2012 Annual and Scientific Meeting

Resident Paper Competition Abstracts

Uniting Surgeons to
Advance Patient Care in Connecticut

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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.
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Map of the Farmington Marriott

Trauma: Boston – Pool Level
Clinical Oncology & Bariatric: Springfield – Pool Level
General Surgery 1: Vermont
General Surgery 1: Rhode Island
Specialty 1 and Plastic: New Hampshire
Specialty 2: Massachusetts

CTACSPA, Inc. 2012 Annual Meeting
Page 3
Oncology Competition
Bariatric Surgery 1st Place Paper

Moderator:
Ramon E. Jimenez, MD, FACS
Surgical Oncologist, Hartford Hospital, Assistant Clinical Professor of Surgery, University of Connecticut Health Center School of Medicine, Chairman, CT Commission on Cancer
Hartford Hospital, Hartford, CT

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

John Borruso, MD, FACS,
Western Connecticut Health Network,
Danbury Hospital, Danbury, CT
1st Prize Paper - Bariatric Surgery

Early Experience with Laparoscopic Sleeve Gastrectomy for the Treatment of Morbid Obesity

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Hospital of Central Connecticut and UCONN

Introduction: Laparoscopic Sleeve Gastrectomy has been introduced as the latest option for the surgical management of the morbidly obese patients. The outcome of this procedure beyond 5 years is unknown due to the lack of reports in the literature. The early experience has been very encouraging with results similar to the gastric bypass and better than the laparoscopic gastric band procedures. However, early significant complications have been reported.

Method(s): A retrospective review of a prospective database was conducted including the first 18 months of introducing Laparoscopic Gastric Sleeve Gastrectomy as an option for the management of the morbidly obese patient. Patients selected this procedure with the surgeon after 2 hours presentation of all procedures. Sleeve Gastrectomy was performed using a 34 F Boogie, starting the transection 5 cm proximal to the pylorus and using biological reinforcement (Peristrip R) in all patients. Demographics, complications and weight loss are reported.

Results: A total of 56 patients were included in our study group. Eighty-two percent were female; average age was 42. The average Body mass index was 46 with 41 % of patients being super obese (BMI>50). There was no mortality. One patient had reoperation within 30 days of surgery. Three patients were readmitted, two of them for signs and symptoms of dehydration. Excess weight loss was 40%, 50% and 58.5% at 1, 6 and 12 months from surgery. Most patients with comorbidities resolved at 12 month, especially diabetes mellitus and sleep apnea.

Conclusion(s): Laparoscopic Sleeve gastrectomy is safe and efficient as a primary bariatric procedure in the hands of experience surgeons. Early results are much better than the laparoscopic band procedure and similar to the gastric bypass. Long term results are needed before is considered as the preferred option for the morbidly obese patient.
Extramammary Paget’s Disease in Males: A Caveat for Surgeons

Stephanie Douglas, BA; Deepak Narayan, MD
Yale University School of Medicine

Introduction: Extramammary Paget’s disease is a rare malignant neoplasm that is 4.5 times more common in females. It predominantly affects Caucasians, with a peak incidence in the seventh decade of life. It generally presents as a red, pink, or brown plaque with sharp borders. Erosions, ulcerations and pigmentation changes may be present. Lesions are often pruritic and are typically located in an area of the body rich in apocrine sweat glands. The anogenital region is most commonly affected, but lesions can occur in any area of skin or mucosa. There is often a lengthy delay between onset of symptoms and diagnosis of extramammary Paget’s disease, which is frequently first mistaken for eczema or contact dermatitis. Prolonged treatment with topical corticosteroids or antifungal creams complicates the clinical picture. A biopsy should be performed on any inflammatory lesion of an apocrine gland-bearing region that fails to respond to standard treatment.

Method(s): A 70-year-old Caucasian man presented with extensive Paget’s disease of the right groin. The lesion had been present for seven years and was treated as a fungal rash until biopsy confirmed the diagnosis. On physical examination, the lesion was noted to involve the medial two-thirds of the right inguinal crease and adjacent abdominal and thigh areas 2-3 inches from the crease line. The area of erythema spread into the lateral aspect of the scrotum extending down into the perianal region. A protuberant growth was present in the central portion of the lesion. Draining lymph nodes were negative. Abdominal exam was within normal limits. A CT scan of the abdomen and pelvis was performed with oral and IV contrast. These scans were negative, as was a colonoscopy. The lesion was excised in a two-stage fashion. During the first stage of the resection, 2-cm margins were obtained and the area was covered by allograft. Once permanent sections confirmed negative margins, a final closure was achieved using local fasciocutaneous flaps.

Results: Post-operatively, the patient developed a wound dehiscence. Closure was achieved with a wound vac and packing within four weeks.

Conclusion(s): Extramammary Paget’s disease is a very rare disease that needs to be borne in mind because it is frequently confused for eczema, contact dermatitis, psoriasis, mycosis, lichenoid skin disorders, melanoma, or basal cell and squamous cell carcinomas. Diagnosis is particularly difficult in males, since they are so infrequently affected with this problem. The hallmark of Paget’s disease is the Paget’s cell, which is critical to establishing the diagnosis. Paget’s cells are large cells with abundant, finely granular basophilic cytoplasm and a large, centrally placed nucleus. Unlike Paget’s disease of the breast, only 15-30% of cases are associated with underlying malignancy, most commonly involving the GI or GU tract. Hence, assessment of these patients in the form of CT scan, colonoscopy, and cystoscopy should be performed. Close follow-up is critical due to the disease’s 60% recurrence rate, which possibly results from involvement of non-contiguous skin areas.

Figure 1: A) Paget’s disease presenting as a pink plaque with sharp borders and areas of erosion involving the right inguinal crease and lateral aspect of the scrotum. B) Defect after obtaining 2-cm margins around the visible lesion. C) Final closure was achieved using local fasciocutaneous flaps.


Yale University School of Medicine

Introduction: Cutaneous melanoma of the head and neck region accounts for up to 20% of all primary melanoma lesions. Metastatic spread and nodal basin drainage are important determinants of surgical management. Surgical excision of primary lesions, sentinel lymph node biopsies and lymph node dissections for metastatic spread are routinely performed at varying stages of disease progression. Data linking clinical outcomes to key management decisions have been limited, leading to variability in certain surgical approaches. This study presents the evaluation of survey responses by national experts on the management of head and neck melanoma.

Method(s): A 10-question survey was created using commercial online software. The survey was designed to be short in length to maximize response rates. The survey was distributed electronically to members of the American Head and Neck Society. Respondents were coded via random user assignment matched to Internet provider addresses to avoid double entry by single respondents. Additionally, the charts of patients from the Yale Melanoma Unit who underwent resection of their head and neck melanoma from January 2000 to December 2006 were previously reviewed. Correlation of survey data to institutional trends and practice were reviewed. Student’s t-test and chi-square tests were used to determine statistical significance between groups in the retrospective cohort review. P-values less than 0.05 were considered statistically significant.

Results: A total of 86 respondents completed the survey. A majority of respondents routinely use lymphoscintigraphy to identify sentinel lymph nodes for biopsy (84%) and perform modified radical neck dissections for positive lymph nodes after melanoma excision (77%). When performing modified radical neck dissections, 71% of respondents remove submandibular lymph nodes, though only 59% believe leaving the submandibular nodes increases the risk of recurrence. For sentinel lymph nodes (SLN) within the parotid gland, 48% of respondents carry out a superficial parotidectomy, 13% perform a total parotidectomy, and 39% identify and excise the sentinel lymph node only. Review of Yale Melanoma Unit data demonstrated specific recurrence of melanoma in the submandibular basin to be similar for lymph node sparing dissections as compared to excision of level I LN’s (4% vs 6.25%, P= 0.488). Parotid-sparing SLN biopsies comprised 94.8% of total surgical approaches for SLN biopsies in the parotid region. The rate of melanoma recurrence in the parotid region was 0% following SLN biopsies that spared the parotid gland.

Conclusion(s): The surgical management of cutaneous melanoma lesions of the head and neck continues to be a challenge. Techniques in sentinel lymph node dissection and radical neck dissection have become less morbid over time. These responses demonstrate a minority of surgeons employing morbidity-sparing surgical approaches relative to current practices at the Yale Melanoma Unit. This study highlights the need for further randomized controlled trials in the surgical management of head and neck melanoma.
Poland Syndrome and Breast Cancer in Males: A Literature Review

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Saint Mary’s Hospital

Introduction: Poland Syndrome is a rare congenital malformation involving unilateral hypoplasia of the sternocostal portion of the pectoralis major muscle and ipsilateral breast hypoplasia. It may be associated with a range of developmental changes involving various degrees of ipsilateral thoracic and superior extremity anomalies. Breast cancer is the most common cancer in women but is quite rare in males; however, there are few reports of breast cancer in patients with Poland syndrome and none reported in males.

Method(s): This study is a literature review focusing on patients with both Poland syndrome and breast cancer. All study types are included in the review (case reports, cohorts, meta-analyses, etc.). Demographic, epidemiological, cancer type, cancer laterality, and risk factors will be reviewed in an attempt to derive a correlation between the two pathologies, specifically as it pertains to the male population of Poland syndrome patients.

Results: The association between certain types of cancer and congenital abnormalities is well established. Poland syndrome is frequently associated with Hodgkin disease, renal tumors, lung cancer, and some types of leukemia; however, no association with breast cancer has been made. Literature review demonstrates that breast hypoplasia associated with Poland syndrome does not preclude the possibility of developing ipsilateral or contralateral neoplastic breast tumors. Nine such case reports of breast cancer associated with Poland syndrome were identified with a wide age range and no identifiable risk factors. All but two cases were isolated ipsilateral cancers. One recently reported case describes a diagnosed contralateral DCIS in a male with Poland syndrome in Waterbury, Connecticut.

Conclusions: Given the small number of reported cases of concurrent Poland syndrome and breast cancer, it is impossible to elucidate any direct correlation or draw any conclusions regarding etiology or risk factors for the development of breast cancer in patients with Poland syndrome. Evidence suggests that there is not likely a significant difference in epidemiology of breast cancer in patients with Poland syndrome compared to the general population, however a possible correlation should not be excluded as Poland syndrome is known to be associated with other forms of cancer. Given only the single report of male breast cancer associated with Poland syndrome, it raises the questions of the need for breast cancer screening in all patients with Poland syndrome.
Papillary Thyroid Carcinoma Manifesting as an Autonomously Functioning Thyroid Nodule; A case report and literature review

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Stamford Hospital

Introduction: Thyroid nodule is a common finding that occurs in about 3-7% of adults by physical exam. About 6-20% present as autonomously functioning thyroid nodules that demonstrate hot uptake on thyroid scintigraphic imaging. Hot nodules are generally accepted as benign and therefore fine needle aspiration is often not recommended. This is a case report of a hot nodule found to be papillary thyroid cancer suggesting the role for fine needle aspiration for all thyroid nodules.

Case Report: This patient is a 50 year old female without any significant medical history who was found to have two palpable thyroid nodules on physical exam during a routine visit to her gynecologist. She did not report any symptoms consistent with abnormal thyroid function at that time. The patient underwent thyroid function tests that revealed a mildly suppressed TSH at 0.143 uIU/mL with free T4 and free T3 values within normal range. She was diagnosed with subclinical hyperthyroidism with a euthyroid clinical state. Sonogram of the neck demonstrated a 2.6x3.5x1.8cm nodule in the right lobe and a nodule measuring 0.8x1.2x6.2mm in the left lobe of the thyroid. An I-123 radioactive uptake scan revealed a hot nodule in the lower pole of the right lobe that correlated to the solid nodule noted on sonogram. Cytology obtained by fine needle aspiration of both nodules were consistent with a benign colloid nodule on the left and atypical cells suspicious for papillary thyroid carcinoma, possibly follicular variant, in the right lobe. Surgical excision was recommended.

Preoperatively, patient was treated with methimazole to attain euthyroid state to optimize her for surgery. She underwent uncomplicated total thyroidectomy with central neck lymph node sampling once her thyroid function tests were in normal range. Pathology demonstrated stage II papillary thyroid cancer of follicular variant without lymphatic spread with concurrent negative BRAF testing. The patient did well postoperatively and underwent radioactive iodine ablation followed by initiation of long term therapy with synthroid.

Conclusion: Thyroid nodules that demonstrate hot uptake on scintigraphic imaging are generally accepted as benign because of the rare incidence of malignancy. The incidence of thyroid carcinoma in hot nodules is less than one percent in most literature. Although hyperfunctioning thyroid carcinoma is a rare entity, it is important to exclude the possibility of malignancy. We recommend neck ultrasonography and fine needle aspiration in all suspicious thyroid nodules regardless of radioactive iodine uptake as to not overlook the possibility of malignancy.
Unusual Case of Isolated Pleural B-Cell Lymphoma

Emilia M Krol MD, Aleksandra Ogrodnik MD, Amirhossein P. Mahfoozi MD, Steven Sieber MD, John Chronakos MD

Danbury Hospital

Introduction: Pleural involvement in lymphoma is a relatively common and well described phenomenon, commonly presenting in association with pleural effusion in approximately 16 – 20% of patients [1]. Primary pleural lymphomas have been divided into two categories: 1) primary effusion lymphoma (PEL) associated with human immunodeficiency virus (HIV) or human herpes virus 8 (HHV – 8) infections [2] and 2) pyothorax – associated lymphoma in association with tuberculosis (PAL) [3]. Both of these subtypes are characterized by a relatively aggressive clinical course. Additionally, an extremely rare form of primary pleural lymphoma has been described in immunocompetent patients without aforementioned risk factors, characterized by an indolent course and good response to chemotherapy. To our knowledge, this is the first reported case of primary pleural B – cell lymphoma developing in a patient previously treated for malignant neoplasm of the lung.

Case Report: A 75 year old woman presented to our institution complaining of increasing exertional dyspnea, without associated fever, chills, night sweat, unintentional weight loss, chest pain or hemoptysis. She was diagnosed with stage IIA (T1 N1M0) adenocarcinoma of the lung 10 years ago, and underwent open left upper lobectomy and completed a course of chemotherapy post operatively. She was followed closely after her treatment, and at the time of presentation was considered disease – free. Chest X-ray on present admission revealed a right – sided pleural effusion. Routine laboratory evaluation was unremarkable. The patient underwent therapeutic and diagnostic thoracentesis. Cytology was negative for malignant cells. She again presented with recurrent pleural effusion; repeated thoracentesis attempts failed to identify the etiology. She therefore underwent right video – assisted thoracic surgery, pleural biopsy and mechanical and chemical pleurodesis, which only showed thickening of the pleura. No intraluminal pathology or gross tumor was identified intra-operatively. Immunohistochemical evaluation of biopsied specimen was consistent with large B – cell lymphoma. She recovered uneventfully from her procedure. Post – operative PET scan excluded any other foci of disease. Bone marrow biopsy was negative. She is currently being treated with R-CHOP chemotherapy (rituximab, cyclophosphamide, doxorubicin, vincristine, prednisolone).

