

Medical Student Research

Melissa Ulbrick, BS	University of Connecticut School of Medicine	A Case Report: Metastatic Renal Cell Cancer Presenting as Multiple Bowel Intussusceptions **Updated
Jennifer Toner, BS	Danbury Hospital	A Rare Case of Necrotic Lactational Mastitis Leading to Septic Shock
Amber Wilkes, BS	University of Connecticut School of Medicine	An Investigative Study of Successful Mentorship Qualities in Surgery
Peter Tramontozzi, BS	University of Connecticut School of Medicine	Anastomotic Complications in Type C Long Gap Esophageal Atresia
Kaitlyn Petitpas, BS	University of Connecticut School of Medicine	Clinical and Economic Outcomes of the Cirrhotic Colorectal Cancer Patient
Ethan Pitney, BS	University of Connecticut School of Medicine	Demographic Factors and Cost Implications in Postoperative Length of Stay Following Total Knee Arthroplasty: A Retrospective Analysis of New York Hospital Systems
Gabriela Esnaola, BA	Yale School of Medicine	Development of a Novel Hierarchical Surgical Complexity Score to Account for Procedural Heterogeneity Across Surgical Specialties
Kaitlyn Petitpas, BS	University of Connecticut School of Medicine	Cirrhosis and the Herniorrhaphy Patient: Clinical Characteristics, Surgical and Economic Outcomes
Michael Gouzoulis, BS	Yale School of Medicine	Emergency department visits after pediatric supracondylar humerus fracture
Oluwatoyosi Akande, BS	University of Connecticut School of Medicine	Optimizing Nutrition Prior to Surgery: Implementation in Orthopedic Trauma
Michael Gouzoulis, BS	Yale School of Medicine	Physical Therapy Utilization Following Single Level Posterior Lumbar Fusion
Daniel Pardo, BS	University of Connecticut School of Medicine	Postoperative Outcomes in Latin American Surgical Patients: Global Health Insights from the Latin American Surgical Outcome Study
Nicholas Estes, BS	Saint Mary's Hospital	Social Vulnerability of Patients undergoing Cholecystectomy during COVID-19 pandemic at a Single Community Hospital
Liam Harvey, BS	Frank H Netter MD School of Medicine	Splenic Rupture and Shock Following an Uncomplicated ESWL: A Case Report
Julian Mobley, BS	The University of North Carolina School of Medicine	The Clinical Significance of Utilizing PASS Thresholds when Administering IKDC and KOOS Patient-Reported Outcomes Post Anterior Cruciate Ligament Reconstruction
Bomsol Lee, BS	Frank H Netter MD School of Medicine	The Impact of Staple Line Reinforcement on Bleeding Rate in Robotic Sleeve Gastrectomy

[A Case Report: Metastatic Renal Cell Cancer Presenting as Multiple Bowel Intussusceptions](#)

Ulbrick, M¹; Petashnick, M²; Healy, A²; Siddiqui, I³

¹University of Connecticut School of Medicine, Farmington, CT

²Department of General Surgery, University of Connecticut, Farmington, CT 06032

³Department of Surgical Oncology, Hospital of Central Connecticut, New Britain, CT 06052

Introduction: Intussusception is a rare condition in adults that is strongly associated with pathological lead points. Surgical management typically addresses clinical symptoms and allows for pathologic diagnosis. Few reports in the literature about multiple concurrent small bowel intussusceptions attributed to Celiac disease or denoted as idiopathic.

Case Report: We present a 66-year-old man with a past medical history of renal cell carcinoma who presented to the emergency room with acute abdominal pain, nausea, vomiting, and significant weight loss. CT imaging ten hours apart revealed two discrete areas of intussusception and high-grade small bowel obstruction. The patient underwent exploratory laparotomy and resections of two discrete intraluminal masses with enlarged mesenteric lymph nodes. Pathological examination confirmed metastatic renal cell carcinoma.

Discussion: Intussusception in adults presents with a varied course, making diagnosis challenging. Increased use of CT imaging has improved the diagnosis and evaluation of intussusception, including identifying lead points. Small bowel evaluation is not routinely included in the initial workup for malignancies, potentially leading to delayed detection of small bowel masses.

Conclusion(s): Patients with a history of systemic symptoms or prior malignancy require increased suspicion for intussusception secondary to malignancy. In advanced disease, multiple intussusceptions may be present in the setting of multiple lead points. Patients with advanced disease present with comorbidities, increasing the risk of post-operative complications.

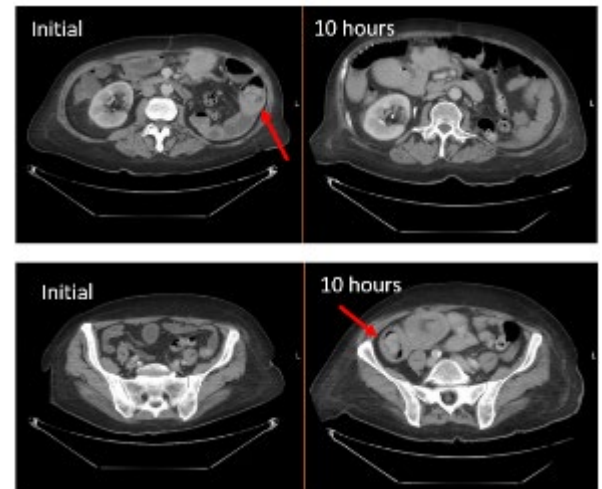


Figure 1. Abdominal computed tomography shows two discrete bowel intussusceptions ten hours apart.

Table 1. Intraoperative images demonstrating intussusception, resected jejunum with inflamed mesenteric lymph nodes, and resected cecum with an intraluminal mass.

<p>A. Intraoperative Jejunal-Jejunal Intussusception</p>	<p>B. Resected proximal jejunum with inflamed mesenteric lymph nodes</p>	<p>C. Resected cecum with intraluminal mass and normal</p>

A Rare Case of Necrotic Lactational Mastitis Leading to Septic Shock

Jennifer Toner, Trevor Roush MD, Stacey June DO, Christine Wolchok DO, Carinne W. Anderson MD
University of Vermont, Danbury Hospital, NuVance Health, CT

Introduction: Cases of lactational mastitis rarely lead to septic shock or a necrotizing infection of breast tissue. We present a case report of multi-focal primary lactational mastitis causing a necrotic soft tissue infection in a postpartum

lactating female. Addressing the challenge of a necrotizing breast infection in a lactating female, we present a multimodal approach using a combination of dopamine agonists, negative pressure wound therapy, and split-thickness skin grafting.

Case Description: Our case is 37-year-old G2P2 lactating woman two weeks postpartum with multi-focal primary necrotic lactational mastitis leading to septic shock. Upon arrival the right breast was approximately 50% larger than the left, with diffuse erythema and tenderness to an area of induration approximately 8 cm in diameter over the inferomedial aspect with a 5 x 6 cm area of overlying ecchymosis. She was treated empirically for mastitis before developing septic shock prompting ICU admission. Initial imaging including ultrasound and CT were consistent with lactational mastitis with areas of overlying cellulitis without evidence of abscess. Breast Tissue culture grew beta-hemolytic streptococcus and *Acinetobacter lwoffii*. Although the patient showed some early signs of improvement after antibiotic narrowing, the right breast cellulitis spread from the right breast to the soft tissue over the right abdomen, flank, and back and the right breast developed a significant amount of necrotic bullae. This development prompted initial OR intervention. She underwent right breast debridement and negative pressure wound vac placement. Following initial intervention, the patient underwent three further debridements, each followed by a wound vac change using Vac Veraflo® with hypochlorous acid solution. Effectiveness of the Vac Veraflo® was hindered by continued lactation. To address the negative impact of milk production on wound healing the patient was instructed to stop breast pumping from the contralateral breast and a course of cabergoline was initiated to prevent further complications. Inhibition of lactation had the desired effect on aiding in the efficacy of negative pressure wound therapy, and after achieving appropriate granulation tissue Plastic Surgery performed definitive intervention with two splint-thickness skin grafts with skin harvested from right thigh donor tissue.

Discussion: Though lactational mastitis is a well-defined entity, it rarely leads to septic shock and/or necrotic tissue infections. Our patient presented with two areas of lactational mastitis that developed into a necrotizing tissue infection of the breast. Though sharp debridement with early involvement of plastic surgery is a mainstay of therapy, the unique aspect of our case was the development of the disease two weeks post-partum and the challenges faced with wound healing as the patient continued to lactate. With concern for hindered wound healing, the patient was instructed to quit breast pumping and a course of cabergoline was initiated. Cessation of lactation improved wound healing and the combination of negative pressure wound therapy and split-thickness skin grafting ultimately lead to a successful cosmetic result.

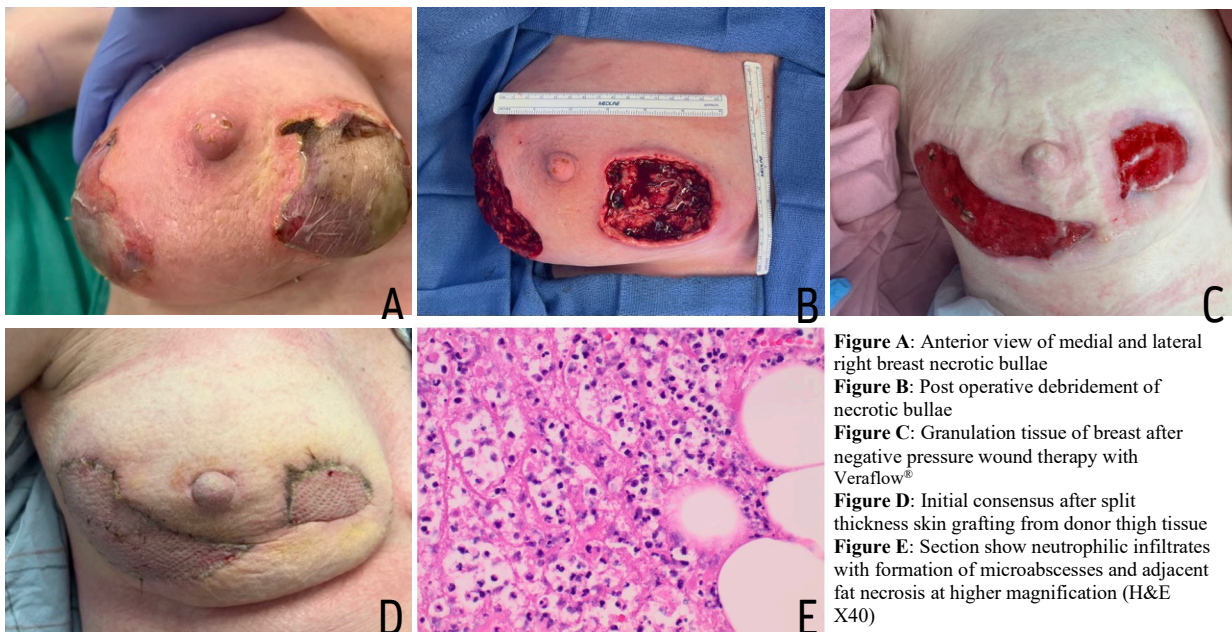


Figure A: Anterior view of medial and lateral right breast necrotic bullae
Figure B: Post operative debridement of necrotic bullae
Figure C: Granulation tissue of breast after negative pressure wound therapy with Veraflow®
Figure D: Initial consensus after split thickness skin grafting from donor thigh tissue
Figure E: Section show neutrophilic infiltrates with formation of microabscesses and adjacent fat necrosis at higher magnification (H&E X40)

An Investigative Study of Successful Mentorship Qualities in Surgery

Amber Wilkes¹, Melissa Ulbrick¹, Kristyn Zajac²

¹University of Connecticut School of Medicine, Farmington, CT

²Calhoun Cardiology Center, University of Connecticut School of Medicine, Farmington, CT

Introduction: Previous research has identified mentorship as an essential component of a successful career in academic medicine and within surgery. Lack of mentorship has been cited as a barrier to career development, with unequal access to mentorship noted as a potential contributor to disparities within medicine. Mentor characteristics and features of mentor-mentee relationships are highly variable, with little research investigating which attributes are most important to career satisfaction and the attainment of leadership positions, promotions, and tenure. We aimed to identify these key characteristics and explore the differences between groups to improve mentorship to attain greater career success.

Method(s): We administered an online questionnaire collecting information on demographics, quantitative and qualitative features of influential mentors, career satisfaction, and attainment of leadership positions, promotions, and tenure. Faculty physicians at academic medical centers were recruited via emails and listservs. SPSS was used to analyze the data involving descriptive analysis, linear regression models, and chi-square testing.

Results: Respondents included 192 faculty from 13 different institutions; 24 participants were physicians in surgical fields, including General surgery, Neurosurgery, Obstetrics and gynecology, Ophthalmology, Orthopedic surgery, and Otolaryngology. Only 50% of the surgeons reported currently having a mentor compared to 68% of non-surgical participants. Half (50%) of surgeons reported utilizing a mentorship team, and 57% reported currently being a mentor to junior faculty. The majority (67%) of surgeons reported gender congruence with their mentor which was similar to that of the non-surgical group (61%). Mentor-mentee specialty congruence was 100% in the surgical group compared to 75% of non-surgical respondents ($\chi^2 3.89, p = .048$). The top qualities surgeons chose as important mentor qualities for career satisfaction were approachability and support, while the most important qualities chosen for career success were expertise in their field and support. Most surgical mentorship relationships began during residency (33%) and during the first 0-2 years of their faculty position (33%). The most common mentor-mentee meeting frequency in the surgical group was multiple times a week (25%) compared to weekly and biweekly in the non-surgical group (17%).

Conclusion(s): Our findings highlight key mentor traits and mentor-mentee relationship factors identified as important by surgeons to attaining career satisfaction and success. Mentor-mentee gender and specialty congruence were notably high within the surgical group, identifying unique features of mentor-mentee relationships in surgical fields. Further research is necessary to understand the barriers preventing a higher number of surgeons from having a current mentor and from mentoring junior faculty.

Anastomotic Complications in Type C Long Gap Esophageal Atresia

Peter Tramontozzi BS, Christine Finck MD FACS, On Behalf of the Eastern Pediatric Surgery Network
University of Connecticut School of Medicine

Introduction: The Eastern Pediatric Surgery Network (EPSN) recently described a multi-institutional cohort of long gap esophageal atresia (LGEA) patients focusing on Gross Type A/B. However, there is a subset of Type C esophageal atresia that is managed as LGEA and we hypothesize that these patients have increased risk of complications including anastomotic leak when compared with Type A/B LGEA.

Method(s): Demographics, LGEA characteristics, and post-operative complications were queried from the EPSN LGEA REDCap database. Complications were assessed at a 30-, 60-, and 90-day interval postoperatively. Type C LGEA was defined as an atresia with a distal tracheoesophageal fistula where the operating surgeon could not bring the ends of the esophagus together for upfront primary repair. Descriptive statistics and Fisher's exact test were calculated using SPSS.

Results: 21 patients with Type C LGEA entered by seven institutions were identified. Demographics can be found in Table 1. Complications of anastomotic leak and anastomotic stricture requiring dilation were identified as the most prevalent in this cohort. The cumulative incidence of anastomotic leak and anastomotic structure requiring dilation in the 90-day post-operative period was 52% and 43%, respectively. For Type A/B LGEA in the 90-day post-operative period, there is a 22% cumulative incidence of anastomotic leak and 69% cumulative incidence of anastomotic stricture (n = 60). The results of the Fisher's exact test (p = 0.0098) indicate a significant association of LGEA Gross Type (A/B or C) and anastomotic leak cumulative incidence.

Conclusion(s): Type C LGEA patients have a high rate of anastomotic complications with a majority (76%) in this cohort experiencing either a leak or stricture requiring dilation and a significant association of anastomotic leak incidence when compared to Type A/B LGEA. Further analyses of these patients would be beneficial to detect perioperative management and complication trends in this LGEA subset.

Sex	
Male	11
Female	10
Average Gestational Age (weeks)	35.3 (SD = 2.3)
Average Birth Weight (grams)	2172 (SD = 611)

Table 1: Patient Demographics

Clinical and Economic Outcomes of the Cirrhotic Colorectal Cancer Patient

Kaitlyn Petitpas BS¹, Maya Petashnick MD^{1,2}, Ashley Althoff DO^{1,2}, Ya-Huei Li PhD³, Oscar K. Serrano MD, FACS^{1,2}

1. School of Medicine, University of Connecticut, Farmington, CT, USA.
2. Department of Surgery, Hartford Hospital, Hartford, CT, USA.
3. Department of Research, Hartford Hospital, Hartford, CT, USA.

Introduction: Cirrhosis is associated with increased perioperative morbidity and mortality, and significant health and economic burdens for patients. Our study sought to identify the potential implications of comorbid cirrhosis on outcomes for patients admitted with colon (CC) or rectal (RC) cancer.

Method(s): A cohort of patients >18 with ICD-9-CM/DRG-24 codes for Rectal Cancer (RC) or Colon Cancer (CC) was identified via retrospective review of 2012-2014 National Inpatient Sample data. Data was collected regarding patient and clinical characteristics as well as economic burden. Propensity Score Matching (PSM) was utilized to understand the interplay between cirrhosis and these health and economic outcomes.

Results: 56,469 colon cancer and 9,574 rectal cancer patients were identified, of which cirrhosis was present in 602 (1.1%) of CC and 90 (0.9%) of RC patients. Following application of our inclusion and exclusion criteria, PSM was performed for patient and admission characteristics on the remaining 11,823 (563 with cirrhosis) CC patients and 162 (81 cirrhotic) patients. We then found that cirrhotic patients had a higher proportion of comorbidities including alcohol abuse (p<0.001), coagulopathy (p<0.001), and fluid/electrolyte disorders (p≤0.013) as compared to their non-cirrhotic counterparts within their respective malignancy cohorts. Both malignancies demonstrated significantly increased number of chronic conditions and length of stay for cirrhotic patients (Table). Cirrhotic CC patients were also noted to have higher

rates of comorbid renal failure ($p=0.046$), postoperative respiratory failure ($p<0.01$), higher number of procedures ($p<0.001$), elevated in-hospital mortality ($p=0.064$), and costlier admissions ($p<0.001$).

Conclusion(s): Rectal and Colon Cancer patients with comorbid cirrhosis appear to have increased rates of comorbidities and chronic conditions, corresponding to increased length of hospital stay. Cirrhotic colon cancer patients were also noted to have increased rates of serious complications, higher number of procedures, increased mortality rate, and increased costs. These trends were mirrored in the rectal cancer group, though our analysis was limited by our small sample size in this malignancy cohort.

	Rectal Cancer (1:1 PSM)		Colon Cancer (1:20 PSM)	
	without cirrhosis n=81	with cirrhosis n=81	without cirrhosis n=11,260	with cirrhosis n=563
AHRQ comorbidity:				
Alcohol abuse	3 (3.7)	27 (33.3)***	275 (2.4)	135 (24.0)***
Coagulopathy	1 (1.2)	23 (28.4)***	327 (2.9)	114 (20.2)***
Renal failure	5 (6.2)	7 (8.6)	1181 (10.5)	74 (13.1)*
Fluid/Electrolyte Disorder	15 (18.5)	29 (35.8)*	2858 (25.4)	184 (32.7)***
Complications:				
Respiratory Failure	0 (0.0)	4 (4.9)	598 (5.3)	45 (8.0)**
Number of chronic conditions	4 [3-7]	7 [5-9]***	6 [3-8]	7 [5-10]***
Number of procedures	3 [1-4]	3 [2-5]	2 [1-4]	3 [2-5]***
Hospital mortality	1 (1.2)	7 (8.6)	273 (2.4)	23 (4.1)*
Length of stay (days)	5 [3-8]	7 [5-10]*	5 [3-8]	6 [4-9]***
Total charges in 2014 USD	47,707 [25,836-81,313]	55,365 [35,370-10,1945]	50,705 [31,622-80,788]	55,423 [36,000-93,843]***
Note: PSM: Propensity score matching; Data presented as frequency (%) or median [25 th -75 th percentiles]; *: $p<0.05$, **: $p<0.01$, ***: $p<0.001$;				

Demographic Factors and Cost Implications in Postoperative Length of Stay Following Total Knee Arthroplasty: A Retrospective Analysis of New York Hospital Systems

Ethan Pitney, BS and Daniel Pardo, BS

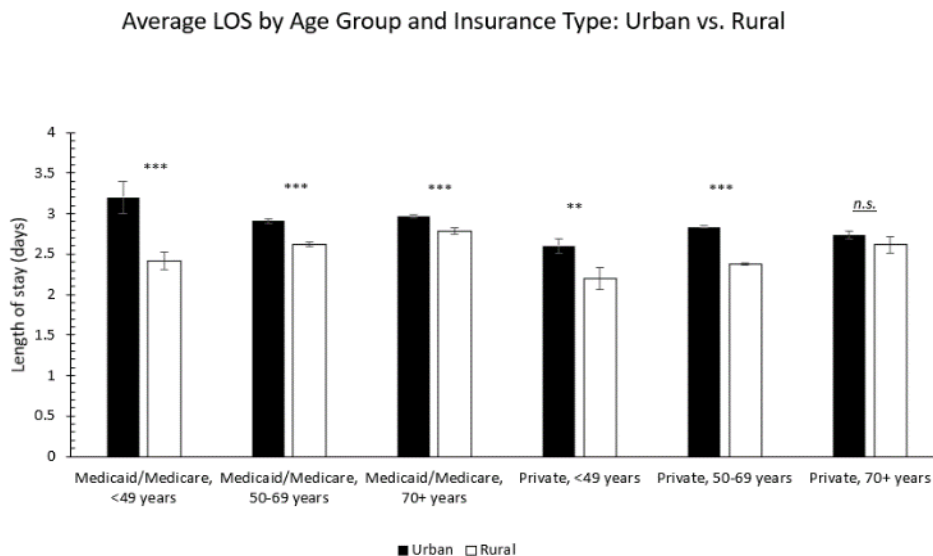
University of Connecticut School of Medicine, UConn Health, Farmington, CT

Introduction: Despite the overwhelming benefits of total knee arthroplasty (TKA), recent studies indicate that upwards of 30% of patients are dissatisfied in their recovery process. A surrogate marker for patient outcomes and hospital resource management is postoperative length of stay (LOS), as it contributes to both quality of life and hospital expenditure. This study sought to identify demographic implications in TKA LOS by analyzing a large statewide database.

Methods: This study utilized the SPARCS database, which compiled information from 42,066 patients who underwent TKA in New York hospitals in 2017. The primary independent variable was hospital county, designated as urban or rural based on predefined US Census criteria. Secondary independent variables included race/ethnicity, age, sex, insurance type, and total costs. Outcome variables for both primary and secondary analyses were LOS and cost, measured in days and USD, respectively. Statistical analyses were employed using the two-sample independent t-test.

Results: Average LOS and costs were significantly greater within urban hospitals and across all racial/ethnic, age, and insurance types. Public insurance positively correlated with increased LOS. Additionally, Black/African American and Hispanic/Spanish racial groups had a significantly longer LOS compared to the White race group, in urban but not rural hospital settings. The greatest LOS burden was experienced by urban Black females (3.37 ± 0.04), while the shortest LOS was experienced by rural White males (2.45 ± 0.03).

Conclusions: LOS was significantly greater in urban counties, contradictory to what has been reported at the national level. LOS discrepancies disproportionately impacted females, minority race/ethnicity groups, and those with public health insurance. These results highlight patient-level demographic factors that should be considered when targeting interventions to overcome prolonged LOS.



Development of a Novel Hierarchical Surgical Complexity Score to Account for Procedural Heterogeneity Across Surgical Specialties

Gabriela R. Esnaola BA, Thomas M. Gill MD, Ronnie A. Rosenthal MD, MS, FACS, Robert D. Becher MD, MS, FACS
Yale School of Medicine

Introduction: Adjustment for procedural risk as a function of surgical complexity is needed to accurately assess and compare outcomes following major surgery. Existing approaches to classifying surgical complexity focus on narrow sets of operations within a single surgical specialty, depend on patient-level risk factors, or are limited to datasets that define operations based on the Current Procedural Terminology (CPT) code system. These approaches cannot adjust for the heterogeneity of operations across multiple surgical specialties, do not account for operation-specific risk inherent to a given procedure and independent of the patient, and cannot be applied to analyses of datasets that employ the ICD-9/10-Procedure Coding System (PCS) to identify operations. To address these limitations, especially given the increasing use of Centers for Medicare & Medicaid Services (CMS) data in surgical research, we developed a novel hierarchical surgical complexity score based on factors inherent to the procedure to classify ICD-9/10 PCS operative codes into tiers of operative risk.

Method(s): To stratify ICD-9/10-PCS codes into hierarchical tiers of surgical complexity independent of patient-level risk, we created a composite complexity score based on five factors inherent to an operation: work Relative Value Units (wRVUs); the Invasive Procedure Complexity Matrix (IPCM) category; surgical anatomy; procedure type; and the Healthcare Cost and Utilization Project (HCUP) procedure class. wRVUs and IPCM placements assigned to CPT codes were mapped to ICD-9/10-PCS. Complexity associated with anatomical and procedural characteristics represented in ICD-9/10-

PCS code textual descriptions were defined through expert interviews conducted with 20 surgical specialists representing the spectrum of surgical care. The final composite ICD-9/10-PCS surgical complexity score placed each code into one of 3 hierarchical tiers of operative complexity: high, intermediate, or low.

Results: Of the 81,597 ICD-9/10-PCS codes evaluated, 71,106 were true operations and therefore included in our analysis. Our approach classified 13% of ICD-9/10-PCS codes (n=9,557) as high complexity operations, while the majority of operations were classified as either intermediate (67%; n=47,241) or low (20%; n=14,308) complexity. Internal validation showed that each tier of complexity codes, and their overall proportion, were consistent with comparable surgical complexity classification systems designed for use with CPT codes.

Conclusion(s): We developed a novel hierarchical composite surgical complexity classification score to stratify ICD-9/10-PCS codes into 3 tiers of surgical complexity – high, intermediate, and low – as a function of risk endogenous to the procedure, independent of patient-level risk. This classification score will permit investigators to better adjust for operational risk when analyzing outcomes using CMS data and ICD-9/10-PCS codes spanning multiple surgical specialties.

Cirrhosis and the Herniorrhaphy Patient: Clinical Characteristics, Surgical and Economic Outcomes

Kaitlyn Petitpas BS¹, Maya Petashnick MD^{1,2}, Ashley Althoff DO^{1,2}, Ya-Huei Li PhD³, Oscar K. Serrano MD, FACS^{1,2}

1. School of Medicine, University of Connecticut, Farmington, CT, USA.

2. Department of Surgery, Hartford Hospital, Hartford, CT, USA.

3. Department of Research, Hartford Hospital, Hartford, CT, USA.

Introduction: The prevalence of cirrhosis continues to increase throughout the United States, placing increased burdens on health and economic outcomes nationally. This study sought to identify the role of comorbid cirrhosis in various outcome measures and social determinants for patients with symptomatic inguinal and umbilical/ventral hernias.

Method(s): We performed a retrospective review of the 2012-2014 National Inpatient Sample data to identify patients >18 with International Classification of Diseases and diagnosis-related group codes for inguinal (IH) and umbilical/ventral (UH) hernias. Data was collected on demographics, clinical characteristics, and surgical and economic outcomes. Propensity score matching (PSM) was then completed to understand the interplay between presence of cirrhosis and these characteristics.

	Inguinal hernia (1-10 PSM)		Umbilical/Ventral hernia (1-3 PSM)	
	without cirrhosis n=1950	with cirrhosis n=195	without cirrhosis n=2535	with cirrhosis n=845
AHRQ comorbidity:				
Alcohol abuse	54 (2.8)	57 (29.2)***	79 (3.1)	327 (38.7)***
Coagulopathy	45 (2.3)	50 (25.6)***	52 (2.1)	258 (30.5)***
Deficiency Anemia	181 (9.3)	47 (24.1)***	171 (6.7)	182 (21.5)***
Fluid and Electrolyte Disorder	254 (13.0)	49 (25.1)***	332 (13.1)	242 (28.6)***
Surgical Complications:				
Pneumonia	33 (1.7)	9 (4.6)**	47 (1.9)	17 (2.0)
Shock	7 (0.4)	3 (1.5)*	17 (0.7)	11 (1.3)
Sepsis	13 (0.7)	1 (0.5)	24 (0.9)	18 (2.1)**
Hospital mortality	8 (0.4)	2 (1.0)	7 (0.3)	14 (1.7)***
Number of procedures	1 [1-2]	2 [1-2]***	1 [1-2]	2 [1-3]***
Length of stay	2 [1-4]	4 [2-5]***	3 [2-5]	4 [2-6]***
Total charges in 2014 USD	30275 [20273-47466]	48569 [24899-62862]***	36091 [24018-55280]	39279 [26559-60989]***
Note: PSM: Propensity score matching; Data presented as frequency (%) or median [25 th -75 th percentiles]; *: p<0.05, **: p<0.01, ***: p<0.001;				

Results: Our review identified 10,012 inguinal hernia patients (IH) and 26,571 umbilical/ventral hernia patients (UH), of which 221 (2.2%) and 940 (3.5%) had cirrhosis, respectively. PSM was performed for comorbidities and hospital characteristics to account for noted statistically significant differences between cirrhotic and non-cirrhotic patients with each hernia type including age, sex, elective/non-elective admission, race, ethnicity, and hospital characteristics. For both hernia cohorts, cirrhotic patients were found to have a higher incidence of comorbidities such as alcohol abuse, coagulopathy, deficiency anemias, and fluid and electrolyte disorders ($p < 0.001$). Higher number of procedures, extended length of stay, and higher costs were similarly noted for cirrhotic patients of both cohorts ($p < 0.001$). Cirrhotic UH patients had higher mortality ($p < 0.001$), and IH patients displayed a similar, though not significant, trend in mortality ($p = 0.229$). Additionally, cirrhotic IH patients had increased rates of complications including pneumonia and shock ($p = 0.005$, $p = 0.021$), and cirrhotic UH patients had increased rates of sepsis ($p = 0.007$). Finally, as compared to White cirrhotic patients, Hispanic and Black cirrhotic patients in our UH cohort had significantly lower income ($p = 0.007$, $p = 0.002$) and higher rates of comorbidities such as deficiency anemia in Hispanic patients ($p < 0.017$), and coagulopathy amongst Black patients ($p = 0.008$).

Conclusion(s): Our findings suggest that patients with comorbid cirrhosis who are admitted for hernia repair experience increased rates of comorbidities, clinical complications, elongated length of stay, increased economic burden, and increased mortality rates. Our evidence further suggests that racial and ethnic minorities with cirrhosis experience increased socioeconomic and health burdens than White counterparts.

Emergency department visits after pediatric supracondylar humerus fracture

Michael J. Gouzoulis, BS¹, Ally Yang, MD¹, Peter Y. Joo, MD¹, David Frumberg, MD¹, David Colen, MD¹, Jonathan N. Grauer, MD¹

¹Department of Orthopaedics and Rehabilitation, Yale School of Medicine, New Haven, CT

INTRODUCTION: Pediatric supracondylar humerus fractures make up approximately 18% of all pediatric fractures, and are the most common pediatric fracture to require surgical intervention. Emergency department (ED) visits following this injury/surgery are not well characterized, but should be of clinical interest.

METHODS: Pediatric patients (age greater than 1 years old and less than 13 years old) who had a supracondylar humerus fractures were identified from the 2010 – 2021 PearlDiver M157 administrative database. These patients were stratified based on whether they visited the emergency department at least once within ninety days following their initial injury diagnosis/evaluation. In order to determine predictor factors for ED utilization, patient characteristics were determined and multivariate logistical regression was performed. Additionally, the timing of when patients were utilizing the ED and reasons for ED visits were determined.

RESULTS: A total of 92,994 patients were identified, of which surgery was performed for 3045 (29.5%). Post-injury/post-operative ED visits were noted for 10,325 patients (11.1%) for a total of 12,627 ED visits.

Nearly half of all ED visits occurred within the two weeks immediately following the fracture (46.1%, Figure 1). Notably, 54.7% of visits were unrelated to the elbow (viral infections, GI related concerns, strep pharyngitis, etc).

On multivariate analysis, patients who utilized the ED were of greater odds ratio (OR) to have: utilized ED prior to their initial injury (OR:2.69), be diabetic (OR: 1.81), had surgical fixation (OR:1.58), be obese (OR: 1.57), have asthma (OR:1.55), have Medicaid insurance (OR: 1.29), or be younger (OR: 1.11 per year decrease) ($p < 0.001$ for all).

Conclusions: In the 90 days following pediatric supracondylar humerus fracture, over 11% of patients visited the ED most commonly in the first two weeks. While many of these were related to fracture/injury care, over half were not. This study is

limited by the retrospective nature of administrative dataset. Additionally, data was viewed at population level, so patient-specific factors were not assessed.

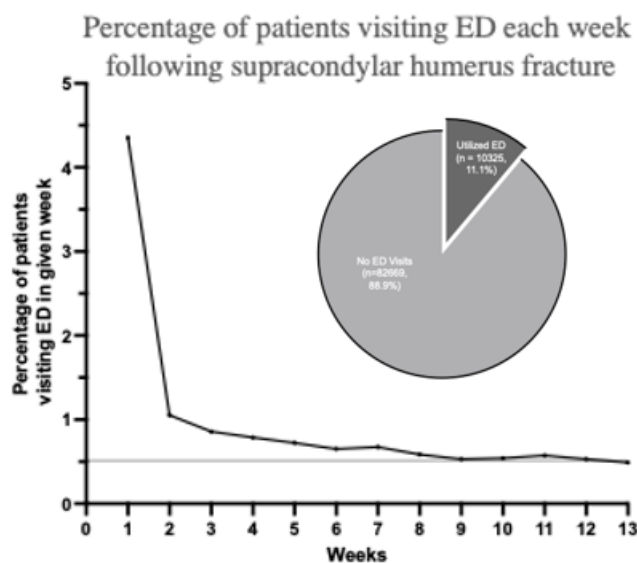


Figure 1: The percentage of overall patients that presented to the ED each week is shown. The grey bar represents the average ED visits a year out from fracture, representing the average ED visits for this population.

Optimizing Nutrition Prior to Surgery: Implementation in Orthopedic Trauma

Oluwatoyosi Akande, BS^{1,2}, Meghan Wally, PhD¹, Ben Masten, MHA¹; Asheli Stroup, MSN, RN¹; Kris Roe, BSN, RN¹; Marissa Reeves, MHA¹; Amy Dixon, MS¹; Amber Stanley, BSPH¹; Rachel Seymour, PhD¹; Laurence Kempton, MD¹; Joseph Hsu, MD¹

¹Department of Orthopaedic Surgery, Atrium Health Musculoskeletal Institute, Charlotte, NC

²University of Connecticut School of Medicine, Farmington, CT

Introduction: The reduction of post operative complications and readmissions continues to be one of the main areas of improvement within surgery. Perioperative nutrition has been described in the arthroplasty population. This study aims to describe the implementation of perioperative nutrition support for orthopedic trauma patients.

Methods: Nondiabetic patients presenting to an orthopedic trauma clinic and scheduled for future surgery, minimum of 2 at least two weeks, later were offered nutritional supplementation beginning in September 2022. The nutrition bundle included: immunonutrition shakes (2 per day for 5 days pre surgery and 5 days post-surgery) and complex carbohydrate beverages (2 beverages the night before surgery and 1 beverage 3 hours before surgery). Outcomes collected included: unplanned readmissions, postoperative infections, additional encounters, and clinic follow ups. We followed these patients prospectively and conducted a retrospective chart review to explore outcomes.

Results: From September 2022 to March 2023, 429 patients had surgery; 94 patients were eligible for nutrition supplementation, and 10 (11%) patients ordered the bundle. In terms of outcomes among the nutrition patients, 40% (N=10) had additional encounters after the index surgery, with most of these stemming from the concern for infection previously diagnosed before surgery. Among the reasons for additional encounters, 30% were for infection concerns, 10% were for additional scheduled surgeries, and 10% were for nonunion revision. No patients had readmissions after the initial surgery, complications during surgery, or reoperations.

Conclusions: It is difficult to say whether or not nutrition support played a significant role in patient outcomes, as both groups of patients had no complications during or after surgery. Nonetheless, malnutrition is still a modifiable risk factor for orthopedic trauma patients who do not need surgery immediately. Strategies are needed to increase support for these patients preoperatively.

Physical Therapy Utilization Following Single Level Posterior Lumbar Fusion

Michael J. Gouzoulis, BS¹, Jay Moran, MD¹, Seongho Jeong, MD¹, Anoop R. Galivanche, MD¹, Alexander J. Kammien, BS¹, Jonathan N. Grauer, MD¹

¹Department of Orthopaedics and Rehabilitation, Yale School of Medicine, New Haven, CT

INTRODUCTION: Posterior lumbar fusion (PLF) is a common procedure that is increasing in frequency. Following such surgeries, physical therapy (PT) may be considered to facilitate mobilization and return to activities. However, the usage of such therapy has not been well-characterized in the literature.

METHODS: Patients undergoing single-level PLF were identified from the 2010 – 2021 PearlDiver M157 administrative database. These patients were stratified based on usage of therapy, home versus outpatient therapy, and timing of such therapy within the 90 days following surgery. To determine predictors of therapy, patient characteristics were determined and multivariate regressions were performed.

RESULTS: A total of 213,240 patients undergoing single-level PLF were identified, of which therapy was done in the 90-days following surgery for 63,231 (29.0%, of which home therapy visits were done for 10,461[16.5%]). Of those that utilized PT, the average +/- standard deviation number of sessions was 10.6 +/- 10.7. Nearly half of all PT visits happened in the first two months: home PT peaked during the second week following surgery and outpatient PT peaked 10 weeks after surgery. Figure 1 shows relative monthly timing of PT utilization for Home and outpatient PT.

Factors that were associated with and form of postoperative PT usage in decreasing odds ratio (OR) order were: having commercial insurance (OR: 1.68), being from the Northeast (OR:1.42), female sex (OR: 1.09), ECI (OR: 1.04 per point), and age (OR: 1.03 per decade) ($p < 0.001$ for all). Home PT utilization was most strongly associated with being from the Northeast (OR: 2.53), Medicaid insurance (OR: 1.52), female sex (OR: 1.39), and age (OR: 1.15 per decade increase) ($p < 0.001$ for all).

Conclusions: In the 90 days following PLF, less than a third of patients received PT (of which only 16.5% was home therapy) and there was large variation in number of sessions. With the use of therapy and home versus outpatient being predicted by nonclinical drivers (insurance and geography), there is clearly room for developing more clinically-based protocols

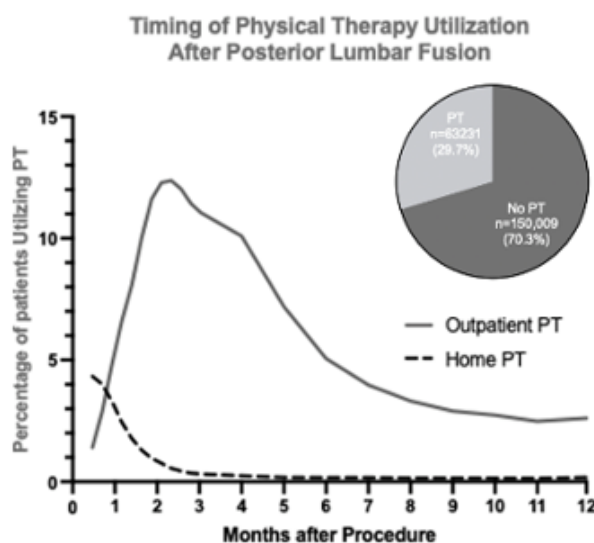


Figure 1: The timing of physical therapy visits within one year following posterior lumbar fusion is shown.

Postoperative Outcomes in Latin American Surgical Patients: Global Health Insights from the Latin American Surgical Outcome Study

Daniel Pardo B.S. MS³, Oscar Aguirre M.D.², Juan Bocanegra M.D.²

¹University of Connecticut School of Medicine, UConn Health, Farmington, CT, USA

²Department of Research, Hospital Universitario de Caldas Servicios Especiales De Salud (S.E.S), Manizales, Caldas, Colombia

Introduction: Postoperative complications are crucial indicators of surgical outcomes. Globally, at least 1 of 6 patients experience a complication (including death) before hospital discharge. Understanding factors that contribute to postoperative morbidity and mortality is essential, especially in diverse and understudied regions like Latin America. The Latin American Surgical Outcome Study (LASOS) aims to evaluate these factors and address outcome disparities in this region.

Methods: All data was collected through review of electronic medical records as delineated in the original LASOS protocol. Inpatient surgical procedures requiring hospitalization during the 7-day period of 09/07/22 - 09/13/22 were included in this study. Patients were excluded from the study if they were discharged on the same day of surgery. Student t-test was used for all comparisons with results reported as mean +/- SEM at the 95th percent confidence level.

Results: The study population (N=58) consisted of a general surgery group (n=43) and a cesarean surgery group (n=15). The overall 30-day survival rate was 96.6%. Comorbidities were present in over 50.0% of patients, with hypertension, diabetes mellitus, and hypothyroidism being the most common. Over 20.0% of patients experienced postoperative complications. Gastrointestinal surgery had the highest complication rate at 75.0%, accounting for 37.5% of all complications. Length of stay was significantly longer in patients with complications. Interestingly, having multiple comorbidities was associated with a decreased length of stay in complicated but not uncomplicated cases.

Conclusion: This study highlights a 3.4% mortality rate and a 27.6% postoperative complication rate in Latin American surgical patients at a single institution. These findings suggest that postoperative outcomes in this region may differ from those reported elsewhere. Further research and efforts to address outcome disparities are warranted to improve surgical care in Latin America.

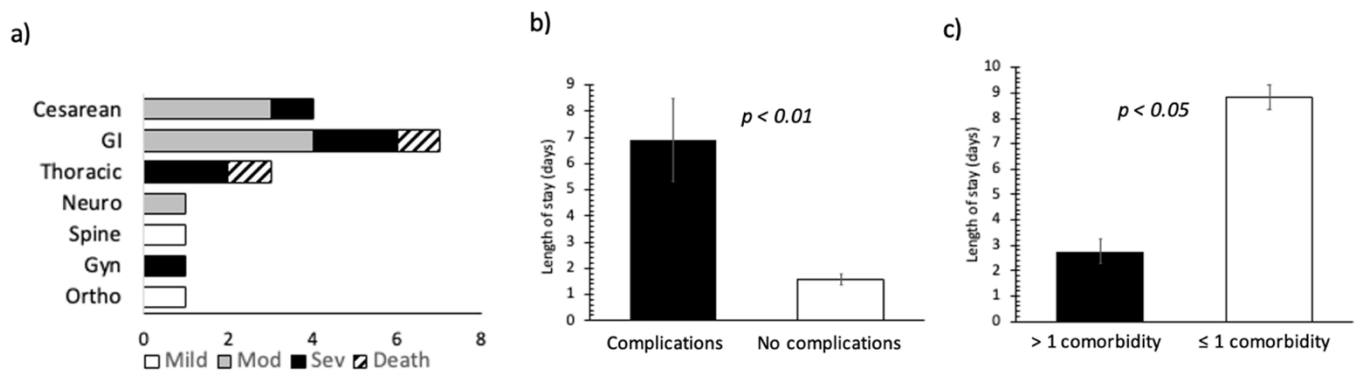


Figure 1. Postoperative Outcomes

a) count and severity of postoperative complications. **b)** Length of stay between complicated and uncomplicated cases, and by multimorbidity within **c)** complicated cases for non-cesarean procedures.

Social Vulnerability of Patients undergoing Cholecystectomy during COVID-19 pandemic at a Single Community Hospital

Nicholas Estes, Nicholas Druar MD, J. Alexander Palesty MD
St. Mary's Hospital – Trinity Health of New England

Introduction: The COVID-19 pandemic highlighted the many shortcomings in access to healthcare in underserved communities. We sought to understand how social factors affect one's access to healthcare during different periods of the COVID-19 pandemic. The Social Vulnerability Index (SVI) uses US Census data to determine the vulnerability of communities based on four variables, including housing type and transportation, household characteristics, race and minority status, and socioeconomic status. Utilizing this index, we sought to understand the differences in patients presenting at different times during the COVID-19 pandemic at a single community hospital.

Methods: We conducted a retrospective chart review of cholecystectomies completed at a single community hospital from the beginning of 2019 to the end of 2020. We utilized patient charts to identify their address and found their census tract, which was then matched with SVI. We divided our study period into four different groups in 2020: the pre-COVID period (January-March), the first surge in COVID cases (April-May), the post-first COVID surge (June-October), and the second COVID surge (November-December). Quantitative data was analyzed using an ANOVA, and categorical variables were analyzed using the Chi-Square test. We excluded patients whose addresses were unavailable or if the patient was listed as out of state.

Results: We identified 254 procedures during the pandemic, with a breakdown of 71.2% female, 28.3% male, 9.4% African American, 76.4% white, 0.4% Asian, 0.4% American Indian, and 11.8% individuals with unreported races. We identified 29.5% of cases in the first COVID group, 12.6% in the second, 43.3% in the third, and 14.6% in the fourth. There were no significant differences when analyzing the overall SVI between the COVID groups. Analyzing variations between COVID groups and the components of SVI showed no significant difference in household characteristics, race and minority status, and socioeconomic status. There was a significant difference between COVID groups one and four and the housing type & transportation ($p = 0.01$).

Conclusions: Our study demonstrates significant differences in patients presenting during the COVID-19 pandemic to a single community hospital who underwent cholecystectomy. The difference observed in the housing and transportation may reflect the patients' inability to travel to the hospital at the pandemic's beginning and a lack of secure housing for recovery following surgery. Our findings highlight the importance of public transportation for vulnerable groups and the impact on access to healthcare when it is unavailable. Further research is required to understand the outcomes for these patients.

Splenic Rupture and Shock Following an Uncomplicated ESWL: A Case Report

Liam Harvey BS¹, Leland J. Soto III MD, FACS²

¹Frank H. Netter MD School of Medicine at Quinnipiac University, ²Griffin Hospital

Background: Splenic rupture following extracorporeal shockwave lithotripsy is exceptionally rare. Few case reports have been published describing this event, which describe the even occurring within 24 hours and others describing rupture in patients with history of splenomegaly.^[1-3] We report a case of a splenic rupture several days post ESWL of an 8 mm left ureteral stone and stent removal.

Case Presentation: An 85-year-old male presented to the emergency room after several hours of severe left lower quadrant abdominal pain radiating to the left chest and axilla as well as nausea and an episode of non-bloody, non-bilious emesis. He had undergone left extracorporeal shockwave lithotripsy (ESWL) 48 hours prior to his presentation. In the emergency room, the patient initially presented with stable vital signs, but became tachypneic and profoundly hypotensive two hours after initial presentation. The patient subsequently had an abdominal CT which revealed a ruptured spleen and significant intrabdominal hemorrhage. The patient denied any recent falls or trauma. The patient, who has a history of atrial fibrillation, had taken their Eliquis that day, which was subsequently reversed with PCC; they were transfused with 2 units of PRBC. General surgery was consulted, and the patient underwent an emergency splenectomy draining 1.5 liters of blood. The patient was admitted to the ICU post-operatively and their course was complicated by ileus and continued oxygen requirement.

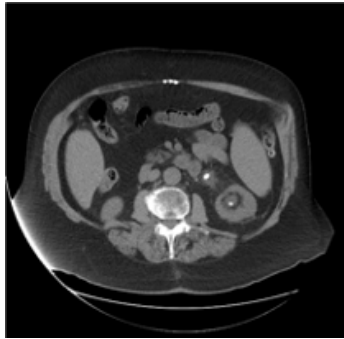


Figure 1: 8mm Stone at uteropelvic junction

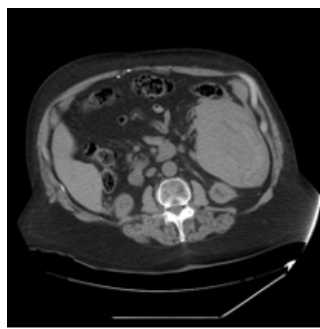


Figure 2: Heterogenous collection engulfing the spleen

Discussion: First introduced for the management of renal and ureteral stones in the 1980s, ESWL is considered a relatively safe method for treating urinary stones; however, rare complications such as splenic rupture are possible. Upon literature review, 13 cases were found describing splenic rupture following ESWL dating back to the early 1990s.^[1-13] Several of these case reports demonstrate an even more acute presentation, occurring 24 hours or less post ESWL. One case report suggested splenic rupture secondary to ESWL was a result of the patient moving frequently during the procedure, leading to misdirection of shock waves, and emphasizing the need for careful patient positioning during the procedure.^[2] Studies have also suggested that in cases of renal parenchymal injury, the mechanism of injury may be related to both the power and total number of shock waves delivered.¹⁴ However, our patient received just 3,000 total shock waves; considered the low end of average during such a procedure.¹⁵⁻¹⁷ Body habitus may also play a role in outcomes of ESWL. Studies assessing skin-to-stone distance, which is largely defined by subject BMI, have a significant implication in success rates for ESWL. Increased skin-to-stone distance has been implicated to affect the energy focusing ability of ESWL, possibly causing an imperfect focus of energy during the ESWL.¹⁸ Our patients' BMI of 33 may have contributed to their complication. We considered if the patient's discontinuation and subsequent resuming of apixaban contributed to their splenic rupture. However, no literature has reported on Eliquis use and splenic rupture following ESWL. However, his anticoagulation may have prevented a small laceration from clotting effectively.

Conclusions: ESWL is considered a relatively safe procedure; however, patients may suffer life-threatening complications that should be recognized. Our patient's original procedure was without difficulty or immediate complications. Although a clear cause cannot be identified in our patient, the event brings to light the importance of healthcare providers recognizing splenic rupture as a possible and life-threatening complication of ESWL.

The Clinical Significance of Utilizing PASS Thresholds when Administering IKDC and KOOS Patient-Reported Outcomes Post Anterior Cruciate Ligament Reconstruction

Julian Mobley BS, Devin Kelly PhD, Amelia Bruce Leicht PhD, CSCS, Gabrielle DelBiondo BS, Joe Hart PhD, ATC
University of North Carolina at Chapel Hill, Department of Orthopaedics and University of Virginia, Department of Orthopaedics

Introduction: Patient-reported outcomes (PROs) such as the International Knee Documentation Committee Subjective Knee Form (IKDC) and the Knee Injury and Osteoarthritis Outcome Score (KOOS) are routinely administered to patients who undergo Anterior Cruciate Ligament Reconstruction (ACLR). The Patient-Acceptable Symptom State (PASS) is a pre-established, evidence-based threshold that defines good perceived outcomes after ACLR. However, since PASS thresholds were established using patient satisfaction ratings, it is unclear whether achieving PASS on these PROs is an indicator of functional performance (e.g., thigh muscle strength). The purpose of this study is to compare quadriceps and hamstring muscle strength between patients who did and did not achieve a PASS on the IKDC and KOOS subscales approximately 6 months post-ACLR. We hypothesized that patients who achieved a PASS on the IKDC and KOOS subscales would demonstrate greater knee extensor and flexor strength than those who did not achieve a PASS.

Method(s): Patients were retrospectively identified from a post-ACLR assessment program where patients were referred by an orthopedic surgeon to complete a battery of tests including isokinetic knee extensor (quadriceps) and flexor (hamstrings) strength at 90 deg/s and PROs. A total of 228 patients (23.5±5.3 years, 7.6±1.7 mo. Post-ACLR) who had undergone a primary

unilateral ACLR were included. Peak extension and flexion torque (Nm/kg) and limb symmetry index (LSI), defined as involved/uninvolved limb *100%, were compared between those who did and did not achieve a PASS on the IKDC and KOOS subscales using independent samples t-tests ($\alpha \leq .05$).

Results: Patients with ACLR who achieved the PASS score threshold on IKDC exhibited greater extensor ($p < .01$) and flexor strength ($p < .001$) for the involved limb and better LSI for extension ($p < .01$) and flexion ($p < .001$). Patients who achieved the PASS score threshold on KOOS-Pain had greater flexor strength for the involved limb ($p = .02$), and better LSI for extension ($p = .01$) and flexion ($p < .001$). Patients who achieved the PASS score threshold for KOOS-ADL has greater extensor ($p < .001$) and flexor ($p < .001$) strength for the involved and uninvolved limbs ($p = .03$; $p = .01$), and better LSI for extension ($p = .01$) and flexion ($p < .001$). Patients who achieved PASS score threshold on KOOS-Sport had greater extensor ($p = .01$) and flexor ($p = .01$) strength for the involved limb; and better LSI for extension ($p < .001$) and flexion ($p = .01$). Patients who achieved PASS score threshold for KOOS-QOL had greater extensor ($p = .01$) and flexor ($p = .02$) strength for the involved limb and better LSI for extension ($p = .01$) and flexion ($p = .01$). The effect sizes for significant differences ranged from .06-.71.

Conclusion(s): Patients that met the PASS threshold on the IKDC and KOOS subscales demonstrated greater knee extensor and flexor strength isokinetic testing at 90 deg/s compared to patients that scored below the PASS threshold on the same PROs. These results support the administration of IKDC and KOOS following ACLR not only to determine patient satisfaction but also to assess strength recovery following surgery. Clinicians may be able to identify patients with intermittent deficits and could provide therapeutic/medicinal interventions earlier if patients are below the PASS thresholds on associated PROs.

The Impact of Staple Line Reinforcement on Bleeding Rate in Robotic Sleeve Gastrectomy

Bomsol Lee BS, Richard Feinn PhD, Nicholas Dugan MD

St. Vincent's Medical Center, Frank H. Netter School of Medicine at Quinnipiac University

Introduction: While robotic sleeve gastrectomy (RSG) has gained popularity over the years, the benefit of reinforcing the staple line in RSG have not been thoroughly studied. This study aims to evaluate the effects of staple line reinforcement (SLR) used during RSG, on complication rates. Specifically post-operative bleeding and leak rates.

Method(s): A retrospective analysis of data from the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP) for the years 2015-2019 was conducted on patients undergoing primary RBG. Patients were divided into three group based on the use of staple line reinforcement, no reinforcement (NR), staple line reinforcement (SLR), and oversewing (OS). Descriptive analysis was performed, followed by inverse propensity score weighting. Pairwise comparison was then performed between the three groups (NR, SLR, OS).

Results: A total of 43,441 RSG cases were identified, with 16,734 in the NR group, 21,207 in the SLR group, and 5,500 in the OS group. Both SLR and OS groups exhibited significantly lower bleeding rates compared to the NR group. Univariate analysis demonstrated that SLR group had lower bleeding rate (0.62% vs 0.88%; $p = 0.0037$) when compared to the NR group and required fewer transfusions (0.47% vs 0.63%; $p = 0.0362$). OS group had similar results in bleeding rate (0.53% vs 0.88%; $p = 0.0033$) and in transfusions (0.42% vs 0.63%; $p = 0.0432$) when compared to NR. Significance was maintained with inverse propensity weighting. SLR group had reduced bleeding risk (0.62% vs 0.90%; $p = 0.002$) and fewer transfusions than the NR (0.46% vs 0.64%; $p = 0.0215$). OS group had reduced bleeding risk compared to NR (0.54% vs 0.89%; $p = 0.007$), however, the significance did not hold up for transfusion rate (0.42% vs 0.63%; $p = 0.0597$). No significant differences were observed in staple line leaks across all groups.

Conclusion(s): This study demonstrates the benefits of utilizing SLR or oversewing techniques in reducing bleeding rates in RSG. Despite the growing trend towards not using SLR, the use of the robotic stapler does not compensate for the benefits of SLR. Therefore, SLR or OS should be considered in RSG to mitigate bleeding risks.