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North & South Texas American College of Surgeons
Stronger Together

# Texas ACS – Stronger Together
# Oral Abstracts

PRESENTATION 1

## SURGICAL RESIDENCY PROGRAMS IN TEXAS: HOW ARE WE DOING IN PREPARING OUR GRADUATES FOR THE AMERICAN BOARD OF SURGERY EXAMINATIONS?

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BACKGROUND
Concerns have been raised by fellowship directors and by the American College of Surgeons Board of Governors regarding the quality of graduating surgical residents. Specifically, the ability of graduating surgeons to operate independently and make clinical decisions have been brought into question. At this point, the only metric available to residency program directors on the quality of their graduates is the American Board of Surgery (ABS) Qualifying (QE) and Certifying (CE) Examinations. Regional variation in ABS pass rates have been previously demonstrated.

OBJECTIVE
To examine Texas programs' examinees pass rates compared to the rest of the United States (US) and to examine the change in Texas programs' ranking compared to the rest of the US.

METHODS
Fifteen year first-time pass rates on the QE and CE for all residency programs are available on the ABS website. The 2006, 2011, and 2016 data, reflecting classes of 2001-2015 were examined. These individual program data were collated such that state, regional, and national performance could be assessed and compared. Statistical evaluation was performed using fisher's exact test using $\alpha < 0.05$.

RESULTS
During the study periods, Texas ranked 4th of 47 states in producing surgical graduates who went on to take ABS exams behind New York, Pennsylvania and California with increasing number of graduates in the three time periods (281, 318 and 343 respectively). In 2006, examinees from Texas programs outperformed the rest of the US in QE (89% vs 84%, $p<0.05$) and QE/CE combined index (81% vs 74%, $p<0.01$) but did not achieve statistical significance in CE (90% vs 86%, $p=0.15$). In 2011, examinees from Texas programs outperformed the rest of the United States in all examinations QE (91% vs 85%, $p<0.01$), CE (89% vs 83%, $p<0.01$) and QE/CE combined index (82% vs 72%). In 2016, examinees from Texas programs outperformed the rest of the US only in QE/CE combined index (80% vs 74%, $p<0.01$) but did not achieve statistical significance in QE (90% vs 88%, $p=0.2$) and CE (86% vs 82%, $p=0.09$). Three (21%) of 14 Texas programs vs 27(12%) of 231 programs from the rest of the country have QE and CE first-time pass rates above 90%. In the table below, we show the changes in ranking of Texas compared to the rest of the US programs out of all 47 states and out of the twenty states with largest number of examinees.

CONCLUSION
Conclusion: Texas Surgery Residency programs produce a large number of graduates and do an above average job of preparing graduates for ABS exams. However, there is room for improvement – and perhaps collaboration – to improve the quality of our surgical graduates as the trend over the past 5 years has been negative relative to the rest of the country.

PRESENTATION 2

**URINE SODIUM CONCENTRATION AS A MARKER OF POOR GROWTH IN CHILDREN AFTER INTESTINAL RESECTION**

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BACKGROUND

Children who have had a significant small bowel resection frequently have difficulty growing adequately due to fluid and electrolyte losses in their stool. Specifically, growth is impaired when total body sodium depletion occurs. Serum sodium, however, is often normal even in the setting of decreased sodium stores. Urinary sodium concentration (UNa) is a more sensitive marker, with </= 30 mmol/L considered low, and can be used to monitor total body sodium status.

OBJECTIVE

The objective of this study was to determine the frequency of low UNa in children after significant bowel resection, and determine if it is associated with poor growth.

METHODS

After IRB approval (Protocol #032016-015), a retrospective chart review of children ( 6 weeks post-operatively) cared for at Children's Health from 2010 to 2016 was performed. Patient characteristics, reason for bowel resection, intestinal anatomy, nutritional intake, anthropometric measurements, and urine and serum electrolytes were collected. Z-scores for weight and height were calculated from WHO and CDC standard growth charts. Anthropometric values were compared between children with a UNa 30 mmol/L. Statistical analysis was completed using Mann-Whitney and Pearson's correlation coefficient, providing both 95% confidence intervals and p-values. Analysis was performed with SAS 9.4 (Cary, NC).

RESULTS

Thirty-eight children with significant bowel resection were included in the study. Patients had a median small bowel length of 50 cm (5-315 cm) and median % small bowel length remaining of 27% (2-91%). The most common etiology for small bowel resection included necrotizing enterocolitis (30%), intestinal atresia (23%), and midgut volvulus (20%). The median UNa was 44 mmol/L, and 10 patients (26%) had a UNa

CONCLUSION

Children with malabsorption after significant bowel resection are at increased risk for sodium depletion and impaired growth. Urine electrolytes should be routinely monitored, and patients with UNa </=30 mmol/L should receive additional sodium supplementation to maximize growth potential.

PRESENTATION 3

**CARDIAC RISK FACTORS FOR PATIENTS WITH CLEFT PALATE: AN ANALYSIS OF THE 2012-2014 NATIONAL SURGICAL QUALITY IMPROVEMENT PROGRAM (NSQIP) DATABASE**

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BACKGROUND

The presence of concurrent congenital cardiac anomalies poses a potential risk for anesthesia and surgical complications during the repair of cleft palate. Large national databases, such as the National Surgical Quality Improvement Program (NSQIP) Pediatric, allows for analysis of national outcomes for patients with cleft palate. The aim of this study is to assess the risk of complication in patients undergoing cleft palate repair with congenital cardiac co-morbidities using the NSQIP Pediatric.

OBJECTIVE

The goal of this study is to describe outcomes of patients with and without cardiac disease undergoing cleft palate repair using a large national database and to assess the risk of complications in patients with congenital cardiac co-morbidities.

METHODS

An IRB approved analysis of the 2012-2014 NSQIP Pediatric database was performed, with patients undergoing cleft palate repair selected for analysis. Data was abstracted to include demographic, clinical and outcomes data. Patients with cleft palate repairs were stratified based on the presence or absence congenital cardiac co-morbidities. Statistical analysis using chi-square and Kruskal-Wallis rank test was performed between these groups.

RESULTS

Nationally between 2012 and 2014, 3240 patients underwent cleft palate repair, 422 (13.0%) with cardiac disease and 2818 (87.0%) without cardiac disease. Age at surgery was 2.1±2.4 vs 2.0±2.6 years ($p=0.70$). Patients with cardiac disease were smaller (10.5±6.6kg v 11.6±8.6kg, $p<0.01$), more likely to be an ASA class 3 or higher (46.2% v 9.8%, $p < 0.01$), to have undergone previous cardiac surgery (29.4% v 0.1%, $p<0.01$) and/or tracheostomy (11.1% v 1.3%, $p<0.05$) compared with those without cardiac disease. The average operative time between the groups was not significantly different (136.9 +/- 74.9 minutes v 131.6 +/- 66.0 minutes, $p = 0.20$). Post-operatively, cardiac patients were more likely to experience an adverse event (8.8% v 4.2%, $p<0.01$). Specifically, they were more likely to experience reintubation (1.7% v 0.4%, $p<0.01$), reoperation (2.1% v 0.6%, $p<0.01$), postoperative pneumonia (1.0% v 0.2%, $p < 0.01$), and longer length of stay (2.7±7.0 v 1.6±2.8 days, $p<0.01$). Rates of surgical site infection (0.0% v 0.2%, $p = 0.34$) and dehiscence (2.1% v 1.2%, $p=0.14$) were not different.

CONCLUSION

Cleft palate repair in patients with concurrent congenital cardiac defects is a safe procedure, but carries elevated risk in the post-operative period as demonstrated in this analysis of the NSQIP Pediatric database. Wound complications were not different between the groups, suggesting that postoperative events result in increased rates of reoperation among cardiac patients. Additional anesthesia and surgical awareness of these potential complications is essential for their prevention.

PRESENTATION 4

**NECROTIZING SOFT TISSUE INFECTION: OPEN-TO-AIR WOUND CARE AS A LESS PAINFUL OPTION**

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BACKGROUND

Standard treatment for necrotizing soft tissue infection (NSTI) treatment is surgical debridement, broad-spectrum antimicrobials, and supportive care. This results in a large wound covering a significant portion of the body surface. Wound care of these large debridements is challenging due to the size of the wound, and associated pain. A potential solution to these issues is to leave the wounds open to air in the period following initial debridement, to allow for regular inspection at bedside while reducing pain associatedd with frequent dressing changes necessary for regular inspection. Reducing infection risk by precluding a moist, favorable environment is a potential additional benefit.

OBJECTIVE

The objective of this study is to evaluate the feasibility of leaving wounds open-to-air from a pain control standpoint.

METHODS

An audit of wound care modalities used on adult patients with NSTI, admitted to a regional burn center between January 2009 and May 2014. Only patients with at least one operation were included, and those opting for palliative care in the immediate peri-operative period were excluded. Wound care was divided into 4 major categories: open-to-air (OTA), negative-pressure wound therapy (NPWT), ointment, and packing. Wound care, pain score, pain medication use, and number of operations were collected for the first 7 days after initial debridement. Adequacy of pain management was assessed by pain scores. The use of analgesics was measured and compared using conversion to morphine milligram equivalents (MME).

RESULTS

96 patients were included, 67% were men with an average age of 50 years, resulting in a total of 672 days of wound care that were evaluated. This included 200 days of packing, 127 days of NPWT, 126 days of ointment, and 69 days OTA (150 days were undocumented). Least square mean pain scores and MME were 2.06 and 35.28 for packing, 2.18 and 34.91 for NPWT, 2.01 and 35.02 for ointment, and 1.63 and 60.15 for OTA. The average daily pain score from all wound care modalities was 2.02. NPWT had the highest reported daily pain score (2.31, $p = 0.034$), while OTA had the lowest pain score (1.48, $p < 0.05$). Mortality rate for those with OTA wound care was 3.8% compared to 7.1% for all other wound care. The most common drugs used to control pain were morphine, dilaudid, hydrocodone, fentanyl, and ibuprofen.

CONCLUSION

Leaving wounds open-to-air is a safe and viable option in the immediate post-debridement period of NSTI to reduce pain, while permitting frequent re-evaluation of the wound edges which allows for quick recognition of disease progression and repeat operative debridement if necessary.

PRESENTATION 5

**MICROGLIA AS MARKERS FOR TRAUMATIC BRAIN INJURITY SEVERITY**

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BACKGROUND

The Center for Disease Control estimates that traumatic brain injury (TBI) results in 275,000 hospitalizations and 52,000 deaths each year. Following the primary injury, microglia may be left in a chronic pro-inflammatory state that lasts years potentiating further secondary injury.

OBJECTIVE

The degree of microglia polarization between the pro-inflammatory state and pro-repair state may be determined by characterization of cellular morphology ex vivo. In vivo, PET/CT imaging can evaluate the degree of reactive microglia polarization by quantifying cellular protein expression of the translocator protein (TSPO), formerly known as peripheral benzodiazepine receptor (PBR). This study aimed to characterize the microglial response to a controlled cortical impact (CCI) rodent model of TBI and the role of PET/CT imaging to assess injury severity in vivo.

METHODS

Male Sprague Dawley rats were selected to undergo either a sham injury or a graded CCI. Microglia activation was assessed 120 hours after injury by PET/CT imaging using the radioligand [11C] PBR28. Standardized uptake values for the brain relative to muscle were calculated over the thirty-minute scan (SUVR). Immunohistochemistry was then performed with Iba-1 in order to quantify microglia morphology as non-activated (ramified), semi-activated (intermediate), or activated (amoeboid). The presence of activated cells was also confirmed by TSPO labeling.

RESULTS

PET results demonstrated a statistical difference between all animals groups when using a repeated measures ANOVA summary to evaluate the SUVR. Turkey's multiple comparison test confirmed greater uptake of [11C] PBR28 in the severe injured group when compared to moderate and sham injured animals. Both moderate and mild injured animals showed a significantly increased uptake of [11C] PBR28 when compared to the sham injured animals. Immunohistochemistry demonstrated a statistically significant difference of activated microglia counts between all animals groups using a one-way ANOVA when evaluating the thalamus. Turkey's multiple comparison test found significantly increased activated microglia counts when comparing the severe to the moderate, mild, and sham injured animals. No discernible difference in the counts of ramified microglia was identified. Immunofluorescent staining confirmed co-localization of TSPO and Iba-1 to reactive microglia. No co-localization between the astrocyte marker GFAP and TSPO occurred.

CONCLUSION

In summary, we used a rodent model of TBI to demonstrate a pro-inflammatory microglia response to CCI. In vivo, we observed this activated state by the increased uptake of the PET radioligand [11C] PBR28 in severely injured rats. These results were confirmed ex vivo, by the increased accumulation of activated microglia in the thalami of severely injured rats. Immunofluorescence highlighted the specificity of TSPO for reactive microglia by co-localization with the microglia antibody Iba-1 and the lack of co-localization with the astrocytic antibody GFAP.

PRESENTATION 6

**WHAT RISK FACTORS WITHIN THE FIRST 24 HOURS OF ADMISSION ARE ASSOCIATED WITH MORTALITY AFTER TRAUMATIC INJURY?**

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BACKGROUND

Traumatic injuries are the leading cause of death among individuals younger than 45 years of age and account for 51.3% of all deaths in the United States. The Trauma Quality Improvement Program (TQIP) was created to provide risk-adjusted benchmarking; nine identified variables in TQIP that are used in risk adjustment include age, injury severity score (ISS), motor component of the Glasgow Coma Scale (GCS), initial systolic blood pressure, initial pulse rate, mechanism of injury, head injury severity, abdominal injury severity, and patient transfer status. Although these parameters stratify risk, there may be other factors not yet validated by TQIP that are direct contributors to mortality.

OBJECTIVE

Evaluate variables within the first 24 hours of admission to identify novel contributors predictive of overall mortality within trauma patients at our institution.

METHODS

We retrospectively analyzed 5,182 admissions between 2013-2014 from the institutional trauma registry at an urban ACS-verified level 1 trauma center in Dallas, TX. Patients were excluded from analysis if they were younger than 16 years, expired prior to arrival, or were transferred from other facilities. Patients were classified as dead within 24 hours of arrival, dead after 24 hours of arrival, and alive at discharge based on discharge times and outcome. Those that passed after 24 hours or were alive at discharge were grouped together to compare against 24 hour mortality. In order to best identify significant predictors of 24 hour mortality, analysis was performed through a manual backwards stepwise binary regression comparing 3 models of fit.

RESULTS

The trimmed model was fitted to include only risk factors that were highly statistically significant. The AUROC for this model was 0.977. Ten factors that were independently predictive of death in the first 24 hours of trauma admission including penetrating injury (OR = 4.93; 95% CI = 2.45 - 9.91), number of diagnoses (1.06; 1.02 – 1.11), maximum AIS score (2.04; 1.58 – 2.63), receiving blood products in the first four hours (4.48; 1.88 - 10.67), and cirrhosis (18.00; 5.97 - 54.30). Factors that were protective of death in the first 24 hours were the number of procedures in the first 24 hours (0.89; 0.85 - 0.94), respiratory rate (0.89; 0.85 - 0.92), Glasgow Coma Scale score (0.70; 0.66 - 0.76), psychiatric illness (0.20; 0.07 - 0.60), and smoking (0.27; 0.11 - 0.64).

CONCLUSION

These findings identify additional variables that correlate with differences in mortality different than the previous identified factors. This suggests that multiple factors within the first 24 hours, beyond the standard risk factors, may better stratify mortality in trauma patients.

PRESENTATION 7

**THE IMPACT OF TIMING AND TYPE OF FEEDBACK ON BASIC SURGICAL SKILLS ACQUISITION**

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BACKGROUND

The impact of timing and type of feedback concurrently on the acquisition of basic surgical skills is not well understood. We hypothesized that subjects who received immediate auditory feedback would outperform those who received delayed and visual feedback. Tests were conducted on a knot-tying model that simulated a bleeding vessel as measured by the amount of pulling and pushing forces that were applied to the vessel (in Newtons) and leak occurrence.

OBJECTIVE

To examine the effect of timing and type of feedback on medical students' knot-tying performance using visual versus auditory and immediate versus delayed feedback.

METHODS

Forty-six first- and second-year medical students were taught to tie two-handed knots. All participants completed three pretest knot-tying trials without feedback. Participants were instructed to tie a knot sufficiently tight to stop the "blood" flow while minimizing the amount of force applied to the vessel. Completion time was unimportant. Following pretest trials, participants were stratified and randomly assigned to five experimental groups. All groups trained to proficiency which included exerting ≤ 0.6N of force and stopping the blood flow on three consecutive trials. Participants unable to achieve proficiency were terminated at 20 trials.

The control group did not receive feedback during the training trials. The immediate auditory group received immediate feedback when force exceeded the threshold of 0.6N (alarm) and whether blood was flowing or stopped (verbal announcement at regular intervals). The delayed auditory group received verbal feedback at the end of each block of five trials regarding the maximum amount of force exerted and whether blood flow was stopped. The immediate visual group received force feedback by watching a real-time graph of force exerted and were able to visualize the end of the vessel to determine whether blood flow had stopped. The delayed visual group were shown a graph of force applied and told whether flow was stopped at the end of each block of five trials.

Following the training trials, participants completed three posttest trials without feedback. Dependent variables included pretest and posttest leak and maximum absolute force. Additional dependent variables included number of training trials required to achieve proficiency and percentage of training trials that leaked. Statistical analysis was performed using paired t-test and ANOVA using $\alpha<0.05$.

RESULTS

There were fewer trials with leak ($p<0.01$) and less force applied ($p<0.01$) on the posttest compared to the pretest, regardless of study group. The immediate auditory feedback group required fewer trials to achieve proficiency than each of the other groups ($p<0.01$) and had fewer leaks than the control, delayed auditory, and delayed visual groups ($p<0.02$).

CONCLUSION

Immediate auditory feedback resulted in fewer training trials to proficiency and fewer leaks compared to visual and delayed forms of feedback.

PRESENTATION 8

**ORAL EXAMS IN SURGICAL CLERKSHIP: HIGH LEARNER SATISFACTION DESPITE LOW PERFORMANCE- WHAT ARE THE STUDENTS SAYING?**

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BACKGROUND

Medical students who perform well on the National Board of Medical Examiners (NBME) written subject exam have limited assessment on ability to integrate medical knowledge to applied decision making. These skills begin to develop during clinical rotations, but lack formative evaluation. Oral examination can be used to evaluate these skills through level appropriate assessment. Acquisition of these skills are important for successful physician development. Utility of the oral exam at this level of training, and perceived student value is unknown.

OBJECTIVE

(1) To determine correlation between performance on the shelf examination and oral final exam during surgical clerkship; (2) to determine performance on the oral exam and its perceived value to medical students; and (3) to identify the utility of the oral exam to students not entering surgery.

METHODS

Prospective data were collected from 25 third year medical students at Texas Tech University Health Sciences Center- Permian Basin from July 2016 to October 2017. Students were given two oral examinations: a practice midterm and final exam. Exam questions remained the same across blocks. The final was administrated by a single board certified surgeon and ABS board examiner. Performance was graded pass or fail and correlated with the shelf exam. Students completed a learner satisfaction survey on a 5 point, Likert-type scale (1=strongly disagree, 2=somewhat disagree, 3=neutral, 4= somewhat agree, and 5=strongly agree).

RESULTS

Shelf exam scores averaged 68.8 (range, 42-80; SD + 25.1). Overall, 92% of students passed the shelf exam and 48% the oral exam. A negative correlation was found between performance on the shelf exam and oral final exam (r= -0. 3; Pearson correlation coefficient). Although half of students failed the oral exam, they reported high satisfaction scores with opportunity to take the exam as being important to their educational experience (mean rater score x=4.0; SD+ 1.25). Students reported strong agreement that they could have performed better on the oral exam (mean rater score x=4.52+ SD 0.59). Students were against discontinuing this exam (mean average, x=1.96; SD +1.1). Out of the 20 students (80%) entering another specialty, mean rater scores favored the exam a valuable to their educational experience (4.0; SD +1.0).

CONCLUSION

1. A negative relationship exists between shelf exam performance and oral exam performance at the clerkship level, 2. Students reported high perceived learner value in taking the oral examination despite poor performance on the exam 3. Learners felt they could have performed better on the oral examination and were against discontinuing the exam in surgical clerkship, indicating this is a valuable exercise with high motivation for learner mastery. 4. Learners going into non-surgical fields found the test valuable, indicating this is a skill learners want to be taught, independent of surgical interest.

PRESENTATION 9

**A STATE-WIDE CONSORTIUM FOR GENERAL SURGERY RESIDENT TRAINING: THE TEXAS ASSOCIATION OF SURGICAL SKILLS LABORATORIES (TASSL) ROBOTIC SURGERY CURRICULUM**

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BACKGROUND

The Texas Association of Surgical Skills Laboratories (TASSL) is a state-wide consortium of accredited General Surgery Residency programs is Texas with a focus on surgical training collaboration, education, and research. As the clinical impact of robotic surgery continues to grow, so does the demand for a robust resident training curriculum in robotic surgery. We present our first year of outcomes from the TASSL Robotics Surgery Curriculum.

OBJECTIVE

To assess the feasibility of a multi-center, state-wide training curriculum in robotic surgery using the TASSL framework

METHODS

Methods: TASSL institutions meeting eligibility criteria to participate in the collaborative identified a PGY-4 or PGY-5 resident going into general surgery practice and a faculty mentor at each site. All residents completed the following curricular training components: Online training modules; seven proficiency-based training tasks on the daVinci Surgical Skills (dVSS) simulator; a minimum of five bedside first-assist cases; a two-day hands-on Basic Training Certification course (pig lab) and Advanced Training course (cadaver lab) in Houston; and a minimum of 10 proctored cases as Console Surgeon with Global Evaluation Assessment of Robotic Skills (GEARS) sheets completed by the faculty mentor. All participating residents completed pre- and post-training questionnaires and data were collected prospectively.

RESULTS

Results: Eight residents participated (PGY-5 n=6, PGY-4 n=2) in the collaborative, all 8 received the Basic Training Certificate and completed 10 Console Surgeon Cases. The hands-on Basic and Advanced Training courses were rated by the residents as having the most value. Median GEARS scores were 23 for Case 1 and 30 for Case 10, with the residents completing >80% of the case as console surgeon by Case 10. Residents performed a mean of 45±28 trials on the dVSS.

CONCLUSION

To our knowledge this is the only state-wide consortium to provide a robust training curriculum in robotic surgery and in the first year of the program awarded both Basic Training Certification and relevant clinical exposure to 8 senior level surgery residents at different institutions across the state of Texas. The training was highly valued by the residents and provided a satisfactory level of competency in robotic surgery skills. For the PGY-5 residents completing the program, all 6 were able to achieve robotic surgery credentialing privileges at their employing hospitals.

PRESENTATION 10

**DOES THE ACGME RESIDENT CASE LOG REALLY REFLECT RESIDENT OPERATIVE EXPERIENCE?**

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BACKGROUND

Graduates of general surgery residency programs are not consistently ready for the autonomy expected by fellowships and practice partners. In an attempt to better meet training needs, the Accreditation Council for Graduate Medical Education (ACGME) recently increased the number of cases required for resident graduation to 850, keeping the requirements for involvement in peri-operative care as part of "surgeon" role. However there is no clear evidence that increasing case numbers will improve competency or if the ACGME case log reflects the residents' true operative experience or skill.

OBJECTIVE

To evaluate how accurately resident case logs reflect faculty and resident assessments of operative participation, we compared the residents' ACGME case logs with faculty and resident surveys completed immediately following those cases.

METHODS

A 16-question survey was administered to residents and faculty following each case over a 4-week period. Residents and faculty were asked to assess the resident's role in the case, whether the resident performed the critical portions of the case, and the resident's role in pre- and post-operative care. The survey reported data were then compared to the residents' ACGME case logs.

RESULTS

ACGME case logs were accessible and complete for 105 cases. Eighty-three of those cases had corresponding completed faculty surveys and 95 had resident surveys. Faculty assessment of role differed from case log in 30/83 (36%) cases, with residents logging themselves as surgeon when faculty considered them first assistant in 26 of those cases. Faculty and residents were more likely to disagree on the residents' role in advanced cases compared to core cases, using Surgical Council on Resident Education (SCORE) definitions. ($p=0.01$). Agreement was not associated with PGY year, the presence of more than one resident in the case, or any specific resident or faculty. Case logs agreed with resident self-assessment of role in 82/95 (86%) cases. In 11% of cases, residents logged their experience as surgeon despite stating in the survey that they acted as first assistant. Of the 88 cases logged as either surgeon chief or surgeon junior, residents reported meeting criteria for "surgeon" as defined by ACGME in only 55%.

CONCLUSION

Resident operative experience as assessed by faculty participating in their cases is not accurately captured by the current case log system. This problem appears to be multi-factorial - residents overestimate their participation, especially in complex procedures, and residents log themselves as surgeon despite reporting that they did not fulfill criteria for that role. This suggests that the accuracy of the resident case log may be improved by logging cases in real time and involving faculty input.

PRESENTATION 11

**PHYSICIAN BURNOUT & PTSD IN SURGICAL RESIDENTS: EVERYBODY HURTS… SOMETIMES**

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BACKGROUND

The incidence of Posttraumatic Stress Disorder (PTSD) among practicing physicians has been demonstrated to be higher than the general population. Physician Burnout (PBO) is also on the rise.

OBJECTIVE

Given the potential overlap of symptoms, we aim to evaluate the incidence of PTSD and PBO among surgery residents. To our knowledge, no previous work has evaluated these two conditions in this cohort.

METHODS

A cross-sectional national survey of surgery residents was conducted. Screening for PTSD and PBO was performed using the Primary Care PTSD Screen (PC-PTSD) and the abbreviated Maslach PBO Inventory respectively. Two or more positive responses to the PC-PTSD screen were considered positive for PTSD (PTSD+). Causative traumatic factors associated with PTSD and PBO were queried. Responses to questions quantified PBO into Low, Average, and High within the categories of depersonalization and emotional burnout. Eleven risk factors for PTSD and PBO were examined including resident demographic information and residency characteristics. A chi-square or Fisher's exact test were employed for statistical significance in large or small sample sizes, respectively.

RESULTS

From July to August 2016, 549 surgery residents completed the survey. A positive PTSD screen was noted in 35% of respondents (n=191), and 51% reported symptoms of PTSD. Overall, there were significant differences in the incidence of PTSD by Post-Graduate Year (PGY). PGY2 residents were at highest risk of developing PTSD, followed by PGY4, PGY3, and PGY1 residents. Upper level residents (PGY5, PGY6, and PGY7) exhibited the lowest risk. Overwhelming responsibilities at work (22%), discord between personal and professional life (19%), and criticism or bullying by attendings (13%) were the most frequently cited stressful experiences.