Comments: Primary pleural lymphomas remain a rare entity and only comprise 2.4% of all primary chest wall tumors [4]. This entity has been described mainly in Japanese literature as being closely associated with chronic pyothorax caused by tuberculosis or as a result of artificial pneumothoraces used for treatment of lung tuberculosis [3]. Also, a relation between PEL and HHV-8 virus infection has been established [2]. Primary pleural lymphoma not associated with pyothorax or immunodeficiency remains a rare disease. A literature search on this entity identified 15 articles since 1995, describing this lymphoma in 18 patients. Mean age of this group was 63.6 years (20 – 81) with female to male ratio 1: 3.5. This indicated higher mean age and larger gender disproportion, than in previously described research [5]. Patients can present with a variety of symptoms, such as exertional dyspnea (27%), chest pain (38%), non – productive cough (16%), fever (16%), soft tissue swelling (11%), weight loss (11%), and night sweats (11%), or can be asymptomatic with an effusion found on chest X-rays performed for unrelated reasons (11%) [6]. Radiographic images reveal pleural effusion, pleural masses or plaque-like thickening of the pleura [6,7]. Large B – cell lymphoma, as described in our case, is the most common histopathologic type described. This type of neoplasm responds well to systemic chemotherapy, and patients have nearly 90% survival on follow – up at 5 years.

The non–specific presenting symptoms and radiologic characteristics may present a diagnostic challenge, mimicking more serious conditions like mesotheliomas, primary pleural sarcomas and a variety of metastatic tumors [8]. In our patient, the working diagnosis was a recurrence of previously treated adenocarcinoma of the lung. As noted in our patient, in this rare subtype of lymphoma, malignant cells are not present in pleural effusion and thus pleural biopsy is indicated for tissue diagnosis.
Timeliness of Colorectal Cancer Diagnosis Lags in Underprivileged Patient Population

Daniel Tuvin, MD, Scott Kurtzman, MD, FCAS

Waterbury Hospital

Introduction: Colorectal cancer (CRC) remains one of the major healthcare problems of the developed world. With the incidence of 150,000 new cases and 50,000 CRC related deaths annually in US significant national effort is channeled into treatment and prevention of the disease. Although effective screening for CRC exists, only a fraction of patients present at a stage at which cure is achievable. Previous studies had showed low socio-economic status to be a strong predictor of poor survival from CRC. Our objective was to evaluate the correlation between insurance status, stage of the disease and survival of patients with CRC over the course of the last decade.

Method(s): Retrospective analysis of National Cancer Data Base (NCDB) of CRC patients with the date of diagnosis from 2000 to 2009 was performed. Patients were stratified according to gender, race, age, insurance status and the stage of the disease. Trends and correlation between those parameters were assessed.

Results: Total of 797,511 cases were found in NCDB for 10 years (2000-2009). More than half of the patients (56.5%) had Medicare and/or Medicare with supplement insurance. There were 19,092 (2.39%) uninsured and 24,440 (3.06%) Medicaid-insured patients. Overall, majority of patients were originally diagnosed at stage II (24.5%) and stage III (22.4%) of the disease. Distribution of stage of the disease at presentation in Medicare-insured patients was similar to the whole studied group. However, statistically significant pattern of later stage diagnosis in uninsured and Medicaid-insured patients was found. Both groups were predominantly diagnosed at stage IV (27.8% and 26.9% respectively), and only 10.6% and 13.6% - at stage I. Medicare-insured patients were diagnosed at stage I of CRC in 22% of the cases.

Conclusion(s): Our results suggest marked discrepancy in timeliness of diagnosis of CRC in patients with different health-insurance coverage. Although there are reports of substantial underutilization of CRC screening even in Medicare-beneficiary patient population, our study stresses the importance of wider availability of CRC screening and the need of greater eligibility for health insurance coverage.
Functional Variants of the LEPR Gene in Patients with Hyperparathyroidism

Gloria Sue, MA

Yale University School of Medicine

Introduction: The genetic causes underlying parathyroid adenoma and hyperparathyroidism are not well understood. The leptin pathway is postulated to play a role in the development of parathyroid disease. We sought to identify novel single nucleotide polymorphisms (SNPs) in the LEPR gene associated with parathyroid adenomas and parathyroid hyperplasia.

Method(s): Patients with documented hyperparathyroidism who underwent parathyroidectomy for standard clinical indications were enrolled. All subjects had blood samples processed for DNA extraction using the AllPrep DNA/RNA/Protein Mini Kit per manufacturer protocol. Five SNPs (rs1137100, rs1137101, rs13306526, rs34499590, and rs8179183) in the LEPR gene were genotyped using predesigned TaqMan Assays. The weight of the largest parathyroid gland resected and total parathyroid tissue removed (in milligrams) was analyzed and correlated to SNPs using PLINK.

Results: A total of 124 patients with hyperparathyroidism were included. Two SNPs, rs13306526 and rs34499590, were excluded from analysis due to monomorphism. For the remaining three SNPs, the call rates were all >95% and Hardy-Weinberg equilibrium p-values were all >0.0167 (0.05/3) indicating no systematic genotyping error.

Using a recessive model of inheritance, SNP rs1137101 had a significant association with both the largest parathyroid gland and the total mass of parathyroid tissue removed (p=0.045 and 0.040, respectively). Under an additive model, a trend toward association was found. After adjustment for the most likely confounders of the association between parathyroid size and LEPR SNPs (age, gender, body mass index [BMI], and systolic blood pressure) the strength of the association remained significant (p=0.047 and 0.042, respectively).

We examined the association between BMI and the LEPR SNPs as leptin and the leptin receptor are known to correlate with BMI. Under both additive and recessive models, none of the three SNPs were associated with BMI. The association of total parathyroid size and SNPs was examined among obese (BMI>30; n=47) and non-obese (BMI<30; n=77) patients. Among obese subjects, both rs1137100 and rs1137101 were significantly associated with total parathyroid size (p=0.0343 and 0.0259, respectively), but this was not significant among non-obese subjects.

Conclusion(s): We identified a SNP in the LEPR gene, rs1137101, which is significantly associated with parathyroid size under a recessive model of inheritance, an association which persisted after adjusting for potential confounders including BMI. Among obese patients, an additional SNP, rs1137100, was significantly associated with parathyroid size. These findings suggest potential genetic changes in the leptin pathway which may account for the development of hyperparathyroidism.
General Surgery I Competition

Moderator:
David Shapiro, MD, FACS
Critical Care - Surgical, Surgery
Trauma, General Surgery,
St. Francis Hospital, Hartford, CT

Judge:
Kathleen LaVorgna, MD, FACS,
Private Practice, Norwalk CT
Assessment of Manual Skills Proficiency of Medical Students Considering Surgical Training

Salim Abunnaja, MD, Shohan Shetty, MD, Alexander Palesty, MD, FACS

Saint Mary’s Hospital

Introduction: Manual skill proficiency and ability to attain skills are not currently employed in selecting residents for surgical training programs. The study objective was to assess whether the technical skill levels and ability to attain skills are higher in medical students considering surgical training versus those considering nonsurgical training.

Method: Twenty-four medical students at a community hospital underwent manual skill testing during their core General Surgery rotation. Three laparoscopic tasks (Grasping, Lifting & grasping and Camera coordination) were assessed on a virtual reality (VR) simulator (LapSim, Goteborg, Sweden). Performance scores and learning curves were computer-generated. The results were analyzed and compared between medical students considering surgical training versus those considering nonsurgical training.

Results: Twenty-four medical students (12 male & 12 female) were assessed. Seven students expressed interest in surgical training (group 1) and 17 expressed interest in nonsurgical training (group 2). Out of the total number of students Six students were considered to have high manual skills (total repetitions < 10 ), 11 students had average skills (total repetition between10-20 ) and 5 students had low skills (total repetition > 20). No statistical significant differences were noticed between group 1 & 2 in the average scores or in the number of repetitions in all three tasks (P values range from 0.1 to 1.0).

Conclusion: Although Virtual reality simulators might be good tools in objectively assessing manual dexterity and visual coordination necessary for future laparoscopic surgical training, there is no evidence at this stage of our study to suggest the routine use of such simulators in the selection process for surgical training programs. Larger and longer terms studies are still needed in this evolving field.
Herniation of the Falciform Ligament Through the Anterior Abdominal Wall: The First Documented Case of Laparoscopic Repair

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St. Francis Hospital and Medical Center

Introduction: First published in 1962, herniation of the falciform ligament is defined as a herniation or prolapse of the falciform ligament into the extraperitoneal space, drawing with it a sac of peritoneum. Open repair of this hernia was described at that time. We present the first reported case of laparoscopic recognition and repair of this type of abdominal wall hernia.

Methods: This is a case report of an otherwise healthy 32-year old female who presented with complaints of epigastric abdominal pain and evidence suggestive of an epigastric hernia in the absence of prior abdominal surgery. The patient was taken to the operating room for elective laparoscopic repair of the ventral hernia. Upon direct visualization of the posterior aspect of the anterior abdominal wall, it was noted that there was a midline defect in which a portion of the falciform ligament was herniating and incarcerated. Laparoscopically, the falciform ligament was reduced, and the hernia was repaired using mesh.

Results: The defect was repaired using a piece of mesh sized 11 x 14 cm and it was stabilized using transfascial sutures as well as laparoscopic tacks. The patient tolerated the procedure well and there were no intraoperative nor immediate postoperative complications. The patient was discharged home the same day of the procedure.

Conclusions: Herniation of the falciform ligament through a defect in the anterior abdominal wall is a rare and unusual type of ventral hernia, with minimal data in the literature. Open repair was first described in 1962. We present the first reported case of laparoscopic recognition and repair. Given the advent of the increasing use of laparoscopy for a variety of abdominal pathology, we feel that this entity will be recognized with more frequency and that laparoscopic repair is a feasible option for treatment.
Robotically-Assisted Cholecystectomies: Beyond the Learning Curve

Ryan Bendl DO, Philip Corvo MD, MA, FACS

Stamford Hospital

Introduction: Robotic surgery has become mainstream. Since the introduction of the Zeus and da Vinci surgical systems in the late 1990’s, robotic surgery has demonstrated superiority in urologic and gynecologic surgery, but still struggles to establish its benefit in the field of general surgery. Many critics cite a lack of tactile feedback, coupled with high operating costs and longer turnover times without evidence of significant benefit. Early studies suggested that operating times for robotically-assisted cholecystectomies exceeded those for conventional laparoscopic cholecystectomies. Average operating times ranged from 55 to 123 minutes for robotic cases and 41 to 95 minutes for laparoscopic cases. For elective laparoscopic cholecystectomies, the reported conversion rate is 5%. Studies found conversion rates between 0% and 6% in robotic cases with these studies limited to a maximum of 51 patients.

Methods: All robotically-assisted cholecystectomies performed between 1/1/10 and 8/31/12 were reviewed. Ninety-five robotic cholecystectomies were attempted during that time period. Six of them were performed using a single port-site approach. These cases were excluded from subsequent analysis. The remaining 89 were done by one surgeon at Stamford Hospital (Stamford, Connecticut) within the aforementioned time period. Incision and closure times were used to determine operative duration. Cases were numbered sequentially.

Results: The average operative time for a robotically completed case was 1 hour 5 minutes. Eighty-eight of the eighty-nine cases (98.9%) which were started robotically were completed without converting to open. The one case which did require conversion was excluded from time analysis. The trend in operative times can be seen in figure 1.

Figure 1. Robotic cholecystectomy operative times

Conclusion: Beyond the initial learning curve experienced with robotic surgery, operative times and conversion rates may approach those seen in conventional laparoscopic surgery. The conversion rate of 1.1% seen in this study of 89 consecutive robotic cholecystectomies is an improvement from the 5% reported for traditional laparoscopic approaches. Future investigation includes expansion of the patient population as well as analysis of patients who have undergone a single-site robotic cholecystectomy.
Translating Pain Guidelines into Practice

Lindsay Bliss, MD; Cynthia Kociszewski, APRN, PhD; Deborah Dillon McDonald, RN, PhD; Steven Hanks, MD, MMM, FACP; Rekha Singh, MD, FACS

University of Connecticut Health Center; The Hospital of Central Connecticut

Introduction: Up to one-fifth of post-operative patient experience severe pain. The Joint Commission pain management recommendations encourage a standardized approach to pain management, but without safety mechanisms, adverse effects from overly aggressive intervention can harm patients. This study describes the implementation of a standardized pain management protocol to reduce adverse events and improve the efficacy of pharmacologic intervention.

Method(s): Standardized pain management ordersets were created using multidisciplinary committees at a 400-bed teaching hospital in the Northeast. A cohort study was performed using retrospective data collection of patients prior to and after pain orderset implementation. Adult postoperative patients requiring opioids and not utilizing patient-control analgesia were studied in the first 24 hours following surgery on a single medical-surgical unit. Measured outcomes include pain intensity improvement and the incidence of adverse drug events.

Results: A total of 130 postoperative medical records were included in the study with 71 records included prior to and 59 records included after orderset utilization. There was no statistically significant difference in mean age or sex breakdown between the two groups. The groups differed significantly in number of co-morbid conditions, with more co-morbid conditions in the orderset utilization group of patients, 2.1 versus 1.3. Mean pain intensity change from pre to post analgesic administration demonstrated no statistically significant difference following adoption of the pain management ordersets. Only one potential adverse event occurred during our study. One patient in the orderset utilization group experienced a mucus plug and required transfer to the critical care unit for additional respiratory support.

Conclusion(s): Although the study did not demonstrate an improvement in the efficacy of pain management based on pain intensity scoring or the incidence of adverse drug events, the process created system-wide safety mechanisms around opioid administration. Orderset implementation reduced provider variation and improved pain management practice patterns.
50 minutes of surgery for 50 years of life: Resection of an Enteric Duplication Cyst

John N Dussel MD, Diego Holguin MD, David Knight MD

Waterbury Hospital

Case Report: March 2012. The surgical mission lead by Dr. David Knight spent 2 weeks in Monrovia, Liberia performing surgery in cooperation with the volunteers of HEARTT. During this time HN, a three year old female, presented with one year of expanding, non-painful abdominal distention. Despite treatment at her local health care facility with diuretics, b12, and dietary modifications, her abdomen continued to expand. Social pressure had ostracized her family keeping her from pre-school, as the village healer believed her to be cursed. HN's family presented to the tertiary referral center as a last effort for treatment. On examination, her abdominal girth was 70.5cm measured 3cm above the umbilicus. Her abdomen was distended, soft, non-tender, with muffled bowel sounds, dull to percussion, and had a positive fluid thrill without bulging abdominal veins. The rest of her past medical history, developmental analysis, review of systems and physical exam was benign. With exception to her abdominal distention, she was perfectly healthy and well developed. HEARTT pediatric volunteers ran available laboratory and imaging analysis of which the only positive finding was on ultrasound. The abdomen had a large cystic area extending from pubis to xiphoid with several light echogenic stripes. Percutaneous tap of this cyst was unsuccessful on two separate occasions. Surgery was consulted and an exploratory laparotomy was performed. A large cyst was found, whose dimensions were 40x30x16cm, weighing 4kg roughly twenty percent of the patients total body weight. The cyst was attached to but not communicating with the greater curvature of the stomach, connected by a vascular pedicle made by the confluence of left and right gastroepiploic arteries. It was successfully resected. Postoperatively HN had full normal function by day 2.

Discussion: The etiology of enteric duplication cysts is uncertain. Speculation ranges from intrauterine vascular accident to partial twinning.[2,6] They can occur anywhere throughout the gastrointestinal tract, most commonly found in the small intestine more specifically the ileum.[4] They usually share a common blood supply with the adjacent bowel, a consideration to keep in mind when resecting. Their presentation, normally in childhood, is dictated by location and the presence or absence of ectopic tissue.[3] Ante-natal diagnosis has been made possible by the regular use of ultrasound since the 1980s.[2] The treatment is early resection to avoid complications such as torsion and it has been postulated that malignant transformation into adenocarcinoma can occur in adult life.[5] Surgery in Liberia is growing since the cessation of civil war. However, their infrastructure only allows for limited diagnostic modalities. This leaves many diagnoses up to the best reasonable guess, something rarely experienced while training in the United States. Without this operation HN and her family would've been relegated to a life of social exile. Life expectancy in Liberia is 57 years [7] and HN's surgery took 50 minutes. The successful resection of her enteric duplication cyst has afforded her the opportunity of at least 54 normal years.
A Novel Technique for Perineal Hernia Repair

Stephanie Douglas, BA; Deepak Narayan, MD

Yale University School of Medicine

Introduction: Perineal hernia is an uncommon complication of abdominoperineal resection of the rectum. Prevalence estimates range from 0.34 to 7 percent. Various surgical repair techniques have been described for the management of post-operative perineal hernias, with reported rates of recurrence approaching 40 percent. Use of a gracilis muscle flap for repair of a post-operative perineal hernia was first described by Bell et al. in 1980. The traditional repair utilizes gracilis muscle alone, without overlying tissues and skin. We present the case of a 69-year-old white male who presented with a perineal hernia subsequent to abdominoperineal resection and radiation to the perineum for advanced rectal cancer in 2009 who was successfully treated with a modified de-epithelialized gracilis myocutaneous flap.

Method(s): The patient presented to his GI surgeon in early 2011 with a midline perineal bulge. Physical exam of the perineal region revealed the presence of a well-healed scar as well as a large, easily reducible hernia measuring approximately 10 cm x 6 cm at the site of his perineal incision. No drainage, irritation, or evidence of radiation damage was observed. A CT scan showed protrusion of small bowel and colon through the hernia defect. Following delay of bilateral gracilis flaps, the patient was taken to the operating room for repair of the perineal hernia. The gracilis muscle along with a skin paddle was harvested and de-epithelialized using the VersajetTM Hydrosurgery System. This was then secured to the coccyx using 0 Maxon suture through holes drilled into the coccygeal bone, completely obliterating the defect. The repair was reinforced by means of a Strattice mesh, which was also secured using 0 Maxon sutures.

Results: The patient did well postoperatively. He recuperated at a rehabilitation facility on a Clinitron bed. A small seroma measuring 2 cm x 2 cm was incised, drained, and packed in clinic. The wound healed, and he is doing well eighteen months post-surgery with no evidence of recurrence.

Conclusion(s): Surgical repair of post-operative perineal hernia using a gracilis flap spares the morbidity of abdominal-based reconstruction and provides a good option for patients in whom the abdomen is unavailable. Use of a myocutaneous flap adds strength to the repair when compared to reconstruction with the gracilis muscle alone. This results from the strength imparted by the dermis, which provides a resilient natural barrier over the long term. The VersajetTM Hydrosurgery System is a means of quickly and easily de-epithelializing the flaps for use in reconstruction of the perineum.

Fig. 1: A) External view of perineal hernia. B) Coronal CT image showing protrusion of colon through hernia defect. C) Intra-operative image of de-epithelialized gracilis flap being inset into hernia defect.
Fecal Transplant For Recurrent Clostridium Difficile Colitis

Rakesh Hegde MD, Nisha Manickam DO, Zhongqui Zhang MD, Steve Aronin MD

Waterbury Hospital

Introduction: Clostridium difficile infection (CDI) is a common complication associated with systemic antimicrobial therapy. Today CDI is a leading cause of antimicrobial associated diarrhea. Current treatment with metronidazole or vancomycin against CDI is suboptimal with high recurrence rates. Both of these antibiotics alter the normal gut flora, that provides colonization resistance against CDI. Re-establishment of normal intestinal flora by fecal transplantation was first described by Eiseman et al in 1958. Since then under 30 articles were published in English literature with promising 87% success with fecal transplantation for CDI

Methods: 60 year old female presented with recurrent Clostridium difficile colitis. She was previously treated with oral vancomycin and dificit, which failed to alleviated her diarrhea. We offered fecal transplant as an alternative to antibiotic treatment. Patients niece readily agreed to donate the stool for the transplant. Donor was screened for HAV Ab, Hep Bs Ag, Anti HCV Ab, HIV 1 and 2 A, Treponema palladium, C-diff toxin A/Routine stool culture, light microscopy for ova parasites.

Stool sample was obtained less than 6 hours before transplantation. Stool specimen with a weight of ~30grams mixed with 50 – 70 ml of sterile 0.9 N NaCl and homogenized with a household blender for 2-4 min until the sample is smooth. Then the suspension was filtered using a paper coffee filter. Adequate time was allowed for slow filtration to come to an end. Suspension was refiltered again using a paper coffee filter. Once again allowing adequate time for slow filtration. 100 ml of homogenized donor stool is directly infused into the cecum through the biopsy channel of colonoscope

Results: Patient reported no diarrhea at 3 week follow up, significant improvement with the abdominal pain and bloating.

Conclusion: Fecal transplant is simple, safe and effective treatment for recurrent Clostridium difficile colitis
Extensive Portal and Superior Mesenteric Vein Thrombosis Following a Laparoscopic Colon Resection for Benign Disease. Case Report

Emilia Krol, MD, Stuart Bussell, MD, FACS

Danbury Hospital

Introduction: Portomesenteric vein thrombosis, following laparoscopic procedures, without injury to portal system, has been described in literature since 1991. It is a rare but potentially lethal complication, and its pathophysiology remains poorly understood. We present a case of extensive portal and superior mesenteric vein thrombosis, as a delayed complication of uneventful laparoscopic right hemicolecctomy, for benign polyp removal.

Methods: Retrospective chart review and literature review

Results: The patient is 43 years old male who underwent an uneventful laparoscopic right hemicolecctomy for a benign polyp of the ascending colon, which was too large to be removed colonoscopically. The patient’s hospital stay was uneventful. However, he returned to the hospital 16 days after discharge with complaints of nausea, vomiting, and vague abdominal pain. Computer tomography (CT) of abdomen and pelvis performed on the day of readmission showed extensive acute thrombus in portal, superior mesenteric and splenic veins. The patient was initially started on intravenous anticoagulation with IV heparin. Follow – up imaging showed persistent clot in the portomesenteric system. Due to the fact that patient still complained of abdominal pain and was unable to tolerate oral intake, he was started on parenteral nutrition. The patient underwent catheter – guided portal vein thrombolysis using tPA on post – operative day 29 with no major change in the portal thrombus. He remained on anticoagulation as an out-patient with steady improvement in his clinical status and is currently doing well at the 12 month follow – up.

Conclusion: Portomesenteric thrombosis remains a rare, but serious complication of laparoscopic surgery. It should be stressed, that this complication can occur even in the absence of any direct vascular trauma during the procedure, as well as that it can occur in delayed fashion after initially uneventful procedure. The standard for treatment has not been developed and remains individualized based on the extend of the thrombus, patient clinical status, and the condition of affected bowel.
General Surgery II Competition

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

Judge:
Alan Meinke, MD, FACS,
Director of Surgical Education at Norwalk Hospital,
Surgical Associates, Inc., Westport, CT
A Comparison of Robotic and Traditional Laparoscopic Approaches to Gallbladder Surgery

Ibrahim Daoud MD, Tariq Lescouflair MD

University of Connecticut

Ever since the first laparoscopic cholecystectomy in the late 1980s, surgeons have been attempting to develop less invasive and more advanced methods for performing the most common surgical procedures. This trend ultimately led to the invention of robotic surgery, which began in earnest in the 1990s. Lately robotic surgery has been gaining ground, with many urologic, gynecologic and general surgery procedures exploiting its many advantages. The aim of this project is to look specifically at the use of robotics in the context of gallbladder surgery. There are three approaches to gallbladder surgery that will be compared: robotic 4 incision, robotic single incision laparoscopic, and traditional laparoscopic. The patients considered for this study have been prospectively entered into a database, which includes all of the cholecystectomies performed by Dr. Ibrahim Daoud at St. Francis Hospital in Hartford, CT, all data was retrospectively analyzed. There were 4 cohorts compared: patients who underwent robotic SILS, those who underwent Robotic 4 incision, traditional laparoscopic, and composite robotic group (either robotic procedure). The comparisons were made as follows. First of all using t-testing and chi-square testing we controlled for various potential biases, and confounders including age, BMI, ASA class. With these controls in mind we aimed to determine whether there was a statistically significant difference in operative time, rate of conversion, rate of complications, length of stay and days until return to normal function. We found that operative time was longer for robotic procedure in general. The rate of conversion and rate of complications were similar in all four cohorts. Length stay did not show statistically significant differences between the cohorts either. Interestingly, we found that robotic surgery was associated with slightly longer time to return to previous function. Another aspect we compared is cost. While it is obvious that the initial investment in the a robot is expensive, we obtained copies of OR charges, including time and materials used in order to determine whether a long term cost benefit exists in performing robotic cholecystectomies of either type (SILS of 4 incision). We found that robotic cases were significantly more expensive than laparoscopic cases. While this is a preliminary study with limited data, it seems to raise the question of whether robotic cholecystectomy is viable in the long term. However, the major caveat here is that robotic surgery is still a developing field, therefore, operative technique, time, and cost will likely evolve.
**Etiology, Treatment and Outcome Pattern in Bilateral Gluteal Compartment Syndrome**

Tolutope Oyasiji, MD Scott W. Helton, MD, FACS

Yale Department of Surgery and Yale-New Haven Hospital

**Introduction:** Gluteal compartment syndrome (GCS) is rare. More rare, even, is bilateral involvement (BGCS). Clinical presentation can be subtle. Coupled with infrequency of cases, the unsuspecting physician can easily miss the diagnosis with potentially devastating complications/consequences for the patient including sciatic nerve palsy, massive rhabdomyolysis, renal failure, multiple organ failure and death. Thirteen case reports identified in the English literature documented one patient per report. We sought to report our three-patient series.

**Method(s):** We reviewed the 3 cases [A,B,C] of bilateral gluteal compartment syndrome in our institution from January 2005 to Dec 2011. We also conducted literature search for reported cases. An analytical review of all cases was done with a view to identify trends of demographics, etiology, presentation, clinical course and outcome which will help in identifying patients at risk of developing BGCS.

**Results:** 88% of patients were male and < 66 years old. No woman had previously been reported prior to our series. 75% presented with pain and 44% developed a nerve palsy or leg weakness despite gluteal fasciotomy. Rhabdomyolysis was present in 56% of patients but only 38% developed acute renal failure. 56% of patients required fasciotomy with debridement while 38% required only fasciotomy. Fall/ prolonged recumbency (44%) was most common etiology followed by lower extremity orthopedic procedures (31%). There was one death (6.3%).

<table>
<thead>
<tr>
<th>Author</th>
<th>Age</th>
<th>Sex</th>
<th>Etiology</th>
<th>Presentation</th>
<th>Treatment</th>
<th>Outcome</th>
</tr>
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<tbody>
<tr>
<td>Osteen et al</td>
<td>52y</td>
<td>M</td>
<td>TKR revision, epid. analgesia</td>
<td>Gluteal pain, Leg numbness, RM</td>
<td>Fasciotomy</td>
<td>No deficits</td>
</tr>
<tr>
<td>Yanagawa et al</td>
<td>39y</td>
<td>M</td>
<td>Drug overdose</td>
<td>Leg paralysis, RM, ARF</td>
<td>Medical management</td>
<td>Foot paralysis</td>
</tr>
<tr>
<td>Somayaji et al</td>
<td>39y</td>
<td>M</td>
<td>THR, epid. anesthesia</td>
<td>Total hip arthroplasty</td>
<td>Fasciotomy, debridement</td>
<td>Leg weakness</td>
</tr>
<tr>
<td>David et al</td>
<td>36y</td>
<td>M</td>
<td>Fall</td>
<td>Severe gluteal pain; ARF</td>
<td>Fasciotomy, debridement</td>
<td>Sciatic nerve palsy</td>
</tr>
<tr>
<td>Pua et al</td>
<td>59y</td>
<td>M</td>
<td>hypogastric artery lig</td>
<td>Myoglobinuria, ARF</td>
<td>Fasciotomy</td>
<td>No deficits</td>
</tr>
<tr>
<td>Ferrie et al</td>
<td>19y</td>
<td>M</td>
<td>ecstasy ingestion; fall</td>
<td>Gluteal pain, RM, ARF</td>
<td>Fasciotomy, debridement</td>
<td>No deficits</td>
</tr>
<tr>
<td>Pacheco et al</td>
<td>47y</td>
<td>M</td>
<td>THR, epid. analgesia</td>
<td>Gluteal pain</td>
<td>Fasciotomy</td>
<td>Sciatic nerve palsy</td>
</tr>
<tr>
<td>Kuklo et al</td>
<td>33y</td>
<td>M</td>
<td>Fall</td>
<td>Thigh pain, RM, ARF</td>
<td>Fasciotomy, debridement</td>
<td>Death</td>
</tr>
<tr>
<td>Bleicher et al</td>
<td>35y</td>
<td>M</td>
<td>Substance abuse, fall</td>
<td>Rhabdomyolysis</td>
<td>Fasciotomy, debridement</td>
<td>Leg weakness</td>
</tr>
<tr>
<td>Castro-Garcia et al</td>
<td>59y</td>
<td>M</td>
<td>Fall</td>
<td>lumbar and gluteal pain</td>
<td>Fasciotomy, debridement</td>
<td>No deficits</td>
</tr>
<tr>
<td>Keene et al</td>
<td>61y</td>
<td>M</td>
<td>Robotic prostatectomy, Dorsal lithotomy</td>
<td>Gluteal pain, leg weakness</td>
<td>Fasciotomy</td>
<td>No deficits</td>
</tr>
<tr>
<td>Shaikh N.</td>
<td>40y</td>
<td>M</td>
<td>Entrapment Injury</td>
<td>Gluteal pain, RM</td>
<td>Fasciotomy, debridement</td>
<td>Foot drop</td>
</tr>
<tr>
<td>Rudolph et al</td>
<td>65y</td>
<td>M</td>
<td>Spine surgery</td>
<td>Gluteal pain; RM; ARF</td>
<td>Fasciotomy</td>
<td>No deficits</td>
</tr>
<tr>
<td>Case A</td>
<td>75y</td>
<td>M</td>
<td>TKR, epid. analgesia</td>
<td>Gluteal pain, RM</td>
<td>Fasciotomy, debridement</td>
<td>No deficit</td>
</tr>
<tr>
<td>Case B</td>
<td>54y</td>
<td>F</td>
<td>TKR, epid. analgesia</td>
<td>Gluteal pain</td>
<td>Fasciotomy, debridement</td>
<td>No deficit</td>
</tr>
<tr>
<td>Case C</td>
<td>55y</td>
<td>F</td>
<td>Fall</td>
<td>Leg weakness, back pain</td>
<td>Fasciotomy</td>
<td>Foot drop</td>
</tr>
</tbody>
</table>

RM=rhabdomyolysis; ARF= acute renal failure; THR= total hip replacement; TKR= total knee replacement

**Conclusion(s):** BGCS is an uncommon entity. Surgeons must be aware of this condition and be able to identify patients at risk in order to achieve prompt diagnosis and treatment which are key to averting severe complications. Considering the rarity of this condition and paucity of data, our series brings significant addition to the growing evidence.
Review of an Institution's Experience with Abdominal Wound Dehiscence Using a Proposed Predictive Model and Risk Scoring System

Tolutope Oyasiji, MD, Scott Helton, MD, FACS, Gary Kaml, MD, FACS

Yale Department of Surgery and Yale-New Haven Hospital

Introduction: We sought to review our institution's experience with abdominal wound dehiscence using the predictive model and risk scoring system proposed by Gabriëlle H. van Ramshorst et al in their study titled Abdominal Wound Dehiscence in Adults: Development and Validation of a Risk Model.

Method(s): A retrospective review of 35 cases of laparotomy wound dehiscence that required operative intervention in our institution over a 12-year period was conducted. Data was obtained from our hospital database using ICD-9 code. Relevant demographic and clinical data, based on the risk model referenced, were collected. These were used to compute the risk score for each patient. Our series was compared with the data from the referenced study. Gynecologic, obstetric and urologic cases of abdominal wound dehiscence were excluded from the study.

Results: 27[77%] were male. Mean age was 65.7 yr[33yr-92yr]. Mean LOS was 22.3 dys. 74% of patients had initial surgery done emergently compared to 46% in the referenced study. 20% of patients in our series had COPD compared to 29% in the series by Gabrielle et al. Incidence of wound infection was 37% [our series] vs 52%. Vascular cases were 6% in our series compared to 15% from the study. 57% of surgeries in our series involved large bowel compared to 27% in the referenced study.

Conclusion(s): Our small series showed similar distribution in terms of age and gender with the data used in formulating the risk model. However, we observed large variation in percentages for distribution of emergent vs elective cases as well as type of surgery performed. This might pose a challenge to the generalization of this model. We propose that national / international multicentric study be conducted to generate a risk model that will be universally applicable.
Single Incision Laparoscopic Surgery as a Safe and Preferable Alternative for Diverting Loop Ileostomy and Colostomy

C. Pietras, MD, MA, K. Bermas, MD, J. Zhang, MD, PhD

Waterbury Hospital

Introduction: Single incision laparoscopic surgery (SILS) is a novel technique in which a single incision is made to accommodate a multiport trocar through which 2-3 laparoscopic instruments are passed. It has been used in appendectomies, cholecystectomies, and hernia repairs, and is now gaining the attention of general and colorectal surgeons for use in diverting loop ileostomy or colostomy (DLI/C). In this procedure, the single incision is made at the planned ostomy site. The bowel loop is exteriorized through this incision, making it ultimately a scarless procedure, and thus preferred by many for reasons of cosmesis and faster recovery time. This study is aimed to identify the advantages of SILS DLI/C over the conventional open DLI/C.

Methods: The charts of patients who underwent DLI/C from July 2010 to April 2012 were reviewed. Patients under age 18 were excluded. The patients were divided into two groups: the control group composed of patients who underwent a conventional open DLI/C, and the SILS group composed of patients who underwent a SILS DLI/C. Other parameters such as the patient’s comorbidities, reason for diversion, operative time, estimated blood loss, postoperative length of stay, number of days until regaining bowel function, and pain level or narcotic requirement were collected for each group.

Results: Parameters were compared between the control group and the SILS group. Surgical complications were noted and compared between both groups.

Conclusion: Based on the comparative data between the two groups, we hope to support our hypothesis that SILS DLI/C is a safe and preferable alternative to the conventional open DLI/C.
Endobronchial Ultrasound Versus Mediastinoscopy in a Community Hospital Setting

C. Pietras, MD, R. McDonald, MD, E. Mirabile, MD

Waterbury Hospital

Introduction: Mediastinoscopy has historically been the gold standard method for determining the presence of nodal metastases. Recently endobronchial ultrasound (EBUS) has been identified as a less invasive alternative for histologic sampling of mediastinal nodes. Either alone or in combination with mediastinoscopy, EBUS is thought to be a safe, highly accurate, procedure that leads to an accurate diagnosis with high diagnostic yield and few complications. The technique can be used by clinicians with bronchoscopy skills with a short learning curve.

To demonstrate that EBUS is a safe and accurate alternative to mediastinoscopy for the evaluation of mediastinal nodes in a community hospital and to release the results over the first year using EBUS in this setting.

Methods: A retrospective analysis of patients undergoing EBUS from November 2010 to December 2011. Endobronchial ultrasound with transbronchial needle aspiration (EBUS-TBNA) was performed in 53 patients. Perioperative Rapid On-Site Examination (ROSE) using cytologic analysis was provided along with determination of adequate specimen. Data obtained and analyzed included preoperative and postoperative diagnoses, lymph node station sampled, complications, and time under general anesthesia.

Results: Out of 53 cases, 49 (92%) had a positive diagnostic yield; 5 (9%) were nondiagnostic due to poor sampling. Distribution of diagnoses included: 9 (17%) Non-small cell lung adenocarcinoma, 5 (9%) Small cell lung adenocarcinoma, 1 (2%) lymphoma, and 6 (30%) sarcoidosis. A total of 13 (25%) were negative for malignant cells. There were 2 reported complications. Data on time under anesthesia is still being analyzed.

Conclusions: In a community hospital where mediastinoscopy has been the gold standard in the retrieval of mediastinal lymph nodes, endobronchial ultrasound is comparable in its level of accuracy, positive predictive value, and low complication rate. Ongoing evaluation of this data will include investigation into the accuracy of using EBUS versus mediastinoscopy and whether the outcome of this data is operator-dependent. Specifically, if outcomes differ depending on the operator's level of procedural experience.
Surgical Treatment of Pilonidal Disease: Z-Plasty as a Feasible Alternative

Sandeep Sachidananda, MD, Tolutope Oyasiji, MD, Mark Weinstein, MD, FACS, John Amodeo, MD, FACS

Yale Department of Surgery and Yale-New Haven Hospital

Introduction Pilonidal sinus is a common surgical condition which has been extensively studied but continues to perplex surgeons worldwide. Incidence is reportedly 26 per 100 000 population, affecting males twice as often as females and predominantly young adults of working age. The various methods of treatment include excision and laying open and several primary closure techniques including primary midline closure, asymmetric oblique closure, Karydakis procedure, Bascom's asymmetric cleft lift procedure, Rhomboid flap, V-Y plasty and Z-plasty. We sought to report our experience with Z-plasty closure after wide elliptical excision of pilonidal disease.

Method(s): Our Z-plasty reconstruction involves a wide elliptical excision of the inflamed area including all the sinus tracts down to presacral fascia and conversion of the deep natal cleft into a plateau. Flaps were raised along gluteal muscle fascia and then the flaps were interdigitated. A 10 mm JP drain was placed in the depth of the wound and brought out at the lateral aspect of the wound. Closure was done with deep layer of 2-0 vicryl inverted, interrupted stitches and skin with interrupted 3-0 nylon stitches. The Z-plasty technique uses a 60 degree angulation with both flaps having the same length as the wound size and achieves a 75% length gain and off-midline closure.

Case 1
20 yr male with recurrent pilonidal disease after previous excision 6 months prior to presentation. Wide elliptical excision with Z-plasty reconstruction as described was done as same-day procedure. Postoperative course was complicated by small hematoma which was evacuated and subsequent satisfactory healing achieved without recurrence on follow up.

Case 2
34 yr male with extensive pilonidal disease underwent wide elliptical excision down to presacral fascia followed by reconstruction with Z-plasty under general anesthesia as short-stay procedure. Uneventful postoperative recovery without recurrence on follow up.

Results: Satisfactory outcome was obtained in the 2 cases managed with Z-plasty reconstruction after wide elliptical excision of pilonidal disease.

Conclusion(s): A technically simple procedure which achieves rapid healing of the wound, minimal morbidity and early return to activity by the patient. The end result is cosmetically less disfiguring compared to Limberg flap and V-Y advancement flaps.
Central Venous Access Port Devices- Comparison Between Subclavian And Internal Jugular Approaches In A Community Hospital Setting

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Saint Mary’s Hospital

Introduction: Totally implantable subcutaneous central venous access port devices have not only provided patients with secure and reliable venous access but have also given them the ability to move more freely and have a more normal lifestyle. At our center both internal jugular and subclavian veins are accessed to implant these devices. Although the published literature does not favor one approach over the other in terms of early or late complications, we decided to conduct a quality of life scale assessment survey to determine patient satisfaction regarding each approach.

Method(s): After IRB approval, the medical records of the patients who underwent central venous access port placement from 1-1-2010 till 12-31-2011 were obtained. Patients were grouped according to the approach i.e. internal jugular (IJ) and subclavian (SC). Using a ten point scale, a questionnaire which could quantify patient’s satisfaction with the insertion procedure and the catheter’s impact on the quality of life was designed and administered to the patients. Data was collected, collated and analyzed using appropriate statistical tests.

Results: A total of 91 patients were included in the study; 53 (59%) underwent internal jugular approach while 38(41%) had subclavian approach. Mean post procedural pain was 2.20 IJ and 1.57 SC group (p= 0.9). 37(40%) patients required pain medication after the procedure 23 (43%) in IJ and 14 (37%) in SC group(p=0.7). Complications (infection, thrombosis, migration and pain) were observed in 14 (15%) patients, 10(19%) in IJ versus 4(11%) in SC. Mean satisfaction with the procedure was 7.96 in IJ group while 8.6 in SC group (p=0.15)

Conclusion(s): In terms of patient satisfaction, there is no statistically significant difference between subclavian or internal jugular approaches for central venous access port devices at our center. A prospective study is planned so that a more accurate, “real time” assessment may be conducted
Immunohistochemistry and Microsatellite Instability testing of Colorectal Cancers for Lynch Syndrome: Incidence at a Community Hospital

Preetha Umamaheswaran, M.D., Steven J. McClane, M.D., Charles Littlejohn, M.D., Bo Xu, M.D., Robert Babkowski, M.D., Erin Ash, MS, CGC

Stamford Hospital

Introduction: Lynch syndrome accounts for 2 - 4% of all colorectal cancers in the United States. It is the most common form of hereditary colorectal cancer. Earlier identification using molecular and histologic screening of tumors for Lynch syndrome can lead to increased surveillance and prevention protocols for colon cancers and other associated cancers. A recent report in the Journal of Clinical Oncology have shown that only 36% Comprehensive Cancer Programs have pursued such screening. The purpose of this study is to analyze and report our experience with immunohistochemistry (IHC) and microsatellite instability (MSI) testing of colorectal tumors in a community hospital.

Methods: This is a retrospective analysis of colon resections for colon cancer performed by two colorectal surgeons from January 1, 2009 to July 31, 2012 at Stamford Hospital. Per pathologist discretion, tumors were tested for expression of the following proteins using IHC: hMLH1, hMLH2, hMSH6, and PMS2. If deficiencies were noted in protein expression or equivocal findings, further MSI PCR testing was pursued of the following markers: BAT-25, BAT-26, MONO-27, NR-21, and NR-24. If two or more instabilities were noted of the five loci tested, the patient was noted to be MSI high. Further testing for BRAF mutations were performed on all MSI high tumors to rule out sporadic cases of colon cancer. If a patient was noted to be MSI high/BRAF negative or if clinically indicated (i.e. has met Bethesda criteria/Amsterdam criteria), further genetic counseling was advised.

Results: A total of 110 colon resections were performed for colorectal cancer during the study period. The following results were obtained:

<table>
<thead>
<tr>
<th>Year</th>
<th>Total # cases</th>
<th>Total # tested (% of total)</th>
<th>IHC - IHC +, MSI high</th>
<th>IHC +, MSI stable/low</th>
<th># sent to genetic counseling</th>
<th># found to have Lynch syndrome</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>27</td>
<td>15 (55.5)</td>
<td>12</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>2010</td>
<td>36</td>
<td>22 (61)</td>
<td>15</td>
<td>5</td>
<td>2</td>
<td>0</td>
</tr>
<tr>
<td>2011</td>
<td>31</td>
<td>18 (58)</td>
<td>16</td>
<td>2</td>
<td>0</td>
<td>6</td>
</tr>
<tr>
<td>2012</td>
<td>16</td>
<td>11 (69)</td>
<td>8</td>
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IHC - = all proteins expressed; IHC + = proteins were not expressed, MSI stable = all loci stable

In summary, 66 of the 110 tumors were tested. Of those, 15 of the 66 showed abnormal IHC expression. Twelve of the 15 were noted to be MSI high: 5 were noted to be BRAF mutations, 4 were over the age of 80 and further genetic counseling was not pursued and 3 were true Lynch syndrome cases. Based on the above results, 4.5% incidence of Lynch syndrome was noted from our screening techniques.

Conclusion: As we increased the molecular biologic screening of colorectal cancer specimens, more cases of Lynch Syndrome were diagnosed. More consistent criteria for Lynch Syndrome screening should be established in order to create a new standard of care for molecular biologic testing of colorectal cancers.
Specialty Surgery Competition 1
Plastic Surgery 1st Place Paper

Moderator:
Michael Deren, MD, FACS,
Secretary, Surgical Caucus of the AMA,
Private Practice, New London, CT

Judge:
Kevin Dwyer, MD FACS
Interim Chairman and Program Director, Dept of Surgery
Stamford Hospital, Stamford, CT
Severe Keloid Scars Secondary to Chronic Pseudofolliculitis Barbae: A Multidisciplinary Approach to Complicated Reconstructive Care

Christopher D Hughes, MD, MPH; Alexandra Krajewski, MD; Andrew Selner, MD; Deena M Babigian, APRN; Elizabeth M Sytulek, RN; Alan Babigian, MD, FACS

Hartford Hospital and University of Connecticut

Introduction: Pseudofolliculitis barbae is a common chronic condition affecting the hair follicles of the face and neck. It is often present in African-American males. Chronic scars can occur as a result of this condition and can lead to the formation of large keloids. This combined disease can present a unique therapeutic challenge to the reconstructive surgeon. Our method of multidisciplinary treatment, including surgical excision, laser hair reduction, and perioperative radiation treatment, can lead to significant improvement.

Method(s): We present a case series of men who initially presented with chronic and recurrent keloid scarring on the face and neck secondary to pseudofolliculitis barbae. Each patient was treated with a combination of laser hair reduction, scar excision with local advancement flap coverage, and perioperative radiation therapy.

Results: All patients were successfully treated and are healing well. None of the patients experienced wound healing complications or scar recurrence postoperatively. They have improved function and aesthetics. All report satisfaction with their functional and aesthetic results.

