhotic that presented with a high-grade bowel obstruction with rapid decompensation attributed to his underlying liver disease. This report suggests the need for parenteral therapy to prevent and treat HE and the importance of early aggressive surgical intervention.

Case Report: The patient is a 60-year-old male with an extensive medical history including Child class B alcoholic liver cirrhosis with portal hypertension and sequelae such as esophageal varices and upper gastrointestinal bleed. He presented to the emergency department with a one-day history of diffuse abdominal pain with bilious, nonbloody emesis and failure to pass flatus or bowel movements. He was competent to relay his history, as he was alert and oriented on presentation. Computed tomography (CT) of the abdomen and pelvis confirmed the diagnosis of small bowel obstruction with a transition point in the right mid-abdomen.

Over the course of hospital day one the patient became more lethargic. By the morning of hospital day two, he was minimally responsive requiring intubation for airway protection and transfer to the intensive care unit. His ammonia level was trending up from 175 to 287 and to 320 ug/dL by that morning. We discussed the overall prognosis and treatment options with the family before proceeding to the operating room for an exploratory laparotomy, adhesiolysis and small bowel resection for the high-grade obstruction.

Postoperatively, his encephalopathy did not resolve and he went into multiorgan failure including fulminant liver failure and hepatorenal syndrome. Despite aggressive measures he succumbed postoperative day five after his family made him comfort care.

Conclusion(s): It is well accepted that the severity of liver disease is correlated with surgical risk and operative mortality for nonhepatic general surgical procedures in cirrhotic patients. Despite this risk, in the case of high-grade small bowel resection, our recommendation based on this single patient experience is early intervention with clear explanation of risks and prognosis. Equally as imperative is the need to investigate other modalities of preventing the accumulation of ammonia in this patient population in the face of a bowel obstruction. Studies have demonstrated success with agents such as intravenous flumazenil and L-ornithine L-aspartate to clear ammonia and improve mental state gradation in HE. These agents are not widely available but may be necessary adjuncts in the treatment of these complicated patients.
A Case Report of Melanoma Metastatic to Small Intestine Without a Known Primary

Dr. Tariq Lescouflair, Dr. Larry Whitcomb, Dr Scott Ellner, Dr. Tina Thomas

Saint Francis Hospital Hartford, Connecticut

Introduction: Metastatic deposits from malignant neoplasms outside of the abdomen do not often involve small bowel. However, it has been noted previously that melanoma has a predilection to metastasize to small bowel, relative to other cancers. In fact, melanoma has been considered the most common extra abdominal malignancy to metastasize to the gastrointestinal tract. An early diagnosis may be difficult to make since the mass itself does not become manifest until it is large enough to cause symptoms, usually obstructive in nature. The patient in this case essentially presented in this manner.

Abstract: This a case report of a 48 year old Jamaican female who presented to the emergency department with worsening abdominal pain along with nausea and vomiting for 3 days. She had no significant past medical history or surgical history. These symptoms of small bowel obstruction were found to have been caused by a small bowel intussusception with an associated mass. The mass was surgically resected and found to be a malignant melanoma on pathological analysis. While small bowel metastatic melanoma remains a rare cause of bowel obstruction, it is an important diagnosis to consider, particularly in patients who have had a diagnosis of melanoma in the past.

Conclusion(s): Ultimately, in a patient who presents with a small bowel obstruction, it is rare to find metastatic melanoma to be the cause. Particularly in patients who have no history of malignant melanoma. Therefore, it is important that patients with small bowel obstructions be taken to the operating room if necessary. Especially those in whom intra-abdominal adhesions are unlikely to be a route cause (i.e. patients who have not had intra-abdominal surgeries). Also, while performing a laparotomy for obstruction it is important to survey the whole gastrointestinal tract for disease.
Inguinal Hernia with Interesting Cord Contents

Dussel J, Shetty J

Waterbury Hospital

BL is a 81 year old male with what appeared to be a typical left inguinal hernia. His past medical history and surgical history were only significant for a right inguinal hernia repair three years prior, which was performed without complication. Approximately 2 months prior he had undergone a normal colonoscopy. His pre-operative evaluation was within normal limits and so he was scheduled for operative management. On the day of surgery, the case begun normally however, following the opening of the hernia sac something highly unexpected was encountered. Lobular tissue and fluid filled the sac, which appeared to be consistent with pseudomyxoma peritonei. The rest of the procedure went within normal limits.

A sample was sent to pathology of which sections showed abundant mucin within fibrovascular tissue, with admixed chronic inflammatory cells including lymphocytes, histiocytes highlighted by the CD68 stain, and mesothelial cells highlighted with WT-1. The presence of abundant mucin was taken as presumptive evidence of the pseudomyxoma peritonei, with a probable mucinous neoplasm in the abdominal cavity.

Though a surprise to this surgical team, this is the normal presentation of pseudomyxoma peritonei, surgical management of another condition. Appropriate follow-up included the CT that was performed and showed a right lower quadrant intraperitoneal loculated cystic structure, suspicious for chronic appendiceal mucocele. His current options for management include surgery and HIPEC heated chemotherapy, decisions to be made through thorough discussion with the surgeon and patient.

Figure 1. Inguinal hernia containing pseudomyxoma contents
Comparing Surgical Assistants: Post-operative Complications as they Relate to the Training Level of the First Assistant

Manuel Moutinho, M.D.; Ellner, Scott, D.O., M.P.H.