Of respondents, 35% (n=191) were positive for a high degree of PBO (PBO+). The emotional exhaustion and depersonalization subcomponents were positive in 23% (n=125) and 29% (n=157) respectively. Degree of depersonalization increased with PGY (p=0.003). Additionally, a greater proportion of women reported burnout on the emotional exhaustion component (p=0.02). Similar to PTSD, overwhelming responsibilities at work, discord between personal and professional life, and criticism or bullying by attendings were the most frequently cited stressful experiences. Finally, 47% of all PTSD+ surgery residents were positive for one of the components of PBO as well ($p < 0.001$).

CONCLUSION

Our data indicates an incidence of 35% for both PTSD and PBO among surgery residents. Additionally, we noted a strong association between PTSD+ and PBO+ residents. Given the overlap between PTSD and PBO, screening and coping strategies should be considered. Physician satisfaction has been linked to improved quality of care, patient safety, patient satisfaction and lower costs. As healthcare evolves, resident wellness cannot be overlooked.

PRESENTATION 12

**FINANCIAL MODEL FOR A ZERO COST ACADEMIC SURGICAL DEPARTMENT IN RURAL AREAS**

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BACKGROUND

Rural hospitals recruit surgeons at a higher cost then their urban counterparts. In addition to surgeon costs, rural hospitals suffer additional costs that come with a lack of scale and location. Regionalization of care has caused cost of health care to skyrocket while causing displeasure amongst patients.

Separately, academic surgical departments have increasingly relied on Graduate Medical Education (GME) funding to offset the cost of departmental administration and education. This has become more difficult as academic surgery departments are disproportionately burdened by the cost of indigent and Medicaid patients.

OBJECTIVE

Our model addresses these two issues by exploiting an arbitrage opportunity between two supply and demand curves. Our model encourages academic surgical departments to increase their revenues, and thus mitigate GME funding reductions, by placing academic surgeons in rural areas through rural hospital partnerships. This model delivers a lower cost to those hospitals for surgical care without having to pay full for private surgeons. In addition to enjoying the better supply demand curve associated with academic surgeons, these rural hospitals also enjoy a reduction in transportation and locum coverage costs, and efficiencies of scale.

METHODS

As an academic surgical department in rural West Texas our goal was to partner with rural hospitals to provide surgical services in the community while developing subspecialty care at the regional tertiary center. This “hub and spoke” model allows for surgical service lines in rural hospitals and development of regionalized care by specialists with minimal loss of continuity and a reduction of costs.

RESULTS

Using these funding lines, our department is able to acquire salary lines for faculty covering numerous surgical specialties. This allows us to cluster hospitals by region in spite of varying hospital interests while still keeping cost down for each member hospital. Also, since our staffing is connected to the hospital itself we are able to reduce our staffing cost. This is either done by renting space with office staff included or as a pass through salary line from the hospital.

We have developed this model with five partner hospitals in the region. This has given our department 7 FTE’s. Our partner institutions have not required locum’s coverage since the start of this model and have reduced patient transfers by over 70%. Finally, patient satisfaction with local service has increased substantially. We believe this model can be augmented to include resident training costs within the department of surgery.

CONCLUSION

This article seeks to showcase a successfully deployed novel methodology to address the costly and growing problem of rural area surgical care. The model has reduced rural area surgical costs, improved quality of care and has the simultaneous effect of increasing revenues for academic surgical programs thus mitigating reductions in the funding enjoyed by these programs.

PRESENTATION 13

**COST TRANSPARENCY OF LAPAROSCOPIC APPENDECTOMY - INCREASING OPERATING ROOM MARGINS WHILE MAINTAINING QUALITY**

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BACKGROUND

In this shifting culture of healthcare, we find ourselves facing a constant struggle to keep rising costs at bay. There is an urgent need to bring US health care costs to a sustainable range. As we move towards a mindset of cost consciousness, increasing revenue, and increasing volume of cases, our aim must be to decrease cost while maintaining a high quality of care.

OBJECTIVE

Reduction of healthcare costs while maintaining quality is the challenge for our modern healthcare system. We investigated methods to decrease operating room costs for laparoscopic appendectomy (LA) through cost transparency.

METHODS

Three pediatric surgeons were provided with an itemized cost analysis of all laparoscopic appendectomies in 2014 at a free-standing pediatric hospital. Necessity to decrease cost was emphasized. Cost transparency was initiated allowing surgeons to review cost data of each partner. An itemized cost analysis was repeated in 2015 to assess for expenditure & equipment changes. Demographics, outcome data, and methods utilized to decrease cost were analyzed.

RESULTS

LA was performed in 274 children. Costs for all laparoscopic appendectomies decreased from an average of $1107 per case in 2014 to an average of $401 per case in 2015 after the initiation of cost transparency ($p < 0.001$). Primary decrease in cost was obtained by endoclip use rather than stapler use for closure of the appendiceal stump. Additionally, use of endocatch bags and disposable suction & irrigation significantly decreased. Operative time was on average 51 minutes and 48 minutes in 2014 and 2015, respectively ($p=0.15$). There was no significant change in length of stay or readmissions.

CONCLUSION

We conclude that institution of a group cost transparency model motivates surgeons to decrease cost expenditures while maintaining quality of care. Single-incision laparoscopic appendectomy cost remains unchanged due to high cost of access ports.

PRESENTATION 14

**VARIABLE INTER-SYSTEM TRANSFER PATTERNS EXIST FOR PEDIATRIC APPENDECTOMY**

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BACKGROUND

Prior studies of pediatric appendectomy patients evaluating predictors of complex disease demonstrated disparities in care associated with insurance status and younger age. Few studies have evaluated inter-hospital transfers in pediatric appendectomy.

OBJECTIVE

The goal of this study is to understand inter-hospital transfer patterns of pediatric appendectomy patients to a tertiary children's hospital (CH) within a large hospital system and determine if any patient characteristics are associated with a greater propensity for transfer.

METHODS

A retrospective cohort study of pediatric appendectomy patients (<18 years) treated between April 2013 and September 2014 within a large hospital system, including eight community non-children's hospitals (NCH) and one tertiary CH. Patient characteristics were extracted from the medical record including race, age, sex, and insurance status (public, private, self-pay). Pathologic diagnosis (simple or complex appendicitis) was deemed a marker for severity of illness. Patient characteristics were compared between patients treated at CH versus NCHs, among NCHs, and within the NCH population (transferred vs. treated). Covariates associated with transfer were identified with a logistic regression model and used to calculate predicted probabilities. These covariates were also tested for interactions. A p value of 0.05 was significant.

RESULTS

555 pediatric appendectomy patients were identified. 309 patients presented to NCHs, of which 71 (22.9%) were transferred to CH (median transfer rate per center 45%, range 1.2-68.2%). Age, race, severity of disease, and insurance status varied significantly between CH and NCHs (Table). Significant variation in patient characteristics also existed among NCHs and between transferred and treated patients. The predictive probability of transfer was 80.3% (95% CI 68.7% - 92.0%) adjusting for non-Caucasian race, complex appendicitis, age <10 years and public insurance.

CONCLUSION

Patient demographics significantly contribute to the likelihood of transfer to our children's hospital. Additional investigation is needed to understand drivers of transfer of pediatric appendectomy patients within a large hospital system, as well as the economic impact of inter-hospital transfers.

PRESENTATION 15

**READMISSION AND IMAGING OUTCOMES IN PEDIATRIC COMPLICATED APPENDICITIS: A MATCHED CASE-CONTROL STUDY**

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BACKGROUND

Currently, the treatment guidelines for perforated appendicitis generally include primary appendectomy or non-operative management followed by an interval appendectomy 6 to 12 weeks post discharge (first-line antibiotics). First-line antibiotics along with abscess drainage and deferred appendectomy is selected with the intent to minimize complications of surgical management. However, investigation of specific, clinically-relevant outcomes identified that primary appendectomy reduced time away from normal activities and was associated with higher family satisfaction, fewer CT scans, and fewer visits to the emergency department. The benefits of each continue to be debated.

OBJECTIVE

The aim of this study was to compare clinically-relevant outcomes such as length of stay, imaging rate and readmission between patients selected for first-line antibiotics and first-line appendectomy using a matched case-control approach.

METHODS

The electronic medical record system was queried for all patients diagnosed with perforated appendicitis who underwent an appendectomy. A total of 3,491 were identified over 4 years. Among 905 patients with perforated appendicitis, 105 underwent first-line antibiotic therapy. The patients were grouped by intervention, first-line antibiotics vs. first-line appendectomy. No standardized protocol currently exists for management of delayed appendectomy at our institution. The 291 patients were matched with a ratio of 1:2 and based on age, gender, and presence of a fecalith on imaging. Data points including length of stay (LOS), total number of imaging scans, and number of visits to the ED and readmission to the hospital were collected. The values are reported as mean and standard deviation.

RESULTS

The first-line antibiotic group had significantly longer primary hospitalization (LOS) in addition to a longer total LOS (158.40 ± 129.10 vs. 108.19 ± 97.91, $p < 0.0001$; 199.72 ± 142.65 vs. 118.80 ± 93.217, $p < 0.0001$). These were readmitted more often (0.21 ± 0.48 vs. 0.08 ± 0.311, $p = 0.0026$) though ED visits were statistically similar to primary appendectomy (0.17 ± 0.40 vs. 0.10 ± 0.35, $p = 0.1024$). Re-hospitalization LOS was not longer ($p = 0.2000$). The first-line antibiotic group also underwent more imaging scans during their initial hospital visit as well as after the primary diagnostic scan (1.02 ± 0.46 vs. 0.54 ± 0.57, $p < 0.0001$; 0.26 ± 0.52 vs. 0.06 ± 0.28, $p < 0.0001$).

CONCLUSION

In this study, we found that delayed appendectomy is associated with longer hospital stays, increased hospital admissions, and more imaging scans. Readmissions are also higher. These outcomes may be related to selection bias as well as lack of a standardized approach outlining when to scan patients and in access to outpatient surgical care.

PRESENTATION 16

**PEDIATRIC BREAST MASSES: SHOULD THEY BE EXCISED?**

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BACKGROUND

Pediatric breast masses can be a diagnostic challenge. Surgeons are frequently consulted to consider removal, with many patients undergoing excision for benign disease. In general, masses > 5 cm or those that are growing rapidly are removed. However, there is no consensus recommendation regarding breast mass excision.

OBJECTIVE

The objective of this study is to describe the group of children who underwent breast mass excision at a single pediatric hospital, and to determine any correlation between clinical or radiographic characteristics and the final pathologic diagnosis.

METHODS

We performed a retrospective review of all pediatric patients (≤18 years) who had breast masses removed at a single institution from 2008-2016. Patients were included if they had a breast mass excised in the operating room with an available pathology report. Male patients with gynecomastia and patients who underwent needle biopsy without formal excision were excluded. Baseline demographic and clinical data including ultrasound reports were collected. A Pearson correlation was used to measure association between clinical variables and pathologic size. A Kruskal-Wallis test was used to measure association between pathologic size and pathologic diagnosis. P-values < 0.05 were considered statistically significant.

RESULTS

A total of 195 patients were included (96% female). Ethnicity was reported as 43% Hispanic, 43% African-American, 10% Caucasian, and 4% other. Mean weight and BMI were 56 kg and 22.4 kg/m2, respectively. Thirty percent of patients complained of pain, 3% had nipple discharge, and 1% had bloody discharge. A mass was palpable on exam in 98%. Pre-operative breast ultrasound was obtained in 70% of patients, with an average mass size of 3.5 cm (range 0.8 – 12 cm). The mean age at the time of surgery was 15.2 years (range 0.8 – 19 years) and patients waited an average of 55 days (range 0 – 624 days) after surgical evaluation before definitive excision. Twenty-one patients (11%) had more than one lesion surgically removed. Final pathology included fibroadenoma (82%), tubular adenoma (5%) benign Phyllodes (3%), and other benign lesions (10%). There were no malignant lesions. Ultrasound size had a Pearson correlation of 0.84 with pathologic size ($p < 0.0001$). There was no association between the size of lesion and the pathologic diagnosis.

CONCLUSION

The vast majority of surgically excised breast masses in children are benign. Ultrasound is an accurate method for determining size, but size does not reliably predict the pathologic diagnosis. Pediatric patients should be strongly considered for observation of asymptomatic breast masses.

PRESENTATION 17

**ELEVATED SERUM INTESTINAL-FATTY ACID BINDING PROTEIN LEVELS AS A BIOMARKER FOR INFANTS WITH NECROTIZING ENTEROCOLITIS**

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BACKGROUND

Necrotizing enterocolitis (NEC) is a serious, highly morbid gastrointestinal disorder that commonly affects premature, low birth weight infants and neonates with congenital heart disease. Intestinal-fatty acid binding protein (I-FABP) has been evaluated as a promising serologic biomarker for disease detection.

OBJECTIVE

The purpose of the study is to evaluate the use of I-FABP as a biomarker for detection of NEC and its levels throughout the disease progression.

METHODS

We prospectively collected residual blood samples from the hematology laboratory from the neonatal and cardiovascular intensive care unit patients at a large tertiary care center from November 2015 to February 2016. Samples of patients suspected for NEC were then analyzed. The diagnosis of NEC was based on modified bell's criteria. I-FABP levels within the first few days of diagnosis, after 1 week, after 2 weeks and greater than 2 weeks were analyzed. I-FABP levels of patients diagnosed with feeding intolerance and age matched controls were analyzed as well.

RESULTS

A total of 324 samples were collected during this time period, we identified 17 patients treated for NEC (bells criteria 2 and 3). Eight patients served as aged matched controls and four patients were diagnosed with feeding intolerance. A total of 96 samples were analyzed from this cohort of patients. I-FABP levels were acquired on nine patients within 24 hours of diagnosis. Mean I-FABP levels on the day of diagnosis was 3.45 ± 1.63 ng/ml and it was found to be significantly higher than age matched controls (0.48 ± 0.69, $p<0.001$). A receiver operating characteristic (ROC) curve was performed and found an I-FABP level of 1.01 diagnostic of NEC (green line in Figure 1) with an area under the curve of 0.95 with 100% sensitivity and 87.5% specificity. After initiation of treatment, the levels of I-FABP abruptly decreased reaching levels similar to controls within two days (Figure 1). I-FABP levels continue to remain low after 1 week of initiating treatment (0.28 ± 0.23), between 1-2 weeks (0.27 ± 0.32), and after 2 weeks (0.24±0.26). No statistical difference was found among these time periods ($p=0.68$). I-FABP values of patients diagnosed with feeding intolerance were significantly lower compared to NEC patients (0.22 ± 0.19 vs 3.45 ± 1.63, $p<0.001$).

CONCLUSION

I-FABP is a sensitive biomarker in the detection of necrotizing enterocolitis. I-FABP levels higher than 1.01 ng/ml are highly suggestive of NEC. Levels tend to rapidly increase on the onset of disease and has a sudden decline after initiation of treatment. I-FABP levels return to normal by 2 days after treatment initiation and remain low throughout the course of the hospital stay. I-FABP can be useful in tailoring the direction of therapy and could aid in differentiating patients with feeding intolerance and NEC.

PRESENTATION 18

**A REVIEW OF THE TREATMENT OF SPLENIC CYSTS AT CHILDREN'S MEDICAL CENTER**

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BACKGROUND

The management of non-parasitic splenic cysts in children is unclear. Options include partial or total splenectomy and rarely percutaneous aspiration and sclerotherapy.

OBJECTIVE

The aim of this study is to assess the outcomes of these interventions.

METHODS

Retrospective review of patients <18 years with splenic cysts (2009-2016) at a major children's hospital was performed after IRB approval. Demographics, mode of intervention and outcome data were collected. Due to the small numbers, statistical analysis was limited.

RESULTS

42 patients were identified and initial management was as follows: 32 observation alone, 10 underwent intervention (4 aspiration and sclerotherapy, 6 resection). Age (yrs) was higher for intervention than observation ($p=0.004$, table 1). Incidental finding was the most common presentation for patients that were observed (n=30; 100%, $p<0.001$) and abdominal pain for intervention groups: aspiration and sclerotherapy (n=3; 75%, $p=0.16$), resection (n=5; 83%, $p=0.05$). Cyst size (cm) was larger for intervention than observation ($p<0.001$, table 1). Follow up was available for 20 of the 32 observed children, 18 requiring no intervention. 2 patients failed observation and required aspiration and sclerotherapy, one at 5 months and one at 3.5yrs due to persistence of symptoms and size increase, respectively. Of the 6 children who underwent aspiration and sclerotherapy; 2 patients underwent 1 round of sclerotherapy, 2 had multiple planned rounds and 2 required multiple additional unplanned rounds of sclerotherapy. 2 patients failed sclerotherapy and underwent resection. For the 8 children who underwent resection, procedures included open splenectomy (n=2), laparoscopic partial (n=2), or complete splenectomy (n=1) and laparoscopic cystectomy (n=3). Cysts were histologically identified as epithelial (n=4), mesothelial (n=2), pseudocyst (n=1), and unknown (n=1). One small recurrence was noted in 5 of 8 patients who followed up. Based on the number of cases, statistical significance could not be computed for recurrence rate. However, aspiration and sclerotherapy required more interventions and failed more often than resection patients.

CONCLUSION

Observation of splenic cysts is an appropriate management strategy for small asymptomatic splenic cysts. Percutaneous aspiration and sclerotherapy is associated with a higher rate of recurrence while surgical resection is associated with lowest recurrence rates and should be considered for patients with large or symptomatic cysts.

PRESENTATION 19

**A COMPARISON OF COSTS AND COMPLICATIONS WITH AND WITHOUT INTRAOPERATIVE CHOLANGIOGRAPHY**

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BACKGROUND

The role of routine intraoperative cholangiography during laparoscopic cholecystectomy is debated. Given the varying estimates of cost effectiveness and prevention or identification of complications, we sought to determine the actual costs associated with the use of IOC during laparoscopic cholecystectomy.

OBJECTIVE

To determine the actual costs and rates of complications associated with the use of intraoperative cholangiography during laparoscopic cholecystectomy.

METHODS

The Commercial Claims and Encounters database within the Truven Health Analytic MarketScan® Research Databases was retrospectively reviewed. Inpatient, outpatient, and outpatient pharmaceutical claims data from January 1, 2012 to December 31, 2014 were used. We separated out elective laparoscopic cholecystectomies with and without IOCs by including only patients who had non emergent diagnoses and no obstruction; Patients were excluded if they had a diagnosis of acute cholecystitis or choledocholithiasis with obstruction. In order to adjust for between-group differences for patients who underwent IOC versus those who did not, propensity score matching with a caliper of 0.10 was implemented. Bivariate analyses with respect to the treatment groups were compared by Student's t-test and chi-square for continuous and categorical variables, respectively ($\alpha$, 0.05). All analyses were performed using SAS/ACCESS® 9.4.

RESULTS

After propensity matching, the IOC group consisted of 4,473 patients (71% women; mean [SD] age 44.3 [13] years) and the without-IOC group consisted of 4,473 patients (71% women; mean [SD] age 44.5 [13], p=0.30). The overall cost of care for the IOC group was \$15,132 ± 27,705 while the non-IOC group accrued a total cost of \$12,324 ± 12,801 ($p<0.001$). The IOC group had significantly higher rates of retained stones (0.3% versus 0.16% p=0.04), common bile duct injuries (0.47% versus 0.2%, p=0.03), surgical site infections (0.3% versus 0.13%, p=0.04) and sepsis (1.2% versus 0.63%, p=0.005) and underwent more ERCPs (11% versus 7.3%, $p<0.0001$) than the non-IOC group.

CONCLUSION

During laparoscopic cholecystectomy for cholelithiasis without obstruction, the inclusion of an IOC increased costs, sepsis, bile duct injuries, retained stones, surgical site infections, and utilization of ERCPs. These findings support selective IOC as the preferred strategy during laparoscopic cholecystectomy.

PRESENTATION 20

**POSTOPERATIVE OUTCOMES FROM RECTAL CANCER RESECTION IN THE US: STILL ROOM FOR IMPROVEMENT**

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BACKGROUND

Colorectal cancer is a leading cause of cancer death in the US. We have previously described changes in cancer-specific rectal cancer treatment and long-term survival over the last 4 decades.

OBJECTIVE

The aim of our current study was to describe changes in early postoperative outcomes after curative-intent surgery for rectal cancer in the US. We hypothesized that postoperative outcomes such as length of stay (LOS), mortality, and postoperative complications have improved over time.

METHODS

The National Inpatient Sample and the Nationwide Inpatient Sample (NIS), Healthcare Cost and Utilization Project (HCUP), Agency for Healthcare Research and Quality data were queried in 5 year intervals from 1993 to 2013 for patients with rectal adenocarcinoma, older than 18 years of age, who had undergone curative-intent surgery (n=16,419). Baseline characteristics (age, gender, type of operation) and postoperative outcomes (LOS, inpatient mortality, discharge disposition, and postoperative complications) were described. Clinical/demographic characteristics and postoperative outcomes were compared by discharge year. Continuous variables were compared using the 1-way analysis of variance (ANOVA) or non-parametric tests, and categorical variables were compared using the chi-square test.

RESULTS

The mean age of the entire population was 65.6±13.1 years. 58.7% of patients were male and median LOS was 8 (IQR 4-11) days. Mean age of diagnosis has decreased with time (68.3±12.1 in 1993, 62.6±13.0 years in 2013, $p<0.001$). The proportion of male patients has increased in the same time period (56% to 62%, $p<0.001$). As in our prior study, sphincter-preserving operations increased significantly over time (51% in 1993 to 60.5% in 2013, $p<0.001$). During the same time period, perioperative hemorrhage and inpatient mortality decreased from 3.6% to 1.6% ($p<0.001$) and 1.9% to 0.7% ($p<0.001$), respectively. There was no clinically significant change in the surgical site infection (SSI) rate (4.3% to 4.6%, $p<0.001$), whereas anastomotic leak and digestive complications increased over time (9.8% to 12.7%, $p<0.001$). Median LOS decreased significantly from 10 (IQR 7-13) to 6 (IQR 4-9) days ($p<0.001$). However, non-home discharges and home-health use increased from 8.3% to 11.4% and 23.5% to 42.7%, respectively ($p<0.001$).

CONCLUSION

The treatment of rectal cancer continues to evolve, with a greater emphasis on sphincter-preserving surgery, as well as decreases in perioperative hemorrhage and inpatient mortality. However, the rate of SSIs has not changed meaningfully and the risk of anastomotic and other digestive complications has increased, potentially secondary to anatomically lower pelvic anastomoses. Although LOS has decreased, there has been an increase in transitional care and home-health service needs. A shift toward organ-preserving strategies is likely necessary to further improve post-operative outcomes from rectal cancer surgery.

PRESENTATION 22

**IDENTIFYING TRAUMA SUPERUTILIZER READMISSIONS WITH 11-YEAR DATA MODEL**

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BACKGROUND

Unplanned hospital readmissions have been associated with increased health care costs as well as increased risk for morbidity. There are patients, known as superutilizers, who account for a disproportionately large number of emergency department visits and hospital admissions, up to 21% of US health spending. Generally, its assumed superutilizers have complex health issues and recovery needs, multiple chronic conditions, and multiple medications, along with no primary care provider. Identifying characteristics of these superutilizers in the year following their initial trauma injury is a step towards reducing the estimated lifetime cost of trauma, $40 billion in the United States in 2000.

OBJECTIVE

Our objective was to identify factors for trauma readmission and characteristics of superutilizers to better tailored resources to high-risk patients.

METHODS

Data was retrospectively collected for 21,231 unique trauma patients admitted to a Level I ACS-certified trauma center over 11 years, with readmissions identified within one year of index admission. A regional database encompassing 15,000 miles including > 85 hospitals was queried. Outcomes of all readmission encounters were analyzed using a binary logistic regression model including demographic, diagnosis, ISS, procedure, Elixhauser comorbidity, insurance, and disposition data. Analysis of 604 patients (N=3070 encounters), each with 3 or more readmissions, was performed to examine patterns in super utilization.

RESULTS

4459 (21%) patients were readmitted during the study period. Superutilizers accounted for 14% of the readmitting population, with number of encounters ranging between 4-22, averaging 5.08 re-encounters, and a median of 4. The model identified 9 significantly independent predictors of superutilizers with a ROC curve of 0.820, characteristic of a strong model.

CONCLUSION

In our model, diagnosis, ISS, procedure, and disposition data were not found to be significant factors for superutilizer readmission. Interestingly, patients without history of fall (documented on arrival, or throughout their encounters) were at most significant risk for readmission. We speculate this may be because patients with a known history of falls are getting higher levels of care, and more likely to not discharge home. This requires further investigation. If a patient had ≥15 encounters prior to their index trauma, they were more likely to continue high utilization. Some demographics were suggestive of readmission such as living ≤ 20 miles of the hospital, and having CMS insurance. Patients with comorbidities such as neurological disorders, congestive heart failure, and depression also had high utilization. Within the hospital, “urgent” admissions, and shorter lengths of stay ≤ 4 days, perhaps suggesting lingering medical issues, were also predictors. Identification of population readmission factors following injury may allow for development of targeted interventions towards reducing resource utilization and healthcare cost.

PRESENTATION 23

**EFFECT OF HOSPITAL SAFETY NET STATUS ON TREATMENT USE AND OVERALL SURVIVAL AMONG PATIENTS WITH HEPATOCELLULAR CARCINOMA**

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BACKGROUND

There are racial/ethnic and socioeconomic disparities in hepatocellular carcinoma (HCC) prognosis. A comparison of healthcare delivery systems can provide insights into the relative contribution of biological and care delivery factors to these disparities.

OBJECTIVE

Our study's aim was to compare the presentation, treatment, and outcomes of HCC patients managed at safety net hospitals (SNHs) to those followed at non-safety net hospitals (non-SNHs).

METHODS

We identified patients in the Texas Cancer Registry diagnosed with HCC between 2001 and 2012, and compared hospital and patient characteristics across 3 categories: non-SNHs, low-proportion SNHs (l-SNHs), and high-proportion SNHs (h-SNHs) as determined by their disproportionate share hospital index. Risk-adjusted treatment utilization and overall survival were compared using multivariable logistic and Cox regression models, respectively.

