FEBRUARY 29-MARCH 2

STCAM 2024

south texas chapter annual meeting

South Texas *Chapter*

ACS Chapters American College of Surgeons

PODIUM ABSTRACTS

Incidence of Pancreaticobiliary Junction Malunion Identified by Routine Intraoperative Cholangiogram in Pediatric Patients

S Farsi, JK Howe, SK Walker
Texas Tech University HSC - El Paso

Background: Pancreaticobiliary junction malunion (PBJM) and choledochal cysts (CC) are anomalies that have been associated with an elevated susceptibility to subsequent biliary tract malignancies in later stages of life. Some surgeons perform routine intraoperative cholangiogram (IOC) to confirm anatomy and rule out the presence of choledocholithiasis during laparoscopic cholecystectomy. By unveiling the existence of PBJM and CC during cholecystectomy in pediatric patients, subsequent investigation and management can be initiated to avert potential complications.

Objective: Our objective was to review our single institution's use of intraoperative cholangiogram during pediatric laparoscopic cholecystectomy and the detection of PBJM and choledochal cyst.

Methods: After IRB approval, a comprehensive retrospective analysis of patients who underwent laparoscopic cholecystectomy in a single children's hospital located on the US-Mexico border was performed. The study cohort comprised 409 patients aged between 1 and 18 years, covering the period from January 2015 to September 2022. Those with IOC performed were divided into those with normal IOC or those with IOC demonstrating PBJM or CC. Statistical analysis was performed using chi-squared analysis for categorical variables and independent sample t-tests for the continuous variables.

Results: A total of 198 IOC were performed accounting for 48% of cholecystectomies. Among these, 14 cases (7%) exhibited the presence of PBJM or CC. Statistical analysis revealed there was no significant difference in terms of sex and ethnicity between patients with and without PBJM or CC. However, noteworthy differences were observed in the age distribution, with patients manifesting PBJM or CC being notably younger (11.36 years vs 14.53 years) in comparison to those with normal anatomical configurations ($P < .001$). Several of the cases identified with PBJM or CC underwent additional surgical interventions to correct the anatomical anomaly, reducing the potential risk of future malignancies within the biliary tract.

Conclusion: Although the occurrence of PBJM and CC remain relatively infrequent, the potential consequences of such anomalies leading to subsequent biliary tract malignancies underscore their clinical significance. The use of routine IOC emerges as a crucial tool for promptly identifying these anatomical deviations, potentially decreasing the risk of subsequent biliary tract malignancies. This study represents the significant role of routine IOC and its profound implications in reducing biliary tract complications within the pediatric population. This seems especially important in patients who present with gallbladder pathology at younger ages. By facilitating the early detection of PBJM and choledochal cysts, as well as enabling the swift implementation of preemptive measures, this practice holds the potential to significantly mitigate future complications.

Graph on next page

	Normal IOC (n = 184)	PBJM/CC Positive (n = 14)	*P value*
Age			
Mean	14.53	11.36	<.001**
Sex			
Female	133	10	.945
Race			
Asian	1	0	.025*
Black	1	0	
White	165	9	
Other	17	5	
Ethnicity			
Hispanic	173	12	.226
Non-Hispanic	11	2	
Emergent	52	4	.980
Insurance type			
Medicaid	116	10	.108
Commercial	46	1	
Other	17	3	
Self-Pay	5	0	

IOC: Intraoperative Cholangiogram, PBJM: Pancreatobiliary Junction Malunion , CC: Choledochal Cyst

*P-value $\leq$ 0.05

**P-value $\leq$ 0.001

President Session | Abstract | Trauma/Burn/Critical Care

Ultrasound-Guided Continuous Coagulation Monitoring for ECMO

E Gilliam, H Brown, R Righetti, J Teruya, H Pryor
Baylor College of Medicine

Background: Extracorporeal membranous oxygenation (ECMO) is a system that allows us to provide cardiac and respiratory support for critically ill patients. Anticoagulation is often administered to prevent blood clots from forming in the circuit, making anticoagulation monitoring essential. This is usually done through serial blood tests at regular intervals; however, continuous monitoring may be possible with ultrasonography.

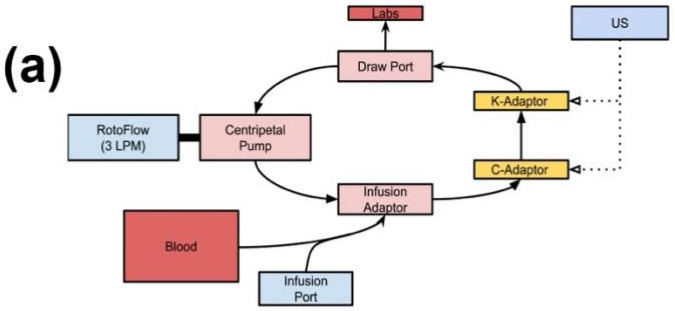
Objective: To test if ultrasonography will reliably detect clot formation in a mock ECMO circuit

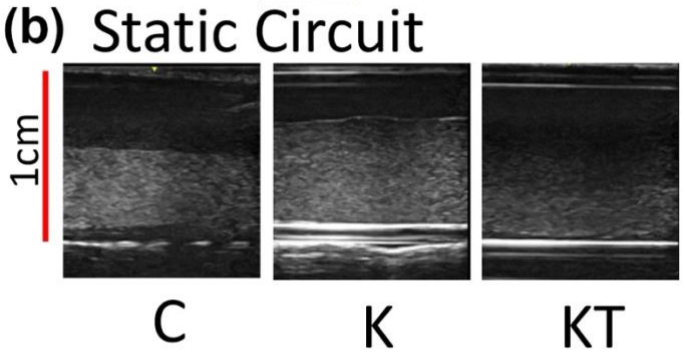
Methods: We constructed a test ECMO circuit that included a pump, infusion/extraction ports, and our test adaptors (Fig a). The test conditions for the adaptors included no coating (C), kaolin (K), and kaolin plus thrombin (KT). All of the adaptors had been filed to create a gouge in the bottom to allow a place for the coating to dry. A high frequency 12L-RS Venus Ultrasound Probe was used to obtain serial images. We ran the circuit with human whole blood at 3 liters per minute (LPM) and took serial ultrasound images and videos along with blood samples from the circuit for anticoagulation testing. A 0.5M CaCl correction was added to account for the citrate present in the whole blood. After baseline labs were collected, 1mg of thrombin was injected into the circuit in ~15 minute intervals and was allowed to circulate for a minimum of 2 minutes before repeat labs and imaging were taken.

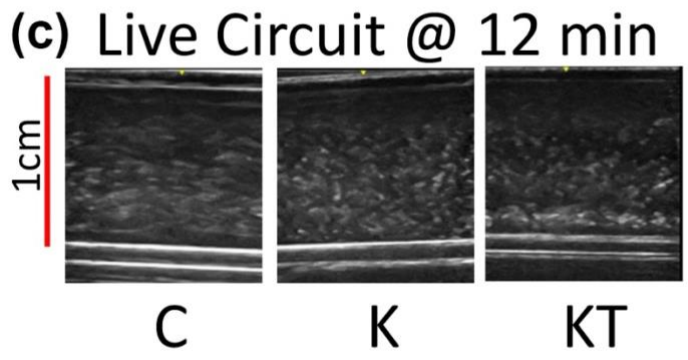
Results: Despite multiple doses of thrombin, our initial run did not show any evidence of clot formation on either ultrasound or coagulation studies. Although the aPTT decreased, the D-dimer remained stable and no concrete evidence of clot formation was seen on ultrasound. Results from a static circuit built with no pump demonstrated robust clot formation in the K adaptor when compared with the C and KT adaptors (Fig b). After correcting for the citrate component in the whole blood, we successfully induced clot formation in the running circuit in the K adaptor but not the C or KT adaptor (Fig c-d). The KT adaptor was omitted in subsequent runs.

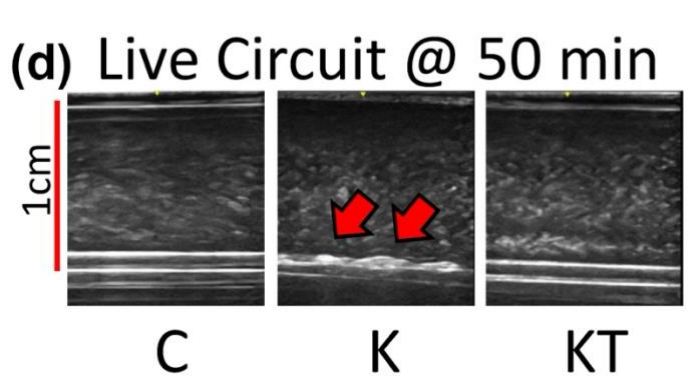
Conclusion: We successfully constructed a mock ECMO circuit with multiple test conditions to evalute clot formation. Interestingly, the KT test condition did not appear to generate significant clot in either the active pump or static circuit conditions. The K test condition did show evidence of clot formation over time after a CaCl correction for citrate and serial thrombin injections.

Graph on next page


(a)
Labs
US
Draw Port
K-Adaptor
RotoFlow
(3 LPM)
Centripetal
Pump
C-Adaptor
Infusion
Adaptor
Blood
Infusion
Port


(b) Static Circuit
1cm
C
K
KT


(c) Live Circuit @ 12 min
1cm
C
K
KT


(d) Live Circuit @ 50 min
1cm
C
K
KT

Structural Racism, Residential Segregation, and Exposure to Trauma: The Persistent Impact of Redlining

J Bradford, M Eldin, S Golestani, T Cardenas, M Trust, M Mery, J Aydelotte, P Teixeira, J DuBose, LH Brown, M Bach, M Robert, S Ali, D Salvo, CVR Brown
University of Texas at Austin Dell

Objective: The aim of this study was to assess the association of historical redlining within a southern US city to spatial patterns of penetrating traumatic injury.

Methods: Retrospectively collected data from violent penetrating trauma admissions between January 1, 2014 – December 31, 2021, at the single Level 1 trauma center in a southern US city were utilized for analysis. Using ArcGIS, addresses where the injury took place were geocoded and spatial joining was used to match them to their corresponding census tract, for which 1935 HOLC financial designations are classified as: “Hazardous”, “Definitely Declining”, “Still Desirable” or “Best”. Tracts with financial designations of “Hazardous” and “Definitely Declining” were categorized as redlined. The incidence rate ratio comparing rates of penetrating trauma among historically redlined vs. non-redlined census tracts was calculated

Results: 1,404 violent penetrating trauma admissions were identified for the study period, of which 226 occurred within the geographic boundary of the 1935 HOLC map and had valid location data for geospatial analysis. Among these, 58% occurred in historically redlined census tracts. The incident rate per 100,000 person years in redlined areas was 31.7 compared with 10.9 in non-redlined census tracts (IRR=2.9, 2.2-3.8, p<0.001).

Conclusion: Neighborhoods subjected to discriminatory redlining practices in 1935 continue to experience an almost 3-times higher incidence rate of violent penetrating trauma today. These results underscore the persistent impacts of structural racism and of historical residential segregation policies on exposure to trauma, and the need to address the social determinants of health to eliminate health disparities.

Table 1: Census Tract Demographics, 2020 American Community Survey Data 5-year Estimates

	HOLC A/B N=33	HOLC C/D N=17	No HOLC Grade N=239	P-Value
Total Population	132,096	55,025	1,063,763	
% White Non-Hispanic/Latino (mean ± SD)	66 ± 17	58 ± 16	47 ± 23	0.03
% Black Non-Hispanic/Latino (mean ± SD)	4.1 ± 6	10 ± 11	8 ± 8	0.01
% Any Race Hispanic/Latino (mean ± SD)	19 ± 10	25 ± 11	35 ± 22	<0.001
% Labor Force Unemployed (mean ± SD)	2.9 ± 2	2.7 ± 2	3.2 ± 3	0.66
% Uninsured (mean ± SD)	10 ± 10	10 ± 5	13 ± 10	0.049
% With public insurance (mean ± SD)	14 ± 9	20 ± 11	23 ± 11	<0.001
Mean Household Income in 1,000 dollars (mean ± SD)	112 ± 64	123 ± 41	112 ± 54	0.71
% Households <$50,000 Annual Income (mean ± SD)	41 ± 24	30 ± 13	30 ± 16	0.004

Analysing the Utility of Propranolol in Adults with Severe Burns

J DeJesus, E Ewing, G Golovko, G Radhakrishnan, R Radhakrishnan
University of Texas Medical Branch - Galveston

Background: Approximately 20,000 severe burns involving at least 20% total body surface (TBSA) area occur in the US annually. Patients with severe burns develop a prolonged hypermetabolic response which can have detrimental effects on multiple organ systems leading to increased muscle catabolism, increased cardiovascular demand, and decreased wound healing. Propranolol, a non-specific beta blocker - has been found to attenuate the hypermetabolic response and mitigate adverse outcomes in children. However, the outcome benefits of beta blockers in adults with severe burns is not well understood.

Objective: The aim of this study was to examine the utility of propranolol in adult patients with severe burns. Primary outcomes of interest were mortality, sepsis, skin graft loss, and protein malnutrition. Secondary outcomes were adverse effects related to propranolol administration including bradycardia, bronchospasm, and hypoglycemia.

Methods: We performed a retrospective cohort study between April 1, 2003 and April 1, 2023 evaluating the effect of beta blocker use on outcomes in adults with severe burn injury using an internationally federated data research network – TriNetX. This database collects and distributes deidentified electronic health record data collected in a manner compliant with Health Insurance Portability and Accountability Act (HIPPA) and regional data use policies. This study was IRB exempt given the deidentified nature of the data analyzed. A cohort of adults (>18 years old) with the following inclusion criteria was created: >20% TBSA burn, received propranolol within 3 days of admission, no history of cardiovascular disease or hypertension, and no beta blocker or calcium channel blocker use before hospitalization. Cohort was then divided into 20%, 30%, 40%, and 50%+ TBSA groups. Controls for each TBSA group were created, comprising adult patients who had not received propranolol within 3 days of injury was. Groups were propensity score matched by age, gender, race, and ethnicity. Outcomes were assessed at 7 days, 14 days, and 30 days after injury.

Results: A total of 961 patients met inclusion criteria. 79% (759) were male and average age at index was 39 + 19.8. 65% (625) patients were white, 18.6% (178) were black, 4.2% (40) were Asian, and 12.3% (118) were other. Propranolol use did not increase odds for adverse bradycardia or bronchospasm during the first 30 days of use in patients with 30% (OR 0.57, CI 0.26-1.257, p=0.15), 40% (OR 1.022, CI p= 0.96), and 50+% TBSA (OR 1.017, CI 0.408-2.535, p=0.970). Odds of mortality in the first 7 days after injury was reduced in the 50%+ TBSA group who received propranolol (OR 0.38, CI 0.18,0.81, p=0.01). Odds of sepsis 2 weeks (OR=0.41, CI 0.211,0.832, p=0.01) to 1 month (OR 0.54, CI 0.302,0.981, p=0.04) after injury was reduced for the 30% TBSA group who received propranolol.

Conclusion: Propranolol use in adults with severe burns may improve sepsis and mortality outcomes in select groups in the first 30 days after injury without increasing adverse effects.

Introduction/Objective:

Predicting the Odds of Adverse Events in Patients Undergoing Elective Thoracoabdominal Aortic Aneurysm Repair.

Kyle W. Blackburn, Susan Y. Green, Marc R. Moon, Joseph S. Coselli
Baylor College of Medicine

Background: Undergoing elective thoracoabdominal aortic aneurysm repair (TAAAR) involves weighing the potential of delay for an aneurysm rupture with possible surgical complications. Patient counseling requires accurately assessing patient-level risk for TAAARs.

Objective: We built a model to predict adverse events in patients after elective TAAAR.

Methods: We retrospectively analyzed outcomes after 2847 TAAARs performed between 1986-2023. Adverse events included operative death or persistent (present at discharge or time of death) stroke, paraplegia/paraparesis, or renal failure necessitating dialysis. A subacute dissection was considered a dissection within 60-days of the operation. We leveraged a multivariable logistic regression model using variables available preoperatively. The predictive effectiveness of this model was evaluated using a 1000 iteration 80:20 cross validation scheme to identify a training and test AUC. This model was converted to a nomogram.

Results: Of 2847 TAAARs, 380 (13.3%) patients experienced an adverse event: 200 operative mortalities (7.0%), 73 persistent strokes (2.6%), 69 (2.4%) and 55 (1.9%) persistent paraplegias or parapareses respectively, and 163 (5.7%) persistent renal failures. The final model included 7 variables: age (OR=1.03, P<0.001), subacute dissection (3.12, <0.001), maximum distal aortic diameter ≥6.5 cm (1.09, 0.03), diabetes (1.68, 0.03), chronic kidney disease (1.81, 0.005), peripheral vascular disease (1.43, <0.001), and Crawford extent I (0.64, 0.01), II (1.60, 0.002), and IV (0.44, <0.001). The training and test AUCs respectively were 0.69 (95% CI: 0.65, 0.73) and 0.68 (0.59, 0.76). The nomogram is presented (Figure).

Conclusion: This study developed an effective model for predicting adverse events. This model was then converted to an intuitive nomogram for patient counseling.

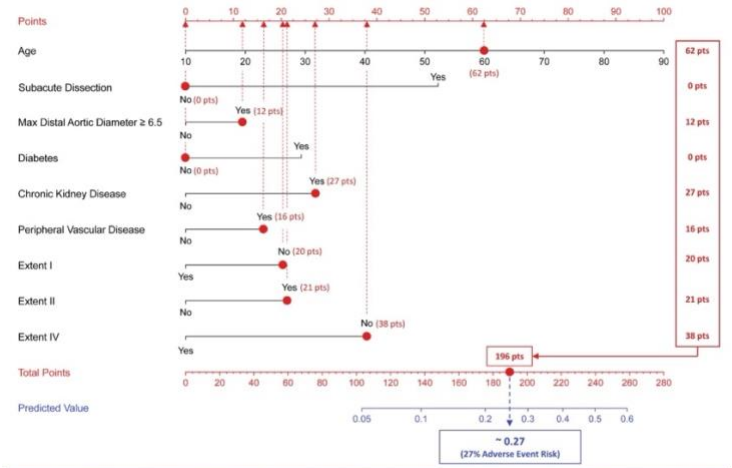


Figure 1. The figure above shows the nomogram for the predictive multiple logistic regression model. For each predictor, the number of points that that predictor contributes can be determined by the corresponding point count on the top line. The sum of these points are then mapped onto the "Total Points" line, and the corresponding location on the "Predicted Value" line corresponds to the predicted risk of an adverse event. For example, a 60-year-old patient (62 pts) with a maximum distal aortic diameter of ≥6.5 cm (12 pts), chronic kidney disease (27 pts), and peripheral vascular disease (16 pts) receiving an extent II repair (21 pts + 20 pts for not receiving an Extent I + 28 pts for not receiving an Extent IV). This produces a total score of 196 pts, which corresponds to an approximate risk of an adverse event of 27%.

An Exploratory Analysis of Traumatic Abdominal Aortic Injuries-- Results From the American Association for the Surgery of Trauma (Aast) Vascular Trauma Registry: The Prospective Observational Vascular Injury Trial (PROOVIT)

J Crapps, J Efird, M Bach, J DuBose, P Teixeira, C Brown, D Feliciano
University of Texas at Austin Dell

Background: Historical surveys of traumatic injuries to the abdominal aorta have described a preponderance of penetrating injuries and a mortality of 65-92%. With improved imaging availability, a shift has occurred in the epidemiology of these uncommon injuries with improved survival.

Objective: A contemporary analysis of abdominal aortic injuries is needed to guide current understanding and management of these injuries.

Methods: The AAST Vascular Trauma Registry: PROOVIT was used to describe patients with an abdominal aortic injury surviving to the hospital. Data included demographics, vital signs, mechanism of injury, injury characteristics, AIS, ISS and mortality.

Results: From 2013 to 2022, 5463 total vascular injuries were submitted to the PROOVIT registry with 102 (1.9%) injuries to the abdominal aorta. Blunt mechanisms accounted for 70.6%, (72/102) of injuries. The overall mortality rate was 16.7%, [penetrating 37.9% (11/29); blunt 8.2% (6/73)]. In patients who underwent injury repair [44.1% (45/102)], open repair was most commonly utilized [24.5% (25/102)] with 31.4% (32/102) diagnosed at the time of emergent abdominal exploration. In patients whose injuries were diagnosed with imaging, management included nonoperative in 68.7% (46/67) with a mortality rate of 6.5% (3/46); open repair in 9.0% (6/67), with a mortality rate 16.7% (1/6); and endovascular repair in 23.9% (16/67) with a mortality rate of 0% (0/16).