UCONN Integrated General Surgery Program

Introduction: The ACGME work hour restrictions have led surgical training programs around the country to employ physician extenders to help with coverage of house duties and OR cases. Intraoperatively, the role of the first assistant is frequently determined by their training level, and certainly to some degree, what their eventual training level will be (i.e. physician assistant, attending physician within the general surgery specialties, attending physician within a specific specialty. The purpose of this study is to examine surgical outcomes from a single institution which employs operative first assistants at all three of these categories and comparing their surgical outcomes. From this data we can make conclusions pertaining to patient safety

Method(s): Using data gathered by the National Surgical Quality Improvement Program database at a single teaching institution, all general surgical patients during a 1 year time period in which the first assistant during the case was known (total of 1,025 patients) were placed into groups determined by their training level. The groups were physician assistants, residents, fellows, and a second board certified attending physician. Various 30-day complication rates were observed from each group (surgical site infections, pneumonia, UTI, PE, death, etc.) and were compared using Fisher’s exact statistical test to the resident group as a control.

Results: Some differences between groups included a higher rate of diabetes in the group of fellow cases (OR 1.677; CI 1.02-2.75), and a higher rate of emergency cases performed by the resident group than for any other group (OR 1.912 vs attendings, 2.926 vs fellows, and 2.593 vs PAs). There were statistically lower rates of surgical site infections and need for transfusion of blood products in the cases assisted by residents. There were no statistically significant differences in rates of post-operative mortality, nor in post-operative morbidities including but not limited to wound dehiscence, pneumonia, UTI, PE, or MI when comparing resident assistants with any other group.

Conclusion(s): At this single institution, there were no statistical differences in 30-day mortality when comparing post-operative patients who were operated on by resident physicians to those cases during which the attending surgeon was assisted with someone of a different training level. The resident group of patients did have a stastically higher rate of surgical site infections and rates of blood transfusion than the other groups; however, they also performed emergency surgical cases at a rate of approximately twice that of the other assistants. This data shows that there is likely no added risk placed upon patients when undergoing procedures with resident assistants when compared to operatively trained physician assistants, fellows, or a second attending physician.
A Case of Athletic Pubalgia

Basil Nwaoz, MD
Stamford Hospital

Introduction: Athletic pubalgia is a clinical term used in sports medicine and orthopedics to describe groin pain or injury of the abdominal and pelvic musculature surrounding the pubic symphysis that is related to specific athletic activity. It has been previously referred to as “sports hernia;” however, this term is misleading since “true” hernias are not common in patients with athletic pubalgia, and they do not produce the same type of pain. Confusion due to poorly defined terms in the medical literature has led to variability in diagnosis and ineffective treatment.

Case Report: 27-year-old man without any significant medical history with complaint of left hip pain for several weeks. Patient denies any particular trauma, but does state that he is very physically active and plays a few recreational sports. He denies any constitutional symptoms. His physical exam is notable for left sided groin 3-4/10 tenderness with normal ROM. No palpable masses or hernias are noted on exam. His gross motor and sensory exam is WNL bilaterally. Pelvic and left hip xray are negative for any fracture. He also had a CTAP which was also negative for any acute abnormalities. The patient was eventually sent for MRI due to persistent symptoms despite a trial of NSAIDS and physical therapy. The MRI showed findings consistent with athletic pubalgia.

Conclusion: Athletic pubalgia results from athletic-associated groin injury. It has been a significant cause of morbidity for both professional and nonprofessional athletes. Athletic pubalgia results from movements that entail twisting at the waist, sudden sharp changes in direction, side to side movement, and quick acceleration and deceleration. It was initially considered most prevalent in soccer players, but is now seen more often in American football players. Accurate diagnosis is often hard to achieve because of the complex anatomical and biomechanical characteristics of the groin region. This may result in overlapping symptoms for distinctly separate anatomical sources of injury. A careful and thorough history and physical examination is paramount for an accurate diagnosis.

MRI has proven to be extremely useful in the evaluation of patients with athletic pubalgia due to its ability to depict anatomy and soft tissue characteristics. The most common MRI findings in athletic pubalgia are rectus abdominis insertion and adductor injuries followed by severe osteitis pubis. Unilateral combined rectus abdominis and adductor longus are the most commonly seen pattern overall.

According to current literature, MRI has been shown to be both highly sensitive and specific in patients with athletic pubalgia: 68% and 100%, respectively for rectus abdominus tendon injury and 86% and 89%, respectively for adductor tendon injury.

Osteitis pubis is defined as edema of the bone marrow that extends along the pubic symphysis anteroposteriorly and results in sclerosis and bony changes of the pubic symphysis.
Changes Associated with Computerized Physician Order Entry (CPOE) Implementation

Tiffany Schatz MD, John Mazzucco MD

Waterbury Hospital

Background: Computerized physician order entry (CPOE) is increasingly being implemented in hospitals in the United States, and a significant amount of investigation has been done in academic tertiary centers regarding its real and potential effects. Some findings are contradictory, including decreased length of stay and decreased overall cost, as well as increased ordering and increased miscommunication between providers and services, such as pathology departments. Community hospitals have more slowly adopted CPOE, partly due to the cost of the technology. Nonetheless, as community hospitals adopt CPOE, the effect of its use can be assessed and compared to larger centers’ usage. Our community hospital, Waterbury Hospital of Connecticut implemented CPOE in November 2011. We collected data from patients’ admissions with colorectal procedures before and after CPOE implementation, in order to compare ordering patterns of clinicians. We hypothesized that ordering patterns would remain the same, despite the new format.