RESULTS

Despite comprising only 23% of hospitals, SNHs delivered care to 42% of all 17,517 HCC patients, with a disproportionately large proportion of racial/ethnic minorities and patients of low socioeconomic status. Although overall treatment use was equivalent between non-SNHs and l-SNHs (45% vs. 45%, adjusted odds ratio [OR] 0.97, 95%CI 0.89-1.05), it was significantly lower at h-SNHs (32% vs. 45%; OR 0.64, 95%CI 0.57-0.73). Similarly, patients with localized HCC were significantly less likely to undergo curative treatment at h-SNHs than non-SNHs (OR 0.51, 95%CI 0.40-0.66). Compared to non-SNHs, overall and stage-by-stage survival rates were similar at l-SNHs (hazard ratio (HR) 0.93, 95%CI 0.89-0.97) but significantly worse at h-SNHs (HR 1.27, 95%CI 1.19-1.36; Figure 1).

CONCLUSION

Patients at safety net health systems are significantly less likely to undergo HCC treatment, even when detected at an early stage, contributing to worse overall and stage-by-stage survival. Differences in care delivery between health systems may partly explain racial/ethnic and socioeconomic disparities in HCC prognosis.

PRESENTATION 24

**ESTABLISHING A SYSTEM-WIDE ASSESSMENT OF PRE-OPERATIVE FRAILTY IN ELECTIVE SURGERY**

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BACKGROUND

: Frailty is a promising metric for pre-operative risk stratification. With reimbursement now linked to outcomes, identification and management of patients at high risk for poor outcomes is paramount. Correlation of frailty with outcomes requires baseline measurements within a patient population.

OBJECTIVE

Our health care system implemented quality initiative to achieve compliance with pre-operative frailty assessment. This study assesses our success with implementation of this program.

METHODS

Our Department of Surgery includes 13 surgical subspecialties with more than 90 surgeons at 4 separate hospitals. Collectively, this group performs >1000 elective operations each month. Recent institutional goals prioritized implementation of pre-operative frailty assessment in elective surgery patients. Previously validated frailty assessment included age, gender, body mass index, American Society of Anesthesiologists Physical Status classification, handgrip strength and recent hemoglobin value. To facilitate documentation, a frailty calculator was built into our electronic health record with the score easily imported into clinic notes. Compliance with frailty measurement was tied to physician compensation, with threshold and high performance targets set at 70% and >90% compliance. A 3-month education period (January-March 2016) permitted instruction and work flow optimization. Feedback was provided during the trial period (April), without impact on compensation. Performance compliance was linked to compensation starting in May, and defined as performance month 1 (PM-1). Compliance measurement, reporting and performance-based compensation continued in subsequent months (PM-2, PM-3 and PM-4). Data was analyzed using Wilcoxon-sign-rank and Kruskal-Wallis tests with significance at $p < 0.05$.

RESULTS

Preoperative frailty assessment performance was evaluated for 92 surgeons, with median surgeon performance over time along with threshold and high performance targets illustrated in Figure 1. Median surgeon compliance for the system was 16% in the education period and 75% in the trial period. Compliance during PM-1 was 88%, with subsequent months showing similar or improved results (PM-2 86%, p=0.055; PM-3 90%, p=0.019; PM-4 87%, p=0.077). Surgical subspecialty and regional hospital specific analysis revealed no difference from the overall performance trend (p=0.082 and 0.66, respectively). As of PM-4, 73% of surgeons met threshold performance when considering all 4 performance months (>70%), of which over ½ achieved high level goal (>90%).

CONCLUSION

Pre-operative frailty measurement at a system level was successfully implemented. Performance on quality initiative was tied to physician compensation. Short-term sustainability was demonstrated over the measured time frame. This program serves as a model for the implementation and compliance of physician driven quality metrics.

PRESENTATION 25

**FRAILTY OR AGE? MORTALITY AND DISPOSITION AFTER TRAUMATIC SPINAL CORD INJURY IN THE ELDERLY**

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BACKGROUND

Approximately 12,500 spinal cord injuries (SCI) occur annually in the USA, and as of 2014, about 276,000 people living in the US with SCI. Predicting outcome and discharge disposition in geriatric patients with traumatic spinal cord injury (SCI) is imperative to appropriately direct hospital resources and to coordinate the extensive post-injury care required by these patients.

OBJECTIVE

While chronological age is commonly used to predict mortality and disposition in geriatric trauma patients, age alone does not take into account the altered physiologic reserve often seen in the geriatric population. Thus, it may not accurately predict a patient's response to injury. The modified Frailty Index (mFI) assesses frailty based on accumulated deficits, or comorbidities present prior to injury and has demonstrated predictive utility with regard to outcome and disposition in various surgical populations. The mFI has yet to be investigated in this population. We looked to determine if the mFI is more reliable than chronological age when predicting in-hospital mortality or unfair discharge disposition in elderly patients with traumatic SCI.

METHODS

The Memorial Hermann Hospital (MHH) Trauma database was queried to identify patients ≥55 years old who suffered any level of blunt spinal cord injury over a 5 year period (Jan 1, 2011-Dec 31, 2015). Pre-admission comorbidity data was collected from a review of clinical records and mFI scores were calculated. In-hospital mortality and discharge disposition were determined and logistic regression was used to determine the relationship between age, mFI, and these two variables. ROC curve analysis was used to determine the relative performance of age and mFI in predicting mortality and unfavorable disposition. SCI was defined as any complete/incomplete cord injury, including cord contusions. Patients lacking adequate documentation of pre-admission comorbidities were excluded from the study (n=17).

RESULTS

Of 807 blunt SCI patients that met the injury criteria, a total of 299 were ≥ 55 years of age. Of these, 281 had sufficient pre-admission data for inclusion in analysis. Median age was 68 years (IQR 61 to 76), 72% were male, 79% had incomplete SCI, median ISS was 18 (IQR 14 to 26), and median Frailty Index score was 0.09 (IQR 0 to 0.18). There was no correlation between chronological age and frailty of the patients ($R^2=0.06$). After adjusting for age and ISS in multiple logistic regression analysis, mFI was not significantly associated with unfavorable discharge disposition ($p=0.5$), while age ($p<0.001$) and ISS ($p<0.001$) were. Upon ROC curve analysis, mFI did not add significant predictive value to a model already including age and ISS (AUC 0.7617 vs. 0.7616).

CONCLUSION

Chronological age may be a better predictor than mFI of in-hospital mortality and unfavorable discharge disposition in elderly patients with traumatic SCI.

PRESENTATION 26

**PRE-CLINICAL EVIDENCE FOR PROGENITOR CELL THERAPIES FOR TRAUMATIC BRAIN INJURY: RESULTS OF A META-ANALYSIS OF FOUR OUTCOME MEASURES**

ML Jackson MD, AK Srivastava PhD, CS Cox MD

BACKGROUND

There is currently no treatment available to reverse the primary or secondary injury associated with traumatic brain injury (TBI). Progenitor cell therapies have shown promise in both pre-clinical and clinical studies.

OBJECTIVE

We conducted a meta-analysis of pre-clinical studies using progenitor cells for the treatment of TBI.

METHODS

EMBASE and MEDLINE were searched for articles using pre-determined search terms for progenitor cell treatment for TBI. Included studied had an animal model of TBI with administration of progenitor cells and outcome measures that included one or more of: brain lesion volume (LV) assessment, rotarod (RR) motor function assessment, neurological severity score, or morris water maze assessment. Studies were excluded if they were not available in English, or if their design included combination with non-cellular therapies. Two investigators independently performed literature searches and screened abstracts. Discrepancies were decided by a third investigator. Analysis was performed using Review Manager 5.3 according to a random-effects model. All studies underwent quality scoring.

RESULTS

Of 456 abstracts identified, 70 met inclusion criteria and underwent full text evaluation. 29 were excluded for using concomitant genetic or scaffolding therapies which modified their progenitor cell treatment, and 8 studies were excluded for poor data reporting (ie, no data could be extracted from the paper). 33 studies were included in the final analysis; some reported more than one outcome measure. Average quality score was 4.25 ± 1.67 out of 8 possible points. No study achieved a perfect score. LV and NSS outcomes favored cell treatment with standardized mean reduction of 1.43 (95%CI 0.85-2.00) and 1.82 (95%CI 1.16-2.47) respectively (reduction indicates improved outcome). RR and MWM outcomes showed a trend towards standard mean improvement of 0.59 which was not statistically significant (95%CI -0.20-1.37) and a reduction in latency time of 0.21 (95%CI 0.26-0.68) respectively. Heterogeneity (I2) ranged from 63% to 85% among the analyses, indicating a high amount of heterogeneity among the studies compared. Single comparison linear regression of effect size as a function of quality showed a trend toward higher effect size with higher quality studies, with a Pearson correlation coefficient of 0.24, showing weak association. However this was not statistically significant with a p-value of 0.09. Precision (size of the 95%CI) was regressed onto quality score, and showed a statistically significant increase in the size of the confidence interval as quality improved, with a Pearson's correlation coefficient of -0.29, p-value of 0.04.

CONCLUSION

Our meta-analysis evaluates both histological and functional outcome of progenitor cell therapies for TBI, and reports that despite heterogeneity among the studies there is a benefit in lesion volume reduction and overall neurologic severity score, and a trend towards overall improvement in motor function and spatial learning.

PRESENTATION 27

**KEEP CALM AND CARRY ON OPERATING! INVESTIGATING OUTCOMES OF PATIENTS UNDERGOING URGENT LAPAROSCOPIC APPENDECTOMY ON ANTITHROMBOTIC THERAPY.**

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BACKGROUND

The literature regarding outcomes in patients on irreversible antithrombotic therapy (IAT) undergoing urgent laparoscopic appendectomy is limited.

OBJECTIVE

The aim of this multicenter retrospective study was to examine the impact of prehospital IAT on outcomes in this population.

METHODS

From 2010 to 2014, seven institutions from the SWSC MCT group conducted a retrospective study to evaluate the clinical course of all patients who underwent urgent/emergent laparoscopic appendectomy. Given statistically significant demographic variations between IAT vs. No-IAT, two groups (IAT vs No-IAT) were matched 1:1 based on age and gender. The IAT group was subdivided into IAT-Aspirin only and IAT-Aspirin-Plavix. The primary outcomes were estimated blood loss (EBL) and transfusion requirement. Secondary outcomes included infections (SSI – Surgical Site Infection, DSI – Deep Space Infection, and OSI – Organ Space Infection), hospital length of stay (HLOS), complications, 30-day readmissions, and mortality. A chi-square or Fisher's exact test were employed for statistical significance in large or small sample sizes, respectively. A $p \leq 0.05$ is considered statistically significant.

RESULTS

Out of the 2,903 patients included in the study, 287 IAT patients were identified and matched in a 1:1 ratio to 287 No-IAT controls. In the IAT vs Control group, no significant differences in EBL ($p=1.0$), transfusion requirement during the preoperative ($p=0.5$), intraoperative ($p=0.3$) or postoperative periods ($p=0.5$), infectious complications (SSI $p=1.0$, DSI $p=1.0$, and OSI $p=0.1$), overall complications ($p= 0.3$), HLOS ($p=0.7$), 30-day readmission ($p=0.3$), or mortality ($p=0.1$) were noted. Outcomes in the IAT-Aspirin only subgroup vs controls also failed to demonstrate statistical significance. Additionally, in the IAT-Aspirin-Plavix subgroup vs controls, no statistically significant differences in the assessed outcomes were observed.

CONCLUSION

Our results demonstrate no difference in outcomes between the overall IAT group and Controls. Furthermore, analysis of the IAT-Aspirin only and IAT-Aspirin-Plavix subgroups failed to show a significant difference in any outcome. Our analysis suggests that urgent/emergent laparoscopic appendectomy is a safe procedure in patients on IAT therapy. Prehospital use of IAT therapy as an independent factor should not be used to delay laparoscopic appendectomy.

PRESENTATION 28

**POST-TRAUMATIC TREATMENT WITH DOXYCYCLINE ATTENUATES MICROVASCULAR PERMEABILITY IN MICE FOLLOWING TRAUMATIC BRAIN INJURY**

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BACKGROUND

Traumatic brain injury (TBI) is a global issue affected approximately 10 million people annually. Many patients who suffer TBI are predisposed to development of other neurological diseases like seizures, epilepsy, dementia and Alzheimer's disease. It is speculated that by the year 2020, TBI will be one of the leading causes of death and disability worldwide. Brain edema that occurs after TTBI leads to challenging clinical scenarios, including elevated intracranial pressure (ICP), decreased cerebral blood flow, poor tissue oxygenation, and brain herniation. Currently, treatment modalities exist to somewhat address symptoms of cerebral edema, but there are no effective medical therapies able to modulate the underlying pathophysiology responsible for TBI-induced microvascular "leak." Doxycycline is a tetracycline antibiotic that inhibits protein synthesis in bacteria. Doxycycline has been shown to inhibit matrix metalloproteinase-9 (MMP-9) activity, which breaks down blood brain barrier proteins leading to increased brain edema.

OBJECTIVE

The purpose of this study is to show that doxycycline reduces microvascular permeability in TBI in vivo.

METHODS

4-6 week old C57BL/6 mice were injected via tail vein with 0.1 mL of 50 mg/mL FITC-dextran dissolved in saline prior to injury as intravascular dye. A moderate TBI (speed of 0.50 m/s, contact time of 0.1 milliseconds, and depth of 2 millimeters) was performed with the Leica controlled cortical impactor after craniectomy. Sham mice had only a craniectomy performed. The doxycycline group was given 20 mg/kg of doxycycline dissolved in normal saline 10 minutes after injury. Intravital microscopy was performed 10 minutes after injury up to 70 minutes after injury.

RESULTS

5 mice were included from each group. The difference in fluorescence was calculated between the intravascular space and the interstitial space on intravital microscopy using Nikon software. The difference in fluorescence was then analyzed using GraphPad Prism 6 software. A 2-way ANOVA showed no difference among the groups at the initial time point of 10 mins after injury ($p=0.3067$). There was a significant difference between the TBI and TBI plus doxycycline groups at 50 mins after injury ($p= 0.0115$ Bonferroni's multiple comparisons test confirmed significance). One-way ANOVA showed that there was a significant difference between the TBI and TBI plus doxycycline groups ($p=0.0001$). There was no significant difference between the Sham group and TBI plus doxycycline group ($p=0.87$). Figure 1 shows representative Intravital microscopy photos with increase FITC dextran in the interstitial space in the TBI group. Figure 2 shows the trend of microvascular permeability in the three groups.

CONCLUSION

Mice treated with doxycycline following TBI had decreased microvascular permeability. Doxycycline attenuates microvascular permeability and may be a viable treatment in TBI patients to decrease brain edema. More studies are needed prior to implementing practical application in patients.

PRESENTATION 29

**RESILIENCE, DEPRESSION, AND POSTTRAUMATIC STRESS DISORDER IN ORTHOPEDIC TRAUMA PATIENTS**

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BACKGROUND

Depression and posttraumatic stress disorder (PTSD) are prevalent in orthopedic trauma and are predictive of poor outcomes related to disability, pain intensity and overall functionality following injury. Resilience is defined as the ability to adapt under stress or adversity and can be measured with the Connor-Davidson Resilience Scale 10 item (CD-RISC 10).

OBJECTIVE

This study examines the prevalence of and relationship between resilience, depression and PTSD in orthopedic trauma patients.

METHODS

One hundred and sixty orthopedic trauma inpatients completed measures for depression (Patient Health Questionnaire-8 Item (PHQ-8), PTSD symptoms (Primary Care PTSD screen (PC-PTSD) and PTSD Checklist-Civilian version (PCL-C)), and resilience (CD-RISC 10) at baseline and 12 months post-injury. Resilience scores were categorized as low, intermediate, or high and compared with depression and PTSD evaluations at baseline and 12 months post-injury.

RESULTS

Depression was seen in 28% of patients at baseline and 29% at 12 months. PTSD symptoms were prevalent in 23% at baseline and 21% at 12 months. Resilience scores at baseline and 12 months were divided into three categories: low (14%, 16%, respectively), intermediate (70%, 68%), and high (16%, 16%). There was no significant difference in the prevalence of depression, PTSD symptoms or resilience scores at baseline and 12 months post-injury. There was a significant relationship between resilience and depression at both baseline and 12 months ($p=0.0015$, $p=0.0003$) and between resilience and PTSD symptoms at baseline and 12 months ($p=0.024$, $p=0.0002$).

CONCLUSION

Low resilience scores are correlated with the presence of depression and PTSD symptoms at both baseline and 12 months post-injury in orthopedic trauma patients. Prevalence of depression and PTSD are significant immediately following (28%, 23%, respectively) and 12 months after traumatic injury (29%, 21%). These results highlight the need for early screening and intervention for depression and PTSD. They further demonstrate the importance of resilience in recovery from orthopedic trauma. The level of resilience and its impact within the orthopedic trauma population merit further investigation.

PRESENTATION 30

**INTRUSION, EJECTION, AND DEATH IN THE COMPARTMENT: MECHANISM-BASED ACTIVATION CRITERIA FAIL TO IDENTIFY SERIOUSLY INJURED PATIENTS**

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BACKGROUND

Trauma activation criteria enable hospitals to quickly identify patients who need the rapid and additional resources of trauma teams. Our Level I trauma center adopted activation criteria that include mechanism-based criteria recommended by the CDC 2011 Field Triage Guidelines. Local experience indicated that these criteria were overly cautious and were leading to wasted resources and trauma activation fatigue.

OBJECTIVE

This study examined the appropriateness of partial trauma activations based on mechanism-based criteria.

METHODS

Using the hospital's trauma registry, we assessed activation reason, emergency department (ED) disposition, Injury Severity Score (ISS), length of stay (LOS), and mortality.

RESULTS

Between 7/1/14 and 1/12/16, there were 1,324 patients who received partial activations with 546 of them being mechanism-based partial activations (MBPAs). Using a binary logistic regression, we compared MBPAs to all other partial activations (Table 1). This revealed that MBPAs had significantly lower ISS, were more likely to be discharged home from the ED, and had fewer ICU days, but did not significantly differ on hospital LOS or mortality. Specifically, MBPAs had a median (IQR) ISS of 5 (1, 10), and 36.9% were discharged home from the ED. This, compared to anatomically based partial activations (n=656) who had higher ISSs of 10 (5, 16) and only 10.7% were discharged home from the ED. Of MBPA patients activated for high risk MVC (n=160), which include those having intrusion, ejection, or death in passenger compartment, median (IQR) ISS was 5 (2, 11), and 61.9% were discharged home from the ED while only 15.0% were ever admitted to an ICU. MBPAs activated for non-superficial penetrating injury at or proximal to knee/elbow (n=259), had a median ISS of 1 (1, 9), and 47.1% were discharged home from ED.

CONCLUSION

Although it is generally preferable to have activation criteria that are overly cautious than to have criteria that are too restrictive, mechanism-based activation criteria appear to be far too cautious. While these partial trauma activations do not mobilize as many resources as do full activations, the high rate of MBPAs being sent home from the ED indicates that these patients are essentially being overtriaged, which, although it has minimal health consequences for the overtriaged patient, it increases financial burdens to both the patient and trauma system, and can divert care from patients who need it. Mechanism-based criteria may be useful in field triage to determine if a patient should be transported to a trauma center, but this study suggests they are less effective in defining the need for trauma team activation as 55.5% of these patients had ISS < 5 and 78.9% had ISS < 10. Surgical consultations may prove more appropriate.

PRESENTATION 31

**THROMBOELASTOGRAPHY BEFORE AND AFTER BRAIN DEATH IN TRAUMA PATIENTS**

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BACKGROUND

Trauma patients with severe traumatic brain injury (TBI) typically present in a coagulopathic state requiring resuscitation and correction of coagulopathy. If they survive, patients progress to a hypercoagulable state and its associated complications including deep vein thrombosis, pulmonary embolism, myocardial infarction, and stroke. Those with the most severe TBI progress to brain death and little is known about the state of coagulation in brain dead potential organ donors. Thromboelastography (TEG) can identify both coagulopathy and hypercoagulability in trauma patients. We hypothesize that brain dead organ donors develop a hypercoagulable state after brain death.

OBJECTIVE

The specific aim of this study was to investigate TEG results and compare the state of coagulation before and after brain death in trauma patients.

METHODS

We performed a retrospective review (2015-2016) of trauma patients who had a severe TBI, progressed to brain death, and went on to organ donation within our local organ procurement organization catchment area. Patients who had a TEG on admission to the hospital and a TEG after brain death were included in the analysis. In addition to demographics, admission physiology, and injury severity, TEG variables collected before and after brain death included R time, split point, K time, alpha angle, maximum amplitude, G value, estimated percent lysis, percent adenosine diphosphate platelet inhibition (ADP inhibition), and percent arachidonic acid platelet inhibition (AA inhibition).

RESULTS

A total of 12 patients were included in the analysis. The population was on average 39 years old, 58% male, 92% Caucasian, and 92% sustained blunt trauma. On arrival to the ER patients had a mean systolic blood pressure = 127 mm Hg, GCS = 3, with an ISS=33 and Head AIS=5. Before and after brain death there was no difference in the following TEG values: R time (4.8 vs. 4.9, p=0.90), split point (4.3 vs. 4.5, p=0.71), K time (1.9 vs. 1.4, p=0.08), alpha angle (65 vs. 71, p=0.07), and AA inhibition (41% vs. 22%, p=0.15). However, after brain death patients were hypercoagulable based on maximum amplitude (61 vs. 68, p=0.03), G value (8 vs. 12, p=0.02), and ADP inhibition (84% vs. 45%, p=0.003).

CONCLUSION

Blunt trauma patients who present with severe TBI and progress to brain death display a transition from a coagulopathic to a hypercoagulable state as determined by TEG parameters. This hypercoagulable state in brain dead organ donors should be investigated further as the hypercoagulability could have adverse effects on transplanted organs.

PRESENTATION 32

**DEFICIENCY AND FRACTURE PROFILE IN GERIATRIC TRAUMA PATIENTS: HIPS DON'T LIE!**

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BACKGROUND

Geriatric patients (≥ 60 years) are exceptionally vulnerable to single or multiple episodes of fall mediated orthopedic injury. Vitamin D deficiency has been associated with poor clinical outcomes in patients with orthopedic injury.

OBJECTIVE

Here we present a study assessing the impact of Vitamin D deficiency in the clinical outcomes of the geriatric trauma patient.

METHODS

A retrospective chart review of all traumatic geriatric orthopedic injury patients from 2006 to 2016 was conducted. Patients were grouped based on initial Vitamin-D level of (A) ≤ 13 ng/mL (VD-) or (B) > 13 ng/mL (Control). General demographics, fracture characteristics and clinical outcomes were evaluated. A chi-square or Fisher's exact test was employed for statistical significance in large or small sample sizes, respectively. A $p \leq 0.05$ is considered statistically significant.

RESULTS

Out of 696 geriatric trauma patients, 28% (n = 193) were VD- (13 ± 0.7 ng/mL) vs. 72% (n = 503) were Control (26 ± 12 ng/mL). Our VD- trauma cohort consisted of 67% female, 77 ± 11 y/o and 9 ± 5 ISS. Fall (55%) was the most common cause of injury. Hypertension (24%) followed by diabetes (9%) and congestive heart failure (3%) were the dominant comorbidities. Our analysis showed statistically significant differences in fracture profiles (femoral neck displacement) and clinical outcomes (time to ambulation and hospital length of stay). VD- patients were found to have significantly more femoral neck fracture (53% VD- vs. 41% control; $p<0.001$), longer time to ambulation (3.8 ± 2 days VD- vs. 3.5 ± 2 days control; $p=0.006$) and hospital length of stay (6.4 ± 3 days VD- vs. 6 ± 5 days control; $p=0.04$).

CONCLUSION

Our analysis reveals significant differences in the fracture profile and clinical outcomes of Vitamin D deficient geriatric trauma patients. Given the vulnerability of this population to fall associated orthopedic injury, muscle weakness and mortality, the effect of Vitamin D supplementation should be evaluated to determine its effect on outcomes.

PRESENTATION 33

**TRANSARTERIAL CHEMOEMBOLIZATION OF UNRESECTABLE HEPATOCELLULAR CARCINOMA: INFLUENCE OF THE MELD SCORE ON SURVIVAL**

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BACKGROUND

Data supporting the routine use of transarterial chemoembolization (TACE) for unresectable hepatocellular carcinoma (HCC) is equivocal. Hepatic decompensation following TACE, especially in the setting of cirrhosis, has been reported in the range of 10-20%. At present, there is no clear threshold of the extent of cirrhosis that precludes TACE.

OBJECTIVE

We sought to examine our institutional TACE experience for unresectable HCC in order to determine: (1) if there is a beneficial treatment effect when compared to systemic therapy or best supportive care (BSC) and (2) if there is a cirrhosis threshold after which benefit diminishes.

METHODS

Institutional tumor registry was queried for all HCC cases treated with TACE (Doxorubicin eluting beads), chemotherapy or BSC. Patients that underwent surgery or ablation were excluded. After 2008, a multidisciplinary tumor board (medical/surgical oncology and interventional radiology) was implemented. To account for the tumor board, a binary variable was coded in the dataset. Inverse probability of treatment weighted propensity scores were created using age, stage, gender, AFP, albumin, MELD score at diagnosis and time period were included in a Cox proportional hazards model to estimate survival. A logistic regression model was created to identify variables associated with survival less than 90 days (S<90D).

RESULTS

746 HCC patients comprised this study. Treatment included: TACE-only 141 patients (19%), chemotherapy only 135 (18%), 55 patients receiving both (7%) and BSC-only 415 (56%) After the implementation of multidisciplinary tumor board in 2008, the percentage of patients receiving TACE tripled (12% to 33%, $p<0.05$). The estimated mean survival was 12.0 months (95%CI:9.83-14.2) for patients treated with chemotherapy or BSC. TACE increased mean survival an additional 9.9 months (95%CI:0.82-18.9, $p<0.05$). In those treated with TACE, variables associated with S<90D included MELD (OR 1.16, 95%CI:1.04-1.29, $p<0.01$) and stage III (OR 12.1, 95%CI:1.40-16.3, $p<0.03$). Stage I&II HCC patients receiving TACE had a greater than 50% probability of survival more than 90 days if their MELD was less than 22, whereas Stage III HCC patients receiving TACE had a similar survival benefit only if their MELD was less than 15.

CONCLUSION

Locoregional TACE significantly improved survival when compared to chemotherapy or BSC. As MELD score increases, especially above 15, the TACE survival benefit diminishes for stage III unresectable HCC.

PRESENTATION 34

# GENOME-WIDE, LOSS-OF-FUNCTION SCREEN IDENTIFIES NOVEL GENES ASSOCIATED WITH PLATINUM THERAPY RESISTANCE

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## BACKGROUND

Platinum agents form the backbone of chemotherapy regimens for advanced colon cancer, which afflicts more than 70.000 people each year. However, the efficacy of platinum therapy is limited, in part, by the presence of inherent or acquired resistance. The biologic mechanisms of resistance remain poorly understood at this time due to our inability to comprehensively interrogate the genetic mechanisms underlying resistance.