Conclusion(s): Keloid scars of the face and neck secondary to pseudofolliculitis barbae can be a challenging clinical problem for predisposed male patients. A multidisciplinary approach to treat both the scar and the underlying condition can yield beneficial results and reduce the risk of recurrence.
Single Incision Robotic Cholecystectomy Using the Da Vinci S Model Robot is Possible

Leah Bassin, MD. Philip Corvo, MD, MA, FACS
Stamford Hospital

Introduction: There have been many advancements over the years in surgery. In respect to cholecystectomies, the procedure progressed from an open approach to a laparoscopic approach, and now to a single incision approach. Single incision laparoscopic cholecystectomies have been proven a safe and effective surgery with improved cosmetic results for the patients. However it requires a very different and awkward operative approach and technique, necessitating crossing instruments. With the advent of the Da Vinci robot the only next logical step in the progression of this surgery is for it to be performed robotically. This paper highlights our experience with single incision robotic cholecystectomies using the Da Vinci S model robot.

Method(s): This is a retrospective chart review of our case series of patients who underwent single incision robotic cholecystectomies between November 2011 and March 2012. All operations performed by a single surgeon.

Case series/Results: Our patients were between the ages of 23 and 56. 4 of the 5 patients underwent successful completion of the robotic SILS (single incision laparoscopic surgery) cholecystectomies. The average operating time was approximately 110 minutes. The average operative time decreases to 84 minutes when the case that was converted is taken out of the equation. One case was converted to an open procedure as it was not safe to proceed robotically or laparoscopically. There were no adverse events in our patient population.

Conclusion(s): Cholecystectomies were first performed laparoscopically in the 1980’s. This procedure enabled patients to have their gallbladders removed during an outpatient procedure saving the patient an inpatient visit. The first robotic laparoscopic surgery was performed in 2000 after FDA approval. In only 12 years we have gone from the robot assisting in surgeries to being able to complete full surgeries with only a single robotic port.

Robotic single incision cholecystectomies are technically feasible and safe for patients. There is a learning curve like as in all robotic surgeries however once mastered this is another option to give patients without having to purchase the updated Da Vinci Si robot.
Intramyocardial Gene Therapy with Adeno beta-Catenin Preserves Cardiac Function by Increased Angiogenesis and Cell Survival in Type I Diabetic Rat

Sumanth Channapatna Suresh, MD1, Mahesh Thirunavukarasu, Ph.D.1, Vaithinathan Selvaraju, Ph.D1, Nilanjana Maulik, Ph.D, FAHA.1, Juan A. Sanchez, MD, FACS1,2

University of Connecticut1 and Saint Mary’s Hospital2

Introduction: Diabetic patients demonstrate greater ventricular remodeling and diastolic dysfunction even in the absence of myocardial infarction leading to heart failure. Therefore, we explored the effects of intramyocardial beta-catenin gene therapy on angiogenesis and cardiac function in a diabetic rat model.

Methods: Sprague-Dawley rats were divided into four groups: non diabetic (ND) Adeno LacZ (Ad.LacZ) (NDLZ); ND Adeno-beta-catenin (Ad.BCAT) (NDBCT); diabetic (D) (Ad.LacZ) (DLZ); D-Adeno-(Ad.BCAT) (DBCT). Rats received STZ (65mg/kg b.wt) by single intraperitoneal injection to induce diabetes. Thirty days after STZ injection Ad.LacZ/Ad.BCAT was administered intramyocardially in nondiabetic and diabetic rats at four sites around the anterior wall of the left ventricle. Four days later the expression of beta-catenin, VEGF, Bcl2 & cyclin E2 were measured. Arteriolar density/Fibrosis/Echocardiogram was done 60 days after diabetes (30 days after gene therapy).

Results: Overexpression of beta-catenin during diabetes (DBCT) showed significant increase in the expression of VEGF (1.8fold), Bcl2 (2.7 fold), cyclinE2 (3 fold) proteins and arteriolar density (25 ± 0.7 vs 18±0.5 counts/mm2; P<0.05) as compared to DLZ group. Also reduced fibrosis (6.8±0.6 vs 11.8±0.8 %; P<0.05) and collagen formation was observed in DBCT as compared to DLZ. Echocardiography 30 days after therapy showed significant, decrease in the E/A ratio (2.28± 0.2 vs. 3.37±0.45) and increase in Ejection Fraction (62±2.2 vs 50±0.8%) & Fractional shortening (35±1.7 vs 27±0.5%) in DBCT compared to DLZ.

Conclusions: This study demonstrates, for the first time, that neovascularization and myocardial dysfunction can be improved by Ad.BCAT gene therapy in diabetic rats.
Catastrophic Bleeding in Patients with Sternal Wound Infection

Gloria Sue MA, Edward Teng MD, Deepak Narayan MD, FACS

Yale University School of Medicine

Introduction: Deep sternal wound infection (DSWI) is a life-threatening complication that develops in 1 to 5% of patients undergoing median sternotomy. Prognosis is poor in patients who develop DSWI, with an estimated mortality rate ranging from 10 to 50%. Several surgical treatment modalities exist for the treatment of DSWI, including vacuum-assisted closure, omental transposition, closed suction antibiotic catheter irrigation, muscle flaps, and a combination of the above options. Major bleeding occurs in approximately 5% of DWSI and is a feared complication associated with high mortality. The predictors of major bleeding in the setting of DWSI remain poorly understood. Here we present a case series of patients with catastrophic bleeding that occurred in the setting of DSWI.

Method(s): Between 2002 and 2012, 4 patients with DSWI post-sternotomy at Yale-New Haven Hospital had catastrophic bleeding during or after operation for the DSWI. We performed a chart review of these patients.

Results: Our case series of 4 patients consisted of 4 male patients with a median age of 63.5, ranging from 47 to 79. The primary operations in this case series included 2 coronary artery bypass procedures, 1 combined aortic valve replacement and coronary artery bypass surgery, and 1 orthotopic heart transplant.

- Patient 1 presented with drainage from a sternal incision in the setting of having had a recent orthotopic heart transplant one month prior. The DSWI was treated with surgical debridement. Upon awakening from the anesthesia, the patient bucked and a brisk arterial bleed was noted coming from the sternal incision. Pressure was held briefly followed by emergent redo-sternotomy, which revealed a hemorrhage from an aortic anastomosis site. The patient ultimately survived this episode but expired in the ICU months later.

- Patient 2 underwent aortic valve replacement and double bypass surgery at an outside hospital was complicated by development of DSWI and left sided empyema infected with Pseudomonas. He received sternal wound debridement, antibiotics were started, and a sternal wound vac was placed. He was transferred to our hospital and underwent a series of sternal wound debridements. During subsequent reconstruction 20 days after the initial cardiac surgery, he was noted to have bleeding from his left hemisternum, which was subsequently discovered to be from a 2" laceration on the right ventricle. This was fixed emergently with bovine pericardium as the pledge. The patient is currently still in the ICU.

- Patient 3 underwent triple bypass surgery, which was complicated by purulent drainage infected with Pseudomonas. Wound debridement was undertaken during which a wound vac was placed. However, on a subsequent dressing change, the right ventricle was observed to be lacerated, which was emergently addressed in the OR, where the laceration was oversewn with pledgeted sutures. This patient survived this episode but expired in the SICU months later.

- Patient 4 had a history of antithrombin III deficiency for which he was taking coumadin on a chronic basis. He underwent a triple bypass procedure that was complicated by sternal dehiscence. He was taken to the operating for wound debridement 16 days after the initial procedure. The day after, he was noted to have blood spurting out from the sternal wound, and when taken to the operating room was found to have a right ventricular laceration which was promptly repaired. He was discharged in good condition a few months later.

Conclusion(s): Catastrophic bleeding can occur as a complication of DSWI. In our case series we present 4 unique contexts in which this was observed to occur. We noted bleeds from the aorta and right ventricle. Of our 4 patients, 2 expired in the hospital following the incident, 1 was discharged in good condition, and the final outcome of the remaining patient waits to be seen.
Preoperative MRI in Breast Cancer Patients – How Should we Handle Additional Findings?

Vladimir Coca-Soliz M.D., Brittany N. Forshay, M.S., Samira Rezaeian, M.S., Sumair Motiwala M.S. Beth Ann Sieling MD, Nicole Sookhan, M.D., FRCS

Saint Mary’s Hospital

Introduction: The use of preoperative breast MRI is becoming more prevalent. The role of the MRI is still controversial. Some experts believe that all breast cancer patients should undergo a preoperative MRI, while others feel only selective patients should undergo a preoperative MRI. MRI can create unnecessary anxiety, requiring more biopsies and using more healthcare resources. In the event that additional foci of suspicion is identified on the breast MRI we examine the use of the second look ultrasound in detecting the MRI abnormality.

Methods: An IRB retrospective review of breast cancer patients undergoing a preoperative breast MRI which was followed by a targeted breast ultrasound over a 1 year period was reviewed. From 2010 –2011, 70 breast cancer patients underwent a bilateral breast MRI preoperatively. Additional foci were detected in X amount of patients. These patients then underwent a focused ultrasound in the office of the breast surgeon. If the abnormality was seen on ultrasound the biopsy was performed under ultrasound guidance. If a correlating lesion was not identified on ultrasound, the patient had an MRI guided biopsy of the lesion.

Results: Of 70 MRI’s performed, the second look ultrasound detected 31 lesions, which was biopsied. Of the 31 patients biopsied 22 amount were diagnosed with additional foci of cancer. Of the 39 patients whose foci were not seen on ultrasound 35 amount had an MRI guided biopsy. Of the MRI biopsies 2 amount had additional foci of cancer. Therefore, this study shows high sensitivity (>80%) in ruling out MRI findings that will likely have a negative pathology.

Conclusions: Many breast cancer patients undergo preoperative breast MRI. When additional lesions to the cancer are identified, focused ultrasound is able to identify a substantial number of these lesions, thus avoiding MRI guided biopsy. In addition, avoiding MRI guided biopsy may decrease anxiety in breast cancer patients, get patients to the operating room more quickly, and decrease cost.
Aged Rats Have Increased Neointimal Thickening And Altered MCP-1/CCR2 Expression After Carotid Artery Angioplasty

Sammy D.D. Eghbalieh MD, Paraag Chowdhary MD, Kenneth R. Ziegler MD, Jose Pimiento MD, Fabio Kudo MD, Akihito Muto MD/PhD, Yuka Kondo MD/PhD, Alan Dardik MD/PhD

Saint Mary’s Hospital and Yale University School of Medicine

Introduction: Although carotid angioplasty is associated with increased adverse events in elderly patients compared to younger patients, it is unclear whether the response to carotid angioplasty is also related to the altered inflammatory axis of elderly patients. Therefore we examined the response to carotid angioplasty as well as the expression of inflammatory cells, in a validated animal model.

Methods: The right common carotid artery of young adult (6 month) or aged (22-24 month) male Fischer 344 rats was injured with a balloon and the ipsilateral external carotid was ligated; common carotid arteries were examined after 3 and 14 days. Serum monocytes, and expression of carotid MCP-1 and CCR2 were examined at 0, 3, and 14 days.

Results: Aged rats had significantly reduced lumen area (0.18±0.03 mm2 vs. 0.24±0.01 mm2; p=.02) and increased neointimal thickening (aged: 0.15±0.04 mm2; young: 0.08±0.03 mm2; p=.006) compared with young adult rats. Aged rats had increased circulating monocytes (95.9±21.0 vs. 54.0±6.5; p=.0007) at baseline. However, young rats had increased MCP-1 after angioplasty but aged rats did not (day 3: 12.5±3.0 vs. 8.1±2.0; n=8). CCR2 levels were restored to baseline in young rats but not in aged rats (day 14: 10.1±3.6 vs. 1.4±0.6; n=8).

Conclusions: Aged Fischer 344 rats are an accurate model for carotid angioplasty in aged humans. Aged rats also have altered numbers of circulating monocytes as well as altered expression of inflammatory cells in post-angioplasty carotid arteries, suggesting a role for these cells in the response to carotid angioplasty.
Statin Therapy In Diabetic Rats Attenuates Myocardial Dysfunction Via a Skp2/p27 Pathway After Myocardial Infarction

Mahesh Thirunavukkarasu, PhD, Vaithinathan Selvaraju, PhD, Nilanjana Maulik, PhD, Juan A Sanchez, MD, FACS

Saint Marys Hospital

Introduction: Cardiovascular disease is the leading cause of morbidity and mortality associated with diabetes mellitus. The lipid lowering role of statins (S) in cardiovascular disease is well known. We explored the cardioprotective effects of statin in diabetic rats subjected to myocardial infarction (MI).

Methods: Rats (300-325g) were randomized to receive single intraperitoneal injection of saline or STZ (65mg/kg.b.wt). Rats were divided into eight groups (n=20/group): control(C) sham (CS); CMI; statin-treated control sham (CSS); statin treated CMI (CSMI); diabetic (D) sham (DS); DMI; statin-treated diabetic sham(DSS); statin-treated diabetic MI(DSMI). Simvastatin (1mg/kg.b.wt) was gavaged 15 days after STZ/saline injection for 15 days. MI was induced by LAD ligation 30 days after STZ/saline injection.

Results: DSMI group showed significant increase in the expression of VEGF (1.6 fold) and cell cycle regulatory protein, Skp2 (2.5 fold) along with reduced cyclin dependant kinase inhibitor (CKI)-p27 expression (2.4 fold) as compared to DMI 4days after MI. Reduced myocardial fibrosis (6.5±0.61vs.16±1.4%,p<0.05) along with increased arteriolar density (23±0.67vs.14±0.35 counts/mm2,p<0.05) was also observed 30 days after MI in DSMI group as compared to DMI. Echocardiographic analysis 30 days after MI showed significant preservation of systolic function (Ejection Fraction (50±1.8vs.32±2.1%, p<0.05) & Fractional shortening (26±1.1vs.16±1.2%,p<0.05)) in the DSMI group compared to DMI.

Conclusion(s): Our study demonstrates an additional therapeutic role of statin in upregulating proangiogenic factor VEGF and a proto-oncogene SKP2 and downregulating p27, resulting in increased angiogenesis, improved cardiac function, and decreased myocardial fibrosis in diabetic rats following MI.
Intelligent Medicine Based Therapy for High Risk Tumors in Children

Christine Finck, MD; Eric Girard, MD; Neal Goodwin, PhD; Nehal Parikh, MD; Michael Isakoff, MD; Fernando Ferrer, MD; Nate Hagstrom, MD; Katherine Herbst, MSc; Camillo Moncada, PhD; Susie Airhart; Ed Liu, MD

Connecticut Children’s Medical Center, Jackson Laboratories, University of Connecticut

Introduction: There are few predictive models of human cancer which scientists may use to test new therapies. The current method is to use single human cell lines in culture but these do not reflect the genetic diversity of actual patient specific human cancer. An improved method entails isolating the aggressive cancer cells (tumor initiating cells or TIC) from a patient’s tumor and test the cells response to novel therapies in 2-D culture. A third option is to develop patient-derived tumor xenografts (PDX). With PDX, a piece of human tumor is grafted into a mouse that lacks an immune system to prevent rejection. Once the tumor grows in the mouse, it is removed, subdivided, placed into a new set of mice and allowed to grow again. The benefit of this method is that patient specific tumor cells including tumor stroma are preserved. At the end of this process, there is enough patient-derived tumor material to test novel therapies in thousands of mice. The purpose of this abstract is to describe an initiative at our institution involving the harvesting of tumor specimens from highly aggressive pediatric tumors and investigate the feasibility of isolating and maintaining patient specific tumor initiating cells in culture. In addition, portions of patient specific tumor are implanted into NSG mice to assess the practicality of patient specific tumor generated PDX mouse models.

Method(s): Pediatric patients with high risk solid tumors are enrolled (IRB approval 04-084). At time of surgical biopsy or excision, tumor is isolated and a portion of it harvested for research purposes following well defined standard operating procedures. Part of the tumor is sent fresh to the laboratory for isolation of TIC and part of the tumor is sent to Jackson Laboratories for creation of a PDX mouse. Patient samples are de-identified and basic demographic and clinical information gathered at time of harvest for analysis with research results.

Results: To date, two patients have been identified with high risk pediatric tumors. Both tumor specimens have been able to successfully propagate cells in culture. An important feature of certain cancer cells is the ability to grow in spheres in culture which both of our specimens did. In addition, both specimens have been implanted into NSG mice. The ability of the specific tumor to continue to expand and generate additional PDX mice is currently undergoing investigation.

Conclusion(s): Intelligent medicine based therapy is a revolutionary concept for directing treatment when dealing with high risk extremely rare tumors. The ability to study different tumor characteristics both in vitro and in vivo has the potential to significantly enhance the ability of the clinician to direct therapy. The addition of genomic analysis as well as bioinformatics could further transform current therapy.
VTE Prevention Through the Application of Evidence-Based Practice: Validation of a Modified Risk Assessment Tool

Foula Kontonicolas MD, Carlos Morales MD, Anita Ayrandjian DNP, Pierre Saldinger MD, FACS

Danbury Hospital

Introduction: Venous thromboembolism (VTE) is a potential preventable complication of surgery which can result in higher morbidity and cost of the surgical episode. VTE risk assessment preoperatively can help stratify high risk patients in order to properly administer VTE prophylaxis. A simple, modified risk assessment tool was developed by Danbury Hospital based on the Caprini risk assessment model. The simplicity of this modified tool supports it’s consistent and efficient application within the preoperative setting.

Methods: The modified risk assessment tool was developed based upon the Caprini risk assessment model. A comparative application of both tools was conducted on 1,000 patients from the American College of Surgeons National Surgical Quality Improvement Database between the dates of 3/2010 to 8/2011. Inclusion criteria followed the ACS NSQIP multi-specialty requirements. Analysis of total VTE score from both tools was conducted.

Results: Of the 1,000 patients, 11 (1.1%) had a score on the VTE risk assessment tool that differed from the Caprini model. One patient (0.1%) had a score difference which would require a change in VTE prophylaxis. Statistically, there was no difference in score results between the Caprini model and our VTE risk assessment tool.

Conclusion: The VTE risk assessment model created by Danbury hospital is as efficacious as the Caprini model in scoring VTE risk and is valid as a risk assessment tool.
Specialty Surgery Competition 2

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

Judge:
Bruce Brenner, MD, FACS
Assistant Professor of Surgery, Department of Surgery
Surgical; Director, Colon Cancer Prevention Program,
University of Connecticut School of Medicine, Farmington, CT
Giant Nevi in Children: Problems and Solutions

Gloria Sue MA, Richard Antaya MD, Deepak Narayan MD, FACS

Yale University School of Medicine

Introduction: Giant nevi are generally defined as nevi that occupy 2% or more body surface area. This corresponds to a lesion that is greater than 9 cm on the scalp or greater than 6 cm on the trunk of an infant, roughly corresponding to a lesion size greater than 20 cm in adulthood. Treatment options for giant nevi include surgical excision, dermabrasion, chemical peel, and laser ablation. Surgical management options include serial excision, tissue expansion, excision with skin grafting, and a combination of these techniques. However, optimal surgical treatment strategies for giant nevi and potential complications are not well described in the literature. Here we present a case series of consisting of complications arising from surgical management of giant nevi.

Method(s): Between 2005 and 2012, 8 children with congenital giant nevi treated surgically at Yale-New Haven Hospital presented with unique complications. A chart review of these patients was performed.

Results: We identified a variety of complications arising from surgical treatment of giant nevi among our case series of 8 children with congenital giant nevi. Among these patients, there were 2 males and 6 females who all presented with giant nevi at birth. The locations of the nevi in these patients included 1 on the scalp, 2 on the forehead, 1 on the cheek, 1 on the trunk, 2 on the back, and 1 on the leg. The median age at initial surgical operation was 10 months of age (range: 5 months to 13.8 years). The treatment complications fell into two broad categories encompassing host complications and implant complications.

Host complications of surgical treatment for giant nevi included repigmentation of the incision line, scar widening after serial excisions, and expansion of nevus tissue beyond incision lines. We observed repigmentation in 3 patients on 3 different locations including the scalp, forehead, and lower abdomen. We also observed a unique trend that the repigmentation occurred in short lines that ran perpendicular to the incision line, appearing to follow lines of tension. In follow-up of the patient with the excision of a giant nevus of the scalp, we also observed scar widening with lack of hair growth leading to an obvious deformity. This complication was ultimately addressed with the placement of tissue expanders in the adjacent hair-bearing scalp areas and flap closure, resulting in a more aesthetically acceptable outcome. Another complication we observed was in a separate case of a patient with a giant nevus of the back extending from the nape of the neck to the gluteal region. This nevus was serially excised inferiorly to superiorly with placement of tissue expanders. Throughout the course of serial excision, it was noted that there were areas of previously normal skin inferior to the inferior incision line that the giant nevus appeared to spread into, sparing the incision line.

Implant complications included kinking of the tube used for filling the expanders, malposition of the port with subsequent inaccessibility, exposure of tissue expander through skin during serial expansion, and symmastia. We observed kinking in the tubing connecting the tissue expander to the fill port in 2 patients. One occurred in the abdomen and the other occurred in the back. Interestingly, both episodes of kinking were observed in the setting of serial expansion of the expanders and it was thought in both cases that the expansion led to increased pressure on the tubing, resulting in tube kinking and an inability to expand further. Both cases required surgical intervention to re-position the tubing and fill port farther from the expander. One patient also presented with a port that had migrated behind the implant and became subsequently inaccessible following placement. 3 patients developed exposure of tissue expanders through the skin following serial expansion, occurring in the forehead, scalp, and lateral neck. All 3 patients were treated with antibiotics and removal of the expander. Lastly, one patient with a nevus on the anterior chest with a tissue expander placed just medial to the left breast developed symmastia. This unforeseen complication was addressed with the placement of tacking sutures down the midline of the chest to reapproximate the skin to the underlying chest wall.

Conclusion(s): The surgical treatment of congenital giant nevi can present with unusual complications. These complications include both patient-level complications and complications associated with the use of an implant.
Bowel Recovery with Entereg (Alvimopan) After Elective Bowel Surgery in a Community Hospital

Yuk Ming Liu MD, Robert Nunoo MD, Shawna Badgeley BA, John Mazzucco MD, FACS, Jayakara Shetty MD, FACS

Waterbury Hospital

**Introduction:** Entereg is a mu-receptor blocker, specific to the GI tract. It is used to prevent ileus in the postoperative period after bowel resection and to decrease the length of stay. This is especially true if used in conjunction with an enhanced recovery program. Our institution introduced an enhanced recovery program with Entereg in December 2009. The objective of this study is to examine the impact of the introduction of Enhanced Recovery Program with Entereg (ERPE) for patients undergoing elective bowel surgery in a community hospital setting.

**Method(s):** Retrospective data collection of all patients that underwent elective bowel surgery after the Enhanced Recovery program with Entereg was introduced on 12/15/09 to 4/30/10. These patients were compared to consecutive patients who underwent elective bowel surgery from 12/15/08 to 12/14/09 (before the introduction of Entereg) and were recovered traditionally. Univariate analysis was done of the outcomes; length of stay, time to first bowel movement, intraoperative IV fluids and charges.

**Results:** 59 patients were recovered traditionally (One year) compared to 26 in the Enhanced recovery with Entereg group. Using univariate analysis of mean length of stay was shorter among the ERPE patients, 3.9 days compared to 6.1 days in the patients recovered traditionally, (3.9 vs 6.1, P=0.0004). The time to first bowel movement was quicker (days) in the FTE group compared to the TR group (2.5 vs 4.3, P= 0.0004). There was no statistically difference between mean Intraoperative IV fluids in mls (2848 vs 2536, P= 0.1955). Finally although the mean charges was lower for FTE group the difference ($1717), was not statistically significant (55,568 vs 57285, P= 0.7)

**Conclusion(s):** The introduction of FTE has decreased the time to first bowel movement, length of stay and a trend towards reduction in charges in this community hospital.
Inhibition of Prolyl Hydroxylase 3 (PHD-3) Promotes Neovascularization and Improves Blood Perfusion in a Mouse Hind-Limb Ischemia Model

Muhammad Tipu Rishi, MD, Mahesh Thirunavukkarasu, PhD, Vaithinathan Selvaraju, PhD, Juan A. Sanchez, MD, FACS and Nilanjana Maulik, PhD.

Saint Mary's Hospital and University of Connecticut

Introduction: Despite considerable advancement in vascular surgery; Peripheral Arterial Disease (PAD) still remains a challenging ailment. Prolyl-hydroxylase domain proteins (PHD 1-3) play a critical role in ischemia-induced neovascularization by regulating the activity of Hypoxia Inducible Factor (HIF). Previously, we demonstrated that silencing PHD3 stabilizes HIF-1alpha and preserves myocardial function following myocardial injury in mice. Here we hypothesize that homozygous disruption of PHD3 (-/-) would result in increased ischemia-induced neovascularization in a mouse model of hind limb ischemia (HLI).

Method(s): We compared ischemia induced neovascularization in 8-12 week old Wild type (WT) and PHD3 Knockout (PHD3KO) mice. After ligating the right femoral artery, mice were followed serially by Laser Doppler Imaging over the course of 4 weeks following which muscle samples were taken for immunohistochemistry.

Results: PHD3KO mice showed significant recovery of blood perfusion when compared to WT mice at post-operative day 14 [0.58±0.04(N=15) vs. 0.41±0.05(N=12); p<0.05] and day 21 [0.72±0.06(N=13) vs. 0.53±0.05(N=12); p<0.05] and a higher motor function score at day 14 [4.33±0.33(N=15) vs. 3.27±0.19(N=18); p<0.05] and day 21 [4.86±0.13(N=15) vs. 3.93±0.20(N=15); p<0.05]. We observed increased capillary density (1981±259.5 vs. 727.7±63.59 counts/mm2; p<0.05, N=6), arteriolar density [20.86±1.72 (N=5) vs. 13.59±0.88 (N=6) counts/mm2; p<0.05] and capillary/myocyte ratio (1.79±0.10 vs. 1.29±0.10; p<0.05, N=6) in PHD3KO mice compared to WT mice. In vitro matrigel analysis of tubogenesis with HUVECs pre-treated with PHD3 siRNA also demonstrated increased tube formation (34.83±6.7 vs. 9.39±1.2 number of branch points; p<0.05, N=3) compared to non-treated cells.

Conclusion(s): Our data demonstrates that silencing PHD3 domain results in significant improvement in ischemia-induced neovascularization in a mouse model of HLI, which can provide a potential therapeutic target in treatment of peripheral vascular disease.
The Role of 3D Visualization in Laparoscopic Simulation Training

Shohan Shetty MD, Sebastian Wilk, Vinay Bhamidipati, Inam Shaikh MD, Sammy Eghbalieh MD, J. Alexander Palesty MD, FACS

St Mary’s Hospital

Introduction: Laparoscopic virtual reality (VR) simulators are becoming an essential tool in surgical training and assessment. These devices provide the operator with various levels of realism, including 3D (three-dimensional) visualization. However, this feature adds to the cost of the devices, and limited data exist assessing the value of 3D visualization in skill acquisition and development. Utilizing the LapSim VR simulator platform (Surgical Science, Goteborg, Sweden) we hypothesized that the incorporation of 3D visualization in laparoscopic simulation would allow superior trainee performance compared with performance of the same basic skills tasks in a non-3D model.

Method(s): Fourteen medical students and general surgery residents with minimal laparoscopic experience voluntarily participated in the study. Each participant performed four tasks, on the LapSim VR simulator platform. After achieving familiarity with the device and tasks, the participants completed the drills both with and without 3D visualization. Metrics include time, target misses, drift, path length, and tissue contact. The scores and repetitions in the 3D enhanced simulation were compared with the performance in the non-3D environment and analyzed utilizing Student's t-test.

Results: We noted differences in repetitions required to complete the coordination module: 2.2 attempts for the non-3D group and 3.7 for the 3D group (P < 0.05). The average score for completing the tasks was higher for the non-3D group when compared to the 3D group (79% versus 73%, P < 0.05). However, we observed no statistical significance between the number of repetitions for the other tasks in the module. Overall, participants (80%) preferred the non-3D option when using the VR simulator.

Conclusion(s): 3D visualization in laparoscopic VR simulation did not demonstrate a performance improvement among our trainees. These data suggest that the additional expense of 3D visualization in laparoscopic simulators may not be justified for skill development.
Towards Personalized Medicine in Tissue Engineering and Respiratory Disease

Eric Girard, MD; Camilo Moncada, PhD; Todd Jensen, MSc; Fan Zhang, MSc; Christine Finck, MD

University of Connecticut

Introduction: Every year almost 400,000 Americans die from lung disease and more than 35 million have chronic lung diseases. The most important of these diseases in children are respiratory distress syndrome (RDS) and bronchopulmonary dysplasia (BPD). About 30% of these severely premature babies are diagnosed with BPD after RDS. Because the under-developed lungs cannot fully recover from the early damage, these conditions could particularly benefit from improvements in regenerative medicine techniques. One of the challenges in this promising field is the ability to obtain patient-specific cells that can be used to regenerate lung tissue. In this regard, human induced pluripotent stem cells (hiPSCs) have attracted considerable attention as prospective materials for regenerative medicine. Genetic reprogramming of human somatic cells to a pluripotent state was first achieved by the ectopic expression of four factors (Sox2, Oct4, Klf4 and c-Myc), using a retrovirus. hiPSCs generated from somatic cell sources and human embryonic stem (hES) cells derived from preimplantation blastocysts are pluripotent and capable of indefinite expansion in vitro. Derivation of endodermal lineages from pluripotent cells have mostly focused in the generation of midgut (pancreatic endocrine cells) and posterior foregut (hepatocyte) cell types, with less progress made in generation of anterior foregut endoderm (AFE) that gives rise to trachea and lung. Very recently, an in vitro strategy based on the sequential generation of increasingly lineage restricted progenitors was developed to specify a highly enriched AFE from human pluripotent cell lines, thus proving the feasibility of directed differentiation into cells derived from the AFE, including the lung. We hypothesize that this approach will allow us to effectively produce lung progenitor cells derived from patient specific hiPSCs cells.

Methods: Patient-derived foreskin fibroblasts were collected according to our IRB approved protocol. These cells were reprogrammed using an excisable lentiviral vector that induces over expression of four pluripotency factors. Cells were cultured until colonies were identified and pluripotent cell lines established. hiPSCs were differentiated in vitro using directed differentiation to endoderm and then to distal lung. These were phenotypically analyzed using fluorescence activated cell sorting (FACS).

Results: Foreskin fibroblasts were successful reprogrammed into hiPSCs as seen by their production of alkaline phosphatase (Figure 1). With lineage directed differentiation, 22% and 28% of the samples were consistent with definitive endoderm by FACS (Figure 2). Upon further differentiation using lung specific media, alveolar markers are present on immunofluorescence (Figure 3).