Methodology: All patients admitted to the surgical service for colorectal procedures during a two month period before and two month period after implementation of the CPOE were retrospectively reviewed. Data collected included basic demographic information including age, sex, diagnosis, surgical procedure, comorbidities, and length of stay. The records were interrogated for the number and type of routine laboratories, electrocardiograms, x-rays, and other ancillary services ordered in the postoperative orders.

Results: 45 patients pre-CPOE with an average age of 46.5 and an average OR length of 67 minutes were compared to 31 patients post-CPOE implementation of average age 41.7 with OR length of 77 minutes. Pre-CPOE average length of stay (LOS) was 9.02 days, post-CPOE LOS was 6.7.

Conclusions: The two groups had a similar number of orders per patient, however they have a significantly different LOS. This may be partially attributed to increased efficiency of placement of orders, but it is difficult to attribute the entire difference to this. Some of the gap is likely due to unequal major comorbidities (75% vs. 42%) and the number of post-op complications (64% vs. 13%). These differences, however, are also difficult to accept in a patient population that presented for similar procedures within a similar time-frame. The main conclusion we may draw from this painstaking collection of data is that the data we have on record is unreliable, and likely incomplete. Additional investigation is needed to flesh out any real differences CPOE makes on physician ordering, length of stay, and health care cost in small community hospitals. Additionally, I must advocate for improved methods and efforts to efficiently and accurately record key patient demographics and events over individual hospital stays, which are consistent and may be searched easily.
Specialty Surgery 1 Competition

Moderator:
Jennifer Bishop, MD
Stamford Health Integrated Practices, Stamford, CT

Judge:
Christina DelPin, MD, FACS
Advanced Surgical Associates, Trumbull, CT
Overexpression of Glutaredoxin-1 Stimulates Revascularization and Improves Blood perfusion in a Murine Hind-Limb Ischemia Model

Salim Abunaja, MD., Vaithinathan Selvaraju, Ph.D., Mahesh Thirunavukkarasu, Ph.D., David, Mcfadden, MD., J Alexander Palesty, MD., Nilanjana Maulik, Ph.D, FAHA.

St. Mary’s Hospital

Introduction: Development of effective strategies in treating peripheral vascular diseases (PVD) is increasingly requiring a genetic and molecular approach. Glutaredoxin-1 (Grx-1) is involved in redox regulation to protect cells from oxidative stress and to reduce apoptosis. One of our previous studies has shown that Grx-1 overexpression promotes cardiac repair after MI by increasing neovascularization and reducing ventricular remodeling through pro-angiogenic and anti-apoptotic mechanisms. This study explored whether Grx-1 overexpression in a mouse model of hind limb ischemia will enhance Ischemia-induced neovascularization and improve recovery. Methods: Femoral artery ligation was performed in 8-12 week old wild type (WT) mice and Grx-1 transgenic (Grx-1TG) mice.

Following ligation, the mice were observed over a 4 weeks period by laser Doppler imaging and the ratio of blood flow in the ischemic to nonischemic limb was documented. Muscle immunohistochemistry was performed to determine the extent of neovascularization, fibrosis and VEGF expression.

Results: Grx-1TG mice showed recovery of perfusion when compared to WT on postoperative day14 [0.68±0.04 (N=19) vs. 0.4±0.02 (N=16); p<0.05] and day 21 [0.75±0.03 (N=19) vs. 0.45±0.03 (N=16); p<0.05]. We observed increased capillary [1049±155.4 vs. 501.1±73.6 counts/mm²; p<0.05, N=5], arteriolar density [23.6±1.75 vs. 13.63±0.82 counts/mm²; p<0.05, N=5-6], capillary/myocyte ratio (1.712±0.074 vs. 0.89±0.02; p<0.05, N=5), decreased fibrosis [4.4±0.49 vs. 12.19±0.466 % p<0.05, N=5] and increased VEGF expression in Grx-1TG vs. WT.

Conclusion: Grx-1 overexpression enhances VEGF expression and improves ischemia-induced neovascularization and increased perfusion in a mouse model of HLI offering a potential, new therapeutic approach.
Recurrence of Iliac Artery Thrombosis in an Athlete

Daniel Bal MD, Kristina Ziegler MD, Timothy Manoni MD, Robert Zucker

Stamford Hospital

Introduction: Endofibrosis of the Iliac Artery (EIA) is a rare arterial disease that usually affects the external iliac artery in high performance trained athletes, especially cyclists and runners. These athletes are normally familiar with the pain and fatigue that follows high intensity exercise. However, occasionally these athletes have reported the rare occasion of leg pain and weakness at the peak of their training. Although unusual and rare, the damage that occurs is mostly secondary to stretching and kinking of the artery during exercise, which leads to constriction of the artery and eventually the symptoms that are felt in the affected leg. In cyclists, this occurs mostly in the external iliac arteries. We are reporting a case of external iliac thrombosis in a 44-year-old cyclist and marathon runner with a previous history of spontaneous iliac artery thrombosis that presented with recurrent symptoms and a new diagnosis of EIA.

Case Description: A 44-year-old female who has a previous history of an isolated episode where she developed spontaneous left iliac artery thrombosis most likely secondary to repetitive trauma of the external iliac from cycling, was admitted again with a recurrent left iliac artery thrombosis. The patient reported thigh pain and weakness that increased during intensive exercise and also while walking, leading her to stop and rest regularly. She stated that this was similar to the symptoms she had with the previous thrombosis. She is a very active person, biking regularly and running marathons. The patient’s medical history was unremarkable, with no risk factors for atherosclerosis. This patient had undergone a catheter directed lytic therapy 2 years prior, with no pathology identified in the external iliac artery and was maintained on Coumadin therapy for 6 months. She was monitored with surveillance of her arteries and never developed a stenosis and eventually was switched to Aspirin where she had been well since. She also underwent a hematology workup, which was reported as negative prior to this. She then presented to the emergency department and was found to have a recurrent left iliac artery thrombosis diagnosed by ultrasound. Results of clinical and vascular examination at rest were normal, except for a non-palpable but dopplerable posterior tibial and dorsalis pedis on the left foot, but palpable femoral and popliteal artery pulses. She was started on full anticoagulation to prevent distal embolization. The following day, after being kept on a heparin drip, she was taken into the operating room for angiogram evaluation with intent to treat the occlusion. A left iliac artery angiogram with AngioJet Thrombolysis was done with a catheter in place infusing tPA continuously until she was taken back to the operating room the next day. She was taken back to the operating room for a follow-up angiogram and IVUS. The IVUS showed a slightly thickened media compared to the common femoral and common iliac arteries. It appeared to be 1mm thicker, but no significant stenosis was identified and was noted to have patent left iliac, femoral, and distal arteries with 3-vessel runoff and good resolution of her thrombus. Postoperatively the patient did well and was kept on the Heparin drip and started on Xarelto afterwards. She was later discharged in stable condition on Xarelto, and followed serially with surveillance of her arteries, and maintained on Aspirin. She is currently doing well with no restenosis, but has limited her activities.

Conclusions: Although uncommon, there are instances in the literature of arterial thromboses related to risk factors associated with exercise. Exercise can create a pro-thrombotic state in the body, although to what extent it actually affects an individual's chance of thrombosis is still unclear. Iliac artery endofibrosis appears to be a common cause of exercise related iliac artery thromboses but is rare in the literature, especially in runners. Reactive thrombocytosis due to exercise appears to be unlikely to create an iliac artery thrombosis but the possibility still theoretically exists as it is known that reactive thrombocytosis in general can result in arterial thrombosis and it can be induced by strenuous exercise. In regards to optimal treatment for endofibrosis of the external artery, the data is extremely limited regarding long-term outcomes, and the range of treatments in the literature is mostly proven to be physician preference. Conservative therapy includes activity modification, which ranges from modifying a cyclist's hip position to cessation of the sport entirely which might not be ideal for the competitive athletes. Surgically, cases have been treated with either patch angioplasty or an interposition graft. Balloon angioplasty in the absence of stenting has also been used. The literature shows that this is a rare occurrence, but there hasn't been a definitive study on the true cause and treatment of EIA. More research needs to be done in order to optimize treatment in patients with EIA.
Presacral Ganglioneuroma in an Adult Male: Case Presentation and Review of Literature

Chan Chu PA-C

Principle Investigators: Dr. David Spiro and Dr. Scott Ellner

Saint Francis Hospital and Medical Center

This case presentation is being reported to describe a rare neural origin tumor. Presacral ganglioneuromas are rare benign tumors whose clinical presentation can range from being asymptomatic to causing neurological deficits or intra-abdominal symptoms. In this case presentation, a 35 year old male with a 10 year history of vague gastrointestinal and neurologic symptoms was found, via pelvic MRI, to have a large pelvic mass causing compression to adjacent structures as shown in Figure 1. The more common causes of presacral pelvic masses in adults include pelvic cyst, schwannoma and neurofibroma. The patient underwent surgical resection of the presacral mass with some residual mass as shown in Figure 2. Confirmatory diagnosis with histopathology revealed presacral ganglioneuroma. The patient became symptom free postoperatively. Further review of literature prompts many more questions regarding this topic. This tumor usually occurs in the pediatric population. This is a benign tumor and is part of a neural crest tumor continuum, in which different tumors in the same family are malignant. Because of this, there have been reported cases where malignant neuroblastomas may have regressed into a benign ganglioneuroma. Treatment of choice is surgical resection, which is curative. There have been no reported cases of recurrence. Adjuvant therapy such as chemotherapy or radiation is not necessary if complete resection is achieved. Chemotherapy is not effective for residual tumor. There have been no reported cases of the effectiveness of radiation for residual tumors.
Superficial Fistula Following Anal Sphincterotomy

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Introduction: Anal sphincterotomies are one of the most common treatments for anal fissures. Superficial fistulas are one of the complications following an anal sphincterotomy but recent studies either do not report fistulas as a complication or report an incidence of less than three percent. The aim of this study was to investigate the incidence of superficial fistula formation as a complication following an internal sphincterotomy among 5 colorectal surgeons within one group.

Methods: This is a retrospective review from 2005-2012 examining the incidence of superficial fistula formation following an anal sphincterotomy in 299 patients from an urban, multicultural environment.