Conclusion: Injuries to the abdominal aorta in patients who survive to reach the hospital are most commonly from blunt trauma. CT imaging allows for the diagnosis of intimal and/or partial wall injuries amenable to observation or endovascular stenting and explains the significant improvements in survival.

Introduction/Objective:

Discussion:

Conclusion:

Case Presentation:

Reimagining Surgical Education: A Comparative Study of Pre-COVID and Post-COVID Cadaver Lab Layouts in General Surgery Residency

S Farhat, A De la Fuente Hagopian, B Benavides, F Amirkhosravi, S Martinez, E Chan, K McDonald, A Echo, N Tariq
Houston Methodist Hospital

Background: The COVID-19 pandemic prompted a reevaluation of the traditional cadaver lab (CL) layout. The traditional CL involved mixed-level groups of 3-4 general surgery residents working on preselected procedures and supervised by an attending physician overseeing multiple stations. In contrast, the new layout consisted of a survey to pair residents according to procedure preferences and PGY level, featuring smaller groups of residents rotating in and out to enable the cadaver to be used by more groups on the same day.

Objective: This study explores the cost/effectiveness of pre and post-COVID CL layouts, residents perception and whether primary instruction time can be maintained.

Methods: To determine cost/effectiveness of pre and post-covid CL layouts, we compared the number and cost per resident per academic year and their hands-on surgical time. A survey was distributed to 12 PGY4/PGY5 residents who had experienced both layouts to evaluate their preferences, engagement, participation, perceived hands-on activity, and confidence level.

Results: The results comparing the PreCOVID and PostCOVID layouts are represented in Table1. Cost of CL decreased by 47% while maintaining similar time as primary surgeon. Ten PGY4/5 residents completed the survey showing preference for post-COVID layout (80%), average degree of resident engagement score of 9/10, higher participation (80%), perceived amount of surgical time (80%), satisfaction (90%), and confidence (80%).

Conclusion: PostCOVID CL layout, with its cost/effectiveness, emphasis on personalized resident preferences, smaller groups with more efficient utilization of the CL is favored by most general surgery residents at our institution, which demonstrates the potential for enhancing training experiences while decreasing cost.

Table 1 Pre-COVID and Post-COVID cadaver labs layouts.

	Pre-covid	Post-COVID
Number of labs/AY	4	3
Number of stations/lab	3	2 x 3 rotating sessions
Number of cadavers	3-4	2
Number of attendings/station	0.25	0.5
Number of residents/station	4	2
Average annual expense for all labs (USD)	32606	12907.33
Average price per lab (USD)	8151.15	4302.44
Average price per resident/lab (USD)	679.25	358.15
Time spent in lab by resident per lab (hours)	6	3
Hands-on time per resident per lab per year (hours)	2	2

Race and Ethnicity are Associated with Social Determinants of Health and Outcomes in Trauma Patients

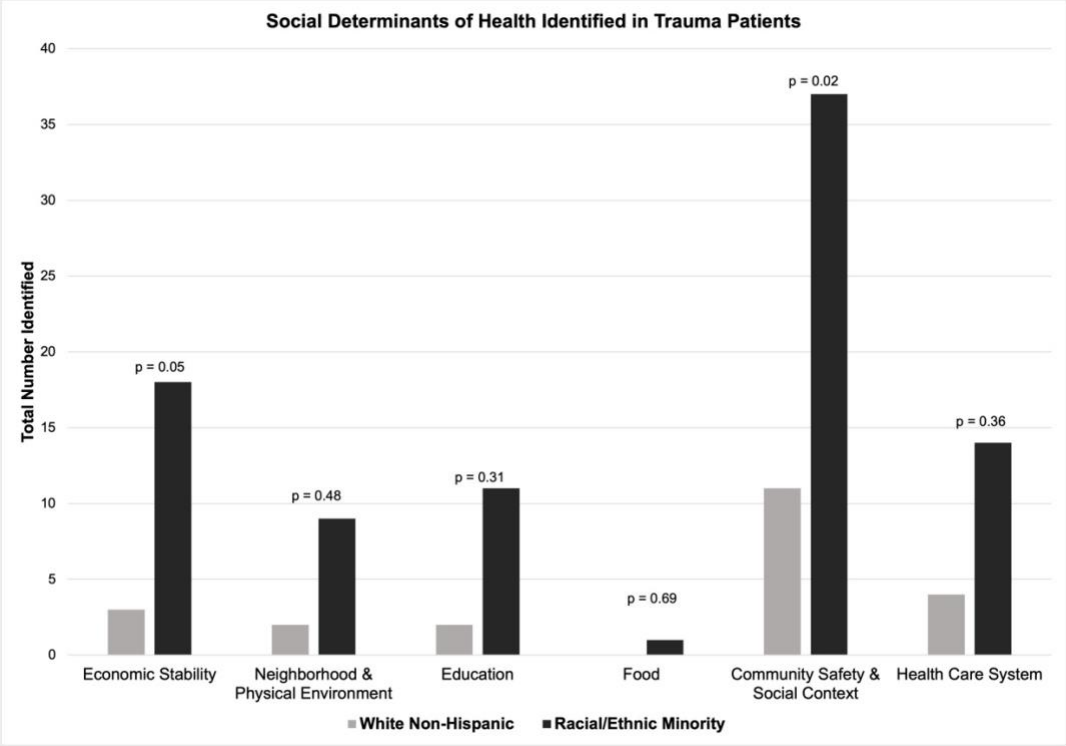
B Du Cruz, T Cardenas, J Efird, J DuBose, P Teixeira, S Ali, M Roberts, C Brown
University of Texas at Austin Dell

Objective: We aimed to analyze the relationship between race/ethnicity and associated social determinants of health of trauma patients presented at M&M conference.

Methods: In this single-center retrospective study, we identified all trauma patients who had a complication and were presented at weekly M&M between July 2021 - July 2023. Race/ethnicity and all applicable SDH were collected for each patient. White, non-Hispanic (WNH) patients were compared to racial and ethnic minorities (REM) regarding differences in SDH.

Results: Over two years, 65 trauma patients were presented at M&M. 43 (66%) were identified as a REM, 19 (29%) were WNH, and 3 (5%) were unknown. Most patients (91%) had at least one SDH identified. The most common category of SDH was community safety and social context (77%), followed by economic stability (34%), health care system (29%), education (22%), neighborhood and physical environment (17%), and food (2%). REM patients were more likely to have at least one SDH identified (98% vs. 74%, p=0.01) and had an increased number of individual SDH (4.2 vs. 1.8, p=0.02).

Conclusion: Most trauma patients who suffer complications have an associated SDH that may impact their outcome. Being of a racial or ethnic minority group is associated with a significant increase in the number of total determinants associated.



Surgical Ed Session | Abstract | Surgical Education

Empowering Future Surgeons: A Surgical Simulation Course for Medical Students

S Hakam, P Gupta, R Wu, B Benavides, A Dhala, N Sears, N Tapia, S Martinez
Texas A&m University School of Medicine EnMed

Objective: We hypothesized that this unique experience would serve as a catalyst for surgical innovation, jumpstarting students' familiarity and understanding of various surgical specialties.

Methods: The four-week course was comprised of comprehensive didactic sessions from general surgery, orthopedic and transplant surgery, neurosurgery, and urology faculty. The surgeons discussed specialty-specific procedures, innovations, and anticipated future clinical needs in their field. In addition to training with basic surgical instruments, the course also included hands-on sessions with state-of-the-art surgical simulation equipment. Students then shadowed surgeons in their surgical specialty of interest to engage and learn technological needs in order to conceptualize prototype solutions.

Results: A total of 32 students participated in the course. Following simulation exposure and surgeon shadowing, 9 different innovation projects were presented, and the preliminary concepts were evaluated based on defined innovation criteria. Of those 9 concepts, 6 have progressed to further research and development. Following course completion, 100% of participants recommended the elective for future students. Written feedback was constructive, with recommendations for future iterations of this elective.

Conclusion: Early instruction and exposure to surgical simulation provides medical students with a unique opportunity to develop foundational technological knowledge in a variety of surgical fields. This focused experience, including access to faculty surgeon mentors, provided students with unique opportunities for innovation and prototype development.

Adversity Narratives in General Surgery Residency Applicants' Personal Statements

V Guloyan, A Tucker, A Atkinson, D Dent, J Kempenich, R Willis
University of Texas Medical Center - San Antonio

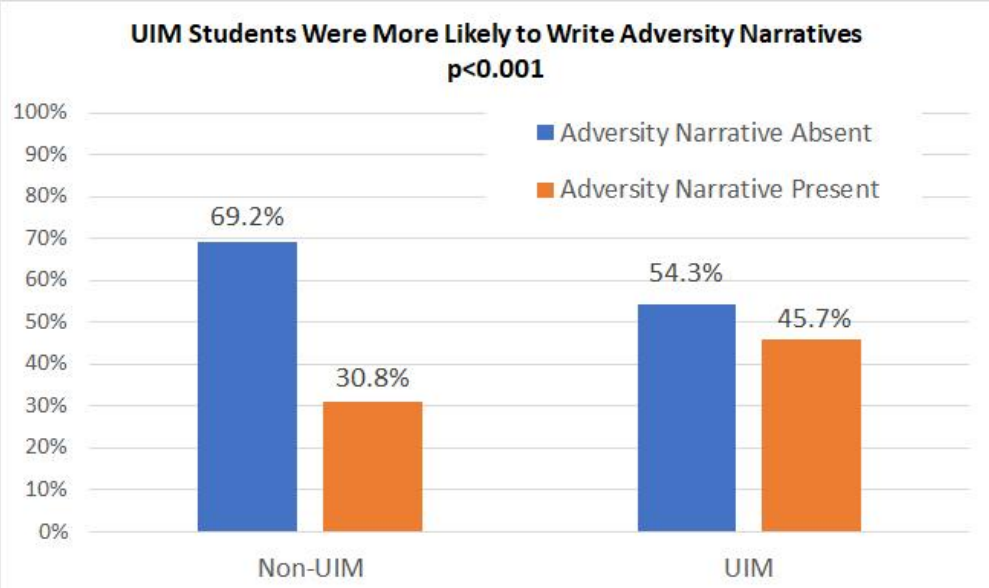
Background: In the 2022 survey of Association of Program Directors in Surgery, 84% of respondents listed the personal statement as an important factor in deciding who gets an interview and 75% considered it important that the applicant had overcome obstacles. There are anecdotal reports of the rise of the “trauma essay” in college applications.

Objective: Our aim was to evaluate the prevalence of adversity narratives in General Surgery residency application personal statements and whether adversity narratives were more common in certain groups.

Methods: Personal statements submitted during the 2019 interview season were reviewed by 2 reviewers after an iterative process was performed to ensure sufficient agreement (88%). Nine adversity themes were identified: Relationship and family, academic, financial, community, cultural, personal illness, mistreatment, maladaptive behavior, and mental illness. Applicant demographic data were collected from the Electronic Residency Application Service (ERAS). Underrepresented in Medicine (UIM) was assigned based on the AAMC definition, 2022 Physician Specialty Data Report, and 2022 US Census data.

Results: We reviewed 1036 personal statements. 352 (34%) statements had adversity narratives. UIM individuals were more likely to write adversity narratives (p<.001, Figure). UIM individuals were more likely to have relationship and family (p=.026), financial (p=.003), community violence (p=.014), and cultural (p<.001) adversity narratives. Gender, medical degree type, citizenship, and medical school country did not differ in terms of presence of adversity narratives. Applicants from US medical schools were more likely to write academic adversity narratives (p=.001).

Conclusion: UIM students may feel undue pressure to disclose adversity in their residency applications.



Mini-Talk Session | Case Review | Breast

A Case of High Grade Metastatic Encapsulated Papillary Carcinoma and a Look at Current Treatment Guidelines

University of Texas Medical Center - San Antonio

Introduction/Objective: Encapsulated papillary carcinoma (EPC) is a well-documented breast malignancy - described as non-invasive carcinoma with an indolent clinical course. Most EPC pathology demonstrates low grade tumors, with rare findings of metastases. EPC currently accounts for 1-2% of breast cancers and is distinguished by its fibrovascular core, covered with epithelium with or without a myoepithelial layer.

Discussion: Despite EPC being well-recognized, current management remains controversial. Most commonly, it is treated and managed as in situ disease. This unusually invasive type of cancer should be treated and managed similarly to invasive ductal carcinoma in high grade cases.

Conclusion: High grade encapsulated papillary carcinoma is a rare member of the indolent papillary breast cancer family.The current management standard of treating EPC as in situ disease may not be comprehensive; algorithms revision should be considered for high grade EPC to minimize risk of recurrence and ensure comprehensive treatment.

Case Presentation: We present a case of a 64-year-old female who initially presented with a painless left breast mass with core needle biopsy demonstrating DCIS involving a papillary lesion. On excision, surgical pathology was significant for upstaging to invasive ductal carcinoma (ER/PR/Her2+) in a background of EPC. Over the following months, the patient developed increased pain, swelling, and an episode of superficial thrombophlebitis which progressed to development of a firm superficial mass. An excisional biopsy of this mass and its feeding vein was performed. Pathology revealed high grade multifocal EPC with small and large vessel lympho-vascular invasion with axillary nodal metastasis necessitating an axillary dissection.

Mini-Talk Session | Case Review | Critical Care

Achy, Breaky Heart: A Case of Bone Cement Implantation Syndrome

University of Texas HSC - Houston

Introduction/Objective: Bone Cement Implantation Syndrome (BCIS) causes perioperative morbidity and mortality in 20-40% of patients undergoing hip hemiarthroplasty, and 75% of those in cancer patients. Symptoms range from transient hypoxia to fulminant right heart failure and death. We discuss treatment of a severe case of BCIS and review its perioperative morbidity and mortality.

Discussion: BCIS has a wide spectrum of severity occurring immediately after cement injection, prosthesis insertion, reduction of the joint or limb tourniquet deflation. Although its pathophysiology is poorly understood, leading hypotheses cite embolism of cement debris from high intramedullary pressures during cementation and prosthetic insertion with resultant endothelial injury, factor release and complement cascade activation. ICU care of this disorder is primarily supportive, with treatment focused on supplementing the refractory hypoxia, right ventricular dysfunction and shock, and potentially minimizing histamine response.

Conclusion: ICU physicians should be familiar with BCIS as a highly morbid cause of refractory shock following orthopedic procedures.

Case Presentation: A 79 yo female with controlled hypertension presented with a right femoral neck fracture after a fall. Following cardiac clearance, she underwent right hip cemented hemiarthroplasty. Immediately after cement implantation, she experienced cardiovascular collapse refractory to high-dose vasopressors. Intraoperative TEE revealed acute RV failure. Postoperatively, she was admitted to the ICU with CTA chest remarkable for backflow of contrast into the IVC and hepatic veins. TTE confirmed severe RV failure with preserved LV function. RV-failure directed vasopressor support was continued for 3d before RV function recovered. She was transferred to a SNF on HD 12.

Differences in MD and DO Applicants to a Single Surgery Program

J Scott Zimmerle MBA, Brendan Rosamond BS, Jonathan S Lall BS, Said Maldonado BS, Nicole B Lyons MD, Ali Siddiqui MD, Zuhair Ali MD, Rajeev Raghavan MD, Mike K Liang MD
Tilman J. Fertitta Family College of Medicine - University of Houston

Background: There has been a large growth of MD and DO programs in the past decade.

Objective: We sought to evaluate differences in applicants to a single institution.

Methods: The research employed a retrospective cross-sectional approach, analyzing differences among MD and DO applicants to a single surgical residency program. Data was sourced from the ERAS 2021-2022 dataset, focusing on applicants to a categorical surgical residency position. Gender information was self-reported, URM status was established according to AAMC definitions. Socioeconomic status (SES) was determined by matching applicants' zip codes with the U.S. Census Bureau's 2021 American Community Survey data median household income and classified according to 2022 tax brackets.

Results: Among the 637 applicants, 367 met the inclusion criteria, representing 11.8% of the 2022 national resident applicant pool for categorical surgical positions. Of these, 70.1% were MDs, and 29.4% DOs. DO applicants were more likely to be white females or from lower SES families. Fewer URM came from DO schools. While not statistically different, DOs scored lower on USMLE.

Conclusion: Both MD and DO students seek surgery residencies. There is more gender diversity among DO programs but less racial/ethnic diversity. Applicants from both programs are equally competitive.

Table 1. Applicant Self-Reported Data

SURGICAL APPLICANTS	DO N=108	MD N=259	P-Value
Age (mean ± SD)	30.34 ± 4.8	30.1 ± 4.8	0.371
Sex:			0.302
Male	51 (47.2%)	139 (53.7%)	
Female	57 (52.8%)	120 (46.3%)	
Race/Ethnicity:			
White	64 (59.3%)	106 (40.9%)	0.001
Non-White			
Asian	20 (18.5%)	68 (26.3%)	
Hispanic	12 (11%)	46 (17.8%)	
Black	5 (4.6%)	18 (6.9%)	
American Indian	1 (1%)	5 (1.9%)	
Other	6 (5.6%)	16 (6.2%)	
SES:			0.049
Low	30 (27.8%)	47 (18.1%)	
High	78 (72.2%)	212 (81.9%)	
USMLE STEP 1 (mean ± SD):	225.6 ± 16.8	224.84 ± 16.8	0.6384
USMLE STEP 2 (mean ± SD):	236.45 ± 12.7	238.15 ± 15.1	0.2154

Mini-Talk Session | Abstract | Education

Medical Student Presentations and Education at Surgical Oncology Pre-Operative Conferences: A Quality Improvement Intervention

S Seale, J Arnold, C Calvo-Strube, C Court
University of Texas Medical Center - San Antonio

Background: Pre-operative case conferences are held weekly by the surgical oncology division in order to discuss surgical management, verify pre-operative work-up, and provide education to medical students and residents. Medical students are charged with preparing and presenting cases each week. It was observed that medical students often struggled to identify pertinent information and present cases in a timely and efficient manner.

Objective: To improve trainee understanding of pre-operative patient care in surgical oncology and improve efficiency of patient presentations at weekly conferences.

Methods: Surgical oncology faculty and senior residents were surveyed to evaluate medical student performance at the conference. Medical students were also surveyed to evaluate their understanding of the conference. Student presenters were then provided with a detailed educational guide to pre-operative care and conference, including example cases. A post-intervention survey was then conducted evaluating medical student performance.

Results: Thirteen faculty members and senior residents participated in the pre-intervention survey, and eight completed the post-intervention survey. Prior to intervention, 38% of responders agreed or strongly agreed that presentations included all of the pertinent information, compared to 75% that participated in the post-intervention survey. Prior to intervention, 38% agreed that the conference was conducted efficiently, compared with 100% post-intervention.

Conclusion: Pre-operative cases conferences are an excellent opportunity for medical students and junior residents to learn about surgical planning and pre-operative management of oncologic patients. By providing a detailed guide outlining the purpose of the conference and describing relevant information, medical student performance improved both in quality and efficiency.

Analysis of Pediatric Dog Bite Injuries: Experiences from a Single Tertiary Care Facility.

Le HB, Soubra Y, Sudarshan A, Frommer SA, Kelley PK
University of Texas Austin - Dell Medical School

Background: Dog bites affect children at a rate 3.2 times higher than in adults and is one of the leading causes of non-fatal emergency room visits. Depending on the bite's severity, patients can receive treatment in the emergency room; however some cases present with complex repair and are in need of surgical intervention.

Objective: Herein we report our institution's experience with surgical intervention of dog bites for pediatric patients.

Methods: A retrospective study on surgical intervention from Pediatric Surgery, Plastics, and the ED for dog bites was performed for patients who came to the ED between January 1, 2022, and January 1, 2023 at our institution. Patient demographic, operative and post-operative information was obtained.

Results: Within the specified timeframe, our institution's ED received 223 patients, with 33 (14.7%) of these individuals undergoing surgical procedures in the OR. Location of their operative bite wounds are outlined in Table 1.1. The majority of cases involved toddlers or school-age children (n=24). Lacerations were the predominant wound type, accounting for 94% of all dog bite injuries. Notably, multiple bite locations were frequently observed, with the upper facial region, involving the lip, nose, and periorbital area being the most commonly affected sites.

Conclusion: There is a dearth of algorithms for pediatrics dog bite management, including the surgical and non-surgical cases. Understanding the demographics of the cases helps with management of care. Additionally, assessing treatment outcomes will facilitate refining future algorithms.

