12th Annual

Abdominal Wall Reconstruction 2021

MedStar Georgetown University Hospital

ABSTRACTS

June 9 to 12, 2021

A Dynamic Virtual Conference with Expert Faculty

Conference Chair:

Parag Bhanot, MD, FACS
MedStar Georgetown University Hospital
Washington, D.C.

Course Directors:

Karen Kim Evans, MD
MedStar Georgetown University Hospital
Washington, D.C.

Jeffrey E. Janis, MD, FACS
Ohio State University Wexner Medical Center
Columbus, OH

William W. Hope, MD
New Hanover Regional Medical Center
Wilmington, NC

MedStar Health

AWRConference.com

Effects of Botulinum Toxin A on an Incisional Hernia Reconstruction in a Rat Model

Eun Key Kim, MD, PhD; Jin Geun-Kwon, MD

Background:
Although the effects of botulinum toxin A (BTX) on a hernia reconstruction have been consistently reported, few studies provide objective evidence. We aimed to compare the effects of chemical component separation (CCS) with mechanical component separation (MCS), and with a combination of CCS and MCS, in a rat hernia model.
Methods:
Rats were divided into group 1 (control), group 2 (CCS), group 3 (MCS), and group 4 (CCS and MCS). Four weeks after hernia induction, BTX was injected into groups 2 and 4. Hernia repair was performed 2 weeks after CCS when MCS was performed in groups 3 and 4. The pre- and post-BTX defect sizes, traction forces, intraabdominal pressure (IAP) and hernia recurrences were analyzed.
Results:
The defect size was significantly decreased in groups 2 and 4 after CCS. The traction force was significantly smaller in groups 2 and 3 compared to the control, and the effects of CCS and MCS were additive. The mean IAP was 16.83 mmHg in group 1, 10.67 mmHg in group 2, 10.17 mmHg in group 3, and 9.67 mmHg in group 4, thus showing significant reductions following CCS and MCS. Recurrence was observed in 6/6 animals (100%) in groups 1 and 3, but only 1/6 (17%) in groups 2 and 4.
Conclusions:
Preoperative BTX significantly reduces the hernia size (by 30%) and the traction force required to medialize the rectus abdominis. After hernia repair, CCS decreases the IAP to a similar degree to MCS but only CCS appears to reduce hernia recurrence.
Asan Medical Center [1] [2]

Use of Gore Enform™ Mesh in Ventral Hernia Repair

Gloria X Zhang; Andrew Hollins, MD; Andrew Atia, MD; Catalin Mateas; Howard Levinson, MD

Background:
Ventral hernia repair (VHR) is one of the most common surgeries performed in the United States. Biosynthetic mesh is a degradable mesh that is made from synthetic materials that undergo breakdown and absorption via hydrolysis. Gore EnformTM is a newer biosynthetic mesh and to date, there are no reports of its clinical outcomes. The purpose of this study is to review the senior authors experience with EnformTM in VHR.
Methods:
This study was a single surgeon case series. Inclusion criteria were patients that underwent ventral hernia repair with Gore EnformTM mesh. Data collection was performed through a combination of retrospective chart review, phone, and email. Outcomes assessed were hernia recurrence, surgical site occurrence (SSO), or surgical site infection (SSI). Hernia-specific quality of life (HerQLes) surveys were used to assess VHR specific patient outcomes.
Results:
A total of 12 patients underwent abdominal wall reconstruction with Gore EnformTM mesh. Table 1 and 2 outline the patient demographics, past medical history, and surgical outcomes. Overall SSO was 25%, analogous to similar patient profile reconstructions. Mean post-operative follow up was 218 days. Table 3 demonstrates the scores of the patients that completed the PROMIS pain survey and HerQles PROs. Three of the patients had an overall similar or unchanged PROMIS and HerQles score.
Conclusions:
This is the first clinical study to report outcomes of ventral hernia repair using EnformTM mesh. We conclude that EnformTM mesh is an acceptable option to consider in ventral hernia repair and demonstrates similar outcomes to other commercially available biosynthetic or biological meshes.
Duke University School of Medicine [1] [4] Duke University Division of Plastic, Maxillofacial, and Oral Surgery [2] [3] [5]

The Abdominal Hernia-Q: An Analysis of the Components that Determine Quality-of-Life

Ginikanwa Onyekaba; Jaclyn Mauch; Viren Patel; Robyn Broach; John P. Fischer, MD, MPH

Background:
Ventral hernias are a common surgical problem that lead to significant morbidity among affected patients. Published assessment tools have examined basic quality-of-life (QoL) measures following ventral hernia repair (VHR). Using the Abdominal Hernia-Q (AHQ), this study aims to assess the relative impact of VHR on key components of QoL.
Methods:
A retrospective chart review was conducted of patients undergoing VHR between September 2017 and September 2019 who had completed at least one pre- and post-operative AHQ. Post-operative intervals were created to capture AHQ responses that clustered around standard follow-up visits (<1.5 months, 1.5-4.5 months, 4.5-11 months, and 11+ months).
Results:
A total of 136 patients were included, of which 77 were female (61%), and the average age at the time of VHR was 54.8 years. All AHQ score components significantly increased from the pre-operative to post-operative periods, regardless of period duration from surgery. The physical domain score significantly increased from <1.5 month to the 1.5-4.5 month period (p=0.04). The appearance score dropped from the 1.5-4.5 month to

4.5-11 month period (p=0.05).