Results: In 299 patients who underwent an internal sphincterotomy, 37 patients developed a superficial fistula afterwards (12.4%). Of those 37 patients, 31 underwent a fistulotomy in the operating room for the fistula, 5 were lost to follow-up, and 1 patient was treated non-operatively. There was no significant difference found in the BMI, age, gender or comorbidities of patients who developed fistulas versus those who did not. The mean time to diagnosis of the fistula after sphincterotomy was 45.8 days with a median of 40 days. Of the 299 patients, 64 patients developed abscesses afterwards. Thirty-three of the 37 patients (89.2%, p=0.003) who formed a fistula had an abscess develop prior. Of those 33 patients, 25 were treated with antibiotics only, 5 were treated with antibiotics followed by incision and drainage, and 3 patients only had incision and drainage.

Conclusion: In comparison to reported statistics on the incidence of fistula formation following sphincterotomy, we found our incidence to be much higher at 12.4%. We feel that fistula formation is an underreported complication of this surgery. It is, however, a significant complication following this operation because in the majority of cases, it requires surgical intervention in the operating room.
EVAR versus Open Repair: A Seven Year Retrospective Review of Ruptured Abdominal Aortic Aneurysm (RAAA) Repair in a Community Hospital Setting

Muhammad Tipu Rishi, MD, J. Alexander Palesty, MD, FACS;
Saint Mary’s Hospital

Introduction: Ruptured abdominal aortic aneurysm (RAAA) is a vascular catastrophe that remains fraught with high morbidity and mortality despite advances in operative technique and radiological imaging. It is expected that the outcome of this unfortunate population may improve with minimally invasive endovascular repair (EVAR). The objective of this study is to perform a retrospective analysis of endovascular repair (EVAR) vs. open repair (OR) in patients with a ruptured abdominal aortic aneurysm (RAAA) in a community hospital setting.

Method(s): Retrospective analysis of all the patients presenting with ruptured abdominal aortic aneurysm (RAAA) was performed from 2007 to 2013 in a community hospital setting. Two groups were identified: (1) Open Repair (OR) group: patients who underwent open repair of RAAA and (2) Endovascular group (EVAR): patients that underwent endovascular repair of the RAAA. All of the data was gathered from medical chart review after obtaining appropriate IRB approval.

Results: From 2007 till 2013, 11 patients presented with and underwent treatment for ruptured abdominal aortic aneurysm (RAAA). Those patients who presented with RAAA and expired before any therapeutic intervention could be undertaken were not included in this study. Average age of the patients undergoing OR and EVAR did not differ [76.4 ± 4.34 years (N=5) vs. 81.33 ± 2.39 years (N=6); p> 0.05]. Mean size of the aneurysm for OR and EVAR was also not significantly different [6.94 ± 1.04 cm (N=5) vs. 7.7 ± 0.49 cm (N=6); p > 0.05]. Out of the 11 subjects, 5 patients underwent open repair (OR) upon presentation of RAAA (45.45%); three patients in this group survived (60%). Out of the rest of six patients (54.54%), 5 underwent EVAR initially upon presentation; however all of them were converted to open later in the case. Only one patient underwent EVAR as the sole procedure. All the patients in EVAR group expired except one (16.67% survival in this group with 100% mortality when EVAR was used a sole procedure). Thirty-day survival of OR group was significantly higher than EVAR group [18.20 ± 5.46 days (N=5) vs. 3.66 ± 2.74 days (N=5); p < 0.05].

Conclusion(s): While recent studies have shown a very promising role of EVAR in management of ruptured abdominal aortic aneurysm, the benefit of this challenging procedure is questionable in community hospital setting where there is paucity of clinical resources and technical support. Our study showed that patients who underwent open repair of RAAA had significantly increased 30-days survival rate when compared to EVAR patients in a community hospital setting.
Angiojet Thrombolysis and Vena Cava Filter Insertion in a case report of a duplicated Inferior Vena Cava

Stuart Blackwood MD, Richard Hsu M.D.
Danbury Hospital

Introduction: Duplication of the inferior vena cava (IVC) complicates interventional procedures. Consequently, an appreciation of this anomaly and preoperative considerations are necessary when treatment of venous thromboembolism is undertaken.

Methods: A 58 year old woman presented emergently with right lower extremity phlegmasia due to extensive thrombosis of her right iliofemoral and infrarenal portion of her duplicated IVC. The patient underwent IVC filter placement and rheolytic thrombectomy with thrombolysis using the Angiojet device followed by venoplasty and stenting of the iliofemoral system and right IVC.

Results: Complete symptomatic and radiographic resolution on duplex imaging was achieved at 1 year follow up.

Conclusions: This case sheds light on the treatment options available with evolving endovascular therapies for this uncommon subgroup of patients, and highlights the importance of accurate intraoperative identification of venous anatomy. Recognizing aberrant venous anatomy ensures optimal management.