Conclusion: Lineage directed differentiation of hiPSCs yields phenotypic alveolar cells. Thus, hiPSCs are a valuable source of cells to create patient specific tissue engineered lung. Further experiments are necessary in order to study the feasibility of re-epithelialization of a decellularized matrix.
Ovarian Adrenal Rest Tumors: Rare Tumors of an Endocrine Disease

TT Thomas, KR Ruscher, F Balarezo, S Mandavalli, C M Finck.

Connecticut Children’s Medical Center and University of Connecticut

Introduction: Ovarian Adrenal Rest Tumors (OARTs) are extremely rare and present a diagnostic challenge when evaluating an ovarian mass. We present a case of OART in a patient with known Congenital Adrenal Hyperplasia (CAH), secondary to 21-hydroxylase deficiency, who was noncompliant with her medications. On routine urologic ultrasound evaluation she was found to have an increasing left ovarian mass.

Objective: We present the clinical course, laboratory and imaging studies of an OART along with pathologic features that help to identify this rare tumor.

Results: A 17 year old female, 45 XY, with known history of CAH s/p multiple perineal surgeries for ambiguous genitalia was found to have a large left ovary lacking normal architecture that was concerning for interstitial type neoplasm. The right ovary appeared to be normal. US of the adrenals did not demonstrate any mass. An MRI was done which confirmed the findings of a large 5cm ovarian mass with heterogeneous signal that replaced the normal ovarian parenchyma. Hormonal levels showed a markedly elevated Adreno-corticotropin level (ACTH) consistent with her known non-compliance with medications. Diagnostic laparoscopy was performed which confirmed an abnormal appearing large left ovary/mass as well as an abnormal appearing smaller right ovary. Frozen section biopsies of both ovaries were non-diagnostic with abnormal appearing cells. The left ovarian mass was removed and there was no viable left ovarian tissue remaining. The right ovary was left intact awaiting final pathology. Sections of the left ovarian mass shows nodules of lesional cells separated by fibrous stroma with tumor cells showing clear to eosinophilic cytoplasm with cytoplasmic pigment. Mild degree of cytologic atypia was seen. Immunohistochemical stains showed cells positive for Inhibin, Melan A and calretinin. This morphology and staining pattern suggests a broad differential diagnosis but the main one being “Steroid cell tumor”. In this clinical context, and histopathologic growth pattern suggests the diagnosis of OART or “Ovarian tumor/ lesion of adrenogenital syndrome.

Conclusion: OARTs are extremely rare benign tumors and cannot be distinguished on routine imaging from ovarian neoplasm. Elevated corticotrophin levels due to noncompliance with hormonal suppression are theorized to contribute to this entity. Pathologic features consistent with this tumor are nests and sheets of steroid cell type cells separated by fibrous bands with positive immunohistochemical staining with sex cord stromal markers. Due to the scarcity of these tumors, it is important to be aware of this entity in female patients with known CAH and incidental ovarian masses.
Trends in Carotid and Aortic Revascularization: New England vs. USA

Carissa Webster-Lake MD, Christopher Binette MD, James Menzoian MD, FACS

University of Connecticut

Introduction: Ruptured abdominal aortic aneurysms (AAA) and cerebrovascular accidents of any etiology are known to cause significant morbidity and mortality. Key landmark studies have demonstrated that AAA repair and carotid endarterectomy are superior measures of preventing aneurysm rupture and stroke secondary to carotid disease when compared with medical management.

In 1999 and 2004 respectively, endovascular aneurysm repair (EVAR) and carotid artery angioplasty and stenting (CAS) were introduced as alternative therapeutic options for aortic and carotid disease, essentially revolutionizing the treatment of these vascular nuisances. Many observers hypothesized that the introduction of these lower-risk procedures would lead to a substantial increase in the overall number of procedures performed, as surgeons would be able to offer the new procedures to patients who had lesions in need of repair but were felt to face unjustifiably high risks from the open procedures.

The purpose of this report is to present our analysis of the trends in carotid and aortic revascularization in New England as compared with the rest of the country since the introduction of EVAR and CAS.

Methods: We collected data from state registries in all 6 New England states using the ICD-9 codes for carotid endarterectomy (38.12), carotid artery angioplasty and stenting (00.61, 00.63), open abdominal aneurysm repair (38.44) and endovascular aneurysm repair (39.71), and compared it to similar data for the rest of the country for the period 2001 to 2008.

Results: Between 2001 and 2008, total numbers of open and endovascular carotid and aortic revascularization procedures gradually declined from 8,547 to 7,552 (-12%), while they declined from 186,380 to 182,336 (-2%) in the USA. Individually, carotid procedures declined from 6,164 to 5,396 (-12%) vs 142,401 to 133,780 (-6%) in the USA; aortic revascularization procedures declined from 2,383 to 2,156 (-9.5%), while they increased from 43,979 to 48,558 (+9.4%) in the USA.

Conclusions: Overall, carotid and aortic revascularization procedures have decreased despite the introduction of minimally invasive endovascular options. The decline has been greater in New England as compared to the rest of the country. Despite the overall decline, endovascular repair of AAA increased throughout the country but decreased in New England; while carotid revascularization procedures were consistent with the overall trend.
Prevalence and Value of BRAF Mutation Seen in Papillary Thyroid Cancers Treated in a Community Setting

Nisar Zaidi MD, Stacie Kahan MD, Xiang Eric Dong MD, FACS

Stamford Hospital

**Introduction:** We aim to examine the prevalence of BRAF mutation among those with papillary thyroid cancer treated at our institution – a university affiliated community hospital. We also seek to elucidate the utility BRAF mutation testing as a marker of poor prognosis.

**Method(s):** From June 2010 to April 2012, 27 patients with biopsy proven papillary thyroid cancer exhibited the BRAF mutation. Using retrospective chart review, associations with markers of poor prognosis were analyzed.

**Results:** BRAF mutation was strongly associated with multifocal disease; incidence of lymph node metastases, and extra-thyroidal extension did not correlate with BRAF mutation positivity.

**Conclusion(s):** BRAF mutation is strongly associated with multicentric papillary thyroid cancer. As such, it may prove to be a useful adjunct in determining extent of surgery in those patients in whom BRAF mutation status is known pre-operatively.
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
Orthopedic Injuries in Children: Boon or Burden for Pediatric Trauma Centers?

T Thomas, H Fiske, G Lapidus, H Salaheen, G Bentley, BT Campbell

Connecticut Children’s Medical Center and University of Connecticut

**Background:** Some studies suggest that variability may exist in treatment and outcomes of pediatric orthopedic injuries. Several studies have demonstrated that children with orthopedic injuries and Medicaid insurance are preferentially transferred to tertiary centers for definitive care. The purpose of this study was to compare outcomes in patients with isolated upper extremity fractures requiring surgical treatment between pediatric level 1 trauma centers (PED) and non-pediatric trauma centers (NON).

**Methods:** The Connecticut Healthcare Information Network Database (CHIME) was utilized for this study. The database was queried to identify patients less than 18 years of age with a diagnosis code for humerus fracture and procedure code for closed reduction and internal fixation of the humerus from January 2006 through December 2010. Data collected included hospital, age, gender, ethnicity, length of stay, insurance type, and discharge status. The outcomes evaluated were discharge status, length of stay, and total hospital charges. Outcomes were compared between Connecticut’s two American College of Surgeons verified pediatric level 1 trauma centers and any hospital that was not a pediatric trauma center that treated children with this injury.

**Results:** A total of 441 cases were identified, and nearly two-thirds (n=289) were cared for at pediatric trauma centers. Pediatric trauma centers and non-pediatric trauma centers appear to be taking care of similar patients with respect to age (PED=5.4, NON=5.4 years, P>.05) and sex (PED=49%, NON=51% , P>.05). Pediatric trauma centers do not appear to be taking care of a disproportionate number of Medicaid patients (PED=36%, NON=32%, P>.05). The mean length of stay (PED=1.3, NON=1.2 days, P>.05), and mean total hospital charges (PED=$2617.64, NON=$2328.22, P>.05) were not significantly different between pediatric trauma centers and the other hospitals.

**Conclusions:** Children with isolated upper extremity fractures requiring surgical treatment do not have a shorter hospitalization or decreased costs when treated at pediatric trauma centers. The care of children with humerus fractures and Medicaid insurance appears to be shared equally by hospitals in Connecticut. Additional studies are needed to determine what types of pediatric orthopedic injuries attain superior outcomes when transferred to level 1 pediatric trauma centers.
Outcomes of Patients Admitted to the ICU With Trauma: Does the Weekend Effect Exist?

Debbie Bakes MD, Farzad Amiri MD, James Krinsley MD, Kevin Dwyer MD, FACS

Stamford Hospital

Introduction: There have been recent observations that trauma patients admitted on the weekend have a higher mortality and worse outcomes than those admitted on weekdays. This study was conducted to determine whether there was a difference in outcomes for trauma patients admitted to our ICU. Our hypothesis is that there is no difference in outcomes with our trauma patients whether admitted on the weekend or weekdays.

Methods: This is a retrospective analysis of prospectively collected data obtained from our Level II trauma center's trauma registry and Intensive Care Unit (ICU) database. All trauma patients admitted to the 16-bed ICU of this university-affiliated hospital from October 1, 2005 through July 31, 2012 were included in this study. Data on demographics, ventilator use, ICU LOS, APACHE IV predicted LOS (APIV LOS), Injury severity score (ISS), actual mortality (M), and APACHE IV predicted mortality (APIV PM) were obtained. The type of injury upon arrival was categorized into four subgroups: head injury with non-operative intervention, body injury with non-operative intervention, head injury with operative intervention, and body injury with operative intervention. The weekend was identified as the time period from Friday 7PM through Monday 7AM. All time outside of this definition was identified as a weekday.

Results: There were 745 patients identified with 319 (43%) admitted over the weekend (WE) and 426 (57%) admitted over the weekdays (WD). Type of injury was well matched in both time periods. Average age was 45 over WE and 57 over WD (P=0.0001). Ventilator support was the only variable difference between the 2 groups, WE 34.8% and WD 27.2%.

All other data was not statistically significant. Of note, our patients were below predicted mortality and ICU LOS in both groups. Mortality was actually higher on the WD, though not significant.

<table>
<thead>
<tr>
<th></th>
<th>WE</th>
<th>NON</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number</td>
<td>319</td>
<td>426</td>
<td></td>
</tr>
<tr>
<td>Type (%)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Head, non-op</td>
<td>50.8</td>
<td>52.3</td>
<td></td>
</tr>
<tr>
<td>Body, non-op</td>
<td>26.3</td>
<td>27.9</td>
<td></td>
</tr>
<tr>
<td>Head, op</td>
<td>7.2</td>
<td>7.3</td>
<td></td>
</tr>
<tr>
<td>Body, op</td>
<td>15.7</td>
<td>12.4</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>45 (28-73)</td>
<td>57 (35-80)</td>
<td>0.0001</td>
</tr>
<tr>
<td>Vent</td>
<td>34.8</td>
<td>27.2</td>
<td>0.0324</td>
</tr>
<tr>
<td>ICU LOS</td>
<td>1.3 (0.7-3.0)</td>
<td>1.3 (0.8-2.6)</td>
<td>0.9024</td>
</tr>
<tr>
<td>ISS (mean, SD)</td>
<td>14.5 (9.6)</td>
<td>13.9 (9.3)</td>
<td>0.3827</td>
</tr>
<tr>
<td>ISS (median, IQR)</td>
<td>14 (8-19)</td>
<td>14 (5-19)</td>
<td>0.5159</td>
</tr>
<tr>
<td>AP IV pred LOS</td>
<td>5.1 (4.4-6.2)</td>
<td>5.1 (4.5-5.7)</td>
<td>0.3611</td>
</tr>
<tr>
<td>Actual-pred LOS</td>
<td>-3.8</td>
<td>-3.8</td>
<td></td>
</tr>
<tr>
<td>Mortality</td>
<td>6.9</td>
<td>9.4</td>
<td>0.2779</td>
</tr>
<tr>
<td>AP IV pred mort</td>
<td>10.4 (17.3)</td>
<td>10.9 (17.6)</td>
<td>0.7202</td>
</tr>
<tr>
<td>O:E mort ratio</td>
<td>0.66</td>
<td>0.86</td>
<td></td>
</tr>
</tbody>
</table>

Conclusion: There is no difference in outcomes in trauma patients admitted to our ICU on the weekend.
The Use of Simulation to Improve Technique and Procedural Confidence in Emergency Cricothyroidotomy

Vijay Jayaraman MD, James Feeney MD, FACS, Robert Brautigam MD, FACS, Karyl Burns PhD, Lenworth Jacobs MD, FACS

Hartford Hospital

Introduction: The simulated setting is particularly suited to teaching emergency skills as situations can be created and repeated as often as necessary to improve skill and confidence. Cricothyroidotomy, a life saving procedure, needs to be performed rapidly and can be associated with psychological stress. We sought to determine if simulation education can improve: 1) knowledge of cricothyroidotomy; 2) self-efficacy (SE) to perform cricothyroidotomy; and 3) performance of cricothyroidotomy in an animal model.

Methods: Two methods of teaching cricothyroidotomy were randomly assigned to first year surgical residents on the Trauma Service. One method was a lecture followed by a video; the other method was the lecture, the video, and instruction and practice in the simulated patient. After receiving instruction in the morning, the residents performed cricothyroidotomy on a swine in the afternoon of the same day. Residents completed a multiple choice test of knowledge and a self-efficacy assessment using a 5-point Likert scale before and after the teaching session. Their performance was evaluated in the animal laboratory by a blinded faculty member using a checklist. The time to complete cricothyroidotomy was recorded. Data were analyzed with the Mann Whitney U test and the Wilcoxon matched-pairs signed rank test. A p value of < .05 was the significance criterion. Medians and interquartile (IQR) ranges are reported.

Results: There were no differences between the groups on knowledge and SE, p>.05. The simulation group (n=11) took significantly less time to complete the cricothyroidotomy than the group not having simulation (n=8) with a median of 5.87 minutes (IQR 4.62-6.85) vs. 9.88 minutes (IQR 7.45-11.18), p <.05. The simulation group had higher laboratory scores indicating better performance, 45 (IQR 44-48) vs. 42.5 (IQR 41-43.75), p < .05. A post hoc power analysis indicated insufficient power to detect differences between groups on knowledge and SE. Both groups improved on SE from pre to post training, p< .05. The simulation group also improved on knowledge from pre to post training, p< .05.

Conclusion: Simulation can decrease the time to complete emergency cricothyroidotomy and improve laboratory performance of the procedure. SE can improve with either type of training. Simulation training should be offered to all residents to learn emergency skills. This study was limited by a small sample size.
Increased Incidence of ICU Admissions in Blood Alcohol Level (BAC) and Urine Toxicology (UTOX) Positive Patients with Penetrating Trauma: Level II Trauma Center Experience

Jessica Hychko MD, Mandip Joshi MD, J. Alexander Palesty MD, FACS

Saint Mary’s Hospital

Introduction: Patients with penetrating trauma are often victims of assault and violent altercations involving additional persons. Alcohol and various illicit drugs can play a role in such traumatic events, as patients routinely have BAC and urine toxicology testing on presentation to the Emergency Department. We hypothesize that the patients with penetrating trauma, with BAC and UTOX positive, have increased ICU admission, which contribute to increased hospital length of stay, as well as increased hospital cost.

Methods: We performed retrospective Trauma Database review of our institution (Level II Trauma Center) for all penetrating traumas from year 2004 to 2011. Out of total two hundred sixty-six patients, 179 BAC negative, and 86 BAC positive. Of the 179 BAC negative patients, 14 were excluded for incomplete data, yielding a total of 165 patients. Of the BAC positive patients, one was excluded for incomplete data, yielding 85 patients total, with thirty-five patients also UTOX positive. We looked at specific mechanisms of injury, including abdominal/flank stab wounds, chest stab wounds, and chest gunshot wounds, and compared the incidence of ICU admission among BAC positive and BAC negative patients, and also BAC/UTOX positive patients with BAC/UTOX negative patients. We calculated relative risk and odds ratio of ICU admission for each mechanism of injury.

Results: We found that BAC positivity, in presence or absence of UTOX positivity, was associated with increased ICU admission of patients with abdominal/flank stab wounds, chest stab wounds, and chest gunshot wounds [Figure 1]

<table>
<thead>
<tr>
<th>ABD/F SW</th>
<th>ICU YES</th>
<th>ICU NO</th>
<th>RR=6.0241</th>
</tr>
</thead>
<tbody>
<tr>
<td>BAC+</td>
<td>12</td>
<td>12</td>
<td>ODDS =11.0</td>
</tr>
<tr>
<td>BAC-</td>
<td>2</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>CHEST SW</td>
<td>ICU YES</td>
<td>ICU NO</td>
<td>RR=4.9357</td>
</tr>
<tr>
<td>BAC+</td>
<td>9</td>
<td>22</td>
<td>ODDS=6.5455</td>
</tr>
<tr>
<td>BAC-</td>
<td>1</td>
<td>16</td>
<td></td>
</tr>
<tr>
<td>CHEST GSW</td>
<td>ICU YES</td>
<td>ICU NO</td>
<td>RR=2.9999</td>
</tr>
<tr>
<td>BAC+</td>
<td>2</td>
<td>2</td>
<td>ODDS=5.0</td>
</tr>
<tr>
<td>BAC-</td>
<td>1</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>ABD/F SW</td>
<td>ICU YES</td>
<td>ICU NO</td>
<td>RR=6.2798</td>
</tr>
<tr>
<td>BAC/UTOX+</td>
<td>4</td>
<td>4</td>
<td>ODDS=12.0</td>
</tr>
<tr>
<td>BAC/UTOX-</td>
<td>2</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td>CHEST SW</td>
<td>ICU YES</td>
<td>ICU NO</td>
<td>RR=4.6378</td>
</tr>
<tr>
<td>BAC/UTOX+</td>
<td>3</td>
<td>8</td>
<td>ODDS=6.0</td>
</tr>
<tr>
<td>BAC/UTOX-</td>
<td>1</td>
<td>16</td>
<td></td>
</tr>
</tbody>
</table>

Conclusions: Our data was consistent with the hypothesis that BAC/UTOX positivity in penetrating trauma patients is associated with increased admission to the Intensive Care Unit and thus possible increased hospital stay and increased hospital costs. Our study is limited by our lack of strength in numbers, as a small, community hospital. There are few articles in publication examining this association on a national level, and we plan to use the NTDB to investigate this association further.
Outcomes Following Central Cord Syndrome: Can our Patients Walk the Walk?

Daniel Daman MD, D’Andrea K. Joseph MD, FACS, Ilene Staff PhD, Lenworth Jacobs MD, FACS, Karyn L. Butler, MD

Hartford Hospital/ University of Connecticut

Introduction: Acute traumatic central cord syndrome (ATCSS) is the most common form of incomplete spinal cord injury. The purpose of this study was to identify factors that may affect functional outcomes following ATCCS. The research question was: What clinical characteristics predict functionality after ATCSS?

Methods: The trauma registry identified all patients admitted for blunt spinal cord injury at our 800 bed, level 1 urban hospital from January 2001 to December 2012. A retrospective review of the medical records of patients who were treated for spinal cord injury was performed and patients having ATCSS were identified from this group. Data collected included age, gender, injury severity score (ISS), admission systolic blood pressure (SBP), admission heart rate (HR), and mechanism of injury (MOI). Information on initial hematocrit, type of treatment; operative or non-operative, location of injury were also recorded. Outcome measures included level of independent functioning (self-feeding, locomotion, and expression) at discharge, hospital length of stay (HLOS) and disposition. A P value of ≤ 0.05 was considered significant.

Results: There were 328 patients with traumatic spinal cord injury of which 57 had ACTSS. Most of the patients were male (78.9%) with a mean age of 57±14 and an average ISS of 19±6. The most common MOI was fall 62%, followed by motor vehicle related 31%, and other 5%. The average GCS on admission was 15±2, average initial hematocrit was 39±4 and mean HLOS was 15±16 days. Overall hospital mortality was 4% (2). Of the 96% (55) of patients surviving to discharge, the majority (59%) was discharged to a rehabilitation facility and 26% were discharged to home. Initial SBP was significantly higher (P = 0.01) (143.4±28.4) in patients who were independent at discharge as compared to patients who were dependent (121.9±31.1). The patients who were independent had ISS that was significantly lower than those dependent (16.8 ±3.5 vs 21.3 ± 7.8; p = .02). Age and mechanism of injury were not significant.

Conclusion: ACTSS is a life altering injury that can be devastating for families and patients. Maintaining an elevated SBP in the peri-injury period has been common practice in maximizing outcome. Admission SBP appears to be an important factor for patients’ functional independence. Further studies are indicated to explore this critical issue.
Is CT Chest Sufficient To Make the Diagnosis of Blunt Aortic Injury?
An Institutional Review of the Evolution of Radiological Diagnosis and the Treatment of Blunt Aortic Injury, at a Level 1 Trauma Center, from 2000-2012

Tahira F. Mirza MBBS FACS, Kellie S. Schenk MD, Kevin P. Baratta, MD MPH

Hartford Hospital

Introduction: The epidemiology, evaluation and treatment of aortic transection is changing with improvement in diagnostic technology and the use of endovascular stents. This research investigates the epidemiology, evolution of diagnosis and evolution of treatment for blunt traumatic aortic injury cases at Hartford Hospital, the only level one trauma center in central Connecticut.

Methods: Data was extracted from the Trauma Registry and patient records from 1/1/2000 to 4/11/2012. Data pertaining to patient demographics, mechanism of injury, chest radiograph (CXR) findings, diagnostic modality, location and type of injury, treatment and mortality were collected. Simple descriptive statistics were used for analysis. 32/52 CXRs were reviewed as they were available for image and report review and 20/52 were reviewed by report only. 2 patients did not have the CXR available for image or report review. Mediastinal distance was measured retrospectively.

Results: 127 patients were identified with the diagnosis of blunt thoracic injury. 73 patients were pronounced dead or expired in the emergency department, on arrival to the ED during the study period. 54 patients reached the hospital alive, and comprised the study sample. A total of 42 cases were diagnosed with transection, 9 with dissection, 2 with aortic mural hematomas and 1 with a laceration. N=45 injuries occurred at the isthmus, n=2 in the ascending aorta, and n=8 in the descending thoracic aorta (one patient had two transections). Of the 54 patients who reached the hospital alive mortality was 26% (n=14). Patients were predominately men (70%) and had a mean age of 43 years. Motorized vehicles: MVC= 37, MCC=8, ATV=1, Jet Ski=1 were involved in the majority of cases. Falls= 3 from greater than 20 feet being the most common non motor vehicle related mechanism, pedestrian versus car =2, 1 was a bicycle accident, and 1 was a construction accident. Initial evaluation always began with a chest radiograph, followed by a Chest CT scan (CT), and then either an aortogram or CT Angiogram (CTA). 6/52 available CXR reports were read as normal. 9/52 did not have mediastinal widening but did have other findings suggestive of traumatic aortic injury. Per report 37/52 patients did have mediastinal widening and 29 (29/37) of those had additional findings suggestive of aortic injury. Of the 32/52 CXRs retrospectively reviewed 30/32 (94%) had mediastinal widening that measured greater than 8cm. From 2000-2003, n=17 had an initial 8-slice CT, 16 of which were followed by an aortogram. One patient had an aortogram without an initial CT. From 2004-2008, after the installation of a 64 slice CT scanner, the trauma protocol included a without and with contrast chest abdomen pelvis CT n=21. During this time 4 CTAs and 1 aortogram were required for further clarification of the aortic injury, 3/4 CTAs were diagnostic, 1CTA did not add any additional information, and the aortogram was diagnostic. From 2009 to present the trauma protocol includes a chest abdomen pelvis contrast enhanced CT scan n= 12. During this time period 5 CTAs were required for further clarification, 3/5 was diagnostic but of these 2 patients did not have an initial Chest CT. 2/5 CTAs were equivocal and were followed by diagnostic aortography and interventional management. Open repair with graft placement was the primary therapy until 10/2009, performed in 34 patients, subsequently 13 patients underwent endovascular repair by interventional radiology or vascular surgery, and 1 patient had an aortic mural hematoma that was successfully managed non-operatively.

Conclusions: Modern Chest CT with IV contrast makes the diagnosis in the majority of cases, and should be the initial diagnostic modality of choice. Cases that are equivocal should be followed with a CTA to clarify the diagnosis. Equivocal CTAs should be followed by with a diagnostic aortogram and or intravascular ultrasound.
RIFLE Criteria as a Predictor of Surgical ICU Outcomes for Patients with Acute Kidney Injury

Katherine Petersen, MD, and James Krinsley, MD

Stamford Hospital

Introduction: Acute kidney injury (AKI) is a known risk factor for mortality in critically ill patients. RIFLE criteria aides in staging patients with AKI, and are a predictor of intensive care unit (ICU) outcome. There is limited literature comparing the outcomes of surgical ICU (SICU) patients with AKI who meet RIFLE criteria to those with renal insufficiency (RI) who do not meet RIFLE criteria.

Our hypothesis is that patients with AKI who meet RIFLE criteria during a SICU admission have increased mortality (M) and ICU length of stay (LOS) compared to patients with RI who do not meet RIFLE criteria and to patients without RI.

Methods: This is retrospective review using prospectively collected data taken from the ICU's database, including 2,723 surgical patients admitted between 10/1/05 and 5/31/12 to the 16-bed ICU of a university-affiliated teaching hospital. RIFLE was defined as the incremental change between initial serum creatinine (Cr) and peak ICU Cr values: R1 (1.5-2.0x); R2 (2.0-3.0x); R3 (>3.0x). Other subgroups included patients with RI on ICU admission who did not subsequently meet RIFLE criteria: RI-1 (peak Cr 1.5-1.9); RI-2 (Cr 2.0-2.9); RI-3 (Cr 3.0+); patients without RI (peak Cr <1.5 and no RIFLE criteria); ESRD. Primary outcomes included prolonged LOS (PLOS, 4.0+ days) and M. Multivariate analysis for M included APACHE IV predicted M and ICU LOS.

Results:

<table>
<thead>
<tr>
<th>Group</th>
<th>N</th>
<th>PLOS (%)</th>
<th>M (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>R1</td>
<td>106</td>
<td>48.1</td>
<td>17.0</td>
</tr>
<tr>
<td>R2</td>
<td>46</td>
<td>52.2</td>
<td>43.5</td>
</tr>
<tr>
<td>R3</td>
<td>27</td>
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<td>40.7</td>
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<tr>
<td>RI-1</td>
<td>190</td>
<td>16.3</td>
<td>8.4</td>
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<tr>
<td>RI-2</td>
<td>104</td>
<td>26.0</td>
<td>16.3</td>
</tr>
<tr>
<td>RI-3</td>
<td>54</td>
<td>27.8</td>
<td>24.1</td>
</tr>
<tr>
<td>ESRD</td>
<td>69</td>
<td>10.1</td>
<td>7.2</td>
</tr>
<tr>
<td>No RI</td>
<td>2,127</td>
<td>10.5</td>
<td>3.1</td>
</tr>
</tbody>
</table>

Only R1, R2 and R3 were independently associated with increased risk of M: (OR, 95% CI) 3.50 (2.05-5.97); 13.68 (7.46-25.11); 11.55 (5.27-25.32), p<0.0001 for each, respectively, as well as increased risk of PLOS (p<0.0001 for each).

Conclusions: In a large single-center cohort of SICU patients, those with AKI who met RIFLE criteria had increased M and PLOS compared to patients without RI who did not meet RIFLE criteria, patients with ESRD, and patients without RI.
Outcomes of Extreme Elderly Patients Admitted to the Surgical Intensive Care Unit

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Introduction: The aging population has placed a burden on healthcare resources, causing some to question the appropriateness of aggressive treatment of this cohort. The impact of preadmission functional status (FS) on outcomes of patients admitted to the surgical intensive care unit (SICU) has not been clearly defined. We hypothesize that FS is independently associated with mortality (MORT) risk in extreme elderly (EE, age 85+) SICU patients.

Methods: This is a retrospective analysis of prospectively collected data from our registry, involving 2,914 surgical service patients admitted to the 16-bed ICU of a university affiliated teaching hospital between 10/1/05 and 5/31/12. 334 were EE; 2,580 were NON. Data included APACHE IV predicted MORT % (APIV PM); ICU LOS; mechanical ventilation (MV); pre-admission functional status (FS): FS1 – independent of activities of daily living (ADL); FS2 – lives at home but partly dependent for ADLs; FS3 – all other; discharge status (DC) of survivors, defined the same as FS; and observed:expected mortality ratio (O:E) (MORT/APIV PM). Multivariate analysis was performed to evaluate the independent relationship of FS to MORT.

Results: The age distribution of NON was <50 (n=686); 50-69 (n=939); 70-84 (n=955). Compared to NON, EE had longer ICU LOS - 1.7 (0.9-2.8) vs. 1.1 (0.8-2.2) days, P=0.0023. However, fewer required MV - 23.1% vs. 28.5%, P=0.0420. EE had higher APIV PM – 16.5% vs. 8.2%, P=<0.0001, higher MORT – 15.0% vs. 4.8%, P=<0.0001, and higher O:E - 0.91 vs. 0.59.

FS and MORT, EE:

<table>
<thead>
<tr>
<th>FS</th>
<th>N</th>
<th>OR (95% CI)</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>FS1</td>
<td>215</td>
<td>0.48 (0.23-1.00)</td>
<td>0.05</td>
</tr>
<tr>
<td>FS2</td>
<td>61</td>
<td>2.16 (0.97-4.85)</td>
<td>0.06</td>
</tr>
<tr>
<td>FS3</td>
<td>58</td>
<td>1.24 (0.50-3.08)</td>
<td>0.64</td>
</tr>
</tbody>
</table>

Among survivors, 24.5% of FS1 were DC1, compared to 5.8% (DC2) and 5.6% (DC3) (p<0.01, both comparisons).

Conclusions: Among a cohort of extreme elderly surgical ICU patients, preadmission functional status was independently associated with mortality risk and was also strongly associated with discharge status of survivors. These data suggest that admission of this group to the surgical ICU is not futile and knowledge of preadmission functional status should inform the decision.