	Infants 0-24 months (n = 5)	Toddlers 24 Months - 6 years (n=12)	School-Age Children 6 years - 12 years (n=12)	Teenagers 12 years - 18 years (n=2)
Area of Bite				
Nose	1	3	2	0
Lip	0	3	3	0
Forehead	0	2	2	0
Eye area (Brows)	2	0	4	0
Cheek	2	2	0	0
Chin	0	0	1	0
Neck	0	1	0	1
Ear	0	1	1	0

Mini-Talk Session | Case Review | Plastic & Maxillofacial Surgery

Odontogenic Sarcoma of the Mandible

University of Texas Medical Branch - Galveston

Introduction/Objective: Ameloblastic fibrosarcoma is considered extremely rare with fewer than 110 reported cases. It is an aggressive odontogenic neoplasm that is considered the malignant version of ameloblastic fibroma. Histologically it is characterized by benign ameloblastic epithelium within a sarcomatous mesenchymal component. As of 2017, the WHO classifies 3 categories of odontogenic sarcomas: 1) Ameloblastic fibrosarcoma (most common), 2) ameloblastic fibrodentinosarcoma, 3) fibro-odontosarcoma. Currently treatment guidelines are non-conclusive in regards to induction chemotherapy prior to surgery. We are presenting a case a that the patient underwent induction chemotherapy prior to resection.

Discussion: Odontogenic sarcomas are an exceedingly rare entity with fewer than 110 documented cases are there are no set or clear guidelines in regards to induction chemotherapy. In the case presented, the patient underwent a 5 day cycle of induction chemotherapy with minimal/marginal change in tumor size. In our experience, the tumor did not appear to respond to induction chemotherapy and delayed surgical resection of the mass due to the resultant leukopenia. It the authors opinion that early surgical intervention be advocated for, to better assure expedited care of the patient.

Conclusion: In conclusion, the medical decision making of induction chemotherapy versus early surgical intervention can be a difficult decision with no clear answer. The negative side effects of chemotherapy and possibly delayed intervention should be weighed against the benefit of being able to hopefully greater ease in obtaining clear surgical margins. Further research and data for this rare entity is needed to further develop evidence based guidelines for standardized treatment.

Case Presentation: A 30 year old African American female presented to UTMB emergency department with a large exophytic oropharyngeal mass and airway compromise. The patient underwent awake tracheostomy, and direct laryngoscopy with incisional biopsy. The patient was found to have a high grade odontogenic sarcoma and the medical oncology team elected to proceed with induction chemotherapy. The induction chemotherapy was 5 day regimen of AIM cycle 1 including Doxorubicin, Ifosfamide, and Mesna. The patient was determined to have marginally improved and underwent surgical resection of the mass and reconstruction with a microvascular free fibula flap.

Mini-Talk Session | Case Review | Plastic & Maxillofacial Surgery

Congenital Intracranial Oropharyngeal Teratoma

Hung Le, BSA; Anirudh Sudarshan; Yasmine Soubra, BS; Sarah Frommer, MD, PhD; Patrick Kelley, MD
University of Texas Austin - Dell Medical School

Introduction/Objective: Teratomas are a rare mass of undifferentiated, embryonic tissues that occur in 1:4000 live births. Herein is a rare in-utero congenital intracranial oropharyngeal teratoma.

Discussion: Patient is now 7 years old and currently has a tracheostomy. Reconstruction for his complex airway trauma is planned once he reaches skeletal maturity. He is unable to completely close his mouth and is undergoing speech therapy.

Conclusion: Coordination of multiple teams at multiple facilities was involved in his care and reconstructive planning due to the inherent unique pathology, difficulty of resection, and reconstruction due to his youth and multiple recurrences of teratomas.

Case Presentation: A prenatal 3D ultrasound and fetal MRI showed a teratoma in the oral cavities and left mandible affecting airway transmission (Figure 1). After birth, an Ex Utero Intrapartum Treatment was performed along with surgical interventions to resect the teratoma from the oral cavity. A complex skull reconstruction was performed and involved the removal of the bone posterior occipital area and other bone grafts to cover skull-based defects. At two months of age, the patient had a malignant teratoma in the left periorbital region for which they received adjuvant chemotherapy. A benign mature teratoma was discovered in the mandible through surveillance examination and the patient had a narrow margin resection including marginal mandibulectomy was performed through an intraoral incision. At nine months another aggressive mandibular mass destroying his mandibular ramus and condyle and subtemporal fossa was discovered, through which a radical resection, including partial mandibulectomy, condylectomy, resection of temporal bone, and TMJ.

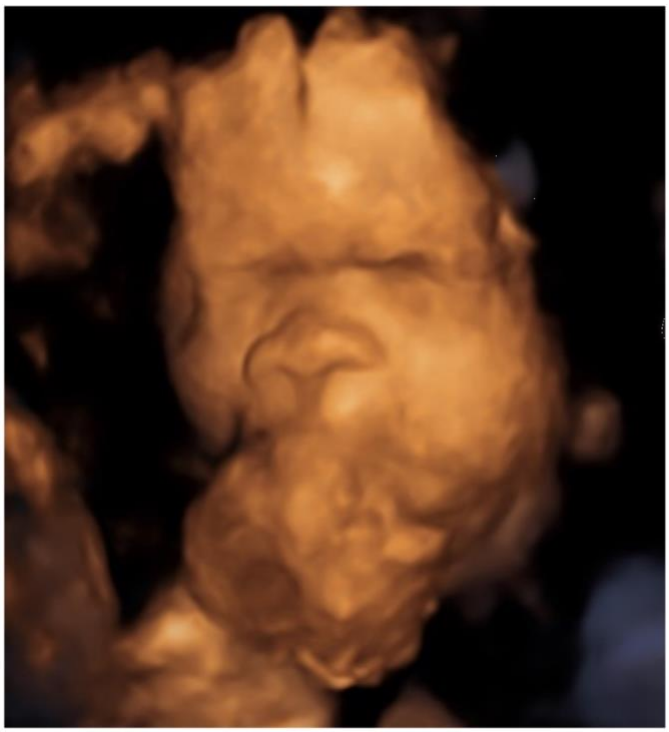


Figure 1: Prenatal 3D Ultrasound (25 weeks gestation)

Revealing A Cleft in the Community: A Systematic Review of Sociodemographic Disparities Affecting the Care of Patients with Cleft Lip

C Obinero, A Boyd, J Barrera, N Munabi, A Valenti, D Sobol, T Imahiyerobo, M Greives
University of Texas HSC - Houston

Objective: This study aims to review the current literature and summarize sociodemographic disparities that impact management and postoperative outcomes in patients with CL/P.

Methods: A systematic review was conducted using Pubmed, Embase, and Medline databases. Studies discussing sociodemographic disparities regarding access to care, management, and treatment outcomes for patients with CL/P were included. Studies performed outside the US and published before the year 2000 were excluded.

Results: Twenty-six studies met the inclusion criteria. Disparities discussed included access to care, missed appointments, use of nasoalveolar molding (NAM), surgical timing, and outcomes. Minority race or ethnicity and public insurance were associated with impaired access to care. Predictors for missed appointments were black race and Medicaid insurance. Decreased use of NAM was associated with Asian race and public insurance. Factors associated with delayed CL surgery were Asian or black race, Hispanic ethnicity, and public insurance. Surgical outcomes were assessed using various aesthetic, speech, and quality of life measures. Factors linked to worse outcomes included black or latin race and public insurance.

Conclusion: Patients with CL/P from minority racial or ethnic groups as well as those with public insurance are disproportionately impacted by health disparities. Disparities related to age, geographic location, and primary language have also been reported. Statewide or institutional social programs may help address these disparities.

Expedited Discharge After Laparoscopic Appendectomy for Uncomplicated Appendicitis

A Andrade, I Alvarado Gonzalez
Texas Tech University HSC - El Paso

Background: Recent studies suggest that same-day discharge for Acute uncomplicated appendicitis is feasible, safe, cost-effective and improves patient satisfaction. Despite these data, universal adoption of this practice is variable even within the same institution. We developed an expedited discharge pathway for patients undergoing laparoscopic appendectomy for uncomplicated acute appendicitis and used NSQIP to evaluate the success of our pathway. Here we review our baseline data and data after one year of implementation in a county hospital on the U.S.-Mexico Border with a majority hispanic population, a population in which this type of data has not been extensively studied.

Objective: The primary endpoint was to ascertain for 30-day readmission and serious post-operative adverse events using NSQIP local hospital data. Secondary endpoint to demonstrate a decreased length of stay.

Methods: Local hospital data from NSQIP was queried pre (2021) and post-implementation (June 2022-May2023) of our expedited pathway. Patients who presented to the emergency room at UMC El Paso and were diagnosed with uncomplicated appendicitis and underwent a laparoscopic appendectomy were selected for the Expedited Discharge Pathway after meeting criteria.

Results: A total of (N)94 appendectomy patients were captured by NSQIP in the post-implementation period. 53 patients met criteria for our expedited discharge pathway. Of these, 34 successfully completed pathway and 19 met criteria but were not discharged from PACU. This is in contrast to 4 patients who were discharged from PACU of 51 patients who met criteria in the pre-implementation cohort. The average time to OR for the patients who followed the Expedited Discharge Pathway was 10.7 hours (3.86 hours faster compared to data obtained in 2021, and 3 hours faster compared to patients who met criteria but did not complete the pathway). The average OR to discharge time was 2.9 hours compared to 17.1 hours in the pre-implementation group. The Average length-of-stay for patients discharged from the PACU was 0.6 days, whereas those admitted to the hospital stayed for 1.21 days. Baseline data from 2021 had an average LOS of 1.96 days for all patients and 1.94 days for patients who met criteria for pathway inclusion. There was 1 patient discharged from the PACU who did not meet discharge criteria and this patient was the only readmission in the entire cohort. There were no other documented serious post-op events for patients included in the pathway.

Conclusion: The Expedited Discharge Pathway showed a decreased length of stay for patients in pathway and surprisingly also for patients who did not meet pathway criteria. It has proven to be a safe protocol by demonstrating no increase in complications or readmissions when adhering to the inclusion and exclusion criteria. As the surgeons familiarized themselves with the protocol, improved adherence was observed and the results continued to elucidate the feasibility and safety of the expedited pathway. Further investigation into cost-benefit and patient satisfaction is still needed.

Comparing Recurrence of Umbilical Hernias with Various Surgical Techniques

J. Durand, C. Richter, Y. Ramgopal, S. Krishna, J. Song, G. Golovko, A. El Ayadi, S. Wolf
University of Texas Medical Branch - Galveston

Background: Recurrence of umbilical hernias following surgical repair is a common post-operative complication that has various recurrence rates depending on several factors.

Objective: This study aims to find accurate recurrence rates for various surgical repair techniques.

Methods: Data was obtained on September 25th, 2023 from a national research database that provides medical records of de-identified patients. The study population included patients with umbilical hernias (ICD10 code K42) that underwent repair. Groups were stratified by open repair with mesh (OM), open repair without mesh (OW), laparoscopic repair with mesh (LM), and laparoscopic repair without mesh (LW). Recurrence of umbilical hernias was investigated within 1 year after repair. Cohorts were balanced by standardized demographic characteristics and various medical conditions. Additionally, for each individual repair technique, incidence and prevalence of hernia recurrence was investigated from 2012 to 2021.

Results: A total of 163,150 cases of umbilical hernia repairs were identified. Risk analysis for hernia recurrence within one year after repair showed that LM had the lowest risk of recurrence when compared to OM ($p< 0.0001$), OW ($p< 0.0001$), and LW ($p= 0.0083$). However, the risk difference between OM and OW was not statistically significant. Incidence proportion and prevalence of hernia recurrence was lowest in 2012 and increases every year for all repair techniques.

Conclusion: Our data demonstrates that recurrence rates of umbilical hernias after repair was lowest for LM, occurring in 63 patients per 1,000 according to 2012 incidence proportion data. In contrast, recurrence was highest in OW, occurring in 128 patients per 1,000.

Measures of Association for umbilical hernia recurrence one year after repair

Techniques Compared	Risk Difference %	P value	95% CI	RR	95% CI
Open+Mesh vs. Lap+Mesh	3.058	<.0001*	1.835, 4.282	1.114	1.067, 1.163
Open+Mesh vs. Lap No Mesh	2.482	<0.0001*	1.344, 3.619	1.089	1.047, 1.133
Open+Mesh vs. Open No Mesh	-0.028	= 0.9534	-0.978, 0.922	.999	0.967,1.032
Open No Mesh vs. Lap No Mesh	1.74	= 0.0012*	0.684, 2.796	1.063	1.024, 1.103
Lap+Mesh vs. Open No Mesh	-2.674	< 0.0001*	-3.893, -1.454	0.91	0.871,0.95
Lap+Mesh vs. Lap No Mesh	-0.73	= 0.2446	-1.959, 0. 5	0.974	0.931,1.018

The Effect of After-Hours Ventral Hernia Repair on Patient Outcomes and Operative Report Detail

C Hogan, NB Lyons, S Maldonado, JS Lall, B Rosamond, JS Zimmerle, V Patel, MK Liang
HCA Healthcare Houston

Background: Often, ventral hernia repairs (VHR) must be performed after hours (7 PM – 7 AM). For many surgeries, night-time surgery is associated with worse outcomes, however, evidence is limited regarding VHR. In addition, nighttime surgery may be associated with less detailed operative reports.

Objective: To assess whether surgeries performed at night have less detailed operative reports and worse surgical outcomes.

Methods: 1,011 VHR operative reports from medical-legal database were obtained. Details deemed important for inclusion in a VHR operative report based on a previously conducted expert consensus and complications including SSI, re-operation, and recurrence were extracted. A target score of 70% was established a priori as a highly detailed report. A binomial regression was performed.

Results: 35.6% of reports were high-detailed and 14.6% were dictated overnight. On univariate analysis, notes dictated overnight were more highly-detailed (48.1% vs 34.1%, p=0.007), however, on multivariate regression, this was non-significant (p=0.140). There were two factors that significantly impacted the level of detail of the operative report: Dictation by a resident (95% CI: 0.247-0.847; p=0.013) and the complexity of procedure which was defined as: recurrent hernia repair (95% CI: 2.486-5.955; p<0.001) and the presence of concomitant procedure (95% CI: 1.215-2.824; p=0.004). There was no difference in complications rates for VHR during day vs night despite more complex cases done at night.

Conclusion: Operative dictations for complex cases tend to be more detailed and more complex cases are dictated after hours. Operative reports written by residents tend to be more highly detailed. Time of surgery did not affect complication rates for VHR.

An Intra-Abdominal Clip Loading Cartridge for Robotic Cholecystectomy

J Aland, E Minner, S Zhou, M Pimentel, A Srivatsa, N Sears, N Tapia
Texas A&M School of Medicine/Houston Methodist Hospital (EnMed)

Background: Cholecystectomy is the standard of care for symptomatic gallstones, and can often be performed robotically. During robotic cholecystectomy, three ligation clips are required for each severed vessel or bile duct. Each clip must be loaded into the robotic clip applier outside of the patient's abdomen and, as a result, valuable operative time is spent waiting on the reloading process.

Objective: We set out to develop a device that improves the efficiency of vessel ligation clip loading during robotic cholecystectomy.

Methods: We designed a clip cartridge compatible with existing robotic clip appliers that can be placed into a patient's abdomen through an 8mm port. Once introduced, the cartridge is held by a robotic grasper. A surgeon then loads a clip by navigating the robotic applier into the cartridge within the patient. After applying the clip, the surgeon can return to the cartridge to load another one (Figure 1).

Results: Early large-scale prototypes achieved individual mechanisms for clip applier loading and initial clip advancement within the cartridge. The former mechanism has been rudimentarily achieved on a scale compatible with the Da Vinci XI Large Clip Applier. Unfortunately, additional device features and results cannot be discussed at this time due to the active pursuit of IP protection.

Conclusion: Future designs will optimize both mechanisms in an appropriately sized device. Initial studies will evaluate the time it takes a group of surgeons to complete a simulated robotic vessel ligation procedure using our device and the traditional loading technique. We hypothesize that our device will significantly reduce operative time.

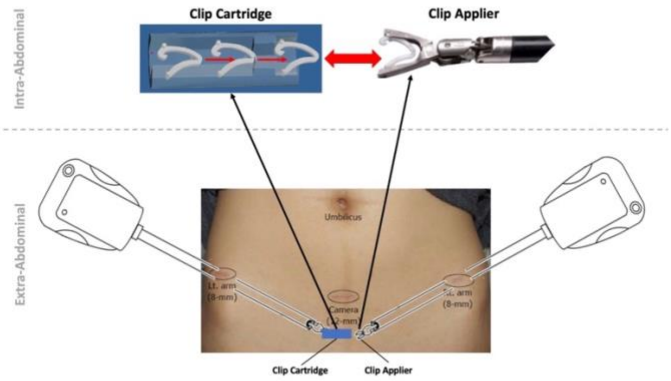


Figure 1.* Schematic for intra-abdominal clip loading process.

*Image adapted from Kim et al's Robotic cholecystectomy with new port sites and Gupta's Application of Biomedical Engineering in Force and Tactile Sensing for Robotic MIS.

After-Hours Robotic Access Allows Acquisition of Robotic Surgical Proficiency In An Acute Care Surgical Model

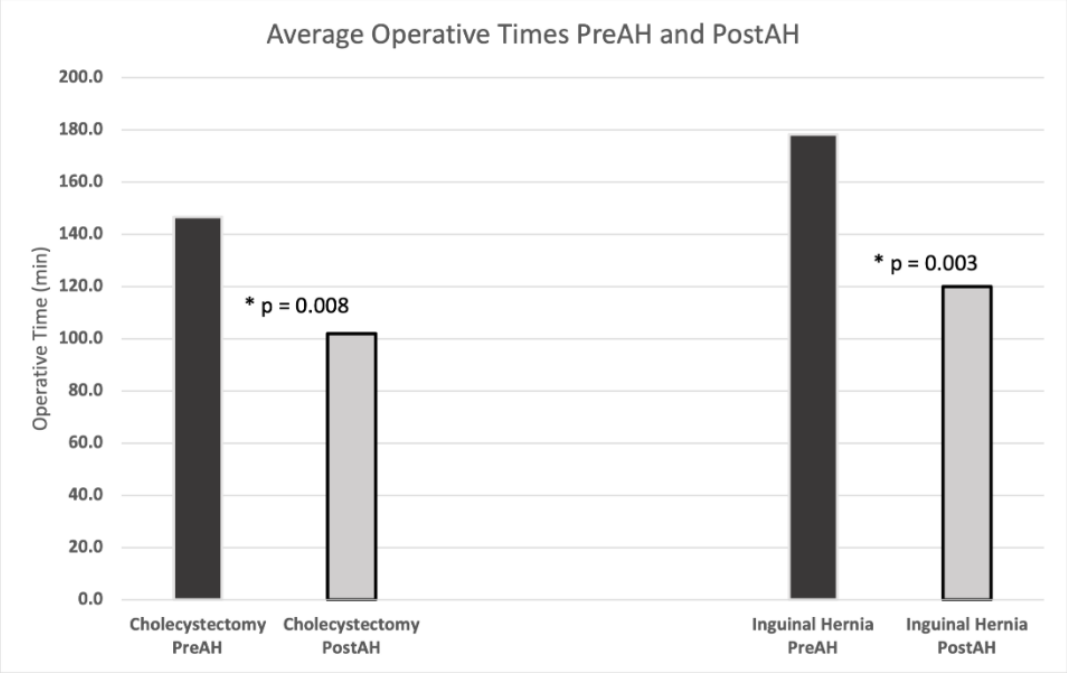
R Wu, S Martinez, N Tapia
Houston Methodist Hospital

Objective: We hypothesized that coordination and initiation of AH availability of the RSP would increase our robotic surgery access and allow improved robotic proficiency via decreased operative time on the RSP.

Methods: We queried our acute care surgical database for robotic and laparoscopic surgical cases from January 2021 to May 2023. AH robotic access was initiated in October of 2021. Case type and number, late (start time after 3pm) and AH case start times, and operative times were compared pre- and post-initiation of AH availability (preAH and postAH, respectively).

Results: A total of four attending surgeons were evaluated over the course of this study. A total of 100 robotic cases were performed preAH and 417 robotic cases postAH. The percentage of cases conducted robotically versus laparoscopically was significantly higher postAH ($p = 0.0024$). The number of late start, after-hours, and weekend cases significantly increased postAH ($p = 0.008$). Using cholecystectomy and inguinal hernia repair operative time as a proxy of surgeon proficiency, operative time significantly decreased postAH compared to preAH for both robot-assisted cholecystectomy ($p = 0.008$) and unilateral inguinal hernia repair ($p = 0.003$).

Conclusion: Coordinated training efforts of OR staff, surgeon specialized equipment training/troubleshooting, and department leadership within the institution's robotic surgery task force facilitated transition to AH access of the RSP. AH access allowed increased robotic surgery case volume and decreased operative time.