Fig 1. Right Ileofemoral thrombosis
Fig 2. Patent Left IVC with filter. Right IVC now stented.
Fig 3. Patent Right IVC after Thrombolysis (star) left IVC with filter (arrow)
Fig 4. Depiction of anomalous anatomy in our patient and immediate postoperative result.
Fig 5. Non-contrast CT scan 3 years prior misidentified the duplicated IVC as an enlarged gonadal vein. Preaortic trunk (white arrow), Aorta (black arrow)
Bariatric Surgery – Honorable Mention Specialty Surgery 2 Competition

Moderator:
J. Alexander Palesty, MD, FACS
Program Director, Saint Mary’s Hospital, Assistant Professor of Surgery, University of Connecticut School of Medicine, Waterbury, CT

Judge:
Michael Deren, MD, FACS,
Private Practice, New London, CT
**Bariatric Surgery – Honorable Mention**

**Acute Portal Venous Thrombosis Following Laparoscopic Roux-en-Y Gastric Bypass and Laparoscopic Sleeve Gastrectomy**

John Hwang, M.D.; Heather Player, M.D.; Daniel Davis, D.O.

Stamford Hospital

**Introduction:** Portomesenteric venous thrombosis (PVT) is an uncommon but potentially lethal condition reported after several laparoscopic procedures, most notably laparoscopic spleenectomy. Its presentation, treatment, and outcomes remain poorly understood. Etiologic factors such as venous stasis from increased intra-abdominal pressure, damage to the splanchnic endothelium, and systemic thrombophilic states has been suggested in the literature. PVT remains a rare phenemon. The largest study consisting of over five thousand patients and yielding seventeen cases of PVT was recently published. We present two additional cases of PVT and also propose prolonged liver retraction as an additional possible cause of PVT.

**Method(s):** The authors present 2 cases from a single-center experience of over 1500 patients as well as a review of the literature.

**Results:** Two cases of PVT following laparoscopic procedures were identified after Roux-en-Y gastric bypass and sleeve gastrectomy. One patient has a history of lower extremity deep venous thrombosis. Hypercoagulability studies were normal in both patients. Clinical symptoms consisted primarily of abdominal pain manifested, food intolerance and decreased appetite at 3 and 4 weeks after surgery respectively. The thrombus involved the portal and splenic veins in both patients.

**Conclusion(s):** Portomesenteric venous thrombosis following laparoscopic bariatric surgery usually manifests as nonspecific abdominal pain. Ultrasound or computed tomography can provide the diagnosis and demonstrate the extent of the disease. Treatment should be individualized based on the extent of thrombosis and the presence of bowel ischemia but should include anticoagulation therapy and possible thrombolysis. Venous stasis from increased intra-abdominal pressure, manipulation of splanchnic vasculature, and underlying systemic thrombophilic states likely converge to produce this potentially lethal condition. Aggressive and prolonged liver retraction may also contribute to the development of PVT. Minimizing operative risk factors must be considered especially in patients with hypercoagulable disease. PVT after laparoscopic bariatric surgery is rare however is becoming increasingly described. A high index of suspicion and familiarity with this potentially lethal condition is crucial in order to establish prompt diagnosis and care.
**Specialty Surgery 2 Competition**

**Stroke Rate is Decreased by the Dual Use of Cerebral Oximetry and Stump Pressures in Carotid Endarterectomy Patients.**

Blackwood S, Krol E, Ogrodnik A, Bekdache K, Dietzek AM

Danbury Hospital

**Introduction:** Currently there is debate as to which patients undergoing carotid endarterectomy (CE) need to be shunted and the role of cerebral oximetry (CO) in detecting these patients. The aim of this study was to determine if employing CO in addition to stump pressure (SP) appropriately indicated shunt use as manifested by a decreased incidence of postoperative neurological events.

**Methods:** An IRB approved retrospective review of all CE’s performed by a single experienced vascular surgeon whose practice is to selectively shunt based on a mean SP <25mmHg was undertaken. We examined 12 years of data including 9 years prior and 3 years subsequent to the use of CO (with shunt use indicated at >20% decrease in CO values) as an adjunct to SPs.

**Results:** 387 patients were identified; 6 patients, none with postoperative neurological events, were excluded due to missing data. Asymptomatic patients comprised 65% of our population with 35% symptomatic. Among patients shunted exclusively on SP, the stroke rate was 2.6% (8/301) compared to 0% (0/80) in the CO/SP group. This value however was not statistically significant (P=0.141 by Fisher’s exact Chi-x^2 test). All strokes occurred in patients in which a shunt was not used. 13.7% (11/80) of patients in the CO/SP group were shunted compared to 8.9% (27/301) in the SP only group. Of those patients shunted in the CO/SP group, 36% (4/11) would not have been shunted based on SP only.

**Conclusions:** This series suggests that the addition of CO impacted favorably on the stroke rate in the study cohort, however, due to sample size, we failed to show statistical significance. The use of CO is an inexpensive and easily employed adjunct which can help in deciding whether to utilize a shunt during CE and may decrease the incidence of stroke in these patients.
Thioredoxin -1 (Trx-1) Engineered Mesenchymal Stem Cell Therapy increased Pro-angiogenic factors, reduced Fibrosis and improved heart function in the infarcted rat myocardium.

Mahesh Thirunavukkarasu, Ph.D, Sumanth Channapatna Suresh, MD, Vaithinathan Selvaraju, PhD, Juan A Sanchez, MD, J Alexender Palesty, MD, David McFadden, MD, Nilanjana Maulik, Ph.D

St. Mary's Hospital

Introduction: Engraftment of mesenchymal stem cells (MSCs) has emerged as a powerful candidate in mediating myocardial repair. In this study, we genetically modified MSCs with adenovector encoding thioredoxin-1 (Ad.Trx1), apart from its antioxidative role Trx-1 is described as a growth regulator, transcription factor regulator, and a cofactor. We explored whether these transplanted engineered MSCs are capable of improving cardiac function and angiogenesis in a rat MI model.