## OBJECTIVE

To perform a loss of function, unbiased, genome-wide screen to identify genes associated with platinum therapy resistance.

## METHODS

The novel Clustered Regularly Interspersed Short Palindromic Repeats (CRISPR)-Cas9 endonuclease technology was employed to inactivate ~20,000 genes in the HCT116 human colorectal cancer cell line. Each gene was targeted with 6 single-guide RNAs (sgRNAs) delivered by lentiviral transduction. Multiplicity of infection was 0.3, sgRNA coverage was 300x. After two weeks of puromycin selection to remove uninfected cells, 8 μM cisplatin was delivered to two sets of cells for 24 hours. A second set of replicates functioned as non-treatment control. Cisplatin was re-introduced in an intermittent fashion over a period of four weeks. At the conclusion of treatment, surviving cells were harvested, genomic DNA was extracted, guide sequences were amplified and submitted for next-generation sequencing by Illumina MiSeq Sequencing System. Model-based Analysis of Genome-wide CRISPR Knockout (MAGeCK) statistical methodology was performed to compare the two populations and identify significantly enriched genes in the platinum treated cells. The top three resistance genes were then validated in knock-out cell lines treated with cisplatin and compared to wild type controls.

## RESULTS

We identified three genes, amongst the 20,000 screened, that, when lost, conferred resistance to cisplatin: TCF7L2, KEAP1 and LRRC8a (Figure 1). P values were <0.001 and False Discovery Rates were 0.018 for all three genes. Monoclonal knock-outs of those genes exhibited significant resistance to cisplatin compared to wild type cells.

## CONCLUSION

We successfully utilized the novel CRISPR/cas9 technology to identify genes that were associated with platinum resistance. KEAP1, a key regulator of antioxidant metabolic pathways through its interaction with Nrf2, has been implicated in platinum therapy resistance. LRRC8a encodes a member of a volume-regulated membrane anion channel that has recently been implicated in the uptake of platinum drugs. Loss of TCF7L2, a member of the Wnt/β-catenin signaling pathway, appears to confer resistance as well. Recent data from The Cancer Genome Atlas (TCGA) has identified mutations of TCF7L2 in colon cancer, including 31% of right-side, mismatch repair-associated colorectal adenocarcinomas. Hitherto, no association between TCF7L2 and chemotherapy resistance had been reported. Further investigation into the mechanisms by which TCF7L2 convey resistance to platinum agents could have significant clinical and therapeutic implications.

PRESENTATION 35

**NEOADJUVANT CHEMOTHERAPY VERSUS CHEMORADIOTHERAPY FOR RESECTABLE PANCREATIC HEAD ADENOCARCINOMA : A PROPENSITY SCORE MATCHED ANALYSIS**

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BACKGROUND

Recent reports showed a survival benefit following neoadjuvant therapy compared to upfront resection for resectable pancreatic adenocarcinoma (PDAC). However, there is limited data as to whether neoadjuvant chemotherapy (nCT) or chemoradiotherapy (nCRT) constitute optimal neoadjuvant treatment.

OBJECTIVE

This study compares overall survival between nCT and nCRT in patients with resectable pancreatic cancer.

METHODS

Adult patients that received neoadjuvant therapy followed by  for clinical stage I or II head PDAC were identified in the National Cancer Database between 2006 and 2012. Patients that received nCT were matched by propensity score with patients that had nCRT. Overall survival as well as early postoperative outcomes were compared.

RESULTS

We identified 2,021 patients (nCT: 743, nCRT: 1,278 patients) that received neoadjuvant treatment followed by resection for early-stage PDAC. From the nCT group, 689 patients (93%) were matched with 689 patients that had nCRT. Overall survival was similar between the nCT and nCRT groups (median survival, 28 vs 27 months; P=0.26; hazard ratio, 1.08; 95% CI, 0.94 to 1.24; Figure 1). In the nCRT group, patients had smaller tumors (pT3 and pT4: 77% vs 63%; P<0.01), less lymph node involvement (61% vs 36%; P<0.01), and less positive resection margins (20% vs 14%;P<0.01). Following resection, patients in the nCRT group received less adjuvant chemotherapy (41% vs 27%; P<0.01), though they had higher 90-day postoperative mortality (4% vs 7%,P<0.01).

CONCLUSION

nCRT for resectable PDAC is associated with decreased tumor size, nodal involvement, and positive margins without significant difference in overall survival when compared to nCT.

PRESENTATION 36

**INHIBITION OF APELIN RECEPTOR SIGNALING DECREASES CHOLANGIOCARCINOMA GROWTH AND ANGIOGENESIS IN A XENOGRAFT MODEL**

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BACKGROUND

Cholangiocarcinoma (CCA) is a malignancy of the intrahepatic and extrahepatic biliary epithelium that is associated with low five-year survival despite multidisciplinary treatment strategies, including surgical resection. Tumor angiogenesis correlates with CCA progression, metastases, and patient survival. The apelin receptor (APLNR), which is activated by the apelin peptide, is a G-protein coupled receptor that has been implicated in the growth and angiogenesis of other malignancies, such as colon, breast, prostate and hepatocellular carcinoma, but has not been studied in CCA.

OBJECTIVE

The purpose of this study is to quantify APLNR expression in CCA, characterize the proliferative and angiogenic effects of receptor activation, and determine if inhibition of the APLNR axis can inhibit tumor growth in a murine xenograft model.

METHODS

In vitro, CCA cell lines (CCLP, HuH-28, HuCCT-1, SG231, TFK-1 and Mz-ChA-1) and benign cholangiocytes (H69) were used to measure the expression of apelin and the APLNR via flow cytometry, ELISA and immunofluorescence. Immunohistochemistry (IHC) and qPCR was used to measure APLNR expression in human CCA tissues. Mz-ChA-1 cells were treated with increasing concentrations of apelin and ML221, an APLNR antagonist. Expression of proliferative (Ki-67 and PCNA) and angiogenic (VEGF-A, VEGF-C, ANG1, ANG2) genes were measured via qPCR. Cell proliferation and migration were also measured using would healing and invasion assays in the presence of ML221. Phosphorylation of the ERK1/2 pathway, a known pathway for cholangiocyte proliferation, was measured using flow cytometry and immunoblots. In vivo, Mz-ChA-1 cells were injected into the flanks of NU/NU immunocompromised mice, which were treated with ML221 (150 ug/kg) via tail vein injection for 4 weeks.

RESULTS

APLNR expression and apelin secretion was upregulated in human CCA cells and tissues compared to benign controls. In vitro, treatment of Mz-ChA-1 cells with apelin increased proliferation and angiogenesis via activation of the ERK1/2 pathway in a dose-dependent response, whereas, ML221 inhibited these affects. ML221 treatment also inhibited Mz-ChA-1 migration and invasion. Treatment of Mz-ChA-1 cells with apelin also increased expression of the apelin gene, suggesting an autocrine/paracrine mechanism of receptor activation. Treatment of CCA tumors in NU/NU mice with ML221 significantly decreased tumor growth (Figure 1), angiogenesis, and markers of tumor progression in the xenograft model.

CONCLUSION

APLNR is increased in CCA tissues and the autocrine/paracrine effects of APLNR receptor signaling regulate tumor growth and angiogenesis, both in vitro and in vivo. Inhibition of the APLNR axis with ML221 decreases tumor growth in our xenograft CCA model. In combination with surgical resection, targeting APLNR signaling has the potential to serve as a novel, tumor directed therapy for CCA by inhibiting cell proliferation and angiogenesis.

PRESENTATION 37

**CLINICAL OUTCOMES OF PANCREATICODUODENECTOMY IN OCTOGENARIANS: A SURGEON'S EXPERIENCE FROM 2007 TO 2015**

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BACKGROUND

As the number of elderly people in our population increases, there will be a greater number of octogenarians who will need pancreaticoduodenectomy as the only curative option for periampullary malignancies.

OBJECTIVE

To evaluate clinical outcomes of pancreaticoduodenectomy in octogenarians, in comparison to younger patients.

METHODS

A retrospective review was conducted of 216 consecutive patients who underwent pancreaticoduodenectomy from January 2007 to April 2015. A two-sided Fisher's exact statistical analysis was used to compare pre-operative comorbidities, intra-operative factors, surgical pathology, and post-operative complication rates between non-octogenarians and octogenarians.

RESULTS

183 non-octogenarians and 33 octogenarians underwent pancreaticoduodenectomy. Of patients with periampullary adenocarcinoma, octogenarians were more likely to present with advanced disease state ($p=0.01$). The two cohorts had similar ASA scores ($p=0.62$); however, octogenarians were more likely to have coronary artery disease ($p=0.03$). The length of operation was shorter in octogenarians ($p=0.002$). Mortality rates ($p=0.49$) and overall postoperative complication rates ($p=1.0$) were similar in two cohorts; however octogenarians had a higher incidence of pulmonary embolism ($p=0.02$).

CONCLUSION

Our data demonstrates that octogenarians can undergo pancreaticoduodenectomy with outcomes similar to those in younger patients. Thus, patients should not be denied a curative surgical option for periampullary malignancy based on advanced age alone.

PRESENTATION 38

**PANCREATIC DUCT ARID1A LOSS RESULTS IN INTRADUCTAL PAPILLARY MUCINOUS NEOPLASM FORMATION**

I Nassour MD, SC Wang MD, X Sun PhD, JC Chuang PhD, LH Nguyen, S Zhang, H Zhu MD

BACKGROUND

Background: ARID1A, a member of the SWI/SNF chromatin-remodeling complex, is mutated in up to ~30% of pancreatic ductal adenocarcinoma (PDAC). ARID1A is suspected to be a tumor suppressor gene but its functional role in carcinogenesis has not been elucidated. Here, we studied the effect of Arid1a loss in pancreatic tumorigenesis.

OBJECTIVE

Objective: To determine the effect of Arid1a in pancreatic carcinogenesis.

METHODS

Methods: Ptf1a-Cre; Arid1af/f (CA) and KrasG12D; Ptf1a-Cre; Arid1a f/f (KCA) mice had Arid1a deleted during development in acinar, duct, and islet cells. KrasG12D leads to the expression of a constitutively activated Kras allele and is the basis for a well-established mouse model of pancreas cancer. We used KrasG12D; Sox9-CreER; Arid1a f/f (SERCA), and KrasG12D; Ptf1a-CreER; Arid1a f/f (PERCA) to delete Arid1a in adult mice specifically in duct and acinar cells, respectively, with the use of tamoxifen, which was given at 4 weeks of age.

RESULTS

Results: Analysis of DNA from toes and pancreata of CA mice showed Arid1a loss only in the latter confirming pancreas-specific recombination. Western blot confirmed decreased protein expression and immunohistochemistry (IHC) demonstrated Arid1a loss in most of the acini and half of the ducts. ~35% of CA mice developed benign appearing cysts by 4 months of age. In contrast, all KCA mice had macroscopic cysts by three weeks of age. Cyst fluid was thick and amylase rich. These cysts resembled intraductal papillary mucinous neoplasm as they had papillary features and stained for Alcian blue, confirming the presence of mucin. Muc protein staining pattern was consistent with pancreaticobiliary type IPMN. The stroma was negative for estrogen and progesterone receptors. SERCA mice developed large mucin producing ductal lesions by 12 weeks while only pancreatic intraepithelial neoplasias were seen in PERCA mice.

CONCLUSION

Conclusions: Arid1a loss in duct cells leads to pancreaticobiliary IPMN. Future directions include aging studies to determine if these cysts transform to frank PDAC, determining the status of ARID1A in human IPMN, and investigations to elucidate the mechanism for cyst formation. Finally, this model may be useful as a platform to test therapeutic interventions to treat IPMN.

PRESENTATION 39

**CHARACTERISTICS AND OUTCOMES OF ANAL CANCER IN HIV INFECTED AND UNINFECTED INDIVIDUALS ATTENDING A SAFETY NET HEALTH SYSTEM: REVIEW OF 5 YEARS OF DATA**

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BACKGROUND

The incidence of anal cancer has been increasing by 2.2% annually over the last decade compared to prior decades. This rise has been attributed to the increasing number of HIV and organ transplant recipients since it is suspected that immunosuppression augments the development of anal squamous cell dysplasia. The estimated incidence in HIV positive men who have sex with men (MSM) is 78 per 100,000 compared to 1.8 per 100,000 in the general population. Recently there has been more emphasis on screening methods and earlier detection of anal cancers since early detection dramatically improves survival. However, there is limited data on the outcomes of HIV positive patients compared to HIV negative patients.

OBJECTIVE

The aim of this study is to determine if there is a difference between HIV patients and non-HIV patients with anal cancer in terms of demographics, treatment, and outcomes.

METHODS

A retrospective chart review was performed for all patients with anal cancer at Parkland Health & Hospital System (Dallas,TX) from 2008-2013. Chi-squared test, t-test, and binomial test were used to calculate statistics.

RESULTS

101 patients were identified with anal cancer from 2008-2013. 47 patients had HIV and 54 patients were HIV negative. The average CD4 count was 289 in HIV positive patients. The majority of HIV positive patient were men (95.7%) versus the HIV negative population which was 44.4% male ($p < 0.0001$) similar to the gender prevalence of anal cancer in the general population which is seen more often seen in women than men. HIV positive patients were also younger (47 years old vs. 53 years old, $p < 0.0006$). The HIV positive patients were also more likely to have other sexually transmitted diseases (31.9% vs. 1.9%, $p < 0.0001$), condylomas (72.3% vs. 32.1%, $p < 0.0001$), and other types of cancers (36.2% vs. 13.0%, $p < 0.006$). The TNM stage was similar at presentation and the subsequent treatment was also similar. Mortality was higher in the HIV positive cohort (27.7% vs. 18.9%) but persistent or recurrent disease rates were similar.

CONCLUSION

The incidence of anal cancer is rising, especially in the HIV positive MSM population. Our study revealed that these patients present at any earlier age and are more likely to have other cancers but are similar with respect to stage at presentation, treatment, and outcome compared to HIV negative patients in the same time period.

PRESENTATION 40

**IS TRANSDUODENAL RESECTION FOR DUODENAL ADENOMAS ADEQUATE?**

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BACKGROUND

Duodenal adenomas (DAs) are uncommon occurrences with malignant potential. The optimal surgical management of DAs remain controversial.

OBJECTIVE

To determine if transduodenal resection of duodenal adenomas have acceptable recurrence rates.

METHODS

We performed a retrospective review of 27 patients at a single institution who received either a Whipple procedure (40.7%) or a transduodenal resection (TDR) (59.3%) for ampullary and nonampullary duodenal adenomas. Perioperative and postoperative outcomes were compared between the two groups.

RESULTS

Both groups had similar demographics. Median operative time and median estimated blood loss (EBL) were longer in the Whipples group than the TDR group. Mean length of stay was longer in the Whipple group vs TDR group (12 vs 7 days). 3 patients (18.7%) who received TDRs developed recurrent adenomas. Two of these patients subsequently received a Whipple procedure. This is summarized in Table 1.

CONCLUSION

Although TDR has the perioperative advantages of less operative time, less EBL and less hospital length of stay, our experience demonstrates that TDR may be inferior to the Whipple procedure for duodenal adenomas due to high recurrence rates.

PRESENTATION 41

**METABOLIC SYNDROME REMISSION AFTER ROUX-EN-Y GASTRIC BYPASS OR SLEEVE GASTRECTOMY - WHICH OPERATION IS WORTH THE RISK?**

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BACKGROUND

Bariatric surgery is known to decrease weight and the prevalence of comorbidities, but there is little evidence on the differential effect of RYGB and SG on remission of the aggregate outcome, metabolic syndrome. Metabolic syndrome is a sensitive outcome measure for assessing magnitude of cardiovascular risk.

OBJECTIVE

(1) To determine the effectiveness of Roux-en-Y gastric bypass (RYGB) and sleeve gastrectomy (SG) on metabolic syndrome in veterans at 4-years after surgery. (2) To determine complication rates over the study period thus generating a context of benefit versus risk for each operation.

METHODS

A retrospective study of consecutive patients who underwent SG and RYGB at the Dallas VA from 2003 to 2012. Descriptive statistics were used to compare baseline characteristics. We determined the effect of both operations on the remission of metabolic syndrome, its individual components (obesity, hyperglycemia, hypertriglyceridemia, low high-density lipoprotein, hypertension), and medium-term morbidity and mortality. Mixed-effects repeated measures linear modeling was used to compare change in weight between groups over the study period. A secondary sensitivity analysis for all outcomes was performed using propensity score matching of baseline characteristics. Logistic regression was used to assess pre-surgery predictors of metabolic syndrome remission. Two-sided p-values less than or equal to 0.05 were considered statistically significant.

RESULTS

266 bariatric surgery patients were identified (159 RYGB and 107 SG) with 96% follow-up at 4 years after operation. The mean age of the cohort was 51.4 years; the majority of patients were male (59%) and Caucasian (69%). RYGB patients at baseline had greater mean BMI (RYGB 45.5 kg/m2, SG 40.7 kg/m2; $p<0.01$) and were more likely to have hypertension (RYGB 96.5%, SG 87.6%; $p=0.02$) or hypertriglyceridemia (RYGB 59.7%, SG 37.9%; $p<0.01$). RYGB was associated with a similar metabolic syndrome remission to SG (37.6% vs. 26.8%; $p=0.09$).
These remission rates remained similar after propensity score matching analysis. The percent weight loss was 25.8% after RYGB and 9.6% after SG at 4-years post operation ($p<0.01$). Predictors of metabolic syndrome persistence were male gender, type 2 diabetes and low high-density lipoprotein. While both operations were associated with similar mortality (RYGB 4.4%, SG 2.8%; $p=0.74$), RYGB was associated with a significantly greater incidence of reoperation ($p<0.001$), ulcer ($p=0.003$), cholecystectomy ($p=0.004$), and vitamin B12 deficiency ($p<0.001$).

CONCLUSION

Despite greater weight loss with RYGB, RYGB and SG have similar effectiveness on remission rates of metabolic syndrome at 4 years after operation. RYGB patients experienced a significantly greater number of complications than those who underwent SG.

PRESENTATION 42

**PRIMARY AND RESCUE ENDOLUMINAL VACUUM (E-Vac) THERAPY IN THE MANAGEMENT OF ESOPHAGEAL PERFORATIONS AND LEAKS**

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BACKGROUND

Esophageal injury due to perforation or anastomotic dehiscence are devastating events associated with high morbidity and mortality, yet optimal management remains controversial. Endoluminal wound vac (E-Vac) therapy has been shown to be a useful modality in the treatment of foregut leaks.

OBJECTIVE

To demonstrate the efficacy of E-Vac therapy in the management of esophageal defects.

METHODS

An IRB approved registry for E-Vac patients was queried from July 2013 to September 2016. Out of 53 patients, 13 patients had transmural, esophageal defects. E-Vac is a negative pressure internal wound vacuum device with an endosponge placed endoscopically into, or adjacent to, a hollow viscus leak site. Rescue therapy is defined as E-Vac therapy initiated following operative repair failure.

RESULTS

Thirteen patients were treated for esophageal perforations or leaks. Etiologies included iatrogenic injury (8), anastomotic leak (2), Boerhaave syndrome (1), and bronchoenteric fistula (2). Ten patients (77%) underwent primary treatment with E-Vac and 3 (23%) were treated with rescue therapy. Mean Pittsburg Perforation Scores in the primary and rescue treatment groups were 7 and 10, respectively. Average defect size was 2.4 (range 0.5-6) cm. Mean time to E-Vac placement following operative management was 22 (range 20-25) days. The rescue group had a shorter mean time to defect closure (25 vs 33 days). Twelve of 13 defects healed. One death in our cohort occurred following the implementation of comfort care. One E-Vac related complication occurred. Hospital length of stay was longer in the rescue group (72 vs 53 days), however ICU duration was similar between groups (23 vs 22 days). Ten patients (83%) resumed an oral diet within one month of discharge.

CONCLUSION

Utilized as either a primary or rescue therapy, E-Vac therapy appears to be a beneficial treatment modality in the management of esophageal perforations or leaks.

PRESENTATION 43

**ADDITIONAL FACTORS FOUND AT OPEN CHOLECYSTECTOMY AND ON PATHOLOGIC EXAMINATION CONTRIBUTE TO THE NEED FOR CONVERTING TO OPEN CHOLECYSTECTOMY**

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BACKGROUND

Although the laparoscopic (LC) approach has been, for 25 years, the gold standard for patients undergoing an elective/urgent-cholecystectomy, some patients still require an open cholecystectomy (OC). Multiple reports have detailed the major contributing factors: inflammation, adhesions, unclear anatomy, organ injury, and bleeding which prompted the surgeon to convert to an OC.

OBJECTIVE

This 10-year study evaluates all intraoperative findings found both at LC and OC along with pathology findings that were contributing factors for conversion to OC in a large series of cholecystectomy patients.

METHODS

Data were prospectively collected and retrospectively reviewed and analyzed.

RESULTS

From 1/1/04 to 12/31/13, 7738 patients underwent cholecystectomy: initial OC (140), LC (7427), and 171 patients had LC→ OC for a conversion rate of 2.2%. These 171 patients (M/F, 73/98) with a $\bar{x}$ age of 51.2 yrs (range 14-83) underwent 27 elective LC's (15.8%) and 144 urgent LC's (84.2%). 144 urgent ER patients had pre-hospital symptoms for $\bar{x}$ 5.9 days and time from ER to operation ($\bar{x}$ 5.1 days) was: within 24 hrs (44.6%), 2-7 days (48.9%, $\bar{x}$ 3.3 days) and > 7 days (6.5%). Majority of in-hospital delays occurred in patients with major comorbidities, biliary pancreatitis or who had preoperative MRCP and/or ERCP. In addition to the 5 major LC → OC factors, several patients had gangrenous cholecystits with perforation. Factors at OC included: additional patients with gangrenous cholecystitis, and perforation, plus Mirrizi syndrome, hydrops, choledocholithiasis, cholecystoduodenal fistula and cancer (Table). Pathologic exam confirmed gangrenous cholecystitis, adenocarcinoma, and porcelain gallbladder and added the additional diagnosis of xanthogranulomatous cholecystitis (Table). These 171 LC → OC patients had multiple contributing factors leading to conversion to OC: one (38.6%), two (40.4%), three (15.2%), and four (5.8%) factors.

CONCLUSION

The results of this study demonstrate that despite a high volume, one institution, cholecystectomy practice, some patients undergoing either an elective or urgent LC will still need to be converted to an OC. Others studies have clearly documented the five main reasons during LC for converting LC to OC. This study demonstrates the critical role that additional factors found during open cholecystectomy (ie cholecystoenteric and cholecystocholedochal fistulas, adenocarcinoma, etc) and at pathologic examination (ie xanthogranulomatous cholecystitis, etc.) contribute clinically to the risk for LC → OC conversion. Pre-hospital and in-hospital delays may have contributed to the progression from acute to severe acute or gangrenous cholecystitis obscuring biliary anatomy at the time of an attempted LC. With this delay, 17 patients had progressed to gallbladder perforation requiring conversion to OC. Further reduction in the already low LC → OC conversion rate of 2.2% appears to depend upon earlier surgical intervention after the onset of acute biliary symptoms.

PRESENTATION 44

**Impact of BMI on operative times and anesthesia times in routine non-bariatric surgeries and its financial implications**

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BACKGROUND

Obesity has been the main focus of many public health efforts in the United States. It is a global epidemic with approximately 33% of adults being obese. Obesity both directly and indirectly leads to increases in health care expenditures and resources. Increased consumption of surgical services by obese patients compared to their non-obese counterparts for routine general surgery procedures has been analyzed.

OBJECTIVE

Our aim was to investigate the relationship between Body Mass Index (BMI) and the time required to complete standard tasks in the operating room during elective cholecystectomy and to identify the financial impact.

METHODS

Our study investigated operative time differences in different BMI groups. Comparisons of continuous variables according to dichotomized BMI were done using a two group t-test or Wilcoxon rank-sum test, while one way analysis of variance or Kruskal Wallis test was used to compare continuous variables according to multi categorical BMI. Linear regression models were developed for all three outcome variables (operating room, anesthesia and surgery times) using multi-category BMI as the main exposure adjusted for age, gender, ethnicity, number of comorbidities, airway type and smoking history.

RESULTS

We included 2068 patients in our study, 1037 patients with BMI<30 and 1025 patients with BMI≥30. The data was further classified according to the WHO obesity classification. The average operating room, anesthesia and surgery times (in minutes) for BMI<25 were 114.4, 124.6, 81.3 respectively and for BMI≥40 were 134.3, 140.5, 96.2. The times of all three outcome variables were significantly different between the two groups with P-values < 0.001. BMI, age, gender and ethnicity continued to be significant in all the final models. When age, gender and ethnicity were adjusted for in our final model, the coefficients for BMI≥40 category compared to BMI<25 category for operating room, anesthesia and surgery times were 22.0 (P-value<0.001), 18.2 (P-value<0.001) and 16.7 (P-value<0.001) respectively (Table 1).

CONCLUSION

As shown by our data there is significant increase in operative room, anesthesia and surgery times in patients with higher BMI which in turn leads to greater perioperative resource usage and increased hospital cost. We propose a change in CPT coding to compensate for the increased utilization of resources.

PRESENTATION 45

**ACS-NSQIP RISK CALCULATOR ACCURATELY PREDICTS COMPLICATIONS IN VENTRAL HERNIA REPAIRS DESPITE THE LACK OF HERNIA SPECIFIC RISK FACTOR INPUT**

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BACKGROUND

Risk stratification is critical when counseling ventral hernia patients. While the ACS-NSQIP surgical risk calculator predicts risk across a range of complications, it does not account for hernia specific factors such as hernia size, infected mesh, or number of prior repairs.

OBJECTIVE

Our study evaluates the accuracy of ACS-NSQIP calculator in ventral hernia patients with attention to hernia size and previous abdominal surgery.

METHODS

An IRB-approved, single institution, retrospective review of ventral hernia repairs (VHRs) from January 2014 through February 2016 was performed. Inclusion criteria were elective open or laparoscopic VHRs: initial or recurrent, reducible or incarcerated, umbilical, epigastric, spigelian and incisional. NSQIP database was queried for demographics and 30 day outcomes (Table 1). Chart review provided surgical history and hernia fascial defect surface area (SA). A risk profile was calculated for each patient using the ACS-NSQIP surgical risk calculator. Brier scores, which measure the accuracy of probabilistic models based on observed versus predicted outcomes, were calculated for each complication. Brier score closer to 0 reflects a more accurate model. Planned sub-group analysis for surgical site infections (SSI) and readmission compared predicted risk by hernia SA subgroups, previous open or laparoscopic surgeries and prior hernia repair. Wilcoxon-Rank-Sum test compared the distribution of predicted risk with significance at $p<0.05$.