Conclusions:

VHR leads to a sustained increase in hernia-specific QoL measures during the post-operative course driven by positive changes in appearance and physical functioning. The initial increase in QoL measures is due to the patients' satisfaction with their appearance, while the sustained increase is due to restored physical function. These findings enhance our understanding of the positive effects of VHR.

University of Pennsylvania [1 2 3 4 5]

Pre-operative Anemia is a Risk Factor for Poor Perioperative Outcomes in Ventral Hernia Repair

Chance Benner, DO; William Childers, DO

Background:

Ventral hernia repairs (VHR) are among the most commonly performed operations by general surgeons. Despite advances in technology there remains high complication and re-admission rates. Pre-operative anemia has been linked to poor outcomes and re-admission across several surgical procedures, however the link to ventral hernia repair outcomes are limited.

Methods:

Utilizing the American College of Surgeons National Safety and Quality Improvement Project (NSQIP) database for years 2016-2018, a total of 115,000 patients were utilized for the study met inclusion criteria. Using propensity matching we matched two groups of patients who underwent VHR: 1) those with pre-operative anemia and 2) those with normal hemoglobin levels, 3669 patients to each group. Anemia criteria was set forth by the World Health Organization (WHO).

Results:

Various post-operative outcomes as recorded by the NSQIP database were analyzed. Univariate analysis did demonstrate statistical significance in post-operative outcomes including significantly greater percentage of serious surgical site infection, poor renal outcomes, transfusion, and unplanned remission in those with pre-operative anemia who underwent VHR. In a multivariate analysis, patients who underwent ventral hernia repair with pre-operative anemia had significantly greater odds of unplanned readmission (odds ratio, 1.35, 95% confidence interval, 1.16 to 1.57) and serious surgical site infection (odds ratio, 1.35, 95% confidence interval, 1.04 to 1.74) independent of known risk factors such as smoking, diabetes and obesity.

Conclusions:

Pre-operative anemia is a risk factor for poor post-operative outcomes in those undergoing ventral hernia repair and should be considered when evaluating a patient for repair.

UPMC Pinnacle [1 2]

Clinical and Longitudinal Patient Reported Outcomes After Transversus Abdominis Release: A Single Surgeon Experience

Adrienne N. Christopher, MD; Martin P. Morris; Louis Xavier; Robyn B. Broach, PhD; John P. Fischer, MD, MPH

Background:

Posterior component separation with transversus abdominis release (TAR) is a novel complex abdominal wall repair technique that maximizes medial myofascial flap advancement in a vascularized, pre-peritoneal plane. Here, we add to a growing body of literature on this technique by assessing longitudinal clinical and patient reported outcomes (PROs) after ventral hernia repair (VHR) with TAR.

Methods:

Adult patients undergoing VHR with TAR between 10/1/2015 and 01/15/2020 by a single surgeon were retrospectively identified. Patients with <12 months of follow-up were excluded unless they had a documented recurrence. Clinical outcomes and PROs using the Abdominal Hernia Questionnaire (AQH) and Hernia Related Quality of Life Survey (HerQLes) were assessed.

Results:

57 patients were included with a median age and body mass index of 60 and 30.6 kg/m2, respectively. The average hernia defect was 384 cm2 [IQR 205-471], and all patients had retro-muscular mesh placed. The most common complications were delayed healing (19.3%) and seroma (14.0%), however only one patient required return to the OR for management of a complication. There were no cases of mesh infection or explantation. Previous hernia repair and concurrent panniculectomy were risk factors for developing any complication (p<0.05). Two patients (3.5%) recurred at a median follow-up of 25.7 months [IQR 18.2-42.1]. Significant improvement in disease-specific PROs was observed and maintained throughout the follow-up period (pre to post p<0.05).

Conclusions:

Longitudinal clinical and patient-reported outcomes after VHR with TAR are limited. We conclude that TAR is a safe and efficacious adjunct in the repair of complex hernia defects.

Thomas Jefferson University Hospital [1] University of Pennsylvania Hospital [2 4 5] Perelman School of Medicine [3]

Calibration of Hernia-Specific Patient Reported Outcome Measures (PROMs)

Viren Patel, MD; Jesse Hsