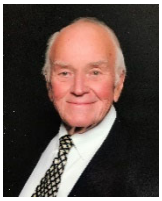
The John MacArthur, MD, FACS Trauma Competition

John MacArthur, MD, FACS was born in Minnesota. Dr. MacArthur was graduated from the University of Minnesota Medical School. He completed his General Surgery Residency at Peter Bent Brigham (now Brigham and Women's Hospital) with Dr Fanny (Francis) Moore.

Dr. MacArthur joined Bridgeport Hospital as Chair of Surgery in 1979. In the 80's he worked with Lenworth Jacobs, MD, FACS, Chip Baker, MD, FACS, James Barone, MD, FACS, and Tony Morgan, MD, FACS to modernize the medical transportation system in Connecticut. Their work also included EMT training and certification. In the early 90's they testified in front of the State Senate encouraging Connecticut to adopt the ACS trauma designation system and use the "optimal resources" document as bases for the designation. They were successful and forever changed the way trauma patients are cared for in our state.

He served as President of this organization from 1995-1996 and retired from practice in Connecticut in the late 90s. Dr. MacArthur continued to practice on Nantucket for many years before moving to Colorado, where he now resides.

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Compliance with the Brain Injury Guidelines – A Single Center Analysis

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Introduction: Traumatic brain injuries (TBI) make up almost a third of all injury-related deaths in the United States. Management of TBI at community hospitals usually entails neurosurgical consultation and extended admission. In 2013, Joseph et al proposed the Brain Injury Guidelines – an algorithm to determine the need for hospitalization, repeat head computed tomography (CT), and neurosurgical consultation – which suggest that this extensive treatment may not be necessary for all TBI. The aim of this study was to assess our institutional compliance with these guidelines and analyze subsequent patient outcomes.

Methods: This is a retrospective, single-center, cross-sectional study analyzing all adult patients (≥ 18 years of age) with traumatic brain injury, identified on computed tomography (CT), who presented to the hospital in 2021. Patients were divided into three categories, BIG I-III, based on the size and location of the intracranial cranial hemorrhage, skull fracture, physical exam, history of intoxication and history of antiplatelet or anticoagulation use, with BIG III representing the greatest severity. The outcomes of interest included worsening repeat head CT at 6 hours post-presentation and average length of stay (LOS). In a subgroup analysis, we excluded patients with multi-visceral injuries and only analyzed patients with isolated head injuries.

Results: A total of 74 patients were identified that met study criteria. The average age was 59 years (SD 20.7) and was predominantly male (65%) (Table). 28.6% of patients in the BIGIII cohort had a worsening repeat head CT, compared to BIGII (17.7%) and BIGI (9.1%). Similarly, while the average LOS was 4.8 days (SD 5.3), BIGIII patients had the highest LOS (3.5 days) compared to BIGII (3.4) and BIGI (2.4). *(cont. on next page...)*

	BIG I (n=11)	BIG II (n=17)	BIG III (n=46)
Age, yrs, mean (SD)	60.7 (6.5)	47.0 (4.1)	63.2 (3.0)
Male, %	63.6	82.4	58.7
Race, %			
-White	11.5	25	40
-Black	24.6	25	0
-Other	63.9	50	60
Worsening on rHCT, %	9.1	17.7	28.6
-In patients with no associated injuries	0	14.3	24
LOS, days, mean (SD)	5.4 (2.0)	4.4 (1.3)	4.7 (0.7)
-In patients with no associated injuries	2.8 (1.8)	3.4 (2.6)	3.5 (3.9)

Conclusion: Our study reports that at a single institution, all TBI patients undergo a radiological evaluation regardless of injury severity with only a small percentage showing worsening head CT. Adherence with the guidelines may offer a clinical benefit when applied in the correct setting and might help reduce LOS.

Utility of Social Vulnerability Index as a Predictor of Survival Following a Firearm Injury

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Introduction: Social Vulnerability Index (SVI) utilizes U.S. Census tracts to map communities based on their relative vulnerability, including social factors such as unemployment and minority status. Recent research suggests higher social vulnerability is associated with higher injury fatality. Here we attempted to understand the role of social vulnerability in terms of mortality for patients presenting with firearms injury at an inner city community teaching hospital.

Methods: Patients admitted to a single community hospital from July 2017 to October 2021 with a diagnosis of assault by firearm based on ICD 10 were identified and included in this study. Each patient's home address at admission was utilized to identify their census tract code and subsequent SVI. We excluded patients with no available address or lived out of state. We also included patients more than once if they presented as a trauma multiple times. Demographic statistics were collected and mortality between patients was analyzed.

Results: A total of 96 patients were identified who met inclusion criteria for analysis with firearm injuries at admission. Patients were then subdivided based on discharge status of either alive or deceased. Additionally, patients were examined based on the 4 sub-indexes that comprise SVI. The mean SVI in the alive at discharge group was not statistically greater than the deceased group (0.796 vs. 0.805, p=0.8740). Mortality was not shown to be significantly different based on mean SVI as well as among the four indexes that comprises SVI, which include socioeconomic, household composition/disability, minority/language, and housing type/transportation.

Conclusions: In a community sample of patients with firearm associated trauma, SVI was not significant but trended higher for patients who died. The relatively small sample size of this study may have limited its findings. Continued investigation of social factors that play a role in traumatic injury outcomes should be pursued to help guide effective public health measures.

Identifying Trauma Patients at Risk of PTSD - Developing a PTSD Screening Protocol

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Introduction: Trauma is the leading cause of death for individuals up to the age of 45 and the fourth leading cause of death overall for all ages. The lifetime prevalence of PTSD is estimated to be 6.8% in the US. In 2007, an estimated 3.6% of US adults had PTSD, with impairment ranging from mild (30.2%), to moderate (33.1%), and serious (36.6%). The prevalence of PTSD among trauma patients is likely significantly higher than the general population, with a 2010 study showing 31% of individuals hospitalized at a trauma center after physical trauma met screening criteria for probable PTSD at 6 months and 28% at 12 months. There has been a recent push for more structured PTSD screening and intervention at trauma centers nationwide, however the practical implementation of protocols in hospitals has been limited. The goal of this project is to develop a reproducible and easily deployed protocol for PTSD screening and intervention, implement this protocol into our program, and demonstrate its effectiveness. The first step in producing such protocol is identifying patients at risk for developing PTSD after trauma and creating an inclusion criteria for screening.

Method(s): A total of 716 trauma cases from 8/1/21 – 7/31/22 were reviewed to identify potential candidates for PTSD screening and outreach. All cases presented through the Stamford Hospital Emergency Department with trauma-related injuries and were classified as full trauma activation, partial trauma activation, trauma consult, or no trauma activation. Cases were then filtered by those who remained alive on discharge and further stratified by injury severity score (ISS) with a cutoff of ISS ≥ 9 to exclude mild traumas. Furthermore, isolated hip trauma patients were excluded from this study.

Results: Among the 716 total trauma cases reviewed, 444 cases were identified as having an ISS ≥ 9. Of these cases, 423 (95.3%) remained alive on discharge and thus remained eligible for potential PTSD screening. Excluding isolated hip trauma resulted in 297 total cases that were included for review. Ages ranged from 1-102 years old (average 62.8) with 166 (55.9%) male cases. ISS ranged from 9-45 (average 13.5); 83 (27.9%) of cases were severe with ISS ≥ 16. Patients presented as either full trauma activation (5.7%), partial trauma activation (31.0%), trauma consult (50.5%), or no trauma activation (12.8%); 231 (77.8%) cases were admitted to the Trauma service as the primary team. There were 22 (7.4%) cases that were related to assault, knife, or firearm injuries, while 64 (21.5%) were related to motor vehicle collisions or pedestrians struck by motor vehicles.

Conclusion(s): We have identified a large population of patients among our trauma registry who are at risk of developing PTSD related to their physical trauma. With this group in mind, we have created a PTSD screening questionnaire based on the Patient Health Questionnaire-9, Posttraumatic Stress Disorder Checklist for DSM-5, and Posttraumatic Adjustment Scale to distribute among these patients retroactively, while new trauma cases will be flagged for screening on arrival. A multidisciplinary team has been assembled to enact PTSD screening and outreach at all levels; for example, surgical residents are being educated on identifying PTSD screening candidates, social workers are approaching admitted patients to broach screening and to introduce patients to the Trauma Survivors Network (TSN), and members of the marketing team are including information on TSN on our hospital webpage and social media sites to raise awareness. A formalized protocol for identifying, screening, and intervening on trauma patients at risk of PTSD will soon be finalized and implemented to ensure these individuals are recognized and provided with appropriate resources and treatment.

Does Low-titer Leuko-reduced O+ Whole Blood Impact Early Mortality in Trauma Patients?

Justin Ellenberg, MD, Daniel Ricaurte, MD, Jonathan Gates, MD, MBA, FACS, Matthew Lissauer, MD, Tara McLaughlin, PhD, Jane Keating, MD
Hartford Hospital

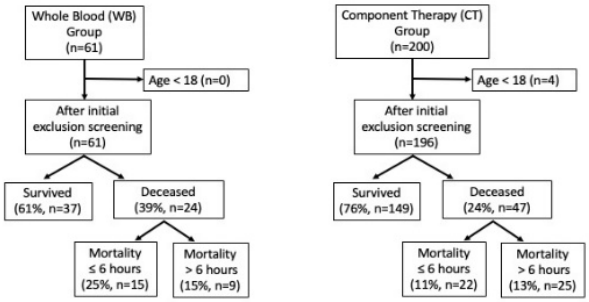
Introduction: Whole blood (WB) resuscitation has demonstrated an early mortality benefit in the military for patients in hemorrhagic shock when compared to component therapy (CT). In the last five years, low-titer, leuko-reduced O+ WB has become available at three times as many trauma centers, including at our own institution. We aimed to study the effect of early WB transfusion on 6-hour mortality among severely injured trauma patients as compared to CT alone.

Method(s): We performed a retrospective review at our urban, academic, Level 1 trauma center to identify patients that were resuscitated with at least 2 units of either packed red blood cells (pRBC) or WB within 4 hours of presentation from December

2018 to March 2022. Patients that received at least 2 units of WB were compared to patients that received CT alone. The two groups were compared using chi square, and logistic regression was performed to assess 6-hr mortality and total blood volume transfused in 4 hours.

Results: 261 patients received at least 2 units of either pRBC or WB within 4 hours following presentation. Patient demographics and injury mechanism were similar between the two groups; however, injury severity score (ISS) was significantly higher among the patients receiving WB. 6-hr mortality was significantly higher among the WB group (24.5% vs 11.2%, p=0.009). Logistic regression showed that CT was predictive of improved 6-hour mortality which was independent of ISS (OR=0.44, 95% CI 0.21-0.94). A second logistic regression showed that the CT group was less likely than the WB group to be at or above the median total blood volume transfused (OR=0.52, 95% CI 0.27 – 0.97).

Conclusion(s): WB resuscitation may be associated with higher transfusion volumes compared to CT; however, our WB population had a significantly higher ISS. Independent of ISS, WB resuscitation was shown in this study to be associated with increased 6-hour mortality when compared to CT alone. Further research is needed to characterize the benefits or harms of early resuscitation with WB.



	Whole Blood (WB) Group N=61	Component Therapy (CT) Group N=196	p-value
Median Age (IQR)	48 (31, 64)	44 (28, 61)	0.158
White	33/61 (54.0%)	116/196 (59.2%)	0.48
Blunt mechanism	48/61 (78.7%)	144/196 (73.5%)	0.41
Median ISS (IQR)	27 (17, 38)	22 (13, 33)	0.025
6-hour mortality	15/61 (24.5%)	22/196 (11.2%)	0.009
Overall hospital mortality	24/61 (39.3%)	47/196 (24.0%)	0.019

Timing, Equity and Outcomes of Rib Fixation: A Large Database Review

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University of Connecticut School of Medicine

Introduction: Recent evidence suggests that surgical stabilization of rib fractures (SSRF) within 72 hours may be beneficial. We utilized a national database to test the hypothesis that outcomes were improved with SSRF within 72 hours. We also explored the frequency of early surgery and the changing racial demographics of patients undergoing SSRF over time.

Methods: We studied the Trauma Quality Improvement Program Participant Use File from 2016-2019 and included patients with chest AIS 3-5 that underwent SSRF. We evaluated injury specifics, demographics, time to surgery, and outcomes including mortality, LOS, and adverse events. Variables were compared using chi-square and Wilcoxon rank-sum tests.

Results: 5,234 (2.9%) of patients with chest AIS 3-5 underwent SSRF. The time to SSRF reduced yearly and the proportion of patients receiving SSRF within 72 hours increased annually (p<0.01). Association between mortality and early surgery was not observed (p=0.6). However, early SSRF was associated with lower rates of VTE, PNA, unplanned intubation/ICU, and total/ICU LOS (p<0.01). Patients undergoing SSRF were noted to be more racially diverse by year and African Americans and those listed as "self-pay or others" were more often delayed to surgery (p<0.03).

Conclusion: The time to SSRF has decreased over time, and an association between SSRF within 72 hours and fewer complications (excluding mortality) was found. The disparities noted among patients undergoing SSRF should be further examined and addressed accordingly. *Cont. next page...*

	2016	2017	2018	2019	p-value
Median Time in Hours to SSRF from Admission (25th-75th %)	77.8 (45.1-123.2)	72.9 (44.1-119.1)	68.1 (40.1-114.7)	68.6 (41.8-108.2)	<0.001
Patients with SSRF w/in ≤72 Hours, %	46.2	49.5	55.3	54.7	<0.001
Latinos Undergoing SSRF, %	7.1	10.5	11.4	11.1	<0.001
Afr Am Undergoing SSRF, %	6.7	8.7	8.7	9.8	<0.001
"Self-pay or Others," %	17.1	15.4	16.7	14.5	0.5

Clinical Utility And Effectiveness Of Specific Spinal Reconstruction Studies Beyond The Standard CT Scans Of The Chest, Abdomen And Pelvis In Trauma Patients

Chelsea Paterson MD, Nick Druar MD, Shayan Ahmed MD MPH, Ava Longo, Dr. Pouya MD, Dr. Corvo MD, MA, FACS
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Introduction: Dedicated reconstruction studies of the thoracic and lumbar spine are an imaging modality option utilized to assist in identifying possible spinal injuries. The aim of this study was to examine the clinical utility and effectiveness of specific spinal reconstruction studies for diagnosing spinal injuries in trauma patients when compared to standard CT imaging of the chest, abdomen and pelvis.

Methods: This is a retrospective study conducted at a single level II Trauma institution which examined injury findings for patients who underwent both standard CT chest with dedicated CT thoracic spine reconstruction as well as patients with standard CT abdomen/pelvis with dedicated CT lumbar spine reconstruction. In our analysis we excluded patients who underwent imaging for non-trauma related indications. In addition, the standard CT and reconstruction study had to be performed within in the same day. Descriptive statistics were used to examine rates of injuries found on standard CT imaging alone in comparison to dedicated reconstruction studies.

Results: There were 191 patients who underwent standard CT Chest and Thoracic reconstruction imaging. This group consisted of 121 males and 70 females with the mean age of 47 years old. It was found that 96.34% of the time injuries were identified on both imaging scans. Secondly, there were 132 patients who underwent standard CT Abdomen/Pelvis and Lumbar reconstruction imaging. There were 68 males and 64 females with the mean age of 52 years old. It was found in this group that injuries were identified on both imaging scans in 93.18% of patients. Further, the rate of identifying injuries on the standard and reconstruction studies were similar despite whether the images were read by the same or different radiologists. When the CT chest and thoracic reconstruction studies were read by the same radiologist the diagnoses were consistent in 97.95% of injuries and 90.90% when read by different radiologists. Similarly in the CT abdomen/pelvis and lumbar reconstruction group, consistent injuries were reported at a rate of 93.88% when read by the same radiologist and 89.29% when read by different radiologists.

CT Chest vs Thoracic Reconstruction Imaging			
Diagnosis Missed	**Number**	**Imaging Study Injury Found**	**Same Radiologist Read**
T1-T2 TP fracture	1	Thoracic Recon	No
T8 TP fracture	1	Thoracic Recon	Yes
T9 TP fracture	1	Thoracic Recon	No
T11 Vertebral body fracture	1	Standard CT Chest	Yes
T12 Vertebral body fracture	1	Thoracic Recon	Yes
T3 Compression fracture	1	Thoracic Recon	No
T4 Superior endplate compression fracture	1	Thoracic Recon	No

(cont. on next page...)

CT Abdomen/Pelvis Lumbar Reconstruction Imaging			
Diagnosis Missed	**Number**	**Imaging Study Injury Found**	**Same Radiologist Read**
L1 TP Fracture	1	Standard CT A/P	Yes
L1 TP Fracture	1	Lumbar Recon	No
L4 TP Fracture	1	Lumbar Recon	No
L5 TP Fracture	1	Lumbar Recon	Yes
T9 Vertebral body fracture	1	Standard CT A/P	Yes
T6, T8 Compression fracture	1	Lumbar Recon	Yes
L3 Compression fracture	1	Standard CT A/P	No
T12 Superior endplate fracture	1	Standard CT A/P	Yes
T6 Oblique fracture	1	Standard CT A/P	Yes
S1 Fractured osteophytes	1	Lumbar Recon	Yes

Conclusions: In conclusion, there does not appear to be a clinically significant difference in the rate of identifying injuries using to dedicated thoracic or lumbar reconstruction studies when compared to standard CT chest, abdomen and pelvis exams. In addition, the rate of identifying injuries on either scan was found to be similar whether the images were read by the same or different radiologists.

Bariatric and Metabolic Surgery

Rachel Huselid, MD Candidate	Frank H Netter MD School of Medicine	Endoscopic Trans-oral Outlet Reduction With Overstich As An Effective Alternative To Surgical Revision Of Gastric Bypass
Shruthi Rajkumar, MBBS	Holyoke Medical Center	Adherent Splenic Vessel during Laparoscopic Sleeve Gastrectomy: A Case Report
Priscilla Lam, MD	Saint Mary's Hospital	Perioperative Use of Haloperidol Reduces Incidence of Postoperative Nausea/Vomiting and Length of Stay Following Elective Minimally Invasive Bariatric Surgery: A Retrospective Review of Cases from a Bariatric Center of Excellence
Shruthi Rajkumar, MBBS	Holyoke Medical Center	Role of Preoperative Imaging in Determining Safe Dissection near the Spleen in Laparoscopic Sleeve Gastrectomy: A Case Report

Endoscopic Trans-Oral Outlet Reduction with Overstitch As An Effective Alternative To Surgical Revision Of Gastric Bypass

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1: Frank H Netter School of Medicine at Quinnipiac University, 2: New York Bariatric Group

Introduction: Morbid obesity is one of the largest public health problems of our generation, and bariatric surgery has been shown to be a safe and effective treatment. Roux-en-Y gastric bypass is the gold standard procedure, with the most common complications of weight regain and gastrojeunal anastomosis (GJA) widening. Endoscopic trans-oral outlet reduction (TORe) is a safe, technically feasible, and durable treatment for revision of GJA enlargement. The objective of this study is to demonstrate that TORe is an effective alternative to surgical correction of GJA widening, with fewer adverse events (AEs) than other surgical options.

Method(s): We conducted a comprehensive review of several databases including PubMed and GoogleScholar to identify relevant articles related to TORe and related procedures. The primary outcomes were the efficacy and practicability of TORe as measured by weight loss, Sigstad score for dumping syndrome, ghrelin levels, outlet diameter, and technical feasibility. We then reviewed the charts of 65 patients who underwent TORe in NY and CT with the primary outcomes of total weight loss (TWL) at 1, 3 and 5 months as well as adverse events.

Results: Six prospective and retrospective studies and one systematic review were included, involving 1778 patients undergoing TORe. TORe was correlated with weight loss as early as 3 months and for as long as 7 years post procedure. Endoscopic suturing was superior to sclerotherapy for weight loss, and there was no significant difference in weight loss between endoscopic and surgical correction of GJA widening. The technical success rate was 99.89-100% with no serious AEs and an overall AE rate of 6.5-11.4%. In our 65 patient sample, the average starting weight was 255.84+/-52.73 lbs with TWL at 1, 3 and 5 months post TORe of 16.06+/-9.17, 25.34+/-12.79, and 30.22+/-12.91 respectively. There were no serious AEs reported, with the most common AE being the need for a second TORe procedure (4 patients, 6.06%).

Conclusion(s): TORe is not only a safe and technically practical option for GJA outlet reduction after gastric bypass, but it may offer weight loss without the risks associated with more invasive surgical revisions.

Adherent Splenic Vessel during Laparoscopic Sleeve Gastrectomy: A Case Report

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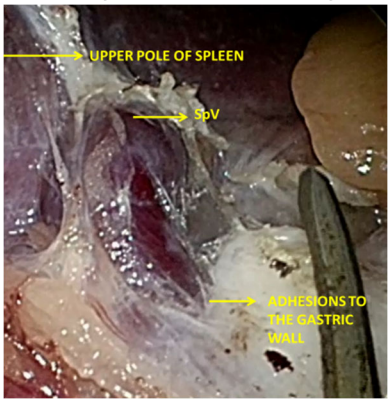
Introduction: Splenic vessels (SpV) are rarely encountered in laparoscopic sleeve gastrectomy (LSG) as much of the dissection is done above the splenic hilum. The splenic artery and vein enter and leave through the hilum. Occasionally, one might come across a superior polar artery in the upper pole of the spleen, which arises from the splenic artery and has an extramedullary course of 39 mm. These vessels are seldom discussed in the context of LSG as most of the splenic bleeding is due to direct splenic injury owning to the short gastrosplenic ligament superiorly.

There is no prior literature on an adherent SpV during LSG. In this case report, we present a challenging splenic dissection with a large SpV adherent to the posterior gastric wall (PGW).

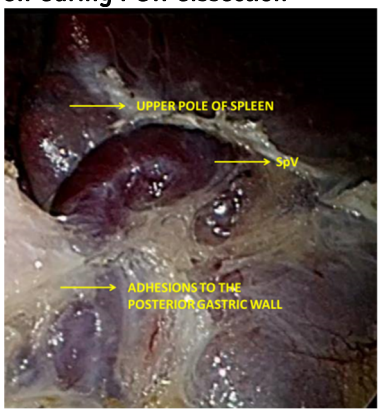
Case Description: A 26-year-old female with an initial BMI of 48.9 kg/m^2 was scheduled for an elective LSG after 5.6% total body weight loss. Her medical history was significant for insulin-dependent diabetes mellitus, reflux disease and prior pancreatitis secondary to gallstones. Her surgical history was remarkable for pancreatic duct stent placement and removal, and cholecystectomy. LSG proceeded normally with division along the greater curvature using Thunderbeat™. Near the upper pole of the spleen, the dissection was extremely difficult due to a large SpV that was densely adherent to the PGW (Image 1 and 2). The rough diameter of SpV was estimated to be 10mm. The short gastric tributaries to this vessel were divided. There was minimal venous bleeding while trying to dissect the SpV off the PGW. Two pieces of Surgicel® were left prophylactically to reinforce hemostasis. Apart from this, there were extensive adhesions between the pancreas and the PGW and the lesser sac was obliterated. After mobilizing the PGW off the pancreas, the stapling was done and LSG was completed successfully. The spleen was inspected for infarction or engorgement before closing.

Discussion: This case report is enlightening evidence of the anatomic variations in the upper pole splenic vessels and their surgical importance in LSG. We hypothesize that the large vessel encountered in the upper pole was the splenic vein due its large size, short gastric tributaries and the slow venous bleeding. Despite the variable tributaries, splenic vein has been described to have consistent course from the hilum to the portal vein. In this case, we observed a splenic vein that was pulled up beyond the hilum and was adherent to the PGW. This could be due to abnormal vascular adhesions secondary to the pancreatitis. The extensive retrogastric adhesions could be attributed to the same. In this case, we used Thunderbeat™ which can seal vessels up to 7mm diameter and it took about 4 minutes to attain hemostasis. In cases of enlarged blood vessels, dissection should proceed with caution and appropriate energy devices must be used. If there is bleeding, prompt hemostasis with careful inspection of spleen can help prevent postoperative splenic complications. Other strategies to prevent splenic vessel bleeding are adequate exposure in the area of dissection and optimal visualization. A short video that highlights our technique to address this challenging case will be presented.

ew during dissection near Angle of His



ew during PGW dissection



Perioperative Use of Haloperidol Reduces Incidence of Postoperative Nausea/Vomiting and Length of Stay Following Elective Minimally Invasive Bariatric Surgery: A Retrospective Review of Cases from a Bariatric Center of Excellence

Priscilla Lam MD, Nicholas Druar MD MPH, Santosh Swaminathan MD, Shohan Shetty MD, FACS
Stanley J. Dudrick Department of Surgery Saint Mary's Hospital

Introduction: Bariatric Enhanced Recovery After Surgery (ERAS) protocols strongly recommend a multimodal approach to postoperative nausea/vomiting (PONV) however, there remains a lack of consensus on the optimal regimen to treat PONV in the bariatric population. As a community hospital with a high volume bariatric program, we sought to identify which perioperative strategies were most effective at reducing incidence of PONV and how that subsequently affected overall length of stay.

Methods: An institutional bariatric database was created by retrospectively reviewing patients undergoing elective laparoscopic gastric bypass procedures from 2018-2021. Demographic data reviewed included age, gender, preoperative body mass index (BMI), ethnicity and primary language. Primary endpoints including reported episodes of PONV, total doses of Ondansetron given, complication rate (ICU transfer, readmission within 30 days) and length of stay were assessed. Fisher's exact test, Mann-Whitney test and ANOVA were used to evaluate the effect of perioperative management on various endpoints.

Results: A total of 130 patients were analyzed with Haloperidol being utilized perioperatively in 15.0% of all patients. Patients receiving Haloperidol were less likely to require Ondansetron outside of the immediate perioperative period (37.25% vs 5.0%, $p = 0.004$) and also experienced less PONV (5.0% vs 37.25%, $p = 0.03$) with a decreased average length of stay (39.89 vs 25.09 hours, $p < 0.001$).

Conclusions: Addition of low dose Haloperidol to perioperative management strategies decreased need for additional antiemetic coverage and decreased incidence of PONV resulting in a significantly shorter length of stay, with increased likelihood of discharge on postoperative day 1.

Variable	No Haloperidol	Received Haloperidol	p-value
Male	10%	5%	
Female	90%	95%	
Average BMI	41.97	42.95	
Complication Rate	12.5%	5.0%	0.47
Required 3+ doses of Ondansetron	**37.25%**	**5.0%**	**0.004**
Incidence of PONV	**50.45%**	**15.0%**	**0.03**
Length of Stay (hours)	**39.89**	**25.09**	**< 0.001**

Table 1: Use of Haloperidol decreases antiemetic requirement, incidence of PONV and shortens length of stay

Role of Preoperative Imaging in Determining Safe Dissection near the Spleen in Laparoscopic Sleeve Gastrectomy: A Case Report

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Introduction: Iatrogenic splenic injury (ISI) is one of the feared complications during sleeve gastrectomy. Although laparoscopic approaches have decreased the incidence to 0.1%, the risk persists. A splenic injury predisposes the patient to the risk of postoperative hemorrhage, splenic infarction, splenic abscess, and splenectomy. The most commonly injured is the splenic capsule. In this case report, we aim to describe the significance of splenic anatomy in ISI and how preoperative imaging can help prevent ISI in laparoscopic sleeve gastrectomy (LSG).

Case Description: A 40-year-old female with an initial BMI of 34.4 kg/m^2 was scheduled for an elective LSG after 9.98% total body weight loss. Her medical history was significant for insulin-dependent diabetes mellitus, reflux disease, hypertension and hyperlipidemia. Her abdominal surgical history was remarkable a hernia repair. LSG proceeded normally with division along the greater curvature using Thunderbeat™. Dissection near the spleen was extremely difficult due to the anatomy of the spleen. It was C-shaped and was enveloping the stomach with very minimal space for a safe dissection (Image 1). We decided to continue the dissection posteriorly and then medial to the splenic artery. This gave a better exposure to dissect the gastrosplenic ligaments and short gastric vessels safely. The splenic capsule was intact. A concomitant hiatal hernia repair was performed before completing the sleeve

gastrectomy. The spleen was inspected for infarction or engorgement before closing. On retrospective analysis of the patient's preoperative upper GI series, an indentation was found on the greater curvature just distal to the gastric fundus (Image 2 vs. normal in Image 3). Similarly on the preoperative abdominal CT, a C-shaped spleen was seen shouldering the stomach superolaterally (Image 4).

Discussion: Anatomical abnormalities with surgical significance are not routinely reported in preoperative imaging studies. In this patient, the spleen was reported as normal in all her preoperative imaging. In images 2 and 3, both patients had a normal study radiologically. However, in Image 2, an obvious indentation was overlooked as it did not affect the purpose of the imaging. This case report is an eye-opener for all imaging studies to report the surgery-specific anatomical variations, beyond the goal of the imaging. If these variations were routinely reported, it would help the surgeon to tailor the port sites, plan the dissection and potentially decrease the operation time. In LSG, anatomic abnormalities seen anywhere along the stomach would be valuable for a safe surgery.

Image 1 – Spleen shouldering the stomach

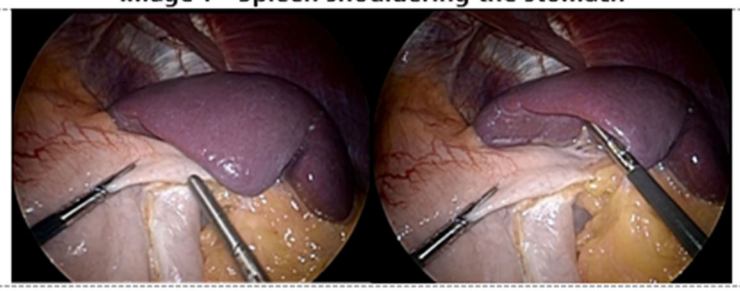

Image 2 – Indentation on Upper GI study

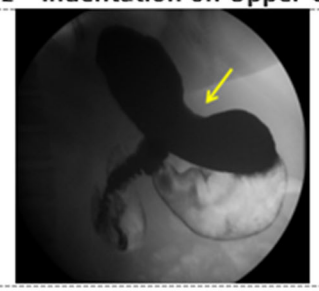

Image 3 – Normal Upper GI study in another patient

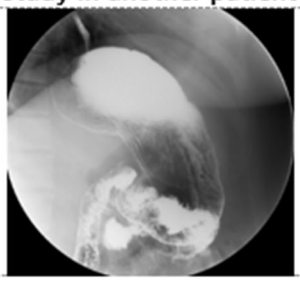

Image 4 – The C-shaped spleen in a preoperative CT Abdomen