RESULTS

388 patients were included. Median age was 54, and the cohort had the following comorbidities: 187 (55.3%) BMI > 29.9, 40 (11.8%) diabetes, 145 (42.9%) hypertension and 73 (21.6%) current or recent tobacco use. 136 (40.2%) of patients had undergone previous open abdominal surgery, 117 (34.6%) previous laparoscopic surgery and 55 (16.3%) at least one previous abdominal hernia repair. 205 (60.7%) patients had a hernia with fascial defect SA < 2 cm2, 68 (20.1%) 2-5 cm2 and 65 (19.2%) >5 cm2. 185 (54.7%) cases were laparoscopic. Observed complications were lower than predicted in all complications (see Table 1) except readmission rates (3.55 vs 3.0%, Brier score 0.033) and cardiac complications (0.3 vs 0.1%, Brier score 0.003). This low complication rate prevented direct comparison of outcomes and hernia specific factors. Despite the lack of hernia specific criteria in the ACS-NSQIP calculator, subgroup analysis of predicted risk by SA and surgical history demonstrated increased complication risk with previous abdominal surgery, hernia repair, and larger hernia surface area (all P

CONCLUSION

ACS-NSQIP surgical risk calculator accurately predicts complications within our VHR population. When stratified by hernia specific variables not reflected in the NSQIP calculator, predicted risk increases with increased surface area and prior abdominal surgeries. These findings suggest current hernia repair CPT codes may better capture risk of disease than appreciated.

PRESENTATION 46

**THE SPORTS HERNIA: A 16-YEAR EXPERIENCE**

JT Preskitt MD

BACKGROUND

Groin injuries in high-performance athletes are common, occurring in 5% to 28% of athletes. A sports hernia is a painful musculotendinous injury to the medial inguinal floor caused by and exacerbated by vigorous sport or physical exertion. It is not a true hernia because there is no "herniation" or protrusion of a visceral sac . However, its repair is very similar to that of an inguinal hernia, and the term has become ingrained. Because the term "athletic pubalgia syndrome" is nearly identical in meaning, the terms are used interchangeably here. However, a surgical procedure intended to correct the abdominal wall injury is called a sports hernia repair.

OBJECTIVE

This is a single surgeon experience in the surgical treatment of a very specific injury, athletic pubalgia syndrome, so-called sports hernia. Over this time period, the author has performed surgery on 216 patients. The intent of surgical repair is to return to sport.

METHODS

All patients had collaborative evaluations by the author, as well as with either sports medicine physicians, orthopedists, athletic team trainers, or physical therapists with agreement on the diagnosis and treatment. The author relies heavily on the so-called rocker test for sports hernia, and a diagnostic trigger point injection.

All patients had open surgical repair. 150 patients had Lichtenstein type repairs with polypropylene mesh reinforcement of the inguinal floor accompanied by repair of external oblique injury and ilioinguinal neurectomy. In the first 50 cases ilioinguinal neurectomy was not routinely performed. The remaining 16 patients had only external oblique repair and neurectomy because of refusal of mesh repair (Shouldice instead), one case, or had prior mesh inguinal hernia repair, open or laparoscopic, 15 cases. All athletes were followed for 8 weeks and until return to sport.

RESULTS

Of the 216 repairs, 190 were documented as successful, in that the patients return to sport at a competitive level by 6 months (88%). Those who did not return to sport at a competitive level had sport limiting symptoms caused by failure to perform neurectomy, persistent adductor muscle symptoms, and re-injury at a different site.

CONCLUSION

In patients with athletic pubalgia syndrome or so-called sports hernias, there is disequilibrium between the upward and oblique pull of the abdominal muscles on the pubis against the downward and lateral pull of the adductors on the inferior pubis. This imbalance of forces can lead to injuries of the lower central abdominal muscles and the upper aponeurotic common insertion of the adductor muscles. These are true injuries that in most cases heal with conservative therapy. In properly selected patients and with close collaboration with other "team" members, a surgical repair has returned nearly 90% of patients to sport at a competitive level. Cautionary tales and lessons learned will be discussed.

PRESENTATION 47

**PREDICTORS OF A HISTOPATHOLOGIC DIAGNOSIS OF COMPLICATED APPENDICITIS**

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BACKGROUND

Complicated appendicitis (CA) is defined by the presence of perforation or abscess during appendectomy. This definition guides clinical assessment and has a profound impact on postoperative antibiotic use and hospital length of stay. Despite its utilization, the intraoperative (IO) assessment of CA is fraught with subjectivity. Although histopathologic (HP) diagnosis should be the gold standard in identifying patients with CA, it is not immediately available after an operation to guide postoperative management.

OBJECTIVE

Given the subjectivity in the IO assessment and delay in obtaining an HP diagnosis, the objective of this study was to identify predictors of an HP diagnosis of CA.

METHODS

A retrospective review was performed of all patients who underwent appendectomy at our institution from 2011 to 2013. Patients were divided into cohorts consisting of those with CA or uncomplicated appendicitis (UA) based on an HP diagnosis. CA was defined by finding evidence of macroscopic or microscopic perforation or abscess on pathology report. Clinical, IO, and postoperative data were compared using chi-square and Wilcoxon rank-sum tests. We evaluated predictors of an HP diagnosis of CA using a multivariable logistic regression model.

RESULTS

A total of 239 out of 1066 patients had CA based on IO assessment, while only 143 out of 239 patients (60%) had both an HP and IO diagnosis of CA. On univariate analysis, older patients, patients with type 2 diabetes mellitus, those with a longer duration of pain prior to presentation, the presence of an appendicolith, abscess and appendix size on preoperative computed tomography (CT) imaging, as well as higher median preoperative temperature and serum creatinine were found to have significant differences between complicated and uncomplicated cohorts diagnosed by HP ($p < .05$). Patients with an HP diagnosis of CA also had less focal right lower quadrant pain and an increased time from presentation to the operating room than those with UA ($p < .05$). Multivariate analysis revealed that an IO diagnosis of CA was found to be associated with an HP diagnosis of CA (OR 12.32; 95% CI, 8.2 - 18.5). Other risk factors were age (per 10 years; OR 1.25; 95% CI, 1.07 - 1.46), number of days of pain (OR 1.21; 95% CI, 1.07 - 1.37), appendix size (per millimeter; OR 1.10; 95% CI, 1.07 - 1.37), and the presence of an appendicolith (OR 1.65; 95% CI, 1.06 - 2.56) on preoperative CT imaging.

CONCLUSION

Age, duration of pain, appendix size and the presence of an appendicolith on preoperative imaging are moderately associated with having an HP diagnosis of CA. The IO assessment is also associated with an HP diagnosis of CA; however 40% of patients were classified incorrectly at the time of surgery. These predictors in combination with improved intraoperative grading could be used to achieve a more timely and accurate diagnosis of CA.

PRESENTATION 48

**EVALUATION OF THE STRYKER 1588 VASCULAR IMAGING TECHNIQUES IN REAL TIME, PARTICULARLY EVALUATING BOWEL ANASTAMOSES.**

Ali Mahmood, Charisma Gajula

BACKGROUND

Bowel ischemia is a major contributor to anastamotic leaks, particularly in colon resection and anastomoses. There have been several novel techniques evaluated to assess bowel perfusion, particularly at the point of bowel anastomoses. We evaluated the Stryker 1588 scope system to see its efficacy with bowel anastomoses. We were the first surgeons to use this technology in the southern United States region (Texas, Louisiana, Oklahoma, New Mexico; index case on February 4, 2015, confirmed with Stryker).

OBJECTIVE

The objective of the study was to evaluate the 1588 Stryker scope in its real time visualization of vascular perfusion.

METHODS

From February 4, 2015 to present, all bowel resection cases studied using the 1588 scope. Patients with an IV allergy were excluded from the study as they could not receive the ICG dye for perfusion studies. Following the construction of the anastomosis, 2 cc of ICG dye was administered by the anesthesiology team. The bowel anastomosis was then studied using the 1588 scope. The patients were followed in the hospital to ensure that they did not have an anastamotic leak.

RESULTS

There were 68 cases that were in our inclusion criteria. There were 40 female patients and 28 male patients. Of the 40 female patients, 22 were undergoing an operation for a mass, while the other 18 had complicated diverticular disease. Of the 28 male patients, 15 patients were undergoing surgery for a mass, while 13 patients underwent surgery for diverticular disease. There were 0 cases that resulted in an anastamotic leak. There were not any abscesses that warranted drainage. The 1588 scope ICG dye study revealed that each anastomosis was adequately perfused.

CONCLUSION

While the hallmark to creating a viable anastamois is dependent upon surgeon judgment, there are some objective factors that contribute to ensuring a successful operation. The vascular supply that perfuses the anastomosis is important to be patent and abundant. This facilitates healing. The use of the 1588 ICG dye enables the surgeon to ascertain real time objective information that will influence the decision to address the anastomosis. It also provides a level of confidence that the bowel will heal well.

PRESENTATION 49

**OUTCOMES AFTER CARDIAC TRANSPLANTATION USING DONOR HEARTS WITH LOW EJECTION FRACTIONS**

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BACKGROUND

Cardiac transplantation remains the gold standard therapy for advanced heart failure, but the availability of donor hearts is limited. Extension of donor criteria to include organs with low (<50%) ejection fraction (EF) has the potential for augmenting the number of patients receiving a transplant. It remains unclear whether low-EF hearts are routinely viable options for transplantation. Although there may be dysfunction seen in the donors on initial evaluation, this frequently reflects a transient state resulting from brain death, and the dysfunction resolves over time or after transplantation. Demonstrating outcomes using the recently published International Society for Heart & Lung Transplantation (ISHLT) criteria for the diagnosis and classification of primary graft dysfunction (PGD) may enable centers to be less restrained in accepting low-EF hearts. This consensus definition allows for a more direct comparison of post-transplant graft function than was previously possible.

OBJECTIVE

Donor heart availability could potentially be bolstered by more frequent use of low ejection fraction (EF) donor hearts. We evaluated outcomes in recipients of low-EF donor hearts at a high volume transplant center.

METHODS

Donor and recipient medical records for consecutive adult cardiac transplants performed between November 2012 and March 2016 were reviewed. Using the recent International Society for Heart & Lung Transplantation (ISHLT) consensus definition of primary graft dysfunction (PGD), the rate of PGD was compared between recipients of low-EF (50% (control group). Using univariate and multivariate analyses, risk factors for assessed for PGD and survival.

RESULTS

A total of 231 patients underwent isolated heart transplantation with 27 (12%) between the two groups meeting ISHLT criteria for moderate/severe PGD. There was no difference in rate of PGD between the low-EF and comparison groups (P=1.0), no difference in 30 day mortality (P=0.56), or 1 year mortality (Kaplan-Meier; logrank P=0.26). Low EF donor recipients were more likely to have prolonged ICU stays (13 vs 7 days), have post-operative infections, and suffer from renal failure.

CONCLUSION

Low-EF donor hearts may form a safe means to increase donor usage without significant effects on PGD or mortality.

PRESENTATION 50

**INFLUENCE OF DIABETIC TREATMENT ON SUBSTRATE SELECTION IN A EX-VIVO CORONARY ARTERY BYPASS MODEL**

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BACKGROUND

Coronary artery bypass grafting remains the standard of care for treatment of multivessel coronary artery disease, particularly in diabetic patients. The influence of diabetic therapies on myocardial substrate selection under these conditions are unknown but may be important to ensure optimal outcomes after cardiac surgery.

OBJECTIVE

We hypothesized that metformin and insulin alter myocardial substrate selection during cardiac surgery and may effect reperfusion cardiac function.

METHODS

Groups of rat hearts (n=4 per group) were perfused under 3 conditions: Normokalemia, Cardioplegia or Bypass. Normokalemia groups were perfused with Krebs-Heinseleit buffer in the presence of no additives (Control), 500mM metformin (Metformin), 10 units/L insulin (Insulin), or both insulin and metformin (Metformin + Insulin). Cardioplegia animals were perfused with the same additives for 30 minutes with potassium modified buffer (20mM) to simulate cardioplegic arrest. Bypass groups containing the same additives were treated with three 22-minute ischemic intervals followed by a 3-minute interval of perfusion with cardioplegia buffer and 30 minutes of normokalemic reperfusion to simulate conditions encountered during coronary artery bypass grafting. Perfusion buffer with physiological concentrations of fatty acids (.35mM), ketones (.17mM), lactate (1.2mM), pyruvate (.12mM), and glucose (5.5mM) with different Carbon-13 (13C) labelling patterns was used for all conditions. 13C NMR spectra were obtained. Fractional substrate oxidation was determined by glutamate isotopomer analysis . Myocardial efficiency (rate*pressure/oxygen consumption) was measured in Bypass groups. Groups were compared by one-way analysis of variance or t-tests.

RESULTS

During cardioplegia, fatty acid oxidation was decreased for all additives. Ketone oxidation in this condition was increased with all additives except for metformin. Fatty acid oxidation was increased in all groups with a corresponding decrease in endogenous substrate oxidation when additive was included in the perfusion buffer. See Figure. Myocardial efficiency was not different for each additive compared to the stabilization period.

CONCLUSION

Conditions encountered during cardiac surgery result in alterations in myocardial substrate oxidation profiles resulting in a reduction in fatty acid oxidation during potassium cardioplegia but increased fatty acid oxidation after reperfusion. These alterations in substrate oxidation did not affect myocardial efficiency in otherwise normal hearts.

PRESENTATION 51

**FEEDING JEJUNOSTOMY TUBE SITE METASTASES: A POTENTIAL PROBLEM WITH AGGRESSIVE ESOPHAGEAL CANCER NUTRITIONAL SUPPORT DURING INDUCTION THERAPY**

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BACKGROUND

Access site metastasis is well-recognized in head and neck cancer; however, there is only one previously reported feeding access site metastasis in esophageal cancer which was diagnosed following definitive resection and jejunostomy (J-tube) placement. We identified J-tube site metastases following induction therapy in three patients.

OBJECTIVE

Our objectives were to identify characteristics of patients with J-tube site metastasis to better understand the biology of the disease and to identify which patients received nutritional support via feeding tube during induction therapy.

METHODS

We performed an institutional retrospective chart review from 2006 to 2014 of esophageal cancer patients that underwent an esophagectomy or exploratory laparotomy. Planned esophagogastrectomies with roux-en-y reconstruction were excluded to exclude primary gastric tumors. Variables of interest included patient demographics, clinical presentation, and utilization of supplemental enteral nutrition. Wilcoxon-Mann-Whitney and chi square tests were used with significance at $p<0.05$.

RESULTS

45 patients met inclusion criteria. 16 (34%) had pre-therapy feeding tubes placed with varied access: feeding jejunostomy (50%), open jejunostomy (31%), gastrostomy tube (13%), and NJ tube (6%). Basic demographics and comorbidities were not different between patients receiving pre-induction feeding access and those who did not (Table 1). Of patients receiving pre-therapy feeding tubes, 25% presented with mild dysphagia, 50% with dysphagia to solids, and 25% with severe dysphagia unable to tolerate liquids or saliva. This differed from patients not receiving pre-induction feeding access ($p=0.0003$). Subjective weight loss at presentation differed (median 0 vs 22.5 lbs $p=0.0003$); however, albumin at presentation was not clinically significant. Both groups had primarily adenocarcinoma ($p=0.08$), located at the distal esophageal/GE junction ($p=0.27$) without significant difference in staging ($p=0.42$). Localized metastatic disease at the jejunostomy site was found in three patients. Disease in two patients was identified intraoperatively with one patient having isolated jejunal serosal metastasis, the other serosal and parietal peritoneal disease. Esophagectomy was aborted in both cases. Pathologic examination confirmed the third patient's serosal and omental metastasis. All three patients with J-tube site metastasis had Stage III adenocarcinoma of the lower esophagus and gastro-esophageal junction. Presentation differed including pain, weight loss, presence of dysphagia, and albumin.

CONCLUSION

Inflammation at the jejunostomy site may provide a suitable environment for metastatic seeding. Consideration should be given to early cytologic examination of peritoneal washings along with laparoscopic abdominal examination prior to esophagectomy. The use of pre-induction feeding access should be carefully evaluated in patients without severe dysphagia or malnutrition.

PRESENTATION 52

# FENESTRATED AND BRANCHED ENDOVASCULAR ANEURYSM REPAIR (FBEVAR) FOR COMPLEX AORTIC ANEURYSMS AMONG STANDARD AND HIGH-RISK PATIENTS FOR OPEN REPAIR

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BACKGROUND

Patients with complex abdominal aortic aneurysms (AAAs) are at higher risk of death and morbidity after open repair. Fenestrated and/or branched endovascular aortic aneurysm repair is an alternative to open repair. Whether FBEVAR should also be offered to standard risk patients has not been defined as most series until now have included preferentially patients unfit for open repair.

OBJECTIVE

The aim of this study is to evaluate perioperative and short-term outcomes of FBEVAR among patients at standard and high-risk for open repair.

METHODS

During a 3-year period, 169 patients (132 men [78%], and 37 women [22%]) underwent FBEVAR using Zenith Fenestrated AAA Endovascular Grafts (70%), Zenith p-Branch (6%), Zenith t-Branch (2%) and fenestrated/branched Custom Made Devices (22%). Demographics, perioperative and follow-up outcomes of high-risk patients (n=76 [45%]) and standard risk patients (n=93 [55%]) were compared. Chi-square or Fisher test were used for categorical variables and non-parametric tests for continuous variables. Kaplan-Meir curve was used for survival analysis.

RESULTS

Median age was 73 years (interquartile [IQR] 68-79 years) for the entire cohort and 77 years (IQR, 71-86 years) among high-risk patients. Median aneurysm size was 56 mm (IQR: 53-62 mm). The median number of fenestrations was 3. Preoperatively, high-risk patients had higher SVS score (5.8 [IQR, 5-7] vs 5 [IQR, 3-6] p=0.01) whereas standard risk patients had lower BMI (26 [IQR, 21-27] vs 28 [24-32] p=0.04). Intra-operatively, technical success was 100% for both groups. The median operative time for high-risk patients was 224 minutes (IQR, 160-272) vs. 212 minutes (IQR, 177-281) in standard-risk patients (p=0.59). The median hospital length of stay was 4 (IQR, 2-5) in high-risk patients vs. 3.5 days (IQR,2-5) for standard-risk patients (p=0.87). ICU length of stay was 2 days for patients from both groups (IQR, 1-3). The rate of postoperative complications was 36% for high-risk patients and 28% for standard-risk patients (p=0.5). None of the patients in this series required dialysis. One 30-day death occurred in a high-risk patient. The 12-month estimated survival rate was 85% in high-risk patients and 95% in standard risk patients (p=0.1). The rate of re-interventions at 12 months was 27% for high-risk patients and 10% for standard-risk patients (p=0.09).

CONCLUSION

FBEVAR is safe and effective procedure for patients at high and standard risk for open repair that are not eligible for standard EVAR. In fact, standard risk patients had similar short-term outcomes compared to higher-risk patients with lower rate of reinterventions at 12 months. The short-term outcomes after FBEVAR among standard risk patients are comparable, or superior, to historical cohorts of patients treated with open repair.

PRESENTATION 53

**ANATOMICAL GENDER BASED DIFFERENCES IN ABDOMINAL AORTIC ANEURYSMS UNDERGOING ENDOVASCULAR REPAIR**

WP Shutze MD, RA Shutze, P Dhot, M Forge

BACKGROUND

Women having abdominal aortic aneurysm (AAA) repair have been noted to be older, less likely to have an endovascular repair, to have more complications, more endoleaks and poorer survival. Some of this has been attributed to differences in the arterial diameters, tortuosity and calcification but this has not been well studied. The anatomic severity grade (ASG) is a numerical composite score created by the Society for Vascular Surgery that assesses the aorto-iliac anatomy in patients with AAA for variables that increase or decrease the likelihood of success or complications during repair. A higher score indicates more hostile anatomy.

OBJECTIVE

We proposed to assess the aortic neck and iliac arteries in patients undergoing endovascular AAA repair (EVAR) using the components of the ASG score and determine if there were gender based differences for this score and it's components. We also sought to evaluate the age and AAA diameter differences between males and females.

METHODS

Between 2002-2009 there were 464 EVAR procedures performed at our institution and 360 patients had an adequate digital preoperative CT scan of the AAA available. These scans were sent to a core imaging lab (M2S, Lebanon, N.H.) which extracted aortic neck length, diameter, angulation and calcification and iliac length, tortuosity, angulation and calcification, and AAA diameter from these scans. These measurements were returned in a spreadsheet to which we added the patient's gender, date of birth, and age at the time of surgery. The overall anatomic severity grading (ASG) score was calculated and sub scores were calculated for the aorta and iliac arteries separately. The male and female cohorts were then compared for each of these measurements and scores and the results analyzed using Students t-test.

RESULTS

There were 301 (84%) males and 59 (16%) females in the total group. The average age for the males was 73 years compared to 77 for the females (p=.0006). The AAA diameter was 51 mm for the males and 54 mm for the females (p=.0952). The ASG score, sub scores, and the mean aortic and iliac measurements for the two groups are listed in Tables 1,2 and 3 along with the results of the statistical comparisons.

CONCLUSION

Significant differences between males and females undergoing EVAR. Women present at an older age but with similar AAA diameter to males. The total aortic and iliac ASG scores are higher in females and this is driven by all of the sub score components except for calcification. Further investigation needs to be done to assess the impact of these differences on complications and outcomes after EVAR and to stimulate gender based differences in endograft design.

PRESENTATION 54

**OUTCOMES OF RESECTION FOR RENAL CELL CARCINOMA WITH EXTENSIVE INFERIOR VENA CAVAL THROMBUS**

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BACKGROUND

Renal cell carcinoma (RCC) has a propensity for vascular invasion with the presence of intravascular tumor thrombus occurring in 10-25% of those cases. Tumor thrombus invades along the renal vein (level 0) to the IVC (level 1-2) and above the hepatic veins (level 3) until ultimately can became an atrial thrombus (level 4), with a worsening prognosis associated with caudal progression. Radical nephrectomy and caval thrombectomy represent the only method of local disease and durable oncologic control.

OBJECTIVE

The aim of this study is to examine the outcomes of resection for renal cell carcinoma with extensive inferior vena cava thrombus in the setting of a multidisciplinary team.

METHODS

A review of a prospectively maintained database of patients with renal cell carcinoma with tumor thrombus was performed. Patients were evaluated pre-operatively with a standardized protocol to assess for extent of disease, specifically presence (and level) of tumor thrombus using renal protocol CT or MRI, as well as evidence of metastases. A multidisciplinary surgical approach was then taken involving Urology, Cardiothoracic, and Vascular surgery. Intraoperative Doppler ultrasound and trans-esophageal echocardiography were performed to aid in confirming the level of thrombus and to identify the lumbar and hepatic veins insertion into the vena cava.

RESULTS

A total of 57 patients underwent radical nephrectomy with tumor thrombectomy over the course of 28 months. Patients were predominantly Hispanic (61%), male (63%), overweight (median BMI 29 [20-56]), and middle aged (median age 58 [21-85]) with a history of hypertension (68%), tobacco use (56%), and diabetes (40%). Almost all patients were symptomatic at presentation: hematuria (53%), flank pain (37%), weight loss (26%). Thrombus level for L0, L1, L2, L3, and L4 disease was 23%, 11%, 32%, 25%, and 11%, respectively. Bypass was required in 35% of cases (veno-veno 25%, cardiopulmonary 11%) and IVC reconstruction with patch only occurred twice (3.5%). Median length of stay was 12 days with a 30-day re-admission rate of 17.5%. Mortality at 30 and 90 days for all patients was 5.7% and 9.4%, respectively.

CONCLUSION

Renal cell carcinoma with extensive inferior vena caval thrombus remains a high risk surgery that requires a multidisciplinary surgical approach, but is associated with acceptable mortality and morbidity. Our results demonstrate Hispanic patients present with less invasive disease than non-Hispanics based on level of thrombus, however Hispanic patients have a higher overall higher mortality at both 30 and 90 days than Non-Hispanic patients.

PRESENTATION 55

**IS VENTRAL HERNIA SURGERY UNDER SIEGE FROM INDUSTRY? A COMPARISON OF CONFLICT OF INTEREST AMONG SURGICAL SPECIALTIES**

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BACKGROUND

A major concern among hernia surgeons is the growing relationship between industry and healthcare.

OBJECTIVE

Our objective is to determine if the prevalence of COI is higher among ventral hernia (VH) publications compared to those of other specialties.

METHODS

PubMed was searched for 400 studies pertaining to VH surgery and to 3 other randomly selected surgical specialties (Orthopedic Surgery, Cardiac Surgery, Otorhinolaryngology) accepted for publication 1/2014-6/2016. Financial relationships self-disclosed in the manuscript and industry-disclosed in the Open Payments Database were documented. Articles were divided into 2 categories: no COI and COI. Articles with COI were subsequently subdivided into those having full disclosure and those having discordant disclosure between self-reported and OPD-reported COI. The amount of payments reported in the OPD were recorded. The primary outcome (COI) was assessed using Chi-Square test and the secondary outcome (payments) was assessed using Kruskal-Wallis test.

RESULTS

Although the prevalence of financial relationships with industry was high among all four specialties, VH publications had the highest prevalence (Table 1). Authors of VH publications were the most likely to disclose all COI, but they also received the highest median payments (1.3-30x that of the other specialties).

CONCLUSION

Financial relationships among VH researchers are widespread. While COI is common among all surgical specialties, VH publications had the highest percentage of manuscripts with a COI, and VH surgeons received the highest median payments. The effects of these COI should be further investigated, as COI has been shown to bias study results and mislead clinicians and patients.

PRESENTATION 56

**PATTERNS OF CARE AND DECISION MAKING IN MASTECTOMY PATIENTS AFTER ACOSOG Z0011**

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BACKGROUND

INTRO ACOSOG Z0011 showed that axillary dissection (ALND) can be avoided in breast cancer patients with 1-2 positive sentinel lymph nodes (SLNs) who undergo breast conserving surgery and whole-breast radiation (XRT).

OBJECTIVE

Our aim was to assess our practice and factors influencing decision making for mastectomy patients with positive SLNs after the publication of Z0011.

METHODS

427 medical records were reviewed from 2010-2016, to find patients with T1-T2 breast cancer, clinically node negative, having mastectomy with positive SLN biopsy. We collected data on demographics, comorbidities, tumor and nodal factors, and adjuvant therapy. Patients with and without ALND were compared by t-test for continuous measures and Chi-square test for categorical measures.