Multi-Center Validation of a Novel Quality Improvement Protocol to Avoid Post-Ileostomy Morbidity from Dehydration, While Allowing Earlier Discharge

A Iqbal, Y Rojas-Khalil, P Parikh-Amin, H Garcia-Chavez, B Hartley, S Keeling, T Read, T Rosengart
Baylor College of Medicine

Objective: We aimed to show the efficacy of a novel ileostomy-specific quality improvement protocol at an academic center, with subsequent validation at another academic institution.

Methods: All patient included in this IRB approved study followed a standardized enhanced recovery after surgery (ERAS) protocol before and after institution of the novel protocol. This prospective study comprised of two phases. The first phase was to establish efficacy of the novel protocol at one institution. In this phase, patients who underwent elective ileostomy creation at University of Florida Health (UF) from 2011-2018 were included. The second phase was to validate the results of phase I at another academic institution. In this phase, all patients who underwent elective ileostomy creation at Baylor College of Medicine from 2018-2023 were included. Postoperative outcomes for the cohort before and after protocol implementation were compared with a matched cohort nationally, based on the Vizient dataset (for UF) and NSQIP (for Baylor). The novel protocol mandated a midline or PICC line for home IV fluids (1,000 ml/night), irrespective of ileostomy output on postoperative day 1 for all new ileostomates. Patients were discharged once tolerating diet and pain was controlled. Patients were called daily after discharge, with counseling and medication adjustments for high ileostomy output. Home IV fluids and the IV line were discontinued when patients were in a positive fluid balance for at least 2 days with oral intake.

Results: A total of 600 patients with a new ileostomy were included in this study. Of these, 250 patients were enrolled in phase I at UF and 350 patients were enrolled in phase II at Baylor. Baseline characteristics were similar for the group pre- and post-protocol institution. Institution of the novel protocol significantly improved the mean length of stay (LOS) (8 days vs 3 days, $p<0.0001$), LOS index (2.1 vs 0.5, $p<0.0001$), readmission rate (40% vs 8%, $p<0.001$), complication rate (65% vs 18%, $p<0.003$), cost of care for the index operation ($49,359 vs $19,050, $p<0.0004$) and cost for the readmission (if readmitted) ($84,380 versus $15,200, $p<0.0001$) for the entire cohort. This was true for both Phase I and II (Figure 1). No PICC/midline-related infection or DVT were noted during the study period.

Conclusion: Implementation of a novel ileostomy-specific standardized protocol to avoid morbidity from dehydration significantly improved quality by decreasing LOS, readmissions, complications and cost of care. Validation of this protocol at another institution confirmed these findings, despite the COVID pandemic during phase II.

Figure on next page

Figure 1: Outcomes for Phase I and Phase II after implementation of novel protocol

	Phase I: UF Health		Phase II: Baylor		p value*
	2011 (pre-protocol)	2018 (post-protocol)	2018 (pre-protocol)	2023 (post-protocol)	
Index operation					
- Mean LOS (days)	8	3	6.9	2.1	<0.01
- LOS Index	3.8	0.6	1.5	0.48	<0.01
- Readmission rate	56%	9%	40%	7%	<0.01
- Readmission Index	4.1	0.8	1.6	0.7	<0.01
- Complication rate	65%	19%	46%	17%	<0.01
- Cost of care	$53,300	$19,700	$47,856	$18,100	<0.01
Readmission (if occurred)					
- Mean LOS (days)	18	3.8	15.4	3.4	<0.01
- Dehydration-related readmission rate	45%	7%	36%	5%	<0.01
- Cost of care	$85,090	$16,400	$86,800	$14,319	<0.01
PICC/midline related complication rate					
- DVT	-	0%	-	0%	-
- Catheter infection	-	0%	-	0%	-

* p value applies to both phase I and phase II pre- vs post-protocol comparison

Reviving Transvaginal Colon Specimen Extraction: A Single Surgeon's Experience Enhanced by Newer MIS Techniques

Jennifer Blake MD, Rahila Essani MD, FACS, FACRS
Texas A&M Scott and White

Background: Natural Orifice Specimen Extraction utilizes transanal or transvaginal routes for specimen extraction. Transvaginal extraction is beneficial in cases of combined gynecological resections, allowing for the extraction of large specimens and improved pain control by reducing the number of incisions and length of stay.

Objective: This study reports outcomes of transvaginal extraction in robotic colon resections using MIS techniques.

Methods: We conducted an IRB approved retrospective review of colon resection data at our hospital from 2017 to 2023, during which robotic colon resections were initiated. Both benign and malignant specimens were extracted via the vagina, and a wound protector was used for specimen extraction in cases of known malignancy.

Results: We performed 30 transvaginal extractions of colectomy specimens. The average patient age was 58 (range 24-86). 14 of the 30 patients underwent Total Abdominal Hysterectomy (TAH) and Bilateral Salpingo-Oophorectomy (BSO) as well. The average BMI was 28 (range 21-50). The average length of stay was 2.8 days, and 26% of these patients were discharged on the same day. Bowel function returned on an average of postoperative day #1. There were no Surgical Site Infections (SSIs), colovaginal fistulas, vaginal suture line breakdowns or anastomotic leaks. There were no complications reported within 30 days post-surgery.

Conclusion: Transvaginal extraction is technically sensible due to the nature of the operation. Advances in MIS and the use of barbed sutures have facilitated the revival of this traditional technique. By eliminating the need for an additional specimen extraction site, achieving same-day discharge has been possible, along with reduced narcotic usage.

Impact on Resource Utilization of Colorectal Surgery For Diverticulitis in Elective And Emergency Settings – A Retrospective Multi-Center Analysis

Jessica Martella, BS[1]; Laxmi Priya Dongur, MD[1]; Uma Phatak, MD FACS[1]; Laila Rashidi, MD FACS[2]; Geetha Radhakrishnan, MD[1]; Ravi Radhakrishnan, MD MBA FACS[1]
[1]University of Texas Medical Branch at Galveston, TX
[2]Multicare Colon and Rectal Surgery – Tacoma, WA

Background: While major advances have been made in colorectal surgery in the last 10 years, little is known regarding the full impact of emergency and elective colorectal surgery on resource utilization. Our study evaluates the incidence of healthcare resource utilization following colorectal surgery in both elective and emergency settings.

Methods: A retrospective multi-center analysis was conducted using the TriNetX database for adults 2008 to 2018, who were matched based on their age, sex, chronic comorbidities (diabetes, hypertension, heart failure, cirrhosis), and diagnosis of Diverticulitis at the time of surgery. Patients with history of multiple colorectal surgeries were excluded. Matched cohorts consisting of 6,338 patients were analyzed for outcomes up to 5 years following Emergency colorectal cases (EM, n = 20,861) and Elective colorectal cases (EL, n = 6,340) using measure of association analysis and odds ratio.

Results: Overall mortality was significantly higher in EM (18.2%) than EL (15.6%). EM patients had significantly higher incidence of post-surgical complications, TPN use, and shock requiring critical care services. There was no significant difference in ED visits, inpatient admission, nursing facility care use, IR drainage procedures and colostomy reversals. EM patients were less likely to have undergone screening colonoscopy, sigmoidoscopy, or proctosigmoidoscopy up to 1 year prior to index event (See Table 1 for detailed outcomes).

Conclusion: Patients with diverticulitis who undergo colorectal surgery in emergency settings not only have higher mortality, but also are more likely to use hospital resources up to 5 years compared to patients in elective setting. This is correlated with reduced ambulatory care in EM patients prior to their surgery. Understanding the pre-index event care will further delineate how the resource utilization can be reduced for patients who present emergently for diverticular disease.

Table 1 Post-Operative Outcomes and Pre-Index Event Resource Utilization

Outcome (upto 5 years)	Patients	% of Cohort	P-Value	Odds Ratio	Confidence Interval
Mortality	987	15.60%	**<0.0001**	0.827	(0.753,0.908)
	1,156	**18.24%**			
ED Visit	3,088	48.72%	0.29	0.963	(0.899,1.03)
	3,147	49.65%			
Inpatient Admission	3,892	61.40%	0.93	1.003	(0.934,1.078)
	3,887	61.30%			
Shock requiring Critical Care Services	1,191	18.79%	**<0.0001**	0.72	(0.661,0.784)
	1,542	**24.33%**			
Nursing Facilty Care Services	156	2.46%	0.40	0.91	(0.73,1.134)
	171	2.69%			
Blood Transfusion	0	0.00%			
	0	0.00%			
TPN	247	3.89%	**<0.0001**	0.622	(0.528, 0.732)
	388	**6.12%**			
Colostomy Reversal	533	8.41%	0.52	0.961	(0.848,1.088)
	553	8.72%			
Post-Surgical Complications	685	10.81%	**<0.0001**	0.718	(0.646, 0.798)
	915	**14.44%**			
Interventional Radiology Procedures	298	4.70%	0.27	0.913	(0.777, 1.072)
	325	5.13%			
Pre-Index Event Resource Utilization	**Patients**	**% of Cohort**	**P-Value**	**Std diff.**	
Office or Other Outpatient Services	4,432	69.90%	0.11	0.02	
	4,513	71.20%			
Colonoscopy, flexible	1,966	31.00%	**0.0003**	0.06	
	1,782	28.10%			
Office or Other Outpatient Consultations	1,265	19.96%	**< 0.0001**	0.08	
	1,483	23.40%			
Inpatient Consultations	778	12.30%	**< 0.0001**	0.08	
	619	9.76%			
Sigmoidoscopy, flexible	553	8.70%	**0.0002**	0.06	
	439	6.90%			
Proctosigmoidoscopy, rigid	363	5.73%	**< 0.0001**	0.17	
	145	2.29%			

Enhanced Recovery After Emergent Colon Surgery: Is It Time for Emergency General Surgeons to Follow Suit?

Ryan Downey, Chad Hall
Texas A&M Scott and White

Background: Enhanced recovery (ERAS) pathways have become the standard of care in elective colorectal surgery. ERAS pathways shorten length of stay and decrease infectious complications but are often overlooked in the emergent setting.

Objective: To examine ERAS compliance in emergent compared to elective colorectal surgery and identify ERAS metrics suitable for emergent operations.

Methods: A single center, retrospective review of colorectal operations between January-September 2023 was performed. Data was extracted from the enhanced recovery database and cross referenced with institutional record of surgical site infections (SSI). Patients were classified as elective or emergent and ERAS metrics were compared. Outcomes included length of stay, return to OR, 30- day readmission rates and SSI.

Results: 239 colorectal operations were reviewed: 123 elective and 116 emergent: Overall ERAS compliance was 85% and 46%, respectively. Optimal compliance (80%) was achieved in only 6 emergent ERAS metrics (Table 1). Elective operations were associated with a shorter length of stay (3.7 v 9.9 days), rate of readmission (8% v 15%), return to OR (0% v 16%), and rate of SSI (5% v 22%) when compared to emergent operations. Emergent patients with SSIs had an ERAS compliance rate of 42%- and 12-day LOS compared to 46% and 9 days in emergent patients without an SSI (p=0.14 and 0.15, respectively).

Conclusion: Enhanced recovery pathways are often neglected in emergent colorectal surgery. Emergency General Surgeons should recognize the ERAS principles appropriate for their patient population. Further study is needed to determine if improved compliance will affect patient outcomes.

Table 1: ERAS Compliance in Elective and Emergent Colorectal Surgery

	% Elective	% Emergent	p
Intra-operative Interventions			
CHG Prep	98	87	0.25
Drain Avoidance	98	96	0.79
Multimodal Anelgesia	96	92	0.47
Post-operative Interventions			
PCA Avoidance	98	84	0.15
Multimodal Anelgesia	97	86	0.2
Early Ambulation	97	84	0.12

Incisional Hernias after Ostomy Takedown at a Houston County Hospital

EA Chamely, RC Browne, J Klugh, JJ Stulberg
University of Texas HSC - Houston

Background: Temporary ostomies are commonly created by surgeons. Reported hernia rates after takedown of an ostomy vary, but more than 20% of patients will develop an ostomy site incisional hernia.

Objective: This study was done to assess our institution's hernia rate and identify areas for improvement.

Methods: We performed a retrospective review of patients who underwent ostomy reversal between Jan 2019 and Dec 2022. Patient demographics, ostomy site closure techniques and patient outcomes were collected. All radiologic scans and surgical notes after ostomy takedown were reviewed for evidence of hernia.

Results: 85 patients were identified, and 18 developed ostomy site incisional hernias. Both groups had similar baseline demographics and no difference in closure suture or techniques. On univariate analysis, BMI (p 0.046) or a cancer diagnosis (p 0.021) were the only significant predictors of hernia. A Bayesian analysis using a neutral prior showed a 96% probability that cancer increased the hernia rate, when controlling for BMI. The median clinical follow up was 32 days (17,163), and the median time to hernia diagnosis was 251 days (89,358). 65 patients had no clinical follow up after 1-year, with 50 having none after 6 months. 39 patients had a post-op CT, usually for unrelated reasons. 14 (36%) were found to have hernias, with 11 diagnosed within one year of takedown.

Conclusion: Patients are at risk of incisional hernia after ostomy takedown, especially those with cancer or that are overweight. This condition is likely underdiagnosed and routine imaging at 1 year may be beneficial in identifying these hernias.

	Ostomy Site Hernia (n=18)	No Ostomy Site Hernia (n=67)	Odds Ratio (95% Credible Interval)	Posterior Probability OR>1
Cancer	11 (61%)	21 (31%)	2.17 (0.91, 5.19)	96%
BMI	32 [28, 33]	28 [23, 32]	1.11 (1.01, 1.24)	98%

Categorical data presented as number (percentage)
Continuous data presented as median [IQR]
Models controlled by Cancer and BMI
Models utilized a neutral prior mean (95% credible interval): 1 (0.25, 4)

Table 1: Bayesian Model for Ostomy Site Hernia Rate

Safeguarding Our Pediatric Patients: Shortcomings of Implementation of Surgical Safety Checklists

Y Young, N Jayarajan, I Anderson, K Sutyak, E Garcia, N Hebballi, M Broussard, T Fisher, K Lally, K Tsao
University of Texas HSC - Houston

Background: Prioritizing patient safety in the perioperative and operative area is critical in preventing adverse events. Despite a mandatory operating room (OR) surgical safety checklist (SSC) policy, checklist adherence was suboptimal.

Objective: We aimed to study the implementation of an updated SSC with specific attention to debriefing to improve patient safety handoffs.

Methods: An observational, mixed-methods study of SSC performance was conducted at a tertiary-care children's hospital from May 2023 to July 2023. SCC implementation was observed and data collected on adherence. Three weeks after the implementation, we sampled staff for semi-structured interviews. Descriptive statistics, Shapiro-Wilk normality, and Wilcox rank sum tests with continuity correction were conducted ($p<0.05$). A thematic analysis was performed on qualitative data.

Results: Of the 94 checklists observed (52% before, 48% after), there were no statistically significant percent differences in adherence between the old and new SSC in regards to the overall checklist (-3.81%, p=0.67), pre-induction (-0.32%, p=0.68), timeout (-0.21%, p=0.64), and debrief (+1.32%, p=0.51). There was a 7.46% (p=0.11) increase in adherence for the pre-existing debrief checklist items, while the new debrief items had 50% adherence. Interview sentiments reflected a more consistent culture of safety (Table 1).

Conclusion: While the new SSC found no significant increase overall in adherence, we did identify shortcomings in new checkpoints. We found disparities amongst sentiments regarding the new checklist rollout, as well as the applicability of the revisions, despite pre-implementation education. Our data highlights the need for multifocal implementation strategies as well as real-time assessment of adherence to ensure optimal compliance.

Table 1: Summary of Qualitative Interview Responses

Question	Responses
What did you think about the new checklist *rollout?*	***Positive:*** *"The rollout was smooth, I didn't run into any hiccups."* ***Neutral:*** *"I don't see a big difference between the old and new checklist."* ***Negative:*** *"There's no standardization of how the checklist is implemented."* *"I don't understand why they even changed the checklist."*
What *DO* you like about the new checklist?	*"The new debrief at the end helps to keep the tone of safety throughout the case."* *"[The debrief section] was previously just a whisper by the surgeon and now everyone is forced to participate."*
What *DON'T* you like about the new checklist?	*"It's hard to hit all the boxes. For example, if something doesn't apply to the procedure, we still have to say it."* *"The debrief is too long and too much."*

Mini-Talk Session | Abstract | Surgical Education

The Cost of Learning: Residents' Awareness of Cadaver Anatomy Laboratories Costs in a Single Institution

A De la Fuente Hagopian, S Farhat, B Benavides, F Amirkhosravi, S Martinez, EY Chan, K McDonald, A Echo, N Tariq
Houston Methodist Hospital

Background: Cadaver laboratories (CLs) are essential for surgical training, but their costs are not reimbursed by Medicare, which can impact residency programs' competitiveness and quality.

Covid-19 and fiscal pressures prompted more efficient Cadaver Lab (CL) structure, where residents perform minor and major surgeries, depending on their level.

Objective: This study explored residents' awareness of unreimbursed CL costs.

Methods: A cross-sectional survey was administered to 34 general surgery residents. Participants estimated cost of single CL training sessions, CL impact perceptions, and demographics. Invoices, annual expenses, number of residents, and CL layout for pre- and post-COVID-19 eras were reviewed.

Results: 34 residents were surveyed, 24 (70.5%) responded. 14 males and 10 females across all levels of training 79% was a US graduate and 21% were international. One had not participated in CL before residency.

Before efficiency program, annual budget for CL $32,606.00, $8,151.00/CL and $679.25 per resident per academic year (res/a.yr). After, expense for CL $12,907.33, $4,302.44/CL and $358.15 res/a.yr; without significant reduction in hands-on time.

None believed the cost per resident per CL was <$500 res/a.yr; 4 (17%) considered it to be $500-999 res/a.yr; 12 (50%) believed it to be $1,000-$1,999 res/a.yr, and 8 (33%) believed it was >$2,000 res/a.yr.

79% of residents believed their estimation justified by educational benefits provided.

Conclusion: Resident perception was more accurate in the pre-COVID-19 era, but costs have significantly decreased, and yet ~80% of residents overestimate the cost by 3x or more. Stakeholder awareness of costs is crucial, given rising fiscal pressures on education programs.

Mini-Talk Session | Case Review | Thoracic Surgery

Successful Repair of a Ruptured Sinus of Valsalva Following Blunt Chest Traumatic Injury

Ray, N, Tanaka, A, Adams, S, Macedo, T, Estrera, A, Eisenberg, S.
University of Texas HSC - Houston

Introduction/Objective: Sinus of Valsalva aneurysms (SOVA) is a rare congenital or acquired condition of the aortic root. Ruptured SOVA typically involves another chamber of the heart. Free wall rupture of the SOVA is usually associated with sudden death due to tamponade. We report a case of blunt trauma resulting in the rupture of the non-coronary sinuses of Valsalva, which was successfully repaired.

Discussion: A literature search did not identify any reports of long-term survival following emergency surgical intervention for traumatic, free rupture of the Sinuses of Valsalva. We identified reports of non-traumatic ruptures of the SOVA into the pericardium causing tamponade.1 The unique feature of this case was the acute traumatic cause of the rupture, the distinct CT and TTE findings, and the successful aortic valve replacement. The history of sternotomy for penetrating trauma possibly contributed to the patient's survival.

Conclusion: Traumatic free wall ruptured sinus of Valsalva into the mediastinum can show specific radiological findings; rapid surgical correction should ensue.

Case Presentation: The patient is a 48-year-old male with a past medical history of sternotomy for penetrating trauma who recently sustained blunt chest trauma. Upon arrival, the patient complained of chest pain and shortness of breath. TTE (figure 1a) and chest CT (figure 1b) revealed SOVA rupture.
The patient underwent a redo sternotomy, revealing a rupture of the non-coronary aortic root sinuses. He received a biological aortic root reconstruction. After a prolonged hospital course, he was discharged to home and resumed all normal activities upon outpatient follow-up.