Methods: Rats were randomized into control sham (CS), Control-MI (CMI), MSC-LacZ-MI (MLZMI) & MSC-Trx-1-MI (MTRXMI) (n=20/group). MI was induced by permanent LAD ligation, immediately after which MSCs preconditioned with either AdLacz or AdTrx1 were administered at 4 sites in the border zone around the infarction.

Results: We observed increased capillary density (2450±107.2 vs. 1541±177.8 & 2026±202; counts/mm²)(60d after MI) in the MTRXMI compared to both CMI and MLZMI. Western blot analysis 4d after MI showed increased expression of HSPA12B (HSP70 family member) and VEGF in MTRXMI compared to CMI. Echocardiography (60d after MI) showed increased ejection fraction (50 vs. 31%) and fractional shortening (27 vs. 16%) in the MTRXMI compared to CMI group. Myocardial fibrosis was less extensive in the MTRXMI group (4.8%) compared to CMI group (16.6%). Immunohistochemistry confirmed increased intercellular connection by measuring connexin-43 in the treatment group.

Conclusion: Our approach of Trx1 engineered MSC therapy may prove to be a strategic therapeutic modality in the treatment of cardiac failure by inducing HSPA12B and VEGF expression, neovessel formation, reducing fibrosis and by increasing functional recovery in the rat MI model.
Inflammatory Myofibroblastic Tumor of the Small Bowel Mesentery Masquerading as Perforated Appendicitis: The Limitations of Laparoscopy

Christopher D Hughes, MD, MPH (1); Ioanna Mazotas, MD (1); Anthony Tsai, MD (2); Abby Theriaque, APRN (2); Richard G Weiss, MD (1,2)

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Introduction: Inflammatory pseudotumor, or inflammatory myofibroblastic tumor (IMT), is a rare lesion among pediatric patients. It is a unique pathologic entity that is histologically benign, but it can behave like a malignant tumor, with local invasion and even metastasis. Although IMT is most commonly found in the lungs, it can occur anywhere in the body. Symptoms vary, but they are typically characterized based on the source region of the tumor. Effective treatment is through surgical resection and subsequent treatment with anti-inflammatory agents.

Method(s): We present a unique case study of a three-year-old girl who presented with abdominal pain and symptoms consistent with perforated appendicitis.

Results: The patient was brought to the operating room for a laparoscopic appendectomy. Upon inspection with the operating laparoscope, we discovered hemoperitoneum and a necrotic segment of small intestine that suggested a more complex pathology. We then converted to laparotomy where we discovered a large, dense mass at the base the patient's small bowel mesentery resulting in a necrotic segment of proximal jejunum. After resection, the patient was reanastomosed, and she subsequently recovered following an uneventful postoperative hospital course. Pathology revealed the lesion as an inflammatory pseudotumor.

Conclusion(s): The diagnosis of IMT can be challenging secondary to its rarity and its variable presentation. Our report of an IMT presenting as perforated appendicitis is unique in the small body of literature on these tumors. Consideration of IMT may aid in early diagnosis and appropriately guided treatment.
Ultrasound – Guided Interventions on Hemodialysis Access in the Office Setting

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Danbury Hospital, Danbury CT; Augusta Health Center, Fishersville VA

Introduction: Interventions under fluoroscopic guidance are currently considered the gold standard for treatment of arteriovenous fistulas, both native and non – autologous. This method offers good visualization of the target in different projections, as well as enables evaluation of the central vein. However, angiography under fluoroscopic guidance requires the use of operating or hybrid room as well as specialist radiologic equipment, and is therefore costly. Moreover, this technique requires the use of contrast and radiation, which can be harmful for the patient and the staff. In recent years, office – base ultrasound guided procedures have received increasing attention. So far, this technique has been described in context of non – maturing native fistulas as having equivalent post – procedure patency rates as interventions under fluoroscopic guidance. We would like to present the results of office – based ultrasound guided procedure, performed on established but failing hemodialysis accesses, in the period of the last two years. We also performed a cost comparison between the office base procedures and traditional radiologic interventions in the angiography suit in Augusta Health Center.

Method(s): We performed a retrospective result evaluation on all patients with established hemodialysis access, treated in our institution between March 2011 and July 2012. In all 30 cases, patients were evaluated with duplex ultrasound by a single vascular technician and qualified for the procedure if the velocity of the fistula flow was decreased. Same vascular technician evaluated the patients during and after the procedure. Fellowship trained vascular surgeons performed all interventions using the same technique. We also performed a cost comparison of procedures performed in our office setting and those performed in Augusta Health Center angioplasty suite using CPT codes.

Results: Total of 30 procedures were performed on 21 patients. In this population, success rate was 93% and no post – procedure thrombosis of hemodialysis access was reported. One failure was due to resistant stenosis that required the use of cutting balloon angioplasty. Transmural hematoma was reported in 8 patients but without any impediment of flow within the fistula. No systemic or long – term complication were observed.

Utilizing the CPT codes describing percutaneous angioplasty, we compared the costs of the procedures basing on the location. We established that the office – based procedure’s cost was $2160.41 (including cost of equipment, medication and professional fees). When it comes to the hospital setting, the cost of the procedure was $5397.17 – out of which $4971.37 was the facility fee and $425.8 was the professional fee.