RESULTS

116 patients met inclusion criteria, 55 patients without ALND (group 1, mean age 53) and 61 with ALND (group 2, mean age 56). There was no difference in comorbidities, clinical stage, multifocality, hormonal status, or Ki67. Both groups had average of 3.2 SLNs. Group 2 had more positive nodes (1.6 vs. 1.0 in group 1; $p< 0.001$), larger mean nodal metastasis (9.5mm vs. 2.2 mm; $p<0.0001$). MSKCC nomogram prediction of positive non-SLNs was higher in group 2 than 1 (mean 51% vs. 14%, $p<0.0001$). 85% of group 2 had positive SLN intraop and completion ALND; 15% had a negative touch prep but positive final pathology with delayed ALND. In group 1, 95% had negative touch prep and 5% had deferred nodal pathology evaluation. 30% of group 1 were presented in tumor board vs. 8% in group 2 ($p=0.0018$). 36% of group 1 received XRT to the axilla vs. only 2.7 % in group 2 ($p=0.0014$).

CONCLUSION

When SLNs were positive intraop, completion ALND was performed. When intraop pathology was negative and nodes positive on permanent section, surgeons were less likely to do ALND. More often they presented the patient in tumor board, advised adjuvant radiation or observation, used nomograms, and were influenced by data from Z0011 and AMAROS trial when justifying no ALND. These findings reflect the need for clinical trials to address management of mastectomy patients with positive sentinel nodes.

PRESENTATION 57

**SURGICAL MANAGEMENT OF ACUTE DIVERTICULITIS; RESECTION WITH END STOMA STILL REIGNS SUPREME**

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BACKGROUND

Multiple recent studies have suggested that primary anastomosis with or without proximal diversion is safe and should be the procedure of choice for most patients with acute diverticulitis requiring an emergency operation.

OBJECTIVE

Describe the most common operations performed in patients with acute diverticulitis and factors associated with the creation of end stoma.

METHODS

The National Surgical Quality Improvement Program(NSQIP) from the American College of Surgeons for the years 2013 and 2014 was queried. Patients undergoing either an emergency or elective surgical procedure for diverticulitis were selected for analysis. Demographics, surgical procedure, length of hospital stay, morbidity and mortality were analyzed. These parameters for emergency procedures were compared to those for elective operations and analyzed with Chi-Square for categorical variables and T-Test for continuous variables. A logistic regression model was then created to assess the influence of independent variables in the creation of an end stoma (Table 1). Significance was determined by a $P < .05$.

RESULTS

During a two-year period, 12,898 patients underwent surgical treatment for diverticulitis at NSQIP participating institutions. 3,056 (23.6%) patients underwent emergency surgery. Compared to an elective procedure, patients undergoing an emergency operation were more likely to have a colon resection without anastomosis (57.8 vs. 5.4%, P<.0001) and performed by the open compared to the laparoscopic technique (85.3 vs. 14.6%, P<.0001). Among emergency cases, factors related to colon resection without anastomosis included: transfer from an outside institution (61.4 vs. 15.3%, P<.0001) and septic shock (75.9 vs. 54.1%, P<.0001). Mortality was higher for patients undergoing an emergency resection without anastomosis compared to those patients who had an anastomosis (3.7 vs. 1.4%, P<.0003). Wound (19.5 vs. 10.7%, P<.0001), pulmonary (12.5 vs, 2.4%, P<.0001) and renal complications (5.1 vs. 2.5%, P<.0001) were higher in patients with resection without anastomosis.

CONCLUSION

This study shows that open colon resection without anastomosis continues to be the most employed surgical intervention for the emergency treatment of acute diverticulitis in the U.S. It is associated with a higher complication rate than resection and anastomosis with or without proximal diversion. Delay in treatment for transferred patients may have contributed to the sepsis and intraoperative technical difficulties that led to the high use of resection without anastomosis in these patients. Further reductions in associated morbidity and mortality appear to be dependent upon earlier diagnosis and treatment of patients with acute diverticulitis at their local hospital. Surgeons treating these patients need to more universally adopt the laparoscopic approach and also be willing to embrace primary anastomosis with or without proximal diversion as the procedure of choice when clinically indicated.

PRESENTATION 58

**A NOVEL BLOOD COAGULATION ASSAY: OPTICAL DETECTION OF PLATELET CONTRACTILITY**

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BACKGROUND

Various devices exist capable of detecting platelet activity and an effect of antiplatelet therapy. However, these devices only offer qualitative data without basis in direct measurement of platelet activity. There is no existing clinical assay capable of quantitatively detecting platelet activity like contractile forces.

OBJECTIVE

The purpose of this study is to create a novel platelet function assay to detect anti-platelet drug effects on clotting by measuring contractile forces of platelets in clotting whole blood.

METHODS

Whole blood samples were collected from healthy human subjects before and after taking 325 mg of oral aspirin. Calcium chloride was added to citrated samples to initiate clotting. Samples were placed in a temperature controlled glass test chamber with acrylic inserts of matched surface areas at the top and bottom creating a cylindrical blood sample of known height and radius. A camera recorded deflection of a bent wire attached to the top acrylic insert. Using beam equations, force generated by the contracting clot was recorded with time. Kinetic metrics such as clot activation, rate of contraction and clot volume change are recorded. Student t-tests compared metrics taken from the force curves.

RESULTS

Qualitative analysis of force curves identified an activation phase prior to a clot reaching a steady state rate of contraction. Student t-tests comparing rates of steady state clot contraction demonstrated aspirinated blood contracted slower, thus generated force at a slower rate than control blood (20.24 versus 23.92 micro-Newtons per second, $p = 0.032$). Time to reach steady state contraction also was longer for aspirinated blood compared to control blood (588 versus 435 seconds, $p = 0.043$).

CONCLUSION

This novel blood coagulation assay detects force generated by platelets in a contracting clot with time and demonstrates the kinetics of blood clotting. Aspirinated blood develops force at a slower rate and takes more time to reach a steady state of contraction than control blood.

PRESENTATION 59

**SUCCESSFUL ENHANCED RECOVERY PATHWAY FOR COLORECTAL SURGERY IN LARGE SAFETY-NET HOSPITAL**

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BACKGROUND

There is ample evidence that Enhanced Recovery Pathways (ERPs) decrease length of stay (LOS) and improve outcomes in colorectal surgery. However, there is a paucity of information regarding the effectiveness of ERPs in the safety-net setting, which predominantly serves the vulnerable under- and un-insured. It is known that such patient populations are at a higher risk for poor surgical outcomes and longer hospital stays due to a variety of factors including limited resources and various social determinants of health.

OBJECTIVE

The aim of this study is to determine the impact of an ERP on the length of stay and readmissions for elective colorectal surgery at a safety-net hospital. Our focus was on the process and outcomes metrics without social interventions.

METHODS

A multidisciplinary panel of experts utilized evidence-based best practices for colorectal surgery to create a comprehensive perioperative ERP. Preoperative components included standardized patient education, optimization of co-morbidities, multimodal analgesia for perioperative pain, and carbohydrate loading. Intraoperative components focused on avoiding fluid overload and minimizing opioid use. Postoperative components included minimization of opioids, early ambulation, early discontinuation of indwelling urinary catheter, and early resumption of diet. The ERP did not include social interventions. The pathway was implemented in September 2014 at a large, urban safety net hospital. Process and outcomes metrics from 100 consecutive patients who underwent elective colorectal surgery in the 18 months prior to ERP implementation were compared to a similar group post implementation. Surgeons and discharge criteria remained the same throughout. Primary end points were length of stay and readmissions. Secondary endpoints included time to ambulation, time to solid food, and time to return of bowel function.

RESULTS

In both cohorts, the funding sources for the majority of patients were either charity care or Medicaid. There was no difference in the ratio of open to laparoscopic cases between the cohorts ($p=0.547$), or in the ratio of colon to pelvic cases ($p=0.373$). Following ERP implementation, the total hospital length of stay was reduced from 7.5 to 5.1 days ($p=0.003$) and the 30-day all-cause readmission rates did not change (22% to 22%; $p=1$). Mean time to ambulation was reduced from 2.2 to 1.5 days ($p=0.001$). Mean time to resumption of solid food was reduced from 4.6 to 2.4 days ($p<0.001$). Mean time to return to bowel function was 3.4 to 2.5 days ($p=0.001$).

CONCLUSION

It is possible to decrease length of stay without increasing readmissions for elective colorectal surgery in a large, urban safety-net setting, even without special interventions to address socioeconomic barriers to health. The cost of ERP implementation is minimal, and there is significant potential for cost savings based on reduced length of stay. Thus, it would be advantageous for all safety net facilities to consider adopting ERP.

PRESENTATION 60

**COLORECTAL CANCER SCREENING IN RURAL POPULATIONS: CHALLENGES ADDRESSED BY GROUP EDUCATION AND CALL REMINDERS**

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BACKGROUND

The Texas Panhandle has a high incidence of colorectal cancer (CRC), with a dismal screening rate of 41% compared to national average of 65%. Barriers to increasing screening are lack of patient awareness, cost, language barriers, and lack of access. National recommendations are to provide healthcare education via 1:1 for best outcomes; however, with an area of 25,887 square miles and a population density of 17 people per square mile, the challenge of providing effective education and screening for CRC requires a unique approach.

OBJECTIVE

Improve CRC education and screening rates in our underserved population.

METHODS

Education in our area was conducted via group or individual learning to increase patient understanding and screening rates of CRC utilizing fecal immunochemical tests (FIT) at no cost for participants. Call reminders were used to increase return rates of FIT. Education was conducted by Community Health Workers (CHW) using flip charts, translation services and FIT demonstrations.

RESULTS

CRC educational outreach sessions have covered 1,129 people, with 622 completing FIT screening. 55.9% of participants were female and 44.1% male. More individuals underwent group instruction, 94.3%, as opposed to individual education. Analysis showed no statistically significant difference between these two methods of education for overall FIT kit return rates (55.58% for group vs 68.97% for individual, p-value 0.18). Average time to return FIT was quicker for the group education with 11 days, compared to 14 days for the individual education. Call reminder frequencies were investigated and determined to increase return rates. 50.9% of FIT kits returned were done without any call reminders, but this return rate doubled by adding a three-call reminder system. Participants in a group setting were more active and engaged in the conversations when compared to participants in 1:1 education.

CONCLUSION

Unique strategies are needed when facing disparities in rural communities to break down the barriers to health care. Group education sessions offer more interaction, a unique comfortable setting, and cut costs without jeopardizing patient satisfaction or FIT return rates. Complex information can be delivered in meaningful ways by utilizing group education.

PRESENTATION 61

**LOW-GRADE BLUNT HEPATIC INJURY AND BENEFITS OF INTENSIVE CARE UNIT MONITORING**

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BACKGROUND

The standard of care for nonoperative management of blunt hepatic injuries (BHI) is intensive care unit (ICU) observation. It remains unknown if subpopulations of BHI exist which can be safely observed in a non-ICU environment. We sought to determine which low-grade hemodynamically normal BHI at first presentation to the emergency department were associated with any of three interventions indicating ICU observation.

OBJECTIVE

N/A

METHODS

We reviewed all BHI admitted to our urban, level 1 trauma center between 01/01/96 and 6/30/14, collecting information on packed red cell (PRC) transfusions, imaging, hepatic angiography, laparotomy, associated injuries, and cause of death. Two groups were created: Group A (hepatic injury grades 1-3 with normal first systolic blood pressure (hemodynamically normal) and Group B (all other BHI). Interventions traditionally undergoing ICU observation were defined as any with the following three criteria: PRC transfusion within the first 24 hours, hepatic angiography, or all-cause laparotomy. Outcomes between Groups and within Group A subgroups were collected. Fischer's exact was used for categorical data and t-tests for continuous data.

RESULTS

Group A (n=838) had a significantly lower ISS, shorter length of stay, fewer units of PRCs transfused, and lower mortality (all $p<0.01$) than Group B (n=331). Interventions in Group A by grade subgroup are listed in Table 1. Hemodynamically normal low grade injuries had a negative predictive value of 77.42% for any of the three interventions that warranted ICU admission. Sensitivity/specificity of the criteria for ICU admission were 46.53% and 73.49%, respectively. Laparotomy specifically for management of BHI was low in both groups (1.9% in the Grade I/II subgroup and 4.3% in the Grade III subgroup). For patients with isolated BHI (n=156), the sensitivity and specificity of the three interventions was 13% and 90%, while the NPV had a small increase to 81%.

CONCLUSION

Hemodynamic stability at presentation is insufficiently sensitive as a sole criterion for safe admission of Grade I-III BHI to a non-ICU environment.

PRESENTATION 62

# DEVELOPING A DATABASE FOR FORENSIC ANALYSIS: IMPACT OF EXPOSURE TIME AND WATER TEMPERATURE ON SCALD BURNS IN HUMAN SKIN.

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## BACKGROUND

Determining the time of exposure to a given temperature of water is important in forensic determinations of the etiology of scalds, especially in deciding if an injury was intentional eg. suspected child abuse. It is known that scald severity is related to water temperature and duration of exposure; however since minimal study has been done on fresh human skin, the ability to apply these findings to practice is limited. Available data lack precision and do not account for differences in age, or ethnicity. Given the high stakes of these determinations, we sought to improve the accuracy of available data tables.

## OBJECTIVE

The results of this study will provide the groundwork for more reliable estimation of the time and temperature necessary to cause a scald burn, which will improve our ability to provide determinations of non-accidental injury, and direct preventive measures.

## METHODS

Patients undergoing elective removal of healthy skin (eg.abdominoplasty) donated the removed tissue for this experiment. Immediately after surgical removal, skin was cut into 2cm x 2cm samples and was exposed to water baths of varying temperature for intervals starting at 1 second, and increasing in length by 1 second per trial until second and third degree burns were visualized

## RESULTS

In the pilot study, skin was obtained from four women of Caucasian and Hispanic descent. As seen in Table 1, time to 2º and 3º burn decreased rapidly as water temperature increased. Differences in time to burn were noted at lower temperatures, with variability decreasing with increasing temperature.

## CONCLUSION

There is variability in time to scald in human skin at lower temperatures, which narrows with increasing water temperature. We are expanding this pilot study to a larger sample size in order to build a robust reference tool for use by the burn community.

PRESENTATION 63

**POSTTRAUMATIC GROWTH IN A HETEROGENEOUS SAMPLE OF TRAUMATICALLY INJURED PATIENTS ONE YEAR AFTER INJURY**

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BACKGROUND

Posttraumatic growth (PTG) describes positive change that occurs as a result of a struggle with challenging or traumatic life events. Researchers have examined PTG in a number of populations, including individuals who have experienced a specific type of traumatic injury, such as traumatic brain injury (TBI), spinal cord injury (SCI), and injuries resulting from motor vehicle collisions. However, none have studied variables associated with PTG in a heterogeneous trauma patient population. This study fills this gap in the literature.

OBJECTIVE

The objective of the present study was to examine factors associated with PTG in a mixed traumatic injury patient population one year post-injury.

METHODS

This prospective cohort study took place at an urban Level I trauma center in Texas. Participants (N=221) included patients 18 years and older who were admitted to the trauma service for at least 24 hours with a traumatic injury, as defined by ICD-9 coding. Other inclusion criteria included lack of cognitive deficits that would prevent the ability to provide informed consent (e.g., effects of severe brain injury, dementia), ability to provide at least one form of contact information, and ability to understand English or Spanish. Baseline measures were administered during participants' hospitalization. Follow-up assessments occurred via phone 12 months later. Demographic and injury-related data were obtained at baseline from participant self-report and review of electronic medical records. Measures of depression, social support, posttraumatic stress symptoms (PTSS), resilience, alcohol use, and premorbid psychiatric history were also administered at baseline as a semi-structured interview. PTG was assessed 12 months post-injury during scheduled follow-up using the Posttraumatic Growth Inventory.

RESULTS

Linear regression showed that greater PTG was associated with Hispanic ethnicity, African American race, lower income, injury by motor vehicle collision, history of psychological disorder, and positive baseline PTSS screen. Given that the variables found to be associated with growth also tend to be associated with PTSD in trauma patients, a t-test was performed to examine if there was a difference in PTG for participants who screened positive versus negative for PTSS at 12 months. This analysis revealed that participants who screened positive for PTSS at 12 months experienced significantly more growth than those who screened negative.

CONCLUSION

The results of this study were somewhat surprising. Based upon past research findings, the variables found to be associated with PTG also tend to be predictors of PTSD in trauma patients. In fact, those who experienced the most growth in the present sample also tended to experience the most distress one year after injury. Therefore, it is important that psychological screening and intervention be implemented for trauma patients in the acute care setting in order to reduce PTSS stress and facilitate the process of growth.

PRESENTATION 64

**DOES MRI CHANGE MANAGEMENT IN BLUNT TRAUMA PATIENTS WITH STABLE THORACOLUMBAR SPINAL INJURIES WITHOUT NEUROLOGIC DEFICITS?**

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BACKGROUND

In blunt trauma patients with CT findings of stable thoracolumbar spinal injury without neurologic deficits, MRI studies are commonly obtained, though the impact on overall management remains unclear. Per EAST guidelines, the indication for MRI includes evaluation of gross neurologic deficits, CT findings suggestive of neurologic involvement, and neurologic examination findings despite the absence of radiographic abnormalities. However, for patients who fall outside of these guidelines, the utility of MRI has not been established.

OBJECTIVE

In this study, we evaluated the role of MRI in surgical intervention of patients presenting with blunt trauma and CT findings of stable thoracolumbar spinal injury without neurological deficits. We hypothesized that the addition of MRI would not alter the decision to intervene and would lead to longer ICU and hospital length of stay.

METHODS

After IRB approval, the trauma registry was queried from 2005-2015 for all blunt trauma patients with thoracolumbar spinal injuries and no neurological deficits. General demographics (age, sex), cause of injury (fall, MVC, other), injury severity score (ISS), hospital length of stay (HLOS), ICU length of stay (ILOS), CT thoracolumbar (T/L) films, MRI T/L films, and management (intervention vs. no intervention) were collected. Primary outcomes were percentage of patients who underwent (1) CT + MRI + no intervention (CM), (2) CT + no MRI + no intervention (C) (3) CT + MRI + intervention (CMI), and finally (4) CT + no MRI + intervention (CI). MRIs were further scrutinized to confirm CT findings. Impact of variant ISS in the four groups was corrected by dividing HLOS and ILOS by ISS prior to statistical analysis.

RESULTS

Our retrospective chart review identified 613 patients with 236 meeting inclusion criteria. For all patients, age was 52 ± 23 y, gender (54% male, 46% female), cause of injury (50% falls, 42% MVC, 8% other), ISS (7 ± 4), HLOS (5 ± 3 days), and ILOS (1 ± 2 days). 56% of patients underwent MRI (n: 133) with 26% in CMI and 74% in CM. 44% of patients did not receive an MRI (n: 103) with 16% in CI and 84% in C. No significant (p: 0.06) difference was noted in attaining intervention with (CMI: 26%) or without MRI (CI: 16%). Additionally, a significant (p: 0.006) increase in HLOS relative to ISS was noted in patients who received MRI (CM+CMI) relative to no MRI (CI+C). Finally, 100% of all patients in the CMI group had consistent spinal stability findings in both CT and MRI.

CONCLUSION

In our study, 56% of blunt trauma patients with CT findings of stable thoracolumbar spinal injury without neurological deficits underwent MRI. The addition of MRI did not significantly affect rate of intervention. Of patients who underwent intervention, MRI findings were 100% concordant with CT findings of spinal stability. Our results suggest that MRI does not affect the decision for intervention in blunt trauma patients with CT findings of stable thoracolumbar spinal injury and no neurological deficits.

PRESENTATION 65

**WEIGHT CHANGES AND WEIGHT MEASUREMENTS IN HOSPITALIZED BURN PATIENTS**

D Mendez-Romero BS, AT Clark MD, H Phelan MD, B Arnoldo MD, SE Wolf MD

BACKGROUND

Burns are associated with significant changes in body weight due to resuscitation volumes leading to increased weight and a hypermetabolic state and prolonged bed rest resulting in wasting of lean body mass and weight loss. The actual weight changes and frequency of weight measurements throughout hospitalization have not been well described across time.

OBJECTIVE

The purpose of this study was to describe weight changes and frequency of weight measurements throughout hospitalization in more detail.

METHODS

A review was conducted of 232 thermally injured patients hospitalized in a large, ABA-verified burn center from February 2016 to September 2016. Patients were seen daily by a nutritionist and received tube or oral feeding as appropriate. Demographics, hospital length of stay, and all weight measurements were collected.

RESULTS

Over 8 months, 232 burn patients were admitted. The mean (±SD) age was 33 ± 24 years, median TBSA was 7% (IQR 13-3) and men were 67.37% of the sample. Patients had a 4.92% ± 1.40% (mean ± SEM) increase in weight from baseline at hospital day 7 (n=40). The mean weight changes of hospitalized patients were -1.57% ± 4.46% at 30 days (n=13), -6.66% ± 4.47% at 45 days (n=10), -13.83% ± 3.74% at 60 days (n=7), and -23.93% ± 12.26% at 130 days (n=2). The maximum length of stay was 205 days, and this subject had a weight loss of 33.33% from baseline. Composite data of mean change of weight from baseline over time was plotted with an R2 value of 0.6 for both linear and third order regression. Patients with a length of stay between 7 to 14 days (n=49), 15 to 30 days (n=15), 31 to 60 days (n=9) and more than 60 days (n=9) had a daily weight recorded only 7.4%, 20.6%, 35.5% and 47% of their inpatient days, respectively.

CONCLUSION

Burn patients demonstrate an increase in body weight within the first week of hospitalization likely related to resuscitation followed by a consistent decline. Patients with stays greater than one month have a decline in weight below their baseline and can lose as much as a third of their body mass even in the setting of nutritional support and rehabilitation efforts. Additionally, these data show that weight is measured more often as length of stay increases. Weight is often used as a marker of nutritional status, although this may not be appropriate in the setting of large fluid shifts and obesity. Additionally, patients might be losing muscle mass in favor of body fat. It is important to recognize long-term weight trends in the burn population, but further investigation is needed regarding the predictors of significant weight loss and associated outcomes.

PRESENTATION 66

**GEOGRAPHIC ANALYSIS OF TRAUMA READMISSIONS IN NORTH TEXAS**

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BACKGROUND

Due to the high cost and increased risk of mortality associated with unplanned patient readmissions, research has been aimed to identify risk-factors in patients with high hospital utilization and recidivism.

OBJECTIVE

The primary aim of this study was to characterize 1-year readmissions across multiple institutions following a trauma admission to a single urban Level I trauma center. We hypothesized that a patient's geographic location of residence can be used to predict readmission rates.

METHODS

Data were collected for 21,231 patients admitted to a Level 1 trauma center and readmissions following an index trauma admission were identified over an 11-year period. Data was queried from a regional database comprised of 88 member institutions that encompass more than 150 hospitals in the North Texas region. Patient ZIP code and county of residence were analyzed using binary logistic regression to determine the probability of readmission by patient geography. Variables such as demographics, diagnosis, Elixhauser comorbidities, and insurance were also analyzed to create a full clinical and geographic regression model describing patterns in readmissions.

RESULTS

4,487 patients were identified as having been readmitted during the data collection period with a combined 12,235 encounters. 52 variables, including 21 geographic variables, were identified as significant predictors of readmissions. Patients who lived within 20 miles of the hospital they were admitted to were more likely to be readmitted. Numerous counties surrounding Dallas County were identified as positive predictors of readmissions. 12 ZIP codes were found to be significant with 7 identified as positive predictors of readmission and 5 identified as negative predictors.

CONCLUSION

This study found that a patient's location can be used to help determine likelihood of readmission following an initial admission for trauma. We believe that identifying risk factors for readmissions may help to aim targeted interventions toward patients to reduce hospital recidivism and consequently, resource utilization and cost. Identifying geographic areas that exhibit high readmission rates may help to develop outreach programs specialized in serving local patients to improve post-discharge follow-up and quality of recovery.

PRESENTATION 67

**ARE FOLEY CATHETERS NEEDED FOLLOWING MINIMALLY INVASIVE REPAIR OF PECTUS EXCAVATUM?**

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BACKGROUND

High narcotic requirements after minimally invasive repair of pectus excavatum (MIRPE) can increase the risk of urinary retention. Intraoperative Foley catheters are often placed to minimize the risk of this complication; however, there is variation in this practice.

OBJECTIVE

The objective of this study is to determine the urinary retention rate in this population to guide future practice.

METHODS

A retrospective review was performed of all patients that underwent MIRPE from 1/2012–7/2016 at two academic children's hospitals. Data collected included patient demographics, body mass index (BMI), severity of pectus defect [Haller Index (HI)], postoperative pain management, and incidence of urinary retention and urinary tract infections (UTI). Urinary retention was defined as the inability to spontaneously void requiring straight catheterization or placement of a Foley. Statistical analysis was performed using the Wilcoxon rank test, Fisher's exact test, and univariate and multivariable logistic regression analyses to identify risk factors for urinary retention.

RESULTS

A total of 305 patients (mean age 15.9 ± 2.6 years) underwent MIRPE (205 at Hospital 1 and 100 at Hospital 2). An intraoperative Foley was placed in 84 (41%) patients at Hospital 1, and 80 (80%) patients at Hospital 2 ($p<0.0001$). Overall, mean HI was 4.4 ± 1.5 and there were 257 (84%) males. The mean IV morphine equivalents received was 1.4 ± 1.2 mg/kg/day per patient with a mean hospital length of stay of 4.7 ± 1.1 days. There were 195 (64%) patients who exclusively had patient-controlled analgesia (PCA), 95 (31%) exclusively had an epidural, and 15 (5%) had both for postoperative pain management. An intraoperative Foley was placed in 164 (54%) patients. Gender, BMI, and HI were not factors in determining Foley placement. However, patients with epidurals were more likely to have an intraoperative Foley (OR 2.1, 95% CI 1.3–3.5, $p<0.01$). There were no UTIs in the entire population. The urinary retention rate was 38% (n=53) for patients without an intraoperative Foley, and 1.8% (n=3) in patients after removal of intraoperatively placed Foley ($p<0.0001$). Adjusting for age, gender, BMI, HI, and pain control regimen, the only significant risk factor for urinary retention in patients without an intraoperatively placed Foley was having an epidural (OR 2.8, 95% CI 1.2–6.4, $p=0.02$); however, patients on a PCA without an intraoperatively placed Foley still had a urinary retention rate of 32%.

CONCLUSION

Intraoperative Foley catheters obviate urinary retention without increasing the risk of urinary tract infection following minimally invasive repair of pectus excavatum. The results of this study will allow surgeons to better counsel patients and families regarding Foley placement during minimally invasive repair of pectus excavatum.

PRESENTATION 68

**REDUCING COMPUTED TOMOGRAPHY FOR PEDIATRIC APPENDICITIS: WHAT'S THE DOWNSIDE?**

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BACKGROUND

Due to increasing awareness of iatrogenic radiation exposure, there is a national trend of diminishing computed tomography (CT) scan use for pediatric suspected appendicitis. There are concerns that this change in imaging practice patterns may affect costs, length of stay, or proportion of negative appendectomies.

OBJECTIVE

The purpose of this study was to evaluate the effects of a children's hospital CT reduction program for evaluation of suspected appendicitis.

METHODS

Records of pediatric appendectomy patients at a tertiary, academic children's hospital from January 2012 through June 2016 were reviewed. Patients with outside imaging were excluded. In 2012, CT only after equivocal ultrasound (US) was promoted, with magnetic resonance imaging (MRI) as the secondary modality encouraged beginning in 2014. US reports were standardized in 2016. Imaging modality, negative appendectomies (normal appendix by pathology), and time from first image to surgery were evaluated by year quarter. Direct radiology cost as a percent of total cost minus imaging cost was calculated to account for inflation and potential changes in cost structure overtime. Cochran-Armitage test for trend was used to evaluate outcomes and imaging patterns; $p<0.05$ was significant.

RESULTS

Of the 407 patients evaluated without prior outside imaging, there was a significant decrease in CT use and increase in US and MRI use over the study period (test for trend, all $p<0.01$). CT use approached zero in 2016. Time from first image to surgery (mean 6.4 ± 3.7 hours, $p=0.8$), negative appendectomies (mean proportion 3.7%, 95% CI 2.7-6.0%, $p=0.9$), and radiology cost percentage (median 1.0%, interquartile range 0.7-2.8%, $p=0.1$) did not change over time.

CONCLUSION

Avoiding CT and its attendant radiation for suspected pediatric appendicitis is possible without prolonging pre-operative time, increasing negative appendectomies or incurring greater imaging costs. Further research is necessary to evaluate the implementation of CT reduction programs at non-children's hospitals where alternative organizational barriers may exist.

PRESENTATION 69

**ARE FOLEY CATHETERS NEEDED IN THE POSTOPERATIVE CARE OF CHILDREN WITH PERFORATED APPENDICITIS?**

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BACKGROUND

Patient-controlled analgesia (PCA) is often used for postoperative pain control in children with perforated appendicitis. Additionally, some providers routinely use postoperative Foley catheters in this population to prevent urinary retention; however, this practice varies by surgeon and institution.

OBJECTIVE

The objective of this study was to determine the rate of urinary retention in this patient population to guide future practice.

METHODS

A retrospective review was performed of all pediatric patients (≤ 18 years old) who received PCA postoperatively for perforated appendicitis between July 2015 and June 2016 at two academic children's hospitals. Data collected included patient characteristics, intraoperative findings, postoperative narcotic use, and incidence of urinary retention and urinary tract infections. Urinary retention was defined as the inability to spontaneously void during the postoperative period requiring straight catheterization or placement of a Foley catheter. Statistical analysis was performed using the Wilcoxon rank test and Fisher's exact test, as appropriate. Additional univariate logistic regression analysis was performed to identify risk factors for urinary retention.

RESULTS

A total of 313 patients (mean age 9.5 ± 3.9 years) underwent appendectomy for perforated appendicitis during the study period (175 at Hospital 1 and 138 at Hospital 2). An intraoperative Foley catheter was placed in 22 (13%) patients at Hospital 1, and 107 (78%) patients at Hospital 2 ($p<0.0001$). For the combined study population there were 196 (63%) males and the overall postoperative length of stay was 5.6 ± 2.9 days. The mean PCA morphine usage was 0.4 ± 0.3 mg/kg/day per patient. Age, gender, and body mass index (BMI) was similar between those that had an intraoperative Foley catheter placed (n=129) and those that did not (n=184). There were no urinary tract infections in either group. The urinary retention rate was 4.3% (n=8) for patients without an intraoperative Foley catheter, and 0.8% (n=1) for those with an intraoperative Foley catheter after removal on the inpatient unit ($p=0.06$). Univariate analysis of patient characteristics, intraoperative findings, PCA specifics (narcotic type, duration, average daily usage, and basal rate), postoperative length of stay, and postoperative abscess formation did not identify any significant risk factors for urinary retention.

CONCLUSION

Practice variations exist regarding placement of intraoperative Foley catheters in children with perforated appendicitis. However, the risk of urinary retention in this population is low despite the use of patient-controlled analgesia. Based on these results we conclude that children with perforated appendicitis do not require routine postoperative Foley catheter placement to prevent urinary retention.

PRESENTATION 70

**DO X-RAYS AFTER CHEST TUBE REMOVAL CHANGE PATIENT MANAGEMENT?**

Bret Johnson MD, Michele Rylander RN PNP, Alana Beres MDCM

BACKGROUND

A link between childhood radiation and future cancer risks exists, and reduction of unnecessary radiation in childhood has been recommended. Pneumothoraces, pleural effusions and many surgical procedures result in the placement of a chest tube or pigtail catheter. Traditional management is daily x-rays, with an x-ray after tube removal.

OBJECTIVE

Our hypothesis is that the "post pull" x-ray rarely results in a change in the clinical management of the patient.

METHODS

With IRB approval a 5 year retrospective chart review was performed. Inclusion criteria were: chest tube or pigtail placed for any reason with records complete to post removal of the tube. Data collected included: demographics, reason for placement, duration of placement, number of x-rays done prior to and after removal. The primary outcome was whether the "post pull" x-ray changed clinical management.

RESULTS

A total of 179 episodes were evaluated. Seventeen were excluded for incomplete data, or death/transfer of the patient with the tube in situ. Forty-nine tubes or pigtails were placed for pneumothorax, 48 for pleural effusion/empyema, 9 for hemothorax and 51 as part of an operative procedure. A median of 5 x-rays were done post insertion. 99% of the patients (160/162) had a "post pull" x-ray performed after tube removal. In only 9 cases did the post pull x-ray result in a change in patient management (new tube or VATS).

CONCLUSION

The x-ray performed after chest tube/pigtail removal rarely changes patient management. We recommend performing this imaging only with clinical symptoms, especially after removal of a pigtail.

PRESENTATION 71

**EARLY PREDICTORS AND OUTCOME FOR FETUSES DIAGNOSED WITH NECK MASSES**

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BACKGROUND

Fetal neck masses encompass an array of rare congenital malformations that can have potentially devastating consequences in the perinatal period. Prenatal MRI and calculation of the tracheoesophageal displacement index (TEDI) helps to risk-stratify fetuses at risk for airway obstruction and those who may most benefit from an ex-utero intrapartum treatment (EXIT) at delivery. Additionally, postnatal complications experienced by these infants include respiratory failure, feeding problems, cosmetic disfigurement, and persistent disease.

OBJECTIVE

The purpose of this study is to evaluate the association between prenatal features and postnatal outcomes, and indications for an EXIT procedure in this population.

METHODS

A single center retrospective review was performed on all fetuses referred to our institution from July 2001 to May 2016 with a prenatal ultrasound diagnosis of neck mass. Imaging features, fetal diagnosis, treatment modality, and fetal and postnatal outcomes were evaluated. At birth, each infant's airway was classified as uncomplicated or complicated. Fetal diagnosis was compared to postnatal diagnosis as confirmed by surgical and pathological findings.

RESULTS

Of 47 fetuses evaluated, 3 had pregnancy termination; 3 had fetal demise and 1 was lost to follow-up. Fetal diagnostic accuracy was 97%; 1 case of thymic cyst was not accurately diagnosed antenatally. Prenatal findings of a teratoma diagnosis (9/13), polyhydramnios (59% vs 28.6%), small stomach bubble (41% vs 21%), mass size (10 [4-15] vs 7 [2-20]), and TEDI >12 all correlated with a difficult airway at birth. EXIT procedures, performed for 23 fetuses with teratoma or large lymphatic malformation (see table), were associated with similar outcomes with regard to survival (82.6% vs 81% respectively, p=0.42) and long term pulmonary morbidity compared to those not requiring EXIT. With multivariate regression analysis, location of the mass (anterior or posterior), presence of polyhydramnios, and mass size as per fetal MRI were independent prenatal predictors of survival at 6 months (p=0.001).

CONCLUSION

Fetuses diagnosed prenatally with neck mass that are at a high risk for difficult airway can be safely delivered via an EXIT. They have a similar rate of survival and morbidity as those fetuses of lower risk who did not require an EXIT. These findings can help aid in the prenatal counseling of these patients.

PRESENTATION 72

**VENOOCCLUSIVE DISEASE IN PEDIATRIC PATIENTS WITH ACUTE LYMPHOBLASTIC LEUKEMIA**

BM Werner BA, JT Murphy MD

BACKGROUND

Venoocclusive disease due to central venous catheter (CVCs) use complicates care in 1-36% of pediatric acute lymphoid leukemia (ALL) patients. Complications include treatment delay, pulmonary embolisms (PEs), post-phlebitic syndrome, catheter related infections, and bleeding. Catheter-related thrombosis is routinely treated with anticoagulation (3 months), leaving the CVC in place as long as it is functional, well-positioned, and not infected. Despite the frequency of this problem, there is little consensus on the prevention or treatment of CVC-related thrombosis in pediatric cancer patients.

OBJECTIVE

This study will evaluate the thrombotic events in the pediatric population treated for ALL at Children's Medical Center Dallas and compare them to existing studies on the diagnosis and treatment of venoocclusive disease in cancer patients.

METHODS

With IRB approval, we reviewed 741 ALL patients who were treated between January 2009 and December 2014. Forty-two patients had venoocclusive disease with a total of 47 venoocclusive events identified. Data points included primary ALL diagnosis, age at diagnosis, number of venoocclusive events, location of catheter, type of catheter, cause of thrombus (if not catheter related), symptoms, diagnostic imaging modality, follow-up imaging, treatment, number of catheter days (if removed), number of days on medication, and clinical consequences.

RESULTS

Catheter-related thrombotic events in ALL patients were most frequently associated with: primary diagnosis of pre-B ALL; age

CONCLUSION

Venoocclusive disease related to central venous catheters is a serious complication in the treatment of pediatric ALL patients. Our findings identify the incidence of catheter-related venoocclusive disease, related symptoms and the currently employed therapeutic interventions in this at-risk pediatric cancer cohort.

PRESENTATION 73

**PEDIATRIC COMPLEX COMPLICATED APPENDICITIS: IS DRAINAGE REALLY NECESSARY?**

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BACKGROUND

Complicated appendicitis encompasses a spectrum of disease, ranging from microperforation to perforation with abscesses in all four abdominal quadrants. It is well-established that laparoscopic appendectomy is the preferred procedure for most cases of complicated appendicitis; however, in patients with perforation with abscess formation, termed complex complicated appendicitis (CCA), operative morbidity may be high due to the severity of inflammation of the peritoneal cavity. A therapeutic option is non operative management (NOM) with IV antibiotics and IR drainage, followed by interval appendectomy. In some cases, drainage cannot be performed. There are few reports of antibiotic treatment alone for this degree severity of appendicitis.

OBJECTIVE

The study aim was to assess the efficacy of parenteral antibiotics alone in treating CCA.

METHODS

Over a three and a half year period, 100 consecutive children were treated with NOM for CCA at a single pediatric hospital. Eighty-three children underwent IR drainage. In 17 children, the radiologist determined that drainage could not be performed because of location or size of the abscess; these 17 children constitute the study group. Data included demographics, symptom length, clinical course (including drainage procedures, recurrence and rehospitalization), need for operative intervention, complications, and length of stay (LOS). Primary endpoints were discharge without operation, drainage procedure, or major complication. Secondary endpoint was unplanned readmission. Results are expressed as median (interquartile range).

RESULTS

Patient age was 9.4 (5.2-12) years and symptom duration was 6 (5-7) days. All children received IV antibiotics. Thirteen had an abscess not amenable to drainage secondary to size/location, two had an unsuccessful attempt at drainage, and two did not have a well-formed abscess by imaging. Abscess size was 5 (3.9-6) cm in the undrained group versus 6.3 (4.5-8.4) cm in the drained group ($p=0.03$). All 17 children met the primary endpoint. LOS was shorter, 4.3 (3.7-5.6) days, in the undrained group compared to 5.8 (4.3-8.0) days in the drained group ($p=0.01$). Only one (6%) of the children treated with antibiotics alone was readmitted. Workup identified indolent appendicitis and an appendectomy was performed. In contrast, 16 (19%) of the children who were drained were readmitted for GI symptoms or infection with/without an incompletely drained abscess ($p=0.29$). Fourteen children underwent interval appendectomy.

CONCLUSION

This study demonstrates that children with a severe form of perforated appendicitis, termed CCA, that cannot be drained, can be treated safely and effectively, and have a shorter LOS, with IV antibiotic therapy alone. We speculate that drainage may not be necessary in many CCA patients; this warrants a prospective randomized clinical trial.

PRESENTATION 74

**DISCHARGE CRITERIA AFTER COLON RESECTION: IS RETURN OF BOWEL FUNCTION NECESSARY?**

KM Black MD, CN Ellis MD

BACKGROUND

Over the past 2 decades standardized care plans (Enhanced Recovery Protocols (ERP)) for the pre-operative, intraoperative and postoperative management, have been developed and implemented; reducing postoperative complications, decreasing the postoperative length of hospital stay, lowering health care costs, and improving the patient experience. ERPs are multimodal perioperative care pathways designed to achieve early recovery after surgical procedures. The key elements of ERPs include preoperative counselling, optimization of nutrition, standardized analgesic and anesthetic regimens and early mobilization.

OBJECTIVE

The goal of this study was to not aggressively begin an oral diet and evaluate tolerance of liquids alone as discharge criteria in a perioperative enhanced recovery protocol. Our hypothesis was that patients could be safely discharged once able to tolerate liquids without return of bowel function.

METHODS

Patients undergoing elective colon resections were prospectively enrolled in an ERP that included oral liquids immediately post recovery, opioid receptor blocker (alvimopam), scheduled nonsteroidal anti-inflammatory agents and discontinuation of intravenous fluids on the first postoperative day. Perioperative care did not include bowel preparation or carbohydrate loading. Patients were considered eligible for discharge when able to tolerate sufficient fluids to prevent dehydration as determined by urine output. The patient's routine diet was begun after discharge.

RESULTS

Over an 18 month period, 107 consecutive patients were enrolled. Minimally invasive techniques were used in 76 (71%) patients. The ERP was discontinued in 13 (12%) patients for various clinical issues. Of the remaining 94 patients, 75 (80%) were eligible for discharge by the second and all by the third postoperative day. Patients received an average of 4 doses of the opioid receptor blocker. Discharge was delayed in 21 (22%) patients primarily for post hospital care arrangements. The average postoperative length of stay was 2.8 days. At the time of discharge, 59 (63%) and 20 (21%) patients reported passage of flatus and stool respectively. On 30 day follow up, 8 (8.5%) patients were re-admitted, all for surgical site infections.

CONCLUSION

These data suggest that after elective colon surgery, patients can be discharged when able to tolerate sufficient liquids such that intravenous fluids are no longer necessary. Tolerance of a solid diet and return of GI function is not necessary prior to discharge. These data also identified issues with arrangements for postoperative care as a major cause of delay in the discharge from the hospital. An assessment of potential post hospital needs; stoma care, home physical therapy, home oxygen therapy, etc; is now a component of our preoperative process.

PRESENTATION 75

**LESSONS LEARNED: THE BAYLOR TRAUMA OUTCOME PROJECT (BTOP)**

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BACKGROUND

Trauma is the leading cause of death for ages 1-44 years, costing $406 billion yearly in healthcare costs and lost productivity. Among survivors, readmission rates are up to 21% in the first year. While outcomes during hospitalization are easy to track, quality of life (QOL) and psychosocial outcomes post-discharge are more difficult. In 2012, our Level I trauma center initiated a prospective longitudinal study of trauma patients, following them from hospitalization (baseline) to 3, 6, and 12 months post-injury.

OBJECTIVE

This abstract outlines the Baylor Trauma Outcome Project (BTOP) study's methods, results, and implications.

METHODS

This prospective longitudinal study included patients ≥18 years (N=506) admitted to an urban Level I trauma center for ≥24 hours. Eligible patients were consented and enrolled by trained researchers. A series of measures were administered at baseline and again via phone at 3, 6, and 12 months. Study subjects were not compensated for participation. Measures included assessments of depression, posttraumatic stress (PTS), alcohol use, resilience, mental and physical QOL, pain, social support, work status, readmission, posttraumatic growth (PTG), and history of traumatic brain injury (TBI). Demographic and injury-related data were collected from the hospital's trauma registry.

RESULTS

The sample had an average age of 44 ± 16.8 years and was predominantly male (65.4%), Caucasian (67.4%), employed (57.4%), and with a yearly household income < $50,000 (40.2%). Primary cause of injury was motor vehicle/cycle collision (36.4%) with an average Injury Severity Score (ISS) of 9 (IQR 5-17) (Table 1). Retention rates were 68.5%, 52.3%, and 48% at the three time points, respectively. Reasons for attrition included unable to contact, voluntary withdrawal, incarceration, and death. Prevalence of depression, PTS, alcohol abuse, and pain are shown in Table 1. Readmission rates were 2.8% at 30 days, 6% at 3 months, and 10% at 6 months. Statistical analyses found significant positive associations between (1) mild TBI and PTS, (2) PTS and alcohol use, (3) orthopedic injury and PTS, (4) depression/PTS and hospital length of stay, and (5) PTS and PTG. Negative relationships were found between: (1) resilience and depression, (2) sarcopenia and physical functioning, and (3) social support and depression.

CONCLUSION

Results highlight the negative outcomes that continue to affect trauma patients in the year after discharge from a Level I trauma center. Remarkably, despite this, many patients experienced PTG and found new meaning and purpose in life. These results emphasize the need for intervention during the acute phase of injury, most notably as it relates to PTS, depression, and alcohol abuse, while also highlighting the positive, though life-altering, effects that can occur as a result of this experience. The success of BTOP demonstrates the feasibility of enrolling and retaining trauma patients in a longitudinal study, even without providing compensation.

PRESENTATION 76

**POINT OF CARE ULTRASOUND BY FIRST RESPONDERS IN RURAL SETTINGS CAN IDENTIFY INJURIES AND CHANGE TRIAGE DECISION-MAKING: A PILOT STUDY IN RURAL WEST TEXAS**

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BACKGROUND

Currently, access to medical care is the most difficult obstacle for people in rural settings. In West Texas, a large proportion of our service area is designated as frontier, meaning less then 6 people per sq. mile. Much of this region's medical care is provided by small rural hospitals with minimal staff and few, if any, ancillary services. By current standards, this makes trauma care delivery almost impossible. The idiom of the golden hour of trauma does not exist in our rural environment.

OBJECTIVE

Currently, the average time from injury to first responder arrival is approximately 80 min. Triage to the definitive site of care is over 167 min. Almost 60% of patients are seen in a local hospital for work up and stabilization prior transfer to a regional trauma center. At most local hospitals, minimal resources are available and interventions cannot be done, thus slowing the triage process with minimal positive effect.

METHODS

As image acquisition did not seem to be a barrier to the incorporation of this new technology, we have decided to use experts in trauma for image interpretation. Imaging sequences will be saved on memory cards by run number, date, and county of service. The images will then be evaluated by expert trauma surgeons outside of our service area, thus being completely blinded. A total of 100 runs will be evaluated in 10 frontier or critical access counties. The reviewing surgeon will decide if the image capture was sufficient to evaluate for life-threatening injuries, as well as if the management would change based on the images captured. Finally, the first responders will be assessed after the completion of runs to see ease of use, comfort with POCUS, time constraints to the evaluation of the patient, and their feelings about the incorporation of POCUS into their care model.

RESULTS

We believe POCUS can be used in rural settings to begin triage of trauma patients in the field, and can assist in appropriate transfer of patients to the appropriate center for care. We believe POCUS can be taught to the first responders with minimal training for adequate skill acquisition to provide interpreters quality images that will allow for immediate intervention if needed. Finally, we believe the cost of development of this system will be offset by the reduction in inappropriate transfers and those cost associated with this.

CONCLUSION

This project has been supported by a research grant from GE Healthcare.

PRESENTATION 77

**REDEFINING THE ABDOMINAL SEATBELT SIGN: ENHANCED CT IMAGING METRICS IMPROVE INJURY PREDICTION**

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BACKGROUND

The abdominal seatbelt sign (ASBS) has an established association with abdominal injury, yet its definition remains ill-defined. The goal of our study was to better characterize abdominal seatbelt sign in the context of seatbelt wear pattern.

OBJECTIVE

We hypothesize specific imaging characteristics associated with the ASBS such as location above the pelvic brim and depth of abdominal wall soft tissue injury would better predict underlying injury and need for operative intervention.

METHODS

We performed a retrospective chart review of all motor vehicle crashes (MVC) evaluated at a level one trauma facility from 2010-2015. Inclusion criteria included age >17, MVC mechanism, diagnosis of abdominal wall contusion, and availability of CT imaging. The population was refined by documentation of an "abdominal seat belt sign" in the medical record. Variables collected for the analysis included demographics, intraperitoneal injuries, pelvic fractures, injury severity score, operative procedures and outcomes. CT imaging was reviewed for the presence of a transverse abdominal wall contusion consistent with lap belt use. Contusion location was determined in relation to the anterior superior iliac spine (ASIS). Abdominal wall thickness as well as contusion depth were measured at the contusion level and an abdominal seatbelt sign depth index (ASBSI) was calculated.

RESULTS

Sample size for the cohort was 333 subjects, of which 111 had evidence of seatbelt sign on CT imaging and 163 had evidence of seatbelt sign only on exam. Operative need was 7.4% in those with ASBS on CT (CT ASBS) and 2.8% in those with only clinical evidence of ASBS (CL ASBS). CT ASBS above the ASIS was associated with higher incidence of intra-abdominal injuries (33.3% vs 18.5%; $p = 0.07$) and a higher rate of abdominal operations (24.6% vs. 7.4%; $p < 0.01$) compared to below the ASIS. In contrast, CT ASBS below the ASIS was associated with a higher incidence of pelvic fractures (24.1% vs. 5.3%; $p<0.005$). Calculation of the associated risk ratios for abdominal exploration noted those with CL ASBS were 1.17 times more likely to need an abdominal operation while those with CT ASBS were 2.12 times more likely to require intervention. Evaluating subjects with CT ASBS above the ASIS, those requiring operative intervention were associated with seatbelt signs higher above the ASIS (5.07 vs 3.21 cm; p- 0.01) and a deeper ASBSI (0.91 vs 0.57; $p <0.001$). Applying these metrics to predict the need for operative intervention demonstrated that ASBSI was significantly associated with abdominal injury requiring operative intervention (Figure 1).

CONCLUSION

Characteristics of the abdominal wall injury on CT imaging such as location above the ASIS and injury depth index are better predictors of abdominal operative need than standard clinical measures. This analysis substantiates a novel diagnostic tool which may have the potential to facilitate clinical diagnosis and management decisions in patients with abdominal seatbelt sign.

PRESENTATION 78

**MYOKINE MUSCLIN EXPRESSION IS ELEVATED IN RATS AFTER BURN**

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BACKGROUND

Annually, over 2 million people in the US experience severe burns, a condition marked by a hypercatabolic state with significant muscle loss. Muscle is necessary for glucose and lipid metabolism. Previous studies have shown detrimental effects of insulin resistance and hyperglycemia associated with muscle loss due to burns. Recently, the novel skeletal muscle myokine musclin has been found to regulate glucose in vitro. Thus, we attempted to better understand the effects of burns on musclin levels.

OBJECTIVE

We aimed to investigate the effects of burns on 1.) musclin levels systemically and 2.) musclin mRNA expression in vitro.

METHODS

Thirty-one adult male Sprague-Dawley rats received 40% total body surface area (TBSA) burns. Rat serum was collected from 6 hours to 14 days after burn. Nine animals without injury served as control. Musclin levels in serum were measured by ELISA. Mouse C2C12 myoblasts were stimulated with 10% rat burn serum for 24 hours. Cells were stimulated with non-burn serum, 6-hour post burn serum, 72-hour post burn serum, and 14-day post burn serum. Following stimulation for 24 hours, C2C12 cells were collected and musclin expression was quantified by real time PCR analysis.

RESULTS

Circulating musclin levels were 59.3 ± 3.3 ng/mL in non-burned control rats. Musclin levels in the serum significantly increased to 76.7 ± 6.0 ng/mL at 6 hours and 76.7 ± 1.9 ng/mL at 24 hours after burn ($p<0.05$). Musclin levels in the serum returned to baseline until 14 days. Normalized to GAPDH mRNA level, musclin mRNA expression was 7.87 ± 0.56 fold in C2C12 myoblasts with 10% non-burn serum stimulation. Musclin mRNA expression significantly increased with the addition of the following burn rat serums: 22.66 ± 5.18 fold with 6-hour post-burn serum, 15.00 ± 1.93 fold with 72-hour post-burn serum, and 12.17 ± 0.82 fold with 14-day post-burn serum ($p<0.05$).

CONCLUSION

Musclin levels increase in rat serum following 40% TBSA burn injury. In vitro stimulation of muscle cells with burn serum increases musclin expression, suggesting that musclin may serve as a biomarker for muscle injury following burn.

PRESENTATION 79

**THE ASSOCIATION OF INJURY AND HOSPITAL STAY TO DEPRESSION AND POSTTRAUMATIC STRESS DISORDER IN ORTHOPEDIC TRAUMA PATIENTS ONE YEAR FOLLOWING INJURY**

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BACKGROUND

Depression and posttraumatic stress disorder (PTSD) are common outcomes after orthopedic trauma, with rates up to 45% and 30%, respectively. Early screening and intervention can have a profound impact on recovery.

OBJECTIVE

This study analyzed the link between injury-related and hospital variables and depression and PTSD at time of injury and 12 months later in orthopedic trauma patients.

METHODS

Participants included patients ≥18 years admitted to an urban Level I trauma center with orthopedic injuries. Demographic and injury-related variables were taken from the trauma registry. Depression was measured using the Patient Health Questionnaire (PHQ-8) and PTSD symptoms using the Primary Care PTSD screen (PC-PTSD) and PTSD Checklist-Civilian version (PCL-C). Injury-related and hospital variables included total length of stay (LOS), intensive care unit (ICU) LOS, ventilator use (VU), etiology of injury, trauma type, Injury Severity Score (ISS), and Glasgow Coma Scale (GCS) score.