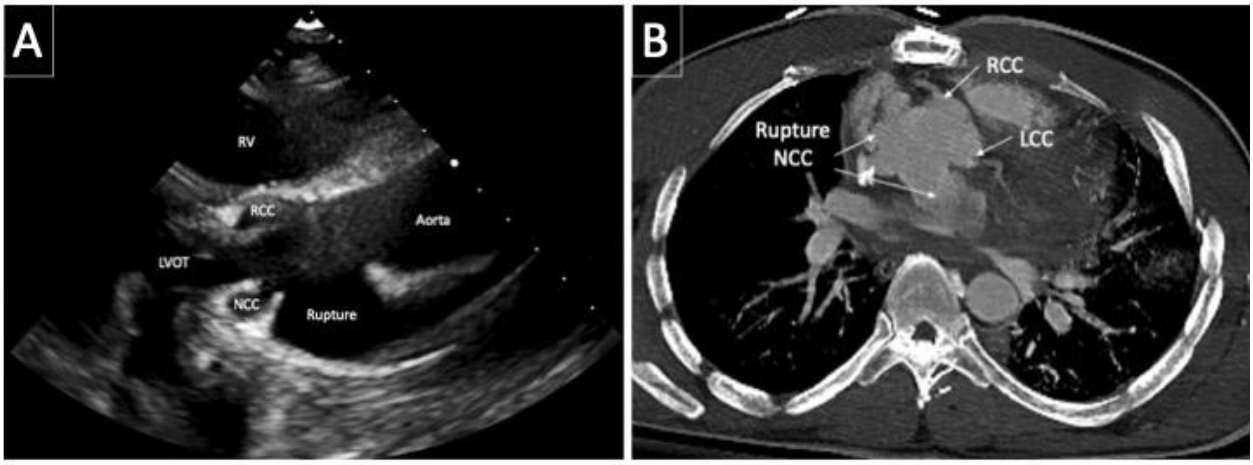


Figure 1a: The transthoracic echocardiograph reveals a rupture of the sinus of Valsalva. The rupture is near the aortic root's non-coronary cusp (NCC). Also visible are the right ventricle (RV), left ventricular outflow tract (LVOT), right coronary cusp (RCC), and ascending aorta.

Figure 1b: Axial view of chest CT showing disruption of the non-coronary sinus (NCC) with contained posterior hematoma within the mediastinum. The left coronary cusp (LCC) and right coronary cusp (RCC) are visualized.

Mini-Talk Session | Case Review | Trauma/Burn/Critical Care

Anaphylaxis Following Rattle Snake Envenomation: A Case Report.

Texas A&M Scott and White

Introduction/Objective: Venomous snake bites are a common occurrence in central Texas and can lead to significant morbidity. The presentation and subsequent response to anti-venom following a venomous snake bite can vary widely. Anaphylactic reaction to envenomation is a sparsely described phenomena in the literature. In this case report, we describe the unique presentation and management of a patient that presented in anaphylactic shock following a rattle snake bite.

Discussion: Anaphylactic reaction is a rare reaction after venomous snake bite. The early diagnosis of anaphylaxis and prompt treatment with resuscitation and epinephrine is important in the management of these patients in addition to giving CROFAB.

Conclusion: Patients with a venomous snake bite are at risk for an anaphylactic reaction, which can appropriately be managed with supportive care, including ICU admission, and anti-venom administration.

Case Presentation: The patient is a 49-year-old female with a history of type two diabetes and hypertension who presented to the Emergency Department with diaphoresis, persistent emesis, and lethargy approximately 40 minutes after she was bit on her right hand by a rattle snake. She was severely hypotensive on arrival with blood pressure measuring 56/33 mmHg. She was given two push doses of 0.3 mg of epinephrine without response, and she was placed on an epinephrine continuous infusion with admission to the Surgical Intensive Care Unit (SICU). During her admission, she received a total of 30 vials of crotalidae polyvalent immune fab (CROFAB). Additionally, she required a re-admission for recurrent disseminated intravascular coagulation (DIC), necessitating the 12 more vials of CROFAB.

Mini-Talk Session | Case Review | Vascular Surgery

Obturator Bypass: A Rare Case of Greater Then 10 Year Primary Assisted Patency in the Setting Of Sepsis and Common Femoral Artery Blow Out

University of Texas Medical Center - San Antonio

Introduction/Objective: Of all recognized access complications, the most complex to manage are arterial infections. The case presented here is of eleven-year primary assisted cryopreserved obturator bypass.

Discussion: The expected five-year patency for an obturator bypass is around 60%. In this patient with aggressive bacterial arterial infection with multiple procedures, his extra-anatomic bypass served as a safe and effective option providing flow for over 10 years.

Conclusion: Obturator bypass should be considered as a viable option with reasonable patency.

Case Presentation: The patient presented with acute arterial occlusion and had two days of thrombolysis through the femoral artery (CFA) and an Angioseal™ placed. He left AMA the following day febrile but returned a week later with a fluid collection superior to the artery. Exploration showed organ space involvement but the artery was intact. Debridement and a VAC were placed. One month later the CFA ruptured requiring femoral interposition grafting with cryopreserved femoral artery and a rectus flap. He had suture line disruption that was temporized as he prepared for a definitive procedure. A spliced obturator bypass from common iliac to below knee popliteal artery with cryo-artery and ligation of the groin vessels was performed. The bypass had primary patency for seven years requiring angioplasty in the thigh and intervention the following year in the obturator segment with angioplasty and drug eluding stent. The bypass remained patent for another 3 years until his death.

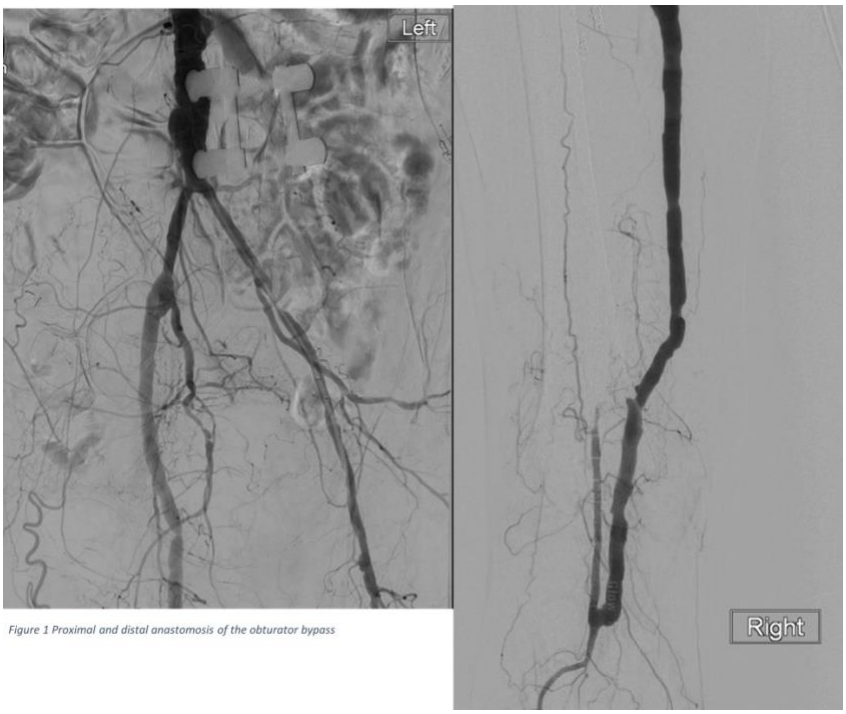


Figure 1 Proximal and distal anastomosis of the obturator bypass

Computed Tomography Usage and Dosing in Pediatric Appendicitis Diagnosis

I Anderson, Y Young, N Jayarajan, K Sutyak, E Garcia, N Hebballi, M Broussard, T Fisher, B Hegde, N Ghosh, S John, S Rose, K Lally, K Tsao
University of Texas HSC - Houston

Background: Radiation used in computed tomography (CT) carries an oncogenic risk, which is heightened in children. Through a system-wide quality improvement project, diagnostic CT rates have declined, but radiation dose within our community remains unknown.

Objective: We aimed to compare current CT usage and radiation dosing between our children's-associated hospitals (system hospitals, SH) and referring community healthcare facilities (non-system hospitals, NSH).

Methods: A retrospective cohort study was conducted on patients (<18 years) who underwent evaluation at SH or NSH and received appendectomy at our tertiary level children's hospital between June 2020–June 2023. Size Specific Dose Estimate (SSDE), accounting for patient diameter, and Effective Dose (ED), accounting for patient age, were calculated. SSDE was evaluated against dose benchmarks achievable dose (AD) and diagnostic reference level (DRL).

Results: Of 1,419 patients, 410 (29%) received a CT during diagnostic work-up for acute appendicitis. This is a 55% reduction in CT usage compared to usage prior to the system-wide quality improvement initiative. Both SSDE and ED were higher at NSH than at SH (Figure). 50.0% of CTs performed at NSH (n=62) exceeded DRL, while 31.6% at our children's facility (n=19), and 32.5% at 11 other SH (n=271), exceeded DRL (Figure).

Conclusion: Despite decrease in CT utilization for appendicitis diagnosis, radiation dose remains a concern. Patients received significantly higher radiation doses and doses exceeded reference levels more often at NSH when compared to SH associated with our children's facility. Pediatric CT reduction protocols should include dosing evaluation and robust dose reduction guidelines.

			Mean SSDE ± sd (mGy) (n=351)	
Age Group	**AD (mGy)**	**DRL (mGy)**	**System Hospitals**	**Non-System Hospitals**
5-10 years	5.9	7.9	7.16 ± 4.41	7.69 ± 4.33
10-15 years	8.9	11	11.54 ± 7.24	* 13.7 ± 6.19
5-18 years	11	14	11.64 ± 6.73	20.6 ± 14.22
Percent of CT scans exceeding DRL:			**32.3%**	**50.0%**

American College of Radiology dose benchmarks:
AD = achievable dose (50th percentile median), DRL = diagnostic reference level (75th percentile)
* = value is significantly higher than DRL by student's t test with $p<0.05$
Age categories with fewer than 5 CT scan observations were excluded

Reinforcing Success: The power of the patch overlay in reducing hernia recurrence in congenital diaphragmatic hernia repair

Kylie I. Holden, Ashley H. Ebanks, Terry Buchmiller, Kevin P. Lally, Matthew T. Harting on behalf of the CDHSG
University of Texas HSC - Houston

Background: Higher rates of congenital diaphragmatic hernia (CDH) recurrence are associated with the thoracoscopic as opposed to open approach in CDH repair. Recurrence may be reduced in a primary repair with the addition of a patch overlay, mitigating the primary morbidity of the thoracoscopic approach.

Objective: This study analyzes the inpatient hernia recurrence rate and the effectiveness of a patch overlay.

Methods: Using the CDH study group (CDHSG) registry, patients undergoing CDH repair were identified. Patient demographics, CDHSG stage, management/operative details, and recurrence were prospectively collected and retrospectively analyzed. Univariable and multivariable analyses were performed.

Results: 4,525 patients with CDH were identified between 2015-2022. 3,988 (88.1%) patients underwent open repair, 537 (11.9%) underwent thoracoscopic repair, and 149 (3.3%) had an early recurrence. Of those that recurred, 28 patients underwent thoracoscopic repair, while 121 underwent open repair with a recurrence rate of 5.2% versus 3.0%, respectively; $p<0.01$. Rate of recurrence by operative approach and CDHSG stage shown in Table. In univariable analyses, defect size, the presence of a hernia sac, surgical approach, and liver position were all statistically significant (all $p<0.01$). A multivariable analysis identified surgical approach ($p<0.01$) to be most significant variable associated with recurrence.

Conclusion: Thoracoscopic repair continues to have a higher rate of recurrence compared to the open approach. Early analyses show that use of a patch overlay may decrease recurrence among those undergoing a primary, thoracoscopic repair. We encourage surgeons to consider this practice, although ongoing investigation is necessary to confirm these early findings.

Table:

	Open				Thoracoscopic			
	Primary Repair		Patch Overlay		Primary Repair		Patch Overlay	
	Total n	Those with recurrences n (%)	Total n	Those with recurrences n (%)	Total n	Those with recurrences n (%)	Total n	Those with recurrences n (%)
A	301	0 (0)	3	0 (0)	151	5 (3.3)	2	0 (0)
B	763	19 (2.5)	12	1 (8.3)	234	14 (6.0)	3	0 (0)
C	147	2 (1.4)	7	0 (0)	25	1 (4.0)	1	0 (0)
D	2	0 (0)	0	0 (0)	0	0 (0)	0	0 (0)
Total	1213	21 (1.7)	22	1 (4.5)	410	20 (4.9)	6	0 (0)

This table depicts the number of patients, and the percent recurrence for each surgical approach by defect size. 27 patients did not have a CDHSG defect size described.

Upregulated Pathways in Hepatoblastoma Vascular Invasion

A Espinoza, R Patel, S Woodfield, S Vasudevan
Baylor College of Medicine

Objective: Given therapies are ineffective, we sought to better understand the biomarkers and biology of VI in HB.

Methods: Using imaging mass cytometry (IMC) we analyzed 18 pre-validated protein targets on formalin-fixed paraffin embedded (FFPE) samples. We performed immunohistochemistry (IHC) on primary and metastatic lesions from additional patients. RNA sequencing of our primary liver tumors and vascular sub-clones of the tumor were performed. Migration and scratch assays were performed after shRNA knockdown of Yap-1 and c-MYC.

Results: Protein expression of c-Myc and YAP-1 are increased as the tumor invades the neighboring blood vessel on IMC. IHC of additional patients demonstrated nuclear positivity of YAP-1 and c-Myc in metastatic lung lesions, compared to the negative nature of the primary liver tumor. RNA sequencing data showed that average gene expression of c-Myc and YAP-1 of the tumor in hepatic vein was 1.61 and 12.9 times, respectively, higher than the primary tumor. c-MYC and Yap-1 knocked down in HepT1 cells had 25% and 30% migrated cells compared to parental, respectively, after 48 hours (p=0.02). In scratch assays, 50% of c-Myc knocked down HepT1 cells migrated compared to parental at 24 hours (p=0.03).

Conclusion: YAP-1 and c-Myc had higher expression in HB as the tumor cells migrate into vasculature and metastasize. YAP-1 and c-Myc expression appear to play a role in vascular invasion that is maintained at metastatic lesions.

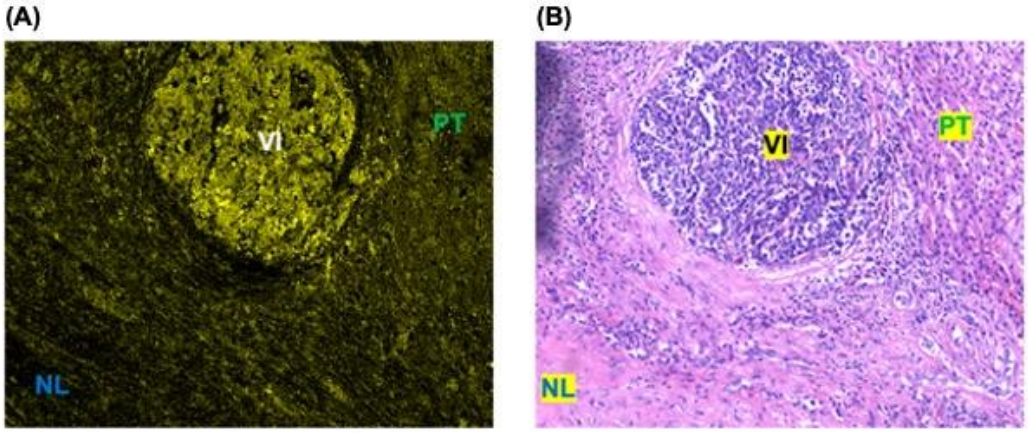


Figure 1A/B. Figure 1A (left) shows imaging mass cytometry with yellow correlating with YAP-1 protein expression. Normal liver (NL), primary tumor, (PT). and vascular invasion (VI). Figure 1B (right) shows 10x H&E of the same area.

Transplanted Human Intestinal Organoid Enteric Nervous System Maturity Impacts SIP Syncytium Development

Hallie R. Wilson BS, Justin E. Lewis MS, Andie C. Dorn BS, Eoin P. McNeill PhD, David J. Sequeira AS, Partha S. Chakraborty MD, Hasen Xue MD, Madushani Herath PhD, Scott D. Olson PhD, Allison L. Speer MD, FACS
University of Texas HSC - Houston

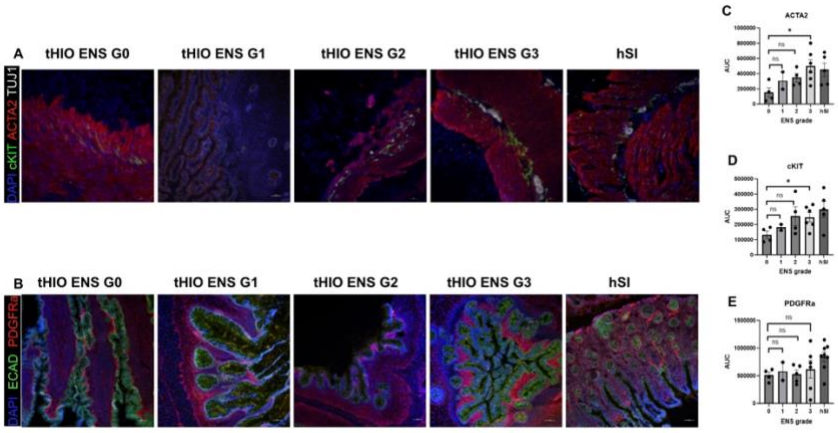
Background: Human intestinal organoids (HIOs) have the potential to cure children with intestinal failure; however, proper ENS development and function needs to be confirmed prior to therapeutic application. HIOs can be generated and innervated from human pluripotent stem cells (hPSCs) to contain epithelium, mesenchyme, and an enteric nervous system (ENS). Intestinal motility is regulated by the ENS and SIP (smooth muscle cells (SMCs), interstitial cells of Cajal (ICCs), and platelet derived growth factor receptor alpha (PDGFRα)) syncytium, but has not yet been recapitulated in HIOs.

Objective: We sought to determine how ENS maturity influences SIP syncytium development in transplanted HIOs (tHIOs).

Methods: HIOs+ENS were generated in vitro from hPSCs and transplanted into NSG mice for 6-18 weeks. Immunohistochemistry (IHC) was performed for TUJ1 to assess ENS development on a grading scale of 0-3. IHC was performed for ACTA2, cKIT, and PDGFRα, and fluorescent intensity quantified. RNA was isolated and analyzed by RNAseq. Heat maps for mesenchymal genes were created.

Results: IHC confirmed variable ENS maturity and the presence of all SIP syncytium components: ACTA2+ SMCs, cKIT+ ICCs, and PDGFRα+ cells in all tHIOs with epithelium and mesenchyme. The expression of ACTA2 and cKIT was significantly higher in tHIOs with G3 ENS vs G0 ENS whereas PDGFRα expression was similar. RNAseq heat maps corroborated IHC data demonstrating increased expression of ACTA2 and cKIT in tHIOs with G3 ENS vs G0 ENS and similar expression of PDGFRα.

Conclusion: These results suggest that ENS maturity within tHIOs impacts SIP syncytium development, enhancing the growth of SMCs and ICCs.



Pediatric Border Health: A Surgically Underserved South Texas Community Struggles with High Rates of Congenital Defects in the Neonatal Population

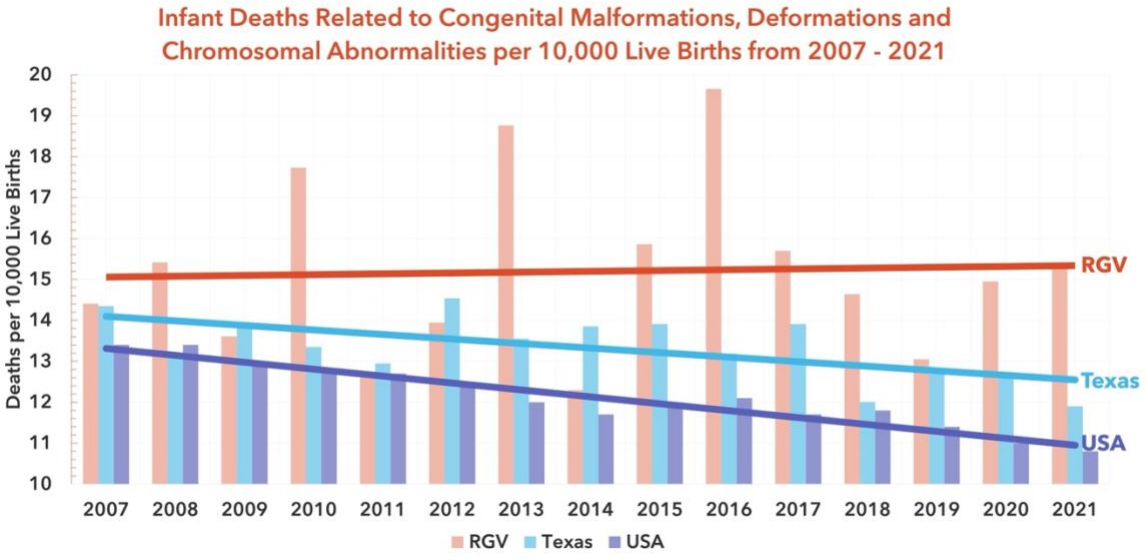
T Akinpelu, VM Jacobsen, AI Dadzie, VS Alia, D Bolton
University of Texas Rio Grande Valley

Objective: This paper aims to identify disparities in available care and associated poor outcomes affecting this vulnerable pediatric population.

Methods: We reviewed the incidence and mortality rates of congenital defects from 2007-2020 using data from the National Vital Statistics System (NVSS) Database, and RGV-specific data from 1998-2018 provided by the Texas Department of State Health Services (TDSHS) report on birth defects showing their prevalence within the RGV. Additional data was obtained from the Texas Medical Board (TMB) and the TDSHS Workforce Supply & Demand Projections to identify trends in population specific specialty-physicians in the RGV.

Results: Analysis of NVSS and TDSHS data showed that Cameron, the second largest county in the RGV ranked 5th (173.37 deaths per 100,000 live-births) in the nation for infant deaths associated with congenital defects. TMB data between 2017-2023 showed the number of state licensed pediatric surgeons servicing all 4 RGV counties (Cameron, Hidalgo, Starr, Willacy) decreased by 66% (from 3 to 1). Data from the TDSHS showed that in 2018 the RGV had the largest shortage of thoracic surgeons in Texas with a Percent Demand Met (PDM) of 75.6%. While projected to rise to 81.5% in 2032, the RGV would still have the second-largest shortage in thoracic surgeons in Texas.

Conclusion: In addition to being a surgically-underserved region, the RGV also has a large undocumented population who often face additional barriers to healthcare-services. The added barriers to prenatal care this special population faces, further contributes to the high rates of congenital abnormalities seen in this region. This maternal-fetal healthcare crisis coupled with shortages in pediatric and cardiothoracic surgeons, has created a dangerous rise in the morbidity and mortality of pediatric populations in the RGV.



MT-Case Review Session | Case Review | Trauma/Burn/Critical Care

A Complicated Case of Polytrauma and Concurrent Fungal Skull Infections

University of Texas Medical Center - San Antonio

Introduction/Objective: To describe a case of multiple invasive fungal infections in the wound bed of scalp laceration and traumatic upper extremity amputation following motor vehicle collision (MVC).

Discussion: To our knowledge, this is the first case of Fusarium, Mucormycosis, and Mycobacteroides coinfection in the literature. These pathogens are known to cause aggressive necrotizing infection, usually from inoculation in traumatic injury.1 HBO has a known role in treatment of invasive fungal infections as it is fungistatic and decreases morbidity.2 There are case reports of topical amphotericin for invasive mucormycosis,3 but no systematic review of efficacy to our knowledge.

Conclusion: This case highlights the importance of a multidisciplinary approach with aggressive surgical debridement and medical therapy. A relevant aspect of our approach includes local antifungal therapy during surgical debridement and HBO to achieve control.

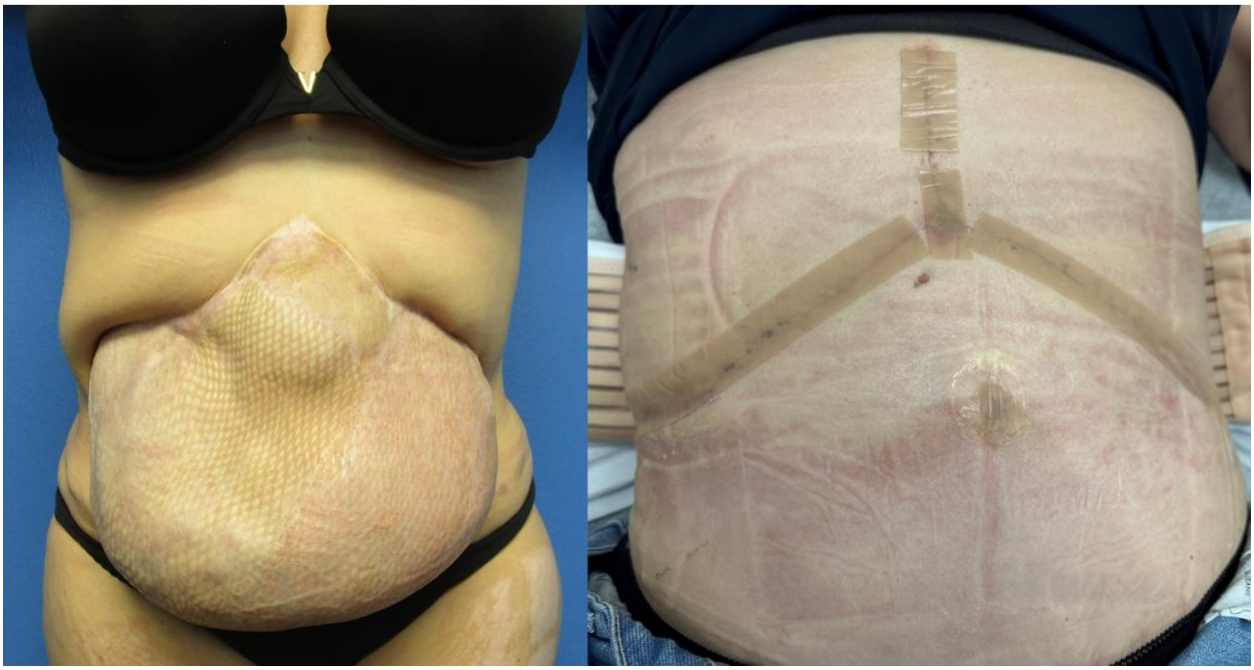
Case Presentation: Fifty-two year old male with well-controlled T2DM and HTN admitted after MVC. Patient had severe trauma to left upper extremity and extensive degloving injury of the skull. He required shoulder disarticulation and debridement of frontal and temporal bones. Wound cultures most notably revealed Apophysomyces trapeziformis, Mycobacteroides (mycobacterium) abscessus, Fusarium species, and Stenotrophomonas maltophilia. Treatment regimen included aggressive systemic antifungal therapy, 46 debridements and washouts of the scalp, skull and left chest with clavicle disarticulation. Adjunct therapies included wound vac therapy, intraoperative topical amphotericin irrigation, and hyperbaric oxygen therapy (HBO). Course finalized with skin grafts for reconstruction. Patient was discharged home on hospital day 143 and has completed antimicrobial therapy.

MT-Case Review Session | Case Review | General Surgery

Abdominal Wall Reconstruction for Loss of Domain Hernia After Open Necrosectomy

University of Texas HSC - Houston

Case Presentation: The patient is a 55-year-old woman with a history of severe necrotizing pancreatitis in April 2022 complicated by abdominal compartment syndrome, for which she underwent exploratory laparotomy and necrosectomy through a chevron incision. Her course was complicated by pancreaticocutaneous fistula due to pancreatic duct disruption. She underwent many operations and was left with an open abdomen for several months, which was eventually managed with a skin graft, leaving her with a very large ventral incisional hernia with loss of domain. Her hernia severely affected her quality of life, and she was referred to us for hernia repair. She underwent tissue expander placement by plastic surgery to facilitate skin coverage. She later underwent peritoneal dialysis catheter placement for progressive preoperative pneumoperitoneum and bilateral trunk denervation with Botox. The patient was taken to the operating room three weeks later for a combined procedure by abdominal wall reconstruction and plastic surgery. We performed exploratory laparotomy, enterolysis, drainage of chronic intra-abdominal abscess, small bowel resection with stapled side-to-side anastomosis, ileocecectomy with stapled side-to-side anastomosis, open repair of ventral incisional hernia with mesh suture and bridging woven Vicryl mesh, removal of tissue expanders, and skin graft excision. She subsequently did very and was discharged home on postoperative day 7. She has since been seen in clinic and has returned to normal activity. We plan to perform ventral hernia repair with mesh in 6-12 months, depending on her functional status.



Mini-Talk Case Review Session | Case Review | General Surgery

Secondary Aorto-enteric Fistula

University of Incarnate Word School of Osteopathic Medicine

Introduction/Objective: Aortoenteric fistula (AEF) is an uncommon but life-threatening condition due to massive gastrointestinal bleeding. AEFs occur when the aorta erodes into the enteric system [1]. Primary AEFs arise spontaneously whereas secondary AEFs typically arise as a complication of a vascular procedure [2]. This is a case review on the diagnosis and management of a secondary AEF which occurs in 0.36% to 1.6% of patients who have undergone vascular procedures [1].

Discussion: The patient had a secondary AEF due to a bifemoral bypass graft that eroded into the right colon. The patient underwent a bifemoral bypass graft due to his history of severe atherosclerotic disease, smoking, hypertension and diabetes mellitus. Years later, the patient presented to the ER with hypotension, tachycardia, and massive rectal bleeding which gave a high index of suspicion for an AEF. Differential diagnoses to consider with this acute presentation are retroperitoneal fibrosis, infected (myotic) aortic aneurysm, and infectious aortitis [3].

Conclusion: AEF is a life-threatening condition that requires prompt diagnosis and emergency surgical intervention especially in hemodynamically unstable patients. Due to the patient's past medical and surgical history, endovascular resection and repair of the graft was justified.

Case Presentation: A 65-year-old male who is a lifetime smoker presents to the ER with tachycardia and hypotension with a past medical history of severe atherosclerotic disease, aortobifemoral bypass graft, hypertension, diabetes mellitus, and atelectasis. CT angiogram of the abdomen and pelvis revealed a massive rectal bleed which gave a high index of suspicion for an AEF secondary to his infected graft. An endovascular graft resection was performed to remove the infected graft. Subsequently, an axillofemoral bypass graft was placed to provide vascular continuity. Lastly, a right colon resection and ileostomy were performed to establish bowel continuity. Post-op management of the AEF revealed an abscess on a CT angiogram, which was removed by Interventional Radiology. The patient was treated with antibiotics and supportive care. This patient will undergo regular screening following the graft repair for the remainder of his life.

Mini-Talk Case Review Session | Case Review | General Surgery

Surgical Complication: A Case of Vibrio Vulnificus in Galveston

HCA Healthcare Houston

Introduction/Objective: Cases of soft tissue infections due to exposure to Vibrio Vulnificus in seawater environments, such as Galveston are well documented. However, the goal of this case is to document a specific and severe incidence of Vibrio Vulnificus in a patient with a history of heart transplant surgery. Given the patient's recent transplant and immunosuppressant medication regimen, their immune system's response was insufficient to clear the infection. Consequently, the infection persisted and their tissue became gangrenous, requiring the patient to undergo an above-the-knee amputation.

Discussion: 57 M with a history of heart transplant (2019) on immunosuppressants, DM, HTN, HLD, CHF, and CAD, presenting with RLE pain, swelling, and erythema. The patient reports he was in Galveston a week ago when he stepped on a seashell while fishing.

The patient reported associated lethargy, fever, vomiting, dizziness, and headache. On physical exam, there was a right plantar laceration and weeping bullae. He was started on Doxycycline and Rocephin.

His labs and vitals were consistent with septic shock and he required pressor support despite fluid resuscitation. and an emergent above-the-knee amputation (AKA) was done.

On POD3, there was increasing leukocytosis and blanching erythema/pain at the right inguinal crease. Due to concerns about infection progression and the possible need for Right Hip Disarticulation, the patient was transferred to an outside institution.

At this hospital, the patient was able to continue antibiotic management and had his AKA formalized after 1 week.

He was then transferred to an inpatient rehabilitation center and subsequently discharged home a few weeks later.

Reported using Care Guidelines.

Conclusion: The incidence of Vibrio Vulnificus is well managed and controlled in the United States, but it is important to consider vulnerable populations, such as those receiving heart transplants as they are more predisposed to morbidity and higher mortality following an infection. It is also important to treat empirically with antibiotics, including Doxycycline and Ceftriaxone, to prevent undesired complications, such as an above-the-knee amputation. However, surgical intervention may be necessary if the affected tissue becomes gangrenous.

Case Presentation: 57 M with a history of heart transplant (2019) on immunosuppressants, DM, HTN, HLD, CHF, and CAD, presenting with RLE pain, swelling, and erythema. The patient reports he was in Galveston a week ago when he stepped on a seashell while fishing.

The patient reported associated lethargy, fever, vomiting, dizziness, and headache. On physical exam, there was a right plantar laceration and weeping bullae. He was started on

Doxycycline and Rocephin.

His labs and vitals were consistent with septic shock and he required pressor support despite fluid resuscitation. and an emergent above-the-knee amputation (AKA) was done.

On POD3, there was increasing leukocytosis and blanching erythema/pain at the right inguinal crease. Due to concerns about infection progression and the possible need for Right Hip Disarticulation, the patient was transferred to an outside institution.

At this hospital, the patient was able to continue antibiotic management and had his AKA formalized after 1 week.

He was then transferred to an inpatient rehabilitation center and subsequently discharged home a few weeks later.

Reported using Care Guidelines.

Mini-Talk Case Review Session | Case Review | General Surgery

Angiomyofibroblastoma: rare pathology in an elderly male patient with a perirectal mass

University of Texas Medical Branch - Galveston

Introduction/Objective: Angiomyofibroblastoma (AMFB) is a rare benign tumor of mesenchymal origin. AMFB occurs almost exclusively in the lower genital tract of women. Here we will present the case of AMFB of the perirectal region in an elderly male.

Discussion: AMFB in males is rare and to our knowledge has not been described in the perirectal region in the literature. Physical exam findings and imaging alone do not suffice to confirm the diagnosis and distinguish these tumors from aggressive angiomyxoma (AAM) which is infiltrative with a high risk of recurrence.

Conclusion: AMFB in males is rare, but benign. The preoperative diagnosis poses a significant clinical challenge, with a differential ranging from benign to malignant. Surgical excision with histological and immunohistochemical work up is required to confirm the diagnosis.

Case Presentation: Our patient is a 74-year-old male who presented with a painless enlarging perirectal mass. MRI showed a well-defined, 2.7 cm x 8 cm x 8 cm mass within the left perirectal and subcutaneous gluteal fat near, but not invading, the external anal sphincter. The mass had a smooth border with heterogenous appearance on T2 hyperintensity without enhancement (Fig. 1). Surgical excision was performed. Histology showed a well circumscribed, non-infiltrative, benign vascular and spindle cell neoplasm. Immunohistochemical studies showed positive staining for estrogen receptor, CD34, Desmin, and HMGA2. There was no reactivity to S-100 or smooth muscle actin. Given these findings, the diagnosis of angiomyofibroblastoma was confirmed. At follow up he had recovered well from surgery without complication.

Prevalence of Delirium After Abdominal Surgery and Association with Ketamine: A Retrospective, Propensity-Matched Cohort Study

F Qamar, H Faisal, E Hsu, J Xu, E Lai, S Wong, F Masud
Houston Methodist Hospital

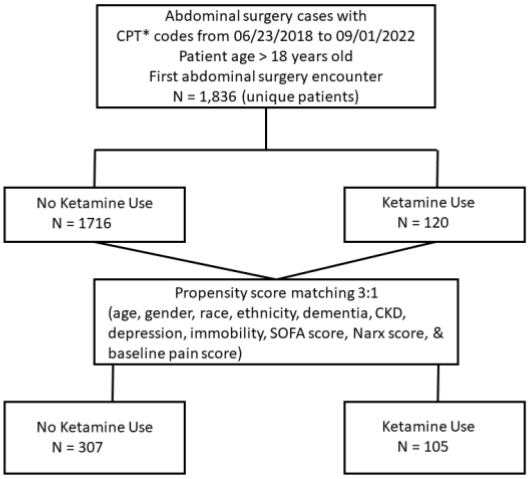
Background: Delirium, a common postoperative complication, especially in the intensive care unit (ICU) and older patients, is associated with increased morbidity and poor outcomes. Ketamine used primarily as an analgesic, has been thought to prevent delirium with conflicting evidence in literature.

Objective: This study aims to determine the prevalence of delirium and evaluate the association of the use of low-dose ketamine with delirium and other postoperative outcomes in ICU patients after abdominal surgery.

Methods: We conducted a single-center, retrospective, propensity-matched cohort study. Our cohort comprised 1,836 patients admitted to the ICU after abdominal surgery between June 23, 2018, to September 1, 2022. Propensity Score matching (PSM) with a 3:1 ratio between no-ketamine use and ketamine use was performed through a greedy algorithm based on a caliper of 0.005. The association between ketamine and the outcomes of interest was assessed by conditional logistic and linear regression with clustering.

Results: The prevalence of delirium was 47.7% (95% CI: 45.41%-50.03%) in the cohort. The age of individuals in the delirium group was significantly higher than those in the non-delirium group (66.29±14.35 Vs. 63.68±15.31 yrs., p<0·001). Out of 1,836 patients, 120 (6.54%) used low-dose ketamine infusion. After PSM, the low-dose ketamine use group was associated with 41% less odds of delirium (OR= 0.59; 95% CI: 0.37,0.94; p= 0.026) than the no-ketamine use group. Patients with ketamine use had higher mean pain scores than no-ketamine use ((3.57±2.86 vs 2.21±2.09, p < 0.001). In the subgroup analysis, patients in the ketamine use group with age ≤ 60 had 64% less odds of delirium (OR = 0.36; 95% CI: 0.13, 0.95; p=0.039). Based on ketamine use, there was no significant difference in mortality and opioid consumption.

Conclusion: Low-dose ketamine infusion was associated with lower prevalence of delirium in ICU patients following abdominal surgery. Prospective studies should further evaluate ketamine use and delirium.



D-Dimer Elevation Near Discharge is Associated with Higher Readmission Risk in Crotalid Snakebite Patients

J Smith, S Matthys, J Burnett, C Hall, S Keith
Texas A&M Scott and White

Background: Significant morbidity and mortality from crotalid snakebites is rare due to effective antivenom therapies; however, readmissions due to delayed coagulopathies are costly. Antivenom administration is typically protocolized using a severity score, which utilizes standard coagulation parameters to determine if initial dosing and re-dosing is indicated.

Objective: Determine if traditional coagulopathy or thromboelastography labs correlate with risk of readmission for patients hospitalized with crotalid snake bites.

Methods: Retrospective review was performed of all adult patients with snakebite injuries at our institution between 2012-2022. Standard coagulopathy values and thromboelastography results from the last lab draw during hospitalization were reviewed. Labs were drawn based upon snakebite protocol or physician discretion. Risk factors for readmission were determined. A Wilcoxon Rank Sum analysis was performed to determine statistical significance.

Results: 272 patients were identified, 35 (12.9%) of which were readmitted. D-dimer and fibrin split product levels were significantly higher ($p < 0.0001$; p 0.0433) in patients who were subsequently readmitted for antivenom administration compared to patients who did not require readmission, with median values of 16.8 vs 0.91 and 10 vs 5, respectively. Additional comparisons are listed in Table 1.

Conclusion: D-dimer and fibrin split product levels were significantly elevated in patients who required readmission for delayed coagulopathy following crotaline snakebite injury. Early recognition of patients who may develop delayed coagulopathy and require readmission is crucial to minimize morbidity for these patients. Further work is in process to develop a scoring system for readmission risk based upon conventional coagulopathy and TEG labs.

Lab Type	Number of patients with unique lab results (Non-readmitted/Readmitted)	Mean Wilcoxon Score (Non-readmitted)	Mean Wilcoxon Score (Readmitted)	P-value
R-time	90 / 22	57.2	53.7	0.66
Angle	96 / 23	62.6	49.3	0.10
MA	96 / 23	62.9	47.8	0.06
Hemoglobin	40 / 9	26.8	16.8	0.07
Platelets	74 / 19	45.8	51.6	0.41
INR	77 / 18	45.7	58.0	0.08
Fibrinogen	71 / 17	46.3	37.0	0.18
Fibrin Split Products	62 / 17	37.5	49.0	**0.04**
D-Dimer	64 / 17	35.0	63.7	**< 0.01**

Table 1: Wilcoxon rank-sum bivariate analysis of readmitted vs non-readmitted snakebite patients

THE SMOKING GUN: TRAUMA HOT SPOTTING AS A TOOL TO GUIDE TARGETED INTERVENTION

J Haag, T Puzio, L Moore, J Harvin, K Mueck, B Cotton, L Kao, D Meyer
University of Texas HSC - Houston

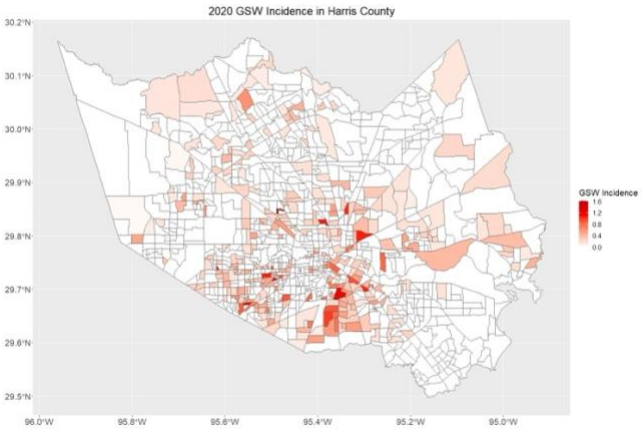
Background: Geospatial analysis has been employed to focus trauma-related intervention strategies. This study aimed to identify Harris County census tracts with increased density of traumatic injuries.

Objective: Identify gun violence hotspots in Harris County, Texas.

Methods: Retrospective review of all patients presenting to a high-volume Level 1 trauma center with a gunshot wound (GSW) in 2020. Injury locations were mapped to census tracts using geocoding. Demographic data were collected from the 2020 US Census and American Community Survey. Hotspots were defined as tracts with ≥3 GSW victims and an incidence of ≥1 per 1000 residents. Multivariable generalized linear models were used to identify demographic variables associated with GSW incidence.

Results: Of 8,177 trauma patients presenting in 2020, 410 sustained a GSW in Harris County. After mapping, 7 of 1115 Harris County census tracts were identified as hotspots, accounting for 29[7%] GSW victims. Age, male sex, injury severity score, and mortality were similar between hotspot and non-hotspot patients. However, hotspot tracts had lower median household income ($34,042[$31,276-$35,423] vs. $58,417[$41,747-$85,718], p=0.0007) and twice the residents living below the poverty level (2,813[12%] vs. 265,055[6%], p<0.0001) or without high school diploma (4,620[20%] vs. 539,491[11%], p<0.0001). After multivariable regression, each $10,000 median income increase was associated with a 12% GSW incidence reduction (RR 0.88[95%CI 0.84-0.93], p<0.0001). In the two hotspots with the highest GSW incidences, all GSWs events were traced to the same two apartment complexes.

Conclusion: Geographic and socioeconomic disparities exist in the burden of traumatic injury. These data can focus EMS training, infrastructure investment, and prevention strategies.



Does TXA Combined with Whole Blood Transfusion in Trauma Patients Increase the Risk of VTE?

JC Myers, S Murphy, L Barry, MA Braverman, E Brigmon, B Eastridge, D Jenkins, S Nicholson
University of Texas Medical Center - San Antonio

Background: Tranexamic acid (TXA) in combination with packed red blood cell (PRBC) transfusions has demonstrated benefits in trauma patients without increasing the risk of venous thromboembolism (VTE). However, the effect of TXA with whole blood (WB) has not been studied. Injury, abbreviated injury severity scores and the need for blood transfusions are historically associated with VTE.

Objective: Determine the relationship between VTE and the combination of TXA with PRBC vs WB.

Methods: Our institutional trauma registry was queried for trauma patients between 2015-2022 who received either WB+TXA or PRBC+TXA (prehospital or within 4 hours of arrival). Multivariate analysis was utilized to determine independent risk factors for VTE. Model covariates can be seen in the table.

Results: 305 patients met criteria. 251 received WB+TXA, 54 received PRBC+TXA. 34 patients had a VTE event (11.1%); 28 (11.2%) and 6 (11.1%) from the WB+TXA and PRBC+TXA groups, respectively. An elevated pre-hospital shock index (PHSI) was associated with higher risk of VTE (OR 1.85, 95%CI1.07-3.20). The remaining variables were insignificant (table 1).

Conclusion: These data demonstrate that the combination of WB+TXA administered to trauma patients has no higher risk of VTE than patients who receive PRBC+TXA, a comparison not studied clinically to date. There is no evidence that TXA combined with WB transfusion is associated with an increased risk of VTE. However, higher PHSI was associated with an elevated VTE rate. These clinical features provide insight into patients who may be at increased risk of developing VTE and may benefit from targeted prevention strategies.

Independent Predictors of VTE

Characteristic	OR (95% CI)	P-value
WB+TXA vs pRBC+TXA	1.37 (0.32-5.82)	0.669
Age	1.01 (0.98-1.05)	0.366
Hispanic ethnicity	2.33 (0.82-6.69)	0.108
BMI	0.99 (0.94-1.05)	0.793
Comorbidities	1.07 (0.35-3.33)	0.903
COVID	0.58 (0.05-6.70)	0.665
Penetrating injury	1.73 (0.58-5.13)	0.324
ISS	1.01 (0.98-1.05)	0.476
AIS lower extremity	1.60 (0.92-2.78)	0.083
Pre-hospital shock index	1.85 (1.07-3.20)	**0.030**

Identifying Predictors of Disability Following Non-fatal Firearm Injury in Adults

G Moran, L Callaghan, B Camarena, D Brisola, T Lee, C Perez-Stable, R Kitagawa, C Seger, C Cain, B Naik-Mathuria
Baylor College of Medicine

Objective: Our study's objective is to determine predictors for delayed recovery of firearm injury that may lead to disability.

Methods: Retrospective review of institutional trauma registries and patient charts was done of adult firearm victims treated at two high-volume Level I trauma centers in a large, urban County in Texas between 2018-2020. Data collected included demographics, shooting intent, injury location, severity, hospital course, and recovery outcomes. Delayed recovery was defined as patients with residual symptoms or complications three months post-firearm injury. Descriptive statistics and logistic regression were used to assess the association of intubation, mental illness, age, injury severity score, and hospital stay with delayed recovery.

Results: Of the 2,112 patients presenting with non-fatal firearm injuries, 1250 (59%) had documented follow-up at 3 months, while 823 (39%) were lost to follow-up. Of those with follow up, 52% (623/1250) fully recovered and 48% (597/1250) had delayed recovery, consisting of chronic pain (35%), neurologic deficit (28%), impaired mobility (26%), PTSD/anxiety (16%), gastrointestinal issue (13%), or other complications (24%). Self-inflicted and assault injuries had significantly higher incidence of delayed recovery compared to unintentional injuries (self-inflicted 76% vs assault 60% vs unintentional 34%; $X2(6)=29.92$, $p<0.001$). Delayed recovery was most common among injuries to the spine (75%) and head (67%) followed by abdomen (54%), extremity (52%), and thorax (46%). Patients had a signifcantly increased odds of delayed recovery due to head injury (OR 2.19, $p=0.005$) and spine injury (OR 3.28, $p=0.041$). History of mental health disorder increased odds of delayed recovery by 1.71 ($p<0.001$). Additionally, each additional hospital day increased odds by 9% ($p<0.001$), while each point increase in injury severity score increased odds by 4% ($p<0.001$). Age and need for intubation were not significant predictors of delayed recovery.

Conclusion: Delayed physical and psychological recovery is prevalent among victims of non-fatal firearm injuries, which may lead to long-term disability and its economic and social consequences. Patients with self-inflicted and assault-related head and spine injuries, as well as those with an underlying mental health disorder, may be at the highest risk. Additionally, each point increase in injury severity score may indicate an increased risk of delayed recovery. However, longer follow-up is needed to validate these findings. This study highlights the need for consistent follow up, as well as social and medical support for victims of firearm injury that continues after trauma center discharge.

Active Gentrification is a Place-Based Risk Factor for Exposure to Penetrating Trauma: A Geospatial Analysis

J Bradford, M Eldin, T Cardenas, P Teixeira, J DuBose, M Trust, M Mery, S Golestani, D Salvo, CVR Brown
University of Texas Austin - Dell Medical School

Objective: The aim of this study was to assess the association of gentrification to spatial patterns of penetrating traumatic injury.

Methods: Retrospectively collected data from violent penetrating trauma admission between January 1, 2018 – December 31 – 2022, at the single Level 1 trauma center in a US city were utilized for analysis. Using ArcGIS, addresses of patient residence were geocoded and spatial joining was used to match them to their corresponding census tract. Using a previously published gentrification index from our institution, census tracts were coded for presence of vulnerable populations and subsequent stage of gentrification: stable, susceptible, actively gentrifying, and gentrified. The incidence rate ratio comparing rates of penetrating trauma among gentrification stage relative to demographically similar stable census tracts was calculated.

Results: 862 violent penetrating trauma admissions were identified for the study period, of which 539 occurred within the geographic boundary of the census gentrification index and had valid location data for geospatial analysis. Among these, 56% occurred in census tracts defined as vulnerable to gentrification. Actively gentrifying neighborhoods had the highest incidence rate of penetrating violence at 113.77 per 100,000 people, compared to stable, vulnerable neighborhoods with an incidence rate of 19.62 per 100,000 people. (IRR=2.2, 1.3-3.8, $p<0.001$)

Conclusion: Actively gentrifying neighborhoods experience a higher incidence rate of penetrating traumatic injury than similar neighborhoods that are not undergoing gentrification or those that have completed gentrification. Furthermore, neighborhoods that have completed gentrification experience a significantly higher incidence rate of penetrating trauma than stable neighborhoods. Injury prevention efforts should consider active gentrification and gentrified neighborhoods as place-based risk factors for exposure to violence, and policymakers should consider the potential health impacts of gentrification policies on vulnerable populations.

Gentrification Stage	Incidence Rate (Per 100,000 person-years)	Incidence Rate Ratio (95% Confidence Interval)	P-value
Stable	10.4	Ref	
Susceptible	14.2	1.37 (0.80-2.49)	0.27
Gentrifying	22.6	2.20 (1.31-3.93)	0.002
Gentrified	16.0	1.54 (0.89-2.85)	0.13

Surgical Treatment of Median Arcuate Ligament Syndrome (MALS) in a Series of Patients with Gastroparesis

B Harper, M Toutoungy, G Aidinian, R McCallum, B Davis
Texas Tech University HSC - El Paso

Background: Median Arcuate Ligament Syndrome (MALS) is a rare disease process characterized by epigastric abdominal pain caused by compression of the celiac artery and its overlying nerve plexus by the median arcuate ligament (MAL). Co-existing gastrointestinal disease such as gastroparesis can complicate the diagnosis.

Objective: To examine the correlation between patient presentation and perceived improvement from surgical MAL release in a series of patients with gastroparesis and MALS

Methods: Retrospective chart review was performed on 8 patients who underwent MAL release by a single surgeon from 2012 to 2023. All patients were evaluated by a gastroenterologist for gastroparesis when they were diagnosed with MALS. Postoperatively, patients were called and asked to describe their percentage of relief from their presenting symptoms. Follow-up ranged from 2- 72 months. Demographics and symptoms were evaluated with student's t-test for correlation with percent reported improvement.

Results: The patients were mostly female. All presented with both abdominal pain and nausea. 88% of patients reported at least occasional emesis. 50% of patients underwent simultaneous or subsequent pyloroplasty. 100% of patients report at least partial relief of presenting GI symptoms and 50% of patients report total resolution of symptoms postoperatively. Statistically greater improvement was seen in patients who were female, had longer length of follow-up, and did not present with diarrhea.

Conclusion: The diagnosis of MALS should be considered in gastroparesis patients that present with persistent nausea and abdominal pain. This population has shown to benefit significantly from MAL release.

PATIENT	AGE	GENDER	BMI	EMESIS	WEIGHT LOSS	DIARRHEA	PSYCH DX	OPEN VS MIS	PYLOROPLASTY	MONTH OF F/U	% IMPROVEMENT
1	56	F	28	OCCASIONAL	Y	N	Y	OPEN	Y	72	100
2	36	F	19	NO	Y	N	N	OPEN	Y	48	100
3	21	F	28	FREQUENT	N	N	Y	OPEN	Y	10	100
4	32	F	18	OCCASIONAL	Y	N	N	MIS	N	4	80
5	49	F	25	FREQUENT	N	N	Y	MIS	N	36	100
6	41	M	23	FREQUENT *	N	Y	N	MIS	N	5	10
7	28	F	41	FREQUENT *	Y	N	Y	MIS	Y	3	55
8	43	F	25	OCCASIONAL	N	Y	Y	MIS	N	2	40

Table 1: Patient demographics and self-reported percentage improvement in symptoms at time of follow up. Legend: age in years, female (F), male (M), body mass index (BMI), yes (Y), no (N), psychiatric diagnosis (psych dx), open surgery (OPEN), minimally invasive surgery (MIS), months of follow up (month of f/u) in months. An asterisk (*) marks two patients dependent on parental nutrition prior to MAL surgical release.

The Effect of Modern Robotic Technology on Clinical Outcomes of Mitral Valve Surgery

Z Gray, A Shafii, G Loor, T Rosengart, K Liao
Baylor College of Medicine

Background: The adaptation of robotic cardiac surgery has been particularly slow due to studies with older robotic technology showing mixed outcomes.

Objective: The purpose of this study was to compare the clinical outcomes of patients who had robotic mitral valve repair and replacement using the most advanced robotic technology (4th generation) with those who had conventional mitral valve surgery at our institution.

Methods: Average Society of Thoracic Surgeons risk scores were used to compare the patient groups preoperatively. Performance metrics and blood transfusion data were used to compare clinical outcomes.

Results: 327 patients from January 2019 to July 2022 (robotic n=154 vs conventional n=173). The two cohorts were comparable in baseline characteristics and risk factors based on risk scores: Rob 2.58+/-3.56% vs conventional 2.54+/-4.35%, p=0.88. Patients were further divided into repair (robotic n=92 vs conventional n=58) and replacement (robotic n=62 vs conventional n=115). The robotic repair group performed significantly better with regard to reoperation, prolonged ventilation, length of stay, composite morbidity and mortality ($p<0.05$) and the robotic replacement group performed significantly better with regard to length of stay($p<0.05$). See Table 1.
Blood transfusion rates were as follows: robotic vs conventional repair 1.8 vs 3.6 and Rob vs conventional replacement 2.9 vs 5.3 units of red blood cells per transfused case.

Conclusion: Robotic mitral valve surgery can significantly decrease hospital cost and patient morbidity compared to conventional methods. The value of modern robotic technology in cardiac surgery should be reexamined.

STS Metrics	Rob repair (N=92) % (#Events/Total)	Conventional repair (N=58) % (#Events/Total)	P-value (two-sided Fisher's exact)	Rob replacement (N=62) % (#Events/Total)	Conventional replacement (N=115) % (#Events/Total)	P-value (two-sided Fisher's exact)
Mortality	0 (0/92)	1.7 (1/58)	0.3867	1.6 (1/62)	9.6 (11/115)	0.0589
Permanent Stroke	0 (0/92)	1.7 (1/58)	0.3867	0 (0/62)	0.9 (1/115)	0.9999
Reoperation	0 (0/92)	10.3 (6/58)	0.0028	4.8 (3/62)	12.2 (14/115)	0.1798
Prolonged Ventilation	1.1 (1/92)	13.8 (8/58)	0.0023	21.0 (13/62)	24.3 (28/115)	0.71
Renal Failure	0 (0/92)	1.7 (1/58)	0.3867	1.6 (1/62)	6.1 (7/115)	0.2638
DSW Infection	0 (0/92)	1.7 (1/58)	0.3867	0 (0/62)	0 (0/115)	0.9999
Short LOS	55.4 (51/92)	20.7 (12/58)	<0.0001	21.0 (13/62)	0 (0/115)	<0.0001
Composite Morbidity and Mortality	1.1 (1/92)	22.4 (13/58)	<0.0001	25.8 (16/62)	27.0 (31/115)	0.9999

Table 1: Summary of STS metrics, source data, and statistical analysis

Rates of Explanted Gastric Stimulators for Gastroparesis – Results from 110 Consecutive Cases

M Wall, M Eastridge, R Peterson, K Van Sickle
University of Texas Medical Center - San Antonio

Background: Gastroparesis is characterized by symptoms of delayed gastric emptying, abdominal pain, nausea/vomiting, and early satiety. Often the result of chronic diabetes, it can also be idiopathic or iatrogenic. A gastric electric stimulator (GES) can be considered when other therapies fail.

Objective: This study evaluated the reasons why patients required explantation their GES. We sought to determine scenarios that may have preoperatively helped us to determine which patients were the most likely to require explantation.

Methods: We maintain a database of gastroparesis surgery with pyloroplasty, GES, or both from 2010 to present. For this study, we included adult patients who had implantation (IP) or explantation (EP) of their GES. Reasons for EP were found in operative reports or histories and physicals.

Results: 110 patients had GES implants at our institution. 79 (71.8%) IP had diabetic gastroparesis, and 31 (28.2%) had non-diabetic gastroparesis (including idiopathic and iatrogenic). 83 (75.5%) female, 27 (24.5%) male. We included 20 EP in our study (18.2% of total studied implant patients). 13 (65%) EP had gastroparesis secondary to diabetes and 7 (35%) had non-diabetic gastroparesis. 18 (90%) female, 2 (10%) male. Stimulators were explanted 30 – 2,219 days from implant. Explant reasons included no/minimal symptom improvement (65%), pain at stimulator site (25%), need for MRI (15%), abdominal wall infection (15%), symptom resolution (5%), desired removal/no other explanation given (5%).

Conclusion: Analysis shows no significant difference in gender or type of gastroparesis in the GES IP and EP population. The most common reason for explant noted for no/minimal improvement in symptoms.

Surgical Potpourri Session | Abstract | Vascular Surgery

Limb Salvage Outcomes in Trauma Patients: The Role of a Vascular Surgery Service
A Siddiqui, G Aidinian, A Daneshpajouh, B Harper, B Zakireh, A Tyroch
Texas Tech University HSC - El Paso

Background: Numerous studies have demonstrated the adverse effects of amputations, including notable cardiovascular and cerebrovascular implications and non-ambulatory status. Regional disparities in limb salvage rates are contingent upon the availability of traditional vascular surgery services. On April 1, 2021, the University Medical Center El Paso inaugurated a formal vascular surgery service.

Objective: Our primary objective was to investigate the influence of this newly established service on limb salvage rates in the context of patients with extremity vascular trauma.

Methods: We conducted a retrospective analysis encompassing adult trauma patients admitted to the University Medical Center El Paso between 2016 and 2023, with the primary endpoint being the incidence of limb salvage.

Results: Our study cohort comprised 98 patients who met the inclusion criteria and underwent vascular interventions: 54 during the period spanning 2016 to 2021, and 44 following the initiation of the vascular surgery service in April 2021. Both groups exhibited similar demographics, comorbidities, trauma mechanisms, injury patterns, associated venous, nerve or bony injury, the capacity to receive antiplatelet and anticoagulation therapies, injury severity scores, and the nature of surgical or endovascular repairs. Among these patients, 10 necessitated amputations as a consequence of their traumatic injuries, with a noteworthy 70% of these amputations occurring prior to the commencement of the vascular surgery service.

Conclusion: The initiation of a formal vascular surgery service at our institution yielded a favorable impact on limb salvage rates among trauma patients, evidenced by a marked reduction in amputation rates.

	All patients	**Before April 2021**	**April 2021 – June 2023**
Number of Patients	98	54	44
Average Age	38.61 ± 15.26	39.6 ± 15.99	37.4 ± 14.39
Sex:			
Male	85 (86.7%)	46 (85.2%)	39 (88.6%)
Female	13 (13.3%)	8 (14.8%)	5 (11.4%)
Mechanism of Injury:			
Blunt	43	20	23
Penetrating	55	34	21
Injury Severity Score	12.89 ± 7.12	13.07 ± 7.00	12.40 ± 7.49
Service involved:			
Non-vascular	57 (58.2%)	54	3
Vascular Surgery	41 (41.8%)	0	41
Amputations Performed (% of total)	10 (10.2%)	7 (12.96%)	3 (6.82%)
			Chi Square = 0.641 **P > 0.05**

The Era 'or Error' of Second Localization Procedures

N Nelson, J Den, H Silva, B Digbeu, F Posleman, V Klimberg
University of Texas Medical Branch - Galveston

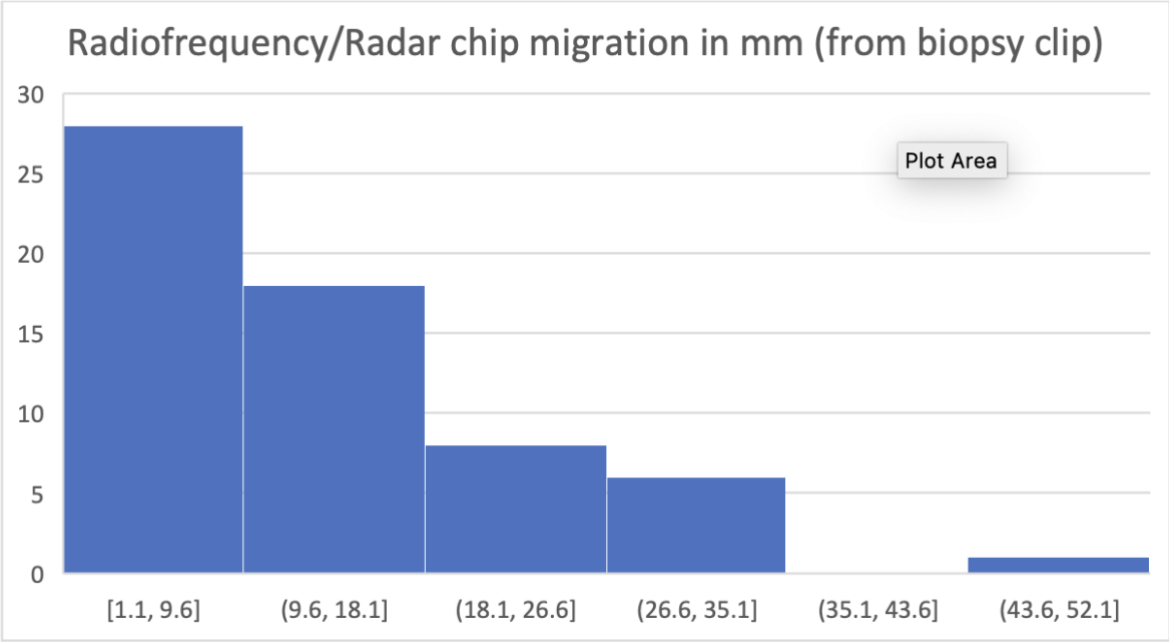
Background: Clip "migration" is known to occur after core needle biopsy. Radiofrequency and radar (R) localization involves a second localization procedure based on the prior clip placement potentially compounding the migration from the original biopsy site. Fluoroscopic intraoperative neoplasm detection (FIND) obviates the need for a second localization by using intraoperative fluoroscopy to localize the original biopsy clip.

Objective: We hypothesize that intraoperative localization using FIND would result in fewer positive margins.

Methods: A retrospective review was performed of patients with non-palpable malignancy who underwent partial mastectomy from Sept 2016 to August 2023. Results were compared between patients who underwent R localization vs. FIND. The Pythagorean theorem was used to calculate the distance in space between the biopsy clip and the R localization device. Chi square was used to calculate the two-tailed p value.

Results: We identified 219 patients: 161 patients localized with FIND and 55 with R. Three percent (6 out of 161) of the patients with FIND and 12% (7 out of 55) of the patients with R had positive margins (p= value 0.01). The average distance between the R device and biopsy clip in patients with positive margins was 19.1 mm and with negative margins was 12.45 mm. (p=0.09) Figure 1 demonstrates the variation in R clip migration.

Conclusion: The positive margin rate with R localization was significantly greater than with FIND. The positive margin rate trended toward increased distance from the localization device to the biopsy clip. Eliminating the second localization results in improved margin positivity rates.



Chemotherapy-Induced Tumor Immune Remodeling in Pancreatic Cancer

Z Gao, SW Kang, D Ramos, R Hernandez, H Janakiraman, D Erstad, G Van Buren, W Fisher, C Marginean, HS Lee, ER Camp
Baylor College of Medicine

Background: Pancreatic adenocarcinoma (PDAC) has limited response to current therapies. Chemotherapy modifies the immune system, although detailed understanding is lacking.

Objective: We hypothesize that oxaliplatin (Oxa)-based therapy can favorably alter the tumor immune microenvironment to become more immunogenic.

Methods: FFPE samples of human surgical PDAC specimens were evaluated by imaging mass cytometry (IMC, Fig 1A). IMC-based immune contextures were compared between histopathologic responders and non-responders. In a murine orthotopic syngeneic KPC PDAC model, treatment with Oxa/5FU and anti-PD1 antibody was compared to control or combination chemoimmunotherapy. Tumors were processed for immune analysis using cytometry by time-of-flight (CyTOF) (Fig.1E).

Results: Of the human PDAC samples (n=27), 14 received upfront surgery, 13 received neoadjuvant FOLFIRINOX. Unsupervised clustering demonstrated that the spatial architecture of PDAC could be grouped into 8 distinct spatial subtypes (Fig 1B). Neoadjuvant therapy significantly changed the frequency of spatial subtypes within patients, increased the proportion of immunogenically favorable spatial subtypes, and increased proportions of CD8 T-cells, PD-1+ CD8 T-cells, PD-1+ CD4 T-cells, and PD-L1+ CAFs ($p < 0.05$, Fig 1C).
In vivo, combination chemoimmunotherapy decreased tumor weight compared to monotherapy ($p < 0.05$). Chemotherapy increased CD8 T-cell and PD-1+ CD8 T-cell infiltration compared to control or anti-PD1 antibody alone ($p < 0.05$, Fig 1E), which may contribute to the synergistic effect of chemoimmunotherapy in our model.

Conclusion: Our evidence shows that PDAC exhibits considerable immune intratumoral heterogeneity that changes favorably in response to neoadjuvant chemotherapy. The increase in PD-1+/PD-L1+ cell populations with chemotherapy suggests the potential for combination chemo-immunotherapy to improve outcomes.

Figure on next page

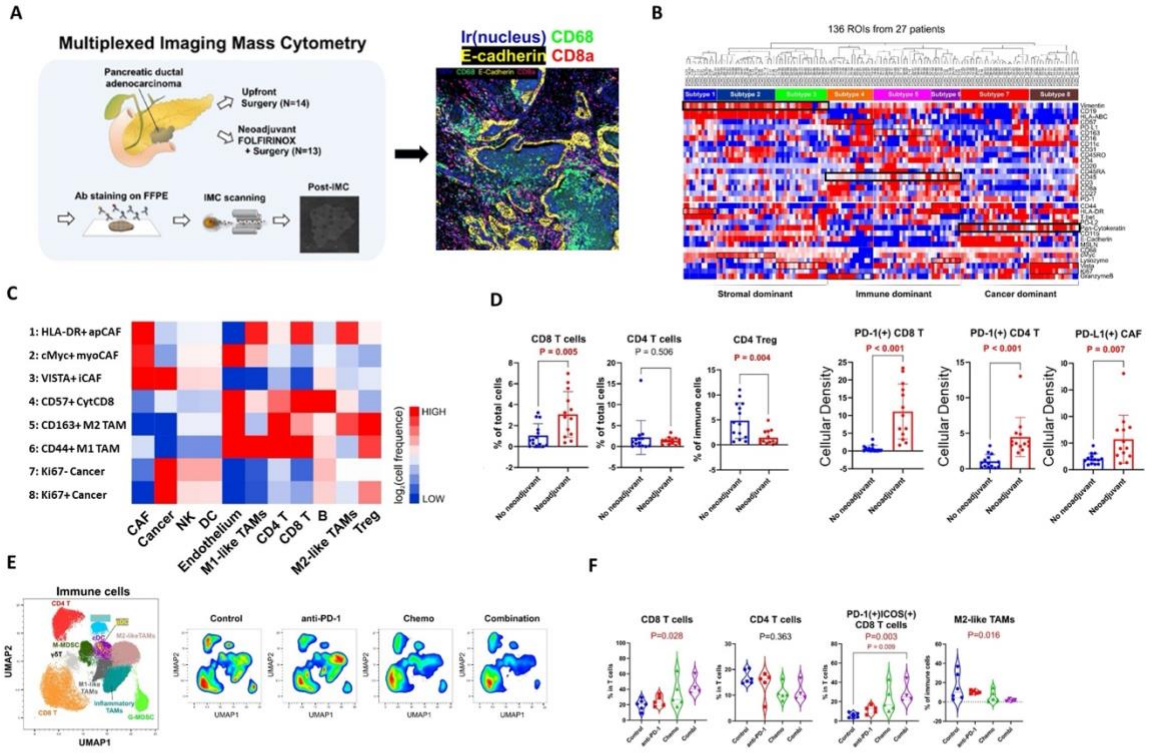


Figure 1: Chemotherapy-induced Tumor Immune Remodeling in Pancreatic Cancer.

A. Procedural workflow of imaging mass cytometry (IMC). Functional marker expressions are highlighted, with Ir as a nuclear marker, CD68 as a macrophage marker, CD8a as a cytotoxic T-cell marker, and e-cadherin an epithelial cell marker **B.** Unsupervised clustering of 136 regions of interest (ROI) from 27 patients to identify 8 distinct spatial subtypes **C**. Heatmap of frequency of tumor microenvironment cell types based on spatial subtyping. **D.** Changes in PDAC tumor microenvironment cell populations with neoadjuvant chemotherapy. **E**. Immune atlas of PDAC by CyTOF. **F**. Alteration of the PDAC tumor microenvironment after chemoimmunotherapy.

Conquering the Common Bile Duct: Outcome of Transcystic Robotic-Assisted Common Bile Duct Exploration

J DeJesus, M Johnson, K Horani, K Brambhatt, A Teoh, C Franco Mesa, S Samreen, J Moffett
University of Texas Medical Branch - Galveston

Background: There is a growing interest for surgeons to reclaim the common bile duct in managing choledocholithiasis. Advantages of concomitant transcystic common bile duct exploration (CBDE) with cholecystectomy include fewer anesthetic events and decreased length of stay (LOS). The robotic platform offers enhanced visualization and freedom of movement, both of which facilitate difficult dissection and are advantageous for successful CBDE.

Objective: We aimed to evaluate the feasibility and outcomes of performing transcystic CBDE with the robotic platform.

Methods: A retrospective chart review (May 1, 2022 – August 31, 2023) was performed, identifying patients with choledocholithiasis who underwent robot-assisted cholecystectomy and transcystic CBDE with choledochoscopy (one-stage management). Preoperative, intraoperative, and postoperative variables were compared to a control group of patients who underwent laparoscopic cholecystectomy with pre- or post-operative ERCP (two-stage management). Chi-square, Fisher's exact test, and nonparametric t-tests were performed.

Results: Forty-one patients underwent one-stage management. Ninety-six patients underwent two-stage management. Mean total procedure times were significantly higher for one-stage management (192.7 vs 144.5 mins, p<0.001). Subgroup analysis was performed comparing one-stage management versus two-stage management with IOC during cholecystectomy (N=42). Difference in mean total procedure time was decreased (192.7 vs 164.3 min, p=0.015). Patients undergoing one-stage management had shorter fluoroscopy times (30 vs 150 sec, p=0.0387), lower radiation doses (20 vs 42.8 mGy, p<0.0001), and decreased total LOS (4.14 vs 5.23 days, p=0.0007). There was no significant difference in complications, readmissions, conversion to open, or stone clearance rate.

Conclusion: Robotic-assisted laparoscopic cholecystectomy with transcystic CBDE is a safe and feasible option in the management of choledocholithiasis.

Table 1: Intra-Operative & Post-Operative Outcomes			
	RCBDE (n=41)	LC +/- IOC + ERCP (n=96)	P Value
Total Procedure Time, min	192.7 ± 66.81	144.5 ± 60.11	<0.0001
Fluoroscopy Time, sec	30 ± 36.03	151.1 ± 168.2	0.0387
Radiation Dose, mGy	20 ± 16.80	42.83 ± 44.31	<0.0001
Stone Clearance	87.8% (36/41)	91.6% (89/96)	0.343
Conversion to Open	0% (0/44)	1% (1/96)	>0.999
Post-Operative Length of Stay, days	2 ± 1.698	2.3 ± 1.574	0.065
Total Length of Stay, days	4.14 ± 3.31	5.23 ± 2.70	0.0007
Complications	1	7	0.4351
30 Day Readmission	0	5	0.3253

Table 2: Subgroup Analysis of Total Mean Operative Times			
	RCBDE (n=41)	LC + IOC + ERCP (n=42)	P Value
Total Procedure Time, min	192.7 + 66.81	164.3 + 70.16^	0.015

Decreased Primary Tumor Th2 Cell Tumor Infiltration is Associated with Liver Metastases Across Cancer Types

M Silva, S Nah, A Tiwari, B Ecker, S Arora, N Newman, C Mcintyre, M Kitano, A Parikh, C Court
University of Texas Medical Center - San Antonio

Background: Management of oligometastatic cancer continues to evolve as systemic therapy, and particularly immunotherapy, improves outcomes for metastatic patients. With evolving surgical indications for oligometastatic disease, understanding the organotropism of cancers and the associated immune context is crucial. Liver metastases may have a distinct immune association, potentially explaining resistance to immunotherapy.

Objective: This study probed the link between liver metastases and primary tumor immune microenvironment across cancers.

Methods: We utilized The Cancer Genome Atlas to develop a comprehensive recurrence dataset and correlated it with immune infiltrate signatures. Immune fractions were estimated using CIBERSORT. Genomic and immunologic subtypes were contrasted against patient outcomes.

Results: Of 10,211 patients across 32 cancer types, 843 had a distant recurrence. Metastases were identified in 22 cancer types, most commonly skin/soft tissue, GI, and GU cancers. Liver metastasis patients had notably lower Th2 cell immune infiltration scores than other sites of recurrence ($t=8.8$, $p<0.001$, $q=1.12e-16$). A sensitivity analysis showed the strongest Th2 cell infiltration association with GI cancers. No Th2 cell infiltration association was observed for lung, peritoneum, or brain metastases, nor was it associated with survival in all patients or all GI patients.

Conclusion: This exploratory study revealed lower Th2 cell immune signatures in patients who eventually developed liver metastases, which may have implications for the surgical management of patients with liver metastases.

Comparing the outcomes of neoadjuvant versus adjuvant chemotherapy for osteosarcoma.

L Dotson, K Blackburn, T Trudeau, J Morrow, D Mand, R Agarwal, R Ward
Baylor College of Medicine

Background: Neoadjuvant chemotherapy, followed by surgery and subsequent consolidation chemotherapy, is a mainstay of many osteosarcoma treatment protocols. However, the effectiveness of this regimen in improving survival compared to adjuvant chemotherapy alone has not been proven. This study directly compares the outcomes among these treatment groups using a large, representative population in the National Cancer Database.

Objective: This project examines the effect of chemotherapy timing on outcomes in osteosarcoma patients.

Methods: Patients with osteosarcoma in the National Cancer Database (2004-2019) were stratified based on chemotherapy and surgery order (neoadjuvant vs adjuvant-only chemotherapy). We used Kaplan-Meier curves to compare overall survival (OS) in the unmatched population and in a propensity score matched cohort that controlled for demographic, treatment, and tumor characteristic differences. Univariate and multivariate analyses were also used to predict the likelihood of positive margins among the population.

Results: The study population included 4659 patients: 3,733 neoadjuvant and 926 adjuvant-only chemotherapy regimens. Neoadjuvant therapy showed significantly better survival in the unmatched analysis ($p<0.0001$), but this difference was lost in the propensity matched survival comparison ($p=0.64$). Mortality at 30 and 90 days was also non-significant between treatment groups in both the full and matched cohorts ($p=0.3$ and $p=0.9$ respectively). Factors significantly associated with positive margins in the multivariate analysis included adjuvant-only chemotherapy (OR=1.6), age (OR=1.01), female sex (OR=1.27), adjuvant radiation (OR=4.96), and stage IVB tumors (OR=2.11).

Conclusion: Neoadjuvant chemotherapy does not increase overall or short-term survival compared to adjuvant therapy. However, it may increase surgical success as adjuvant chemotherapy alone is associated with positive margins.

Graph on next page

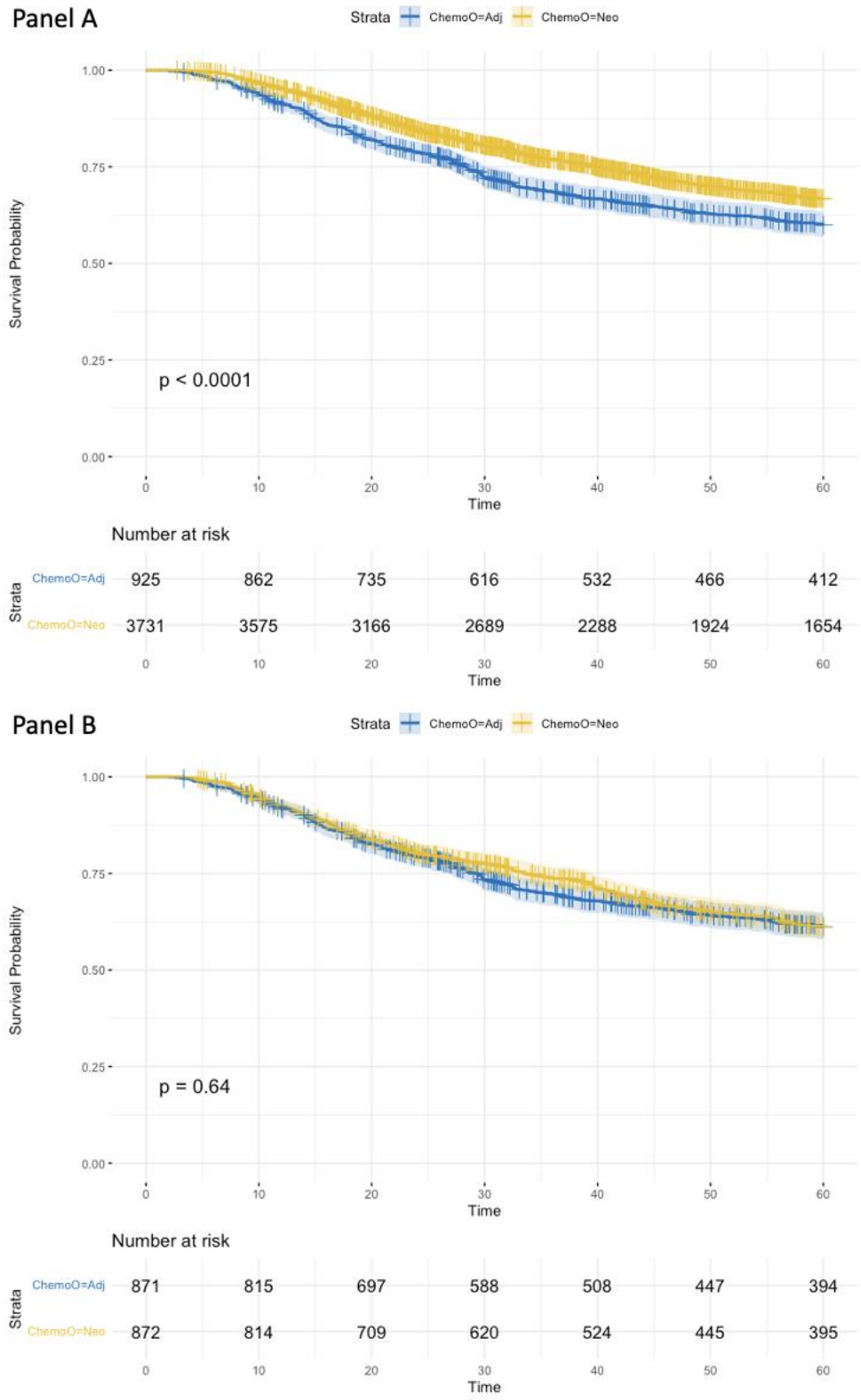


Figure 1. The above figure shows the unmatched (panel A) and matched (panel B) survival comparisons based on chemotherapy timing.

HPB/Surgical Oncology Session | Abstract | Surgical Oncology

Medicaid Patients Have Increased Amputation Rates for Primary Chondrosarcoma of the Lower Extremities

T Trudeau, K Blackburn, L Dotson, J Morrow, D Mand, R Agarwal, R Ward
Baylor College of Medicine

Background: Advancement in treatment modalities for chondrosarcoma have allowed for a reduction in the use of amputation in favor of limb salvage resection to improve quality of life outcomes for patients. Differences in amputation rates between demographic groups and socioeconomic factors in primary chondrosarcoma affecting the extremities has not been investigated and could help identify disparities in care.

Objective: This study aimed to explore amputation rates in patients diagnosed with primary chondrosarcoma of the upper and lower extremities based on demographic and socioeconomic variables.

Methods: The National Cancer Database was queried from 2004 – 2019 for patients with primary chondrosarcoma of the lower and upper extremities. Univariate and multivariate analysis were used to investigate factors associated with amputation.

Results: A total of 1245 patients were identified with 458 having primary chondrosarcoma of the upper extremities and 787 patients of the lower extremities. On multivariate analysis patients of older age (p=0.01, OR:1.02) and those with Medicaid insurance status (p=0.02, OR:2.19) were more likely to undergo amputation for the lower extremities, while female patients were less likely to undergo amputation (p=0.01, OR:0.61). These relationships did not hold true for the upper extremities as no variables reached statistical significance.

Conclusion: We found that patients with Medicaid insurance and older age were more likely to undergo amputation for primary chondrosarcoma of the lower extremities. While these results could be indicative of Medicaid patients presenting with more advanced disease, disparities in care are possible which could be further investigated to attempt to identify actionable factors that could improve healthcare equality.