Conclusion(s): Color Doppler ultrasound for years played a significant role in detection of vascular flow impairment and vessel disease in multiple areas of the body. It has also been described as imaging method for percutaneous interventions even in such difficult to visualize areas as inferior vena cava. Therefor, color Doppler ultrasound is now utilized as safer method for both patients and staff to perform procedures on hemodialysis access. A few reports are available in the literature about this technique safety and effectiveness. However, there is still limited data regarding interventions performed on arteriovenous fistulas solely under ultrasound guidance and no cost comparison has yet been reported between office and hospital – based procedures.

Considering the safety benefit for patients and staff, as well as significant decrease in cost for the ultrasound guided, office based procedures we foresee an increase use of this method in daily vascular practice.
The Validity of Entering Using the NSQIP Database

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Introduction: Alvimopan (Entereg) is an opioid receptor antagonist that has been approved for use to accelerate gastrointestinal recovery after small bowel and colon resections with primary anastomosis. It has been affiliated with lower lengths of stay. The aim of this study was to determine if alvimopan has any effect on length of stay or is affiliated with any complications using the NSQIP database.

Methods: All surgeries involving the small and large intestine with primary anastomosis recorded in ACS NSQIP in a single academic institution were identified between October 1, 2007 and July 1, 2012. Patients were placed into two groups based on if alvimopan was given. Post-operative length of stay and complication rates were compared amongst the groups.

Results: 174 patients in the entereg group were compared to 350 patients who didn’t receive entereg with similar demographics. Mean length of stay (LOS) after surgery was 5.7 +/- 3.9 for the entereg group versus 6.9 +/- 4.8 (p=0.010). Length of stay was no longer considered significant if only laparoscopic cases were compared amongst the groups (5.3 +/- 3.9 with entereg versus 5.9 +/- 3.5 control). However, entereg was still shown to have an independent effect on length of stay in the laparoscopic cohort using univariate analysis (p = 0.043). The following post-op complications between the control and entereg groups were also very similar with no statistical difference (p>0.05): post-operative acute renal failure 0% with entereg vs. 0.9% without, myocardial infarction 0.6% vs. 0.3%, bleeding 14.2% vs. 13.7%, sepsis 6.8% vs. 5.1%, unplanned return to the operating room 6.8% vs. 4.1%, and thirty day re-admission rate 13.8% vs. 12.5%.

Conclusion: Entereg may help decrease length of stay, but is more likely to have this effect with open intestinal surgery.
Laparoscopic Vasectomy: A Case Series

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Introduction: The incidence of laparoscopic inguinal hernia repair has increased since the technique was first described in 1990. Vasectomy is performed on over 500,000 men per year and is the most common non-diagnostic procedure performed by urologists in the United States. In some patients these procedures have been combined, offering several advantages. Here we present a series of three patients who underwent a combined laparoscopic procedure to repair their inguinal hernias and to perform a bilateral vasectomy.

Case Report: The three patients were middle-aged males presenting over the course of 15 months for extraperitoneal laparoscopic hernia repair. They elected to undergo bilateral vasectomy for contraception at the time of hernia repair surgery. All patients were counseled preoperatively by the general surgeon regarding the risks of laparoscopic inguinal hernia repair. They were also counseled by the urologist about the risks of laparoscopic vasectomy, specifically that the procedure would be irreversible.

All patients underwent general anesthesia. An incision was made beneath the umbilicus, the anterior rectus sheath was opened just lateral to the midline, and the rectus muscles were retracted laterally. The posterior sheath was identified and a balloon dissector was inserted. This was inflated to open the pre-peritoneal space, after which a 12-mm blunt port was placed. The pre-peritoneal space was insufflated with carbon dioxide to 15 mmHg. Two 5-mm ports were placed under direct visualization. At that time the structures of the spermatic cord on one side were identified and the vas deferens was dissected free. A 5-mm LigaSure device was used to excise a 2-cm fragment of the vas deferens. Attention was then turned to the opposite side and a similar procedure performed. Following vasectomy the hernia repair was completed by reducing the hernia sac into the abdomen and placing an appropriately sized mesh. The excised specimens were verified to be vas deferens by pathologic examination.

Conclusions: There are several advantages to performing a vasectomy in combination with other laparoscopic procedures. This technique avoids a separate scrotal incision. Complications occur in approximately 1-6% of patients who undergo a traditional trans-scrotal vasectomy, and some of these may be avoided with a laparoscopic approach. The literature regarding laparoscopic vasectomy is limited, thus the possible complications of this approach have not been well defined. None of the patients in this series suffered complications.

Limitations of a laparoscopic approach to vasectomy include the difficulty of reversal. For this reason our patients were all counseled that this procedure is permanent. Reversal of vasectomy performed via a trans-scrotal approach is generally successful, with sperm return to the ejaculate after 70–99% of vasectomy reversals, allowing for unassisted pregnancy in 30–80% of couples. Further limitations of a laparoscopic approach include the necessity of general anesthesia, whereas the trans-scrotal approach can safely be performed in an office setting under local anesthesia. We conclude that a laparoscopic vasectomy may be performed safely during a laparoscopic hernia repair in men opting for permanent sterilization. Further research is required to quantify the possible complications of this procedure.