RESULTS

Subjects (N=160) were mostly Caucasian (74%) males (56%) with an average age of 48.1 (SD=16.8). Median ISS was 9 (IQR=5,14). Depression was seen in 28% at baseline and 29% at 12 months. PTSD was seen in 23% at baseline and 21% at 12 months. VU and LOS were associated with depression at baseline and 12 months. PTSD at baseline was associated with etiology of injury, blunt injury, VU, ISS, ICU LOS, and total LOS. PTSD at 12 months was associated with blunt injury, ICU LOS, VU, and total LOS. GCS was not associated with either variable.

CONCLUSION

Hospital and injury-related variables were significantly associated with depression and PTSD at baseline and 12 months. Rates of depression and PTSD did not change significantly from baseline to follow up. These results highlight the importance of early psychological screening and intervention to improve patients' physical and mental health.

PRESENTATION 80

**A COMPARISON OF PROGNOSIS CALCULATORS FOR GERIATRIC TRAUMA: A P.A.L.LI.A.T.E. CONSORTIUM STUDY**

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BACKGROUND

The nine-center PALLIATE consortium has validated the Geriatric Trauma Outcome Score (GTOS) as a prognosis calculator for injured elders.

OBJECTIVE

We compared GTOS' performance to that of the Trauma Injury Severity Score (TRISS) in a multicenter sample composed exclusively of geriatric trauma patients.

METHODS

Three PALLIATE centers not submitting subjects to the GTOS validation study identified subjects aged 65 to 102 yrs admitted from 2000-2013. GTOS was specified using the formula [GTOS = age + (ISS x 2.5) + 22 (if transfused packed red cells (PRC) at 24 hrs)]. TRISS uses the Revised Trauma Score (RTS), dichotomizes age (55 yrs=1), and was specified using the updated 1995 beta coefficients. TRISS Penetrating was specified as [TRISSP = -2.5355 + (0.9934 x RTS) + (-0.0651 x ISS) + (-1.1360 x Age)]. TRISS Blunt was specified as [TRISSB = -0.4499 + (0.8085 x RTS Total) + (-0.0835 x ISS) + (-1.7430 x Age)]. Each then became the sole predictor in a separate logistic regression model to estimate probability of mortality. Model performances were evaluated using misclassification rate, Brier score, and AUC.

RESULTS

Demographics (mean + SD) of subjects with complete data (N=10,894) were age=78.3 yrs ± 8.1; ISS=10.9 ± 8.4; RTS=7.5 ± 1.1; mortality=6.9%; blunt=98.6%; received PRCs at 24 hrs=3.1%; arrived intubated=8.2%. The penetrating trauma sub-sample (n=150) had a higher mortality rate of 20.0%. The misclassification rates for the models were GTOS=0.065, TRISSB=0.051, and TRISSP=0.120. Brier scores were GTOS=0.052, TRISSB=0.041, and TRISSP=0.084. The AUCs were GTOS=0.844, TRISSB=0.889, and TRISSP=0.897.

CONCLUSION

GTOS and TRISS function similarly and accurately in predicting probability of death for injured elders. GTOS has the advantages of fewer variables to be collected, no reliance on data collected in the Emergency Room or by other observers, and a single formula for all mechanisms of injury.

PRESENTATION 81

**RELATIONSHIP BETWEEN TRAUMA BAY WAIT TIME AND MORTALITY**

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BACKGROUND

The majority of trauma related deaths occur within the first 24 hours of injury. Time elapsed until intervention of a trauma related injury is one of the greatest causes of preventable death in mature trauma centers.

OBJECTIVE

This study seeks to determine if there is a direct correlation between time spent in the trauma bay and mortality outcomes.

METHODS

A retrospective analysis of Level 1 trauma patients from January 1, 2010 to January 1, 2016 was performed to determine if the time spent in the Emergency Department is correlated with mortality outcomes.

RESULTS

Charts from 1678 Level 1 trauma patients with 1290 (76.9%) blunt and 388 (23.1%) penetrating injuries were analyzed. Three hundred and forty-five total patients died and 237 (68.7%) died within the first 24 hours. One hundred and five (30.4%) died in the trauma bay. Destinations after trauma bay included 1109 (66.1%) to the ICU, 323 to the OR (19.2%), and 246 (14.7%) to other hospital floors. Patients who survived had a mean Injury Severity Score (ISS) of 15.9, mean TRISS of 0.830, and spent a mean of 82.9 minutes in the trauma bay, compared to the cohort who died with 28.1, 0.516, and 53.2 minutes respectively. Multivariate analysis yields an inverse correlation between increased times spent in the trauma bay and mortality, with controls for injury severity, age, and race/ethnicity and with deaths in the trauma bay excluded ($p<0.001$). Each additional minute spent in the trauma bay increases odds of surviving by 1%. However, increase in ISS and decrease in TRISS was directly correlated with reduced time in the trauma bay for both blunt and penetrating traumas, see Figure 1. Additionally each unit increase of ISS increased odds of death by 6%, and increase in TRISS by 0.01 reduced odds of mortality by 4%. Results did not differ based on mechanism of injury or destination after the trauma bay.

CONCLUSION

Reduced time spent in trauma bay was not correlated with improved mortality outcomes in Level 1 trauma patients. Findings do not necessarily suggest that increased trauma bay time would reduce mortality, but rather that current evaluation procedures may prioritize trauma patients appropriately. Instinctive adjustment by emergency care providers to move more severely injured patients out of the trauma bay quicker and other additional variables could account for the measured phenomena. Although ISS and TRISS are strong predictors of mortality, it may not fully account for site of injury, which may be a confounding factor in urgency with which a patient is moved from the trauma bay. ISS and TRISS were predictors of time spent in the trauma bay, with patients with greater injury severity and a decreased probability of survival spending less time in the trauma bay. TRISS is better predictor of mortality than ISS.

PRESENTATION 82

**URINARY BLADDER INJURY: A 10 YEAR EXPERIENCE IN THE TEXAS PANHANDLE**

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BACKGROUND

Bladder injuries can result from blunt, penetrating, or iatrogenic trauma. The probability of bladder injury varies according to the degree of bladder distention; full bladder is more susceptible to injury than an empty bladder. It is diagnosed intraoperatively or thru CT scan or CT cystogram. The management depends on whether it is intraperitoneal or extraperitoneal. Trauma, General surgeons or urologists repair the injury in layered fashion with an indwelling catheter. It can be fatal but timely diagnosis and appropriate management provides excellent outcomes. Early clinical suspicion and appropriate radiologic studies facilitate prompt intervention and successful management of bladder trauma.

OBJECTIVE

The purpose of this study is to define the characteristics of patients who sustained bladder injury and to determine how it is diagnosed and if they can be safely treated in a level 3 trauma facility.

METHODS

This is a consecutive series involving a chart review of all patients sustaining bladder injuries in a span of ten years. Data collected include demographics, BMI, mechanism of injury, toxicology screen, length of hospital stay, length of ICU stay, need for urology consultation, GCS, ISS, RTS, initial SBP, complications, associated injury, mortality, insurance coverage and disposition on discharge.Data were analyzed using the Student's t test for continuous data, Mann-Whitney U test for non-parametric data, chi square test and Fisher's exact test for proportional data with level of significance set at p value less than 0.05.

RESULTS

During the last 10 year, a total of 96 patients were admitted for bladder injuries. The ages of the patient ranged from 3 to 90 with a mean age of 35.8. The patients were predominantly male (74%), Caucasian (63.5%). The most common mechanisms of blunt trauma are motor vehicle collision (65.6%), fall (8.3%), and assault (6.3%). In penetrating trauma, the most frequent culprit is gunshot wound (7.3 %), followed by stabbing (2.1%). The mean Injury Severity Score is 23.95 ± 12.1 with a mean GCS of 10.75 ± 5.49. Only 8.3% were transferred to a Level 1 facility. More than half of the patient went to the operating room. Most of the patients are discharge home in 46.9%. Mortality is 16.7% and usually due to associated injuries.

CONCLUSION

Bladder injury can be safely diagnosed and treated at a level 3 trauma facility. Traumatic bladder rupture can be managed successfully with or without surgery, depending upon the type of injury whether it is intraperitoneal or extraperitoneal. Critical to the successful management of traumatic bladder rupture are a timely evaluation, accurate diagnosis, and proper management based on the location and severity of injury.

PRESENTATION 83

**RECURRENCE RATES IN TRIPLE NEGATIVE BREAST CANCER UTILIZING CAVITY SHAVE MARGINS**

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BACKGROUND

Breast conserving surgery (BCS) requires tumor excision with negative margins. Randomized controlled trials have demonstrated that routine cavity shave margins (CSM) decrease re-excision rates in breast cancer. Triple negative breast cancer (TNBC) is known to have more aggressive tumor biology and high rates of early local and systemic recurrence.

OBJECTIVE

The aim of this study is to identify whether performing routine CSM's in TNBC reduced recurrence rates.

METHODS

311 triple negative breast cancers treated with BCS between 2005-2013 were reviewed. Patients underwent standard partial mastectomy (SPM) or CSM per surgeon practice patterns. Data collected included demographics, pathology, treatments, recurrence and re-excision rates.

RESULTS

226 SPM's were compared to 85 CSM's with a median follow-up of 4.5 years. Analysis between groups revealed no differences in stage, tumor pathology, demographics or receipt of therapy. Average age at diagnosis was 54, and a majority (n=195, 63%) of patients were African-American or Hispanic. Overall re-excision rate was 20.6%. Most re-excisions (64.1%) were performed for tumor close to a margin (<2mm). Patients undergoing CSM were less likely to undergo re-excision (n=13, 15.3% versus n=51, 22.6% for SPM). Overall recurrence rate was 16.7% (n=52). 37 (16.4%) SPM's recurred versus 15 (17.6%) CSM's (p=0.27). Isolated loco-regional recurrence was equivalent between the two groups (p=0.9). The majority of recurrences in both groups were distant recurrences (SPM n=20, 54.1% vs CSM n=9, 60%).

CONCLUSION

In triple negative breast cancer patients undergoing BCS, recurrence rates are not impacted by CSM technique.

PRESENTATION 84

**IMPACT OF HYDROCODONE SCHEDULE CHANGE ON PATIENTS UNDERGOING MAASTECTOMY**

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BACKGROUND

In October 2014, the Drug Enforcement Agency (DEA), in an effort to decrease the rate of prescription drug abuse and addiction, re-classified hydrocodone combination products (HCP's) from Schedule III to Schedule II. This change was meant to limit ready access to HCP's and prevents routine refills of HCP's.

OBJECTIVE

The impact of this change on breast surgery patients and breast surgeon practice patterns has not been studied. There was concern that this schedule change would increase hospital length of stay and potentially lead to increased refill rates of less potent alternatives that would have to be utilized. This is the first study to evaluate the impact of this schedule change on post-operative pain management in patients undergoing total mastectomy with expander based reconstruction.

METHODS

300 patients undergoing mastectomy with expander reconstruction at an academic medical center before and after the HCP schedule change were identified by retrospective review. Factors evaluated included demographics, discharge medications, use of epidurals, length of stay, refills of medications, use of anxiolytics/muscle relaxants, electronic and telephone messages sent by the patient regarding inadequate pain control, and outpatient change in pain medication. Patients were excluded if they had a history of chronic pain medication use, underwent complete axillary lymph node dissection, or were re-admitted for complications unrelated to pain control.

RESULTS

Sixty patients met final inclusion criteria, half prior to the schedule change (PSC) and half after the schedule change (ASC). No difference was noted between groups in regards to age, BMI, or receipt of neoadjuvant chemotherapy (Table 1). There was a significant reduction in the use of HCP's after the schedule change (<0.0001) with a transition to utilization of tramadol (20% PSC vs 50% ASC) and codeine containing agents (0% PSC vs 23% ASC). Length of stay, phone calls and electronic messages for pain control, as well as use of muscle relaxers was equivalent between groups. Epidurals were utilized in patients ASC, but not PSC. There was an increased need to change pain medications in the outpatient setting ASC, but this was not statistically significant

CONCLUSION

In patients undergoing mastectomy with expander placement, the change in schedule of HCP's significantly altered prescribing patterns, with increased utilization of alternatives containing codeine as well as tramadol. This change did not increase hospital length of stay or interactions with medical staff regarding inadequate pain medication as an outpatient, although there was a trend towards having to change pain medications ASC. The impact of this change on rates of opioid abuse and rates of serotonin syndrome due to increased use of tramadol is an area of future investigation.

PRESENTATION 85

**INTRA-OPERATIVE RADIOGRAPHIC MARGIN EVALUATION: A SINGLE INSTITUTION RETROSPECTIVE ANALYSIS OF THE RADIOGRAPHIC AND PATHOLOGIC CONCORDANCE OF INTRA-OPERATIVE MARGIN RE-EXCISION SPECIMENS**

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BACKGROUND

Background: In breast surgery for oncologic treatment, partial mastectomy generally requires pre-operative placement of a localizing wire/needle under radiologic guidance. In the operating room, the breast lesion and the localizing wire are removed and sent for a specimen radiograph. When the radiologist who placed the localization device views this specimen, a call is made to the surgeon who then is informed if the specimens' margins are radiographically clear. If the radiographic margins are too near the edge of the specimen, the surgeon can re-excise additional margins. This is done in an effort to reduce repeat surgical procedures when final pathological staging reveals positive margins that require further surgical intervention.

OBJECTIVE

Objective: The question that our study seeks to answer is how often these additional margins improve the oncologic outcome and how often they lead to excision of additional benign tissue at the time of surgery.

METHODS

Methods: This retrospective chart review will include 300 patients with non-invasive and invasive breast cancer treated with a partial mastectomy over the previous five years at a single institution. We will look into the concordance between radiographically positive re-excised margins and their pathological findings.

RESULTS

Results: Out of 74 total cases of partial mastectomies, there were 42 positive radiographic margins that were re-excised. Of the 42 re-excisions, 9 were pathologically positive for cancer. Our radiographic margins correlated with the pathological margins 21% of the time and were benign tissue in 79% of the re-excised specimens.

CONCLUSION

Conclusion: With our institution's data, it seems that we are taking unnecessary additional margins during our partial mastectomies 79% of the time. The result of which 4 out of 5 times confers no benefit to the patient, and potentially negatively affects the cosmetic results of our surgeries. With breast conservation being one of the benefits of a partial mastectomy, and new guidelines declaring no tumor on ink to be a negative margin, we need to continue to evaluate the role of radiographic margins in our operative decision-making. Further study is needed before final conclusions can be drawn but this data has the potential to impact future oncologic breast surgery at our institution and potentially improve radiographic margin accuracy in future specimen evaluations.

PRESENTATION 86

**ADDRESSING SURGICAL DISPARITIES BETWEEN A PUBLIC AND PRIVATE HOSPITAL: EQUALIZING THYROIDECTOMY OUTCOMES THROUGH A MULTIDISCIPLINARY PATHWAY**

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BACKGROUND

Surgical outcomes for underserved patients facing social and economic disparities are frequently suboptimal. Our institution developed a multidisciplinary endocrine surgical team with carefully implemented postoperative care pathways to aid in the care of disadvantaged patients at our county safety net hospital.

OBJECTIVE

The objective of this study is to compare surgical outcomes after thyroidectomy at our public hospital to outcomes at the private hospital in our institution. We hypothesized that our multidisciplinary patient-centered approach would largely eliminate disparities in postoperative outcomes.

METHODS

We performed a retrospective cohort study of 512 patients undergoing partial or total thyroidectomy at a private teaching hospital and a public safety net hospital within the same academic institution over 77 months from 1/2010 to 5/2016. The cases were performed by the same clinical team including surgery, endocrinology, anesthesiology and pathology. Temporary nerve injury was defined as injury that resolved within 6 months, temporary hypocalcemia was defined as immediate postoperative PTH 6 months post operatively.

RESULTS

A total of 358 patients from the public hospital and 154 patients from the private hospital were studied. 91% of patients at the public hospital were from racial/ethnic minorities compared with 42% of private hospital patients ($p<0.001$). 26% of patients at the public hospital were insured versus 100% at the private hospital ($p<0.001$). There were no significant differences in age, gender, cancer stage, or size of the thyroid gland. Rates of temporary nerve injury, permanent nerve injury, permanent hypoparathyroidism, postoperative hematoma or ER visits did not differ between groups (Table 1). Rates of temporary hypocalcemia at the public hospital (34.4%) were higher than at the private hospital (17.5%, $p=0.001$). We performed additional analyses stratified by type of insurance again finding rates of nerve injury, permanent hypoparathyroidism, postoperative hematoma or ER visits did not differ by type of insurance, but temporary hypocalcemia was more common in patients without insurance (38.5% vs 19.8%, $p<0.001$, Table 1).

CONCLUSION

A dedicated endocrine surgery team was able to deliver excellent outcomes for patients lacking insurance and being treated at a public safety net hospital. Our findings suggest that social and economic disadvantages can be largely overcome for endocrine surgery patients with a combination of dedicated surgical care, multidisciplinary team coordination and patient-centered care pathways.

PRESENTATION 87

**MASTECTOMY IN PATIENTS ELIGIBLE FOR BREAST CONSERVING THERAPY FOLLOWING NEOADJUVANT CHEMOTHERAPY**

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BACKGROUND

Breast conserving therapy (partial mastectomy followed by radiation; BCT) provides equivalent overall survival compared to mastectomy for breast cancer. However, there is a noticeable trend toward mastectomy following neoadjuvant chemotherapy (NAC), even in BCT-eligible patients.

OBJECTIVE

The aim of the study is to identify rates and influential factors in receipt of mastectomy in BCT-eligible patients having undergone NAC.

METHODS

Retrospective review of academic institutional tumor registries, belonging to private and county hospitals, identified patients who received NAC followed by surgery for breast cancer from 2001 to 2013. BCT-eligible patients were divided into 2 groups: 1) those who received BCT and 2) those who proceeded with mastectomy. The primary endpoint was receipt of mastectomy in BCT-eligible patients. Data regarding demographics, clinical presentation, tumor characteristics and treatment were collected and analyzed.

RESULTS

A total of 414 female patients underwent NAC followed by surgery. 215 patients were deemed eligible for BCT following completion of NAC. Of these, 145 underwent BCT (group 1) and 70 proceeded with mastectomy (group 2). The mean age at diagnosis was 49.7 ± 10.3 years. Univariate analysis demonstrated no statistically significant difference between study groups with regard to age, race, tumor location, stage, histology and receptor status. Analysis using a multivariable logistic regression model revealed insurance status to influence the type of definitive surgery received. When compared to the uninsured, county hospital patients, those with private insurance were more likely to receive mastectomy [57.1% vs 15.7%, p = .01; odds ratio (OR) = 2.7, 95% confidence interval (CI) 1.3-6.0]. Likewise, when compared to the uninsured, county hospital patients, those with Medicare or Medicaid were more likely to receive mastectomy (27.1% vs 15.7%, p = .04; OR = 2.5, 95% CI 1.0-6.0).

CONCLUSION

Insurance status influenced the receipt of mastectomy over BCT in BCT-eligible patients following NAC. Given the lack of survival benefit of mastectomy in BCT-eligible patients, further studies evaluating surgical decision making are warranted.

PRESENTATION 88

**MALIGNANCY RATE OF BREAST RADIAL SCARS IN AN INNER-CITY HOSPITAL: A 15-YEAR EXPERIENCE**

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BACKGROUND

A pathological diagnosis of a breast radial scar has been associated with a risk of malignant degeneration. Surgical excision has been routinely recommended but recent studies have suggested this may not be necessary.

OBJECTIVE

Our study intended to quantify the malignancy rate on final pathology following a core needle biopsy diagnosis of a radial scar at our institution in a high-risk population.

METHODS

A retrospective review of a prospectively maintained breast surgical database in an inner city hospital was queried for all patients referred to breast surgery clinic with a pathological diagnosis of a radial scar from 2000 to 2015. Exclusion criteria included a history of a BRCA mutation, concurrent breast cancer. Demographic, diagnostic and clinical data were extracted and analyzed using summary statistics.

RESULTS

Fifty-seven patients met criteria. The median age was 51 years old and all were women. Twenty-seven went on to have surgical excision. The malignancy rate among all radial scars surgically excised was 7.4%(2/27). Among cases with concurrent cellular atypia the malignancy rate was 11.1%(1/9) and 5.6%(1/18) among cases without concurrent cellular atypia. No clinical or imaging characteristics were predictive of malignancy. On follow up (median 30.6 months), two patients who did not undergo surgical excision of the radial scar were diagnosed with invasive breast cancer; one was ipsilateral and the other contralateral from the breast found to have a radial scar. No clinical or imaging characteristics were predictive of malignancy.

CONCLUSION

Radial scars with and without concurrent cellular atypia found on core biopsy are associated with malignancy and surgical excision should be recommended. Larger studies are needed to identify imaging and clinical predictors of malignancy on final pathology.

PRESENTATION 89

**IMPLEMENTATION OF FINDINGS OF ACOSOG Z1071 INTO CLINICAL PRACTICE FOR BREAST CANCER PATIENTS (T0-4, N1-2) UNDERGOING NEOADJUVANT CHEMOTHERAPY**

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BACKGROUND

It has been widely recognized that it often takes many years for the results of clinical trials to be incorporated into clinical practice. ACOSOG Z1071 assessed the feasibility and false negative rate of sentinel lymph node biopsy (SLNB) performed after neoadjuvant chemotherapy (NAC) in patients presenting with clinical T0-4, N1-2 breast cancer. The false negative rate (FNR) was reported to be 12.6% overall. However, the FNR was further reduced to < 10.8% if dual-tracer technique was used and 3 or more sentinel lymph nodes were examined.

OBJECTIVE

Our aim is to analyze how ACOSOG Z1071 findings influenced our clinical practice and whether surgeons followed appropriate techniques.

METHODS

A retrospective review of institutional tumor registries identified 140 female patients who had T0-4 and N1-2 breast cancer and underwent NAC prior to definitive surgical management from May 2013 to September 2016. Data collected included: demographics; attending surgeon; clinical presentation including tumor location, histology, receptors and clinical stage at diagnosis; radiographic studies performed; type of NAC; type of breast and axillary surgery performed; technical aspects SLNB and final pathologic features, including retrieval of a clipped axillary lymph node, the finding of biopsy site change and final pathologic stage. Patients were determined to be eligible for SLNB based on the criteria of ACOSOG Z1071. The primary endpoint was compliance with offering eligible patients SLNB. Secondary endpoints included analyses of the SLNB technique and methods employed in order to reduce the FNR of the procedure. Kruskal-Wallis and Fischer's Exact tests were performed.

RESULTS

Of 140 patients identified, 127 were deemed eligible for SLNB. Compliance in offering eligible patients SLNB increased rapidly over time. This increase in rate of adoption of Z1071 was statistically significant when analyzed by half-year increments and as a function of continuous time ($p= 0.0003$). Statistically significant differences in implementation of Z1071 approach existed among surgeons ($p<0.0001$) as well as between University and County hospital facilities ($p<0.0001$). Of 86 patients undergoing SLNB, appropriate technique for minimizing FNR was performed in 94.2%. Positive axillary lymph nodes were clipped in 39.5% of patients undergoing SLNB. Of these, retrieval was confirmed in 73.5%.

CONCLUSION

Implementation of the findings of clinical trial ACOSOG Z1071 into clinical practice increased rapidly in the first two years following presentation, achieving a high rate of acceptance. There appear to be factors influencing surgeon decision-making that warrant further study. Surgeons have been careful to use the recommended SLNB techniques shown by Z1071 to reduce the FNR. Many have taken additional intra-operative steps to further reduce FNR. Further study to assess methods for minimizing false negative SLNB results, such as clip placement at nodal biopsy or preoperative localization of known positive nodes, is needed.

PRESENTATION 90

**INTERNAL MAMMARY LYMPH NODE BIOPSY DURING FREE FLAP BREAST RECONSTRUCTION: ACCURATE ONCOLOGIC STAGING LEADS TO CHANGE IN ADJUVANT THERAPIES**

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BACKGROUND

Accurate breast cancer staging, including nodal status, is essential for optimal management of adjuvant therapies leading to improved disease-specific and overall survival. Lymphatic drainage of the breast is known to involve both axillary and internal mammary (IM) lymph node basins. While IM nodal metastases represent advanced cancer stage, sampling is not routinely advocated due to relative lack of accessibility and the assumption that IM node positivity rarely alters adjuvant therapies.

OBJECTIVE

The current study analyzes the incidence of IM nodal metastases sampled during routine IM vessel exposure for free flap breast reconstruction and changes in adjuvant treatment.

METHODS

A retrospective analysis of patients with positive IM lymph node biopsies at the time of free flap breast reconstruction following mastectomy between September 2008 and December 2015 was performed. Patients undergoing reconstruction following prophylactic mastectomy and reconstruction where IM vessels were not exposed (thoracodorsal vessels used for anastomosis) were excluded. Incidence of neoadjuvant therapies, previous lumpectomy with axillary lymph node sampling, pre-operative imaging, and location of malignancies were recorded. Tumor size, axillary lymph node status, and prognostic factors were obtained from final pathologic analysis. Change in adjuvant therapies (chemotherapy or external beam radiation) based solely on IM lymph node positivity was calculated.

RESULTS

During the study period, 2057 patients underwent free flap breast reconstruction following mastectomy using IM recipient vessels. Twenty eight (1.3%) patients were found to have IM lymph node metastases. Mean age of patients with positive IM metastases was 49 years with 13 (46%) patients undergoing reconstruction in the immediate setting, while 15 (54%) patients undergoing reconstruction in a delayed fashion. Pre-reconstruction chemotherapy or external beam radiation was administered in 50% or 54% of cases, respectively. Five (18%) patients had previously undergone lumpectomy with axillary sampling prior to mastectomy and reconstruction for cancer recurrence. Eighteen (64%) patients had pre-operative MRI, out of those, only 2 had finding suggestive of IM metastases. Mean breast tumor size was 3.7 cm (range 0.4 to 10 cm). While 5 (18.5%) patients contained multicentric disease, the upper outer quadrant represented the most common (29.6%) individual tumor site. Ten (37%) patients had isolated IM lymph node metastases with negative axillary nodal disease. Ultimately, 17 (63%) patients had a change in their adjuvant therapy (additional chemotherapy or IM radiation therapy) based on positive IM lymph nodal disease.

CONCLUSION

Despite the low overall incidence of IM lymph node metastases, IM lymph node biopsy at the time of free flap breast reconstruction is recommended. In 37% of cases, nodal metastases were isolated to the IM nodes. Interestingly, a significant percentage (18%) of patients had previously undergone lumpectomy and axillary sampling. Identification of IM metastases significantly influenced adjuvant therapies in a majority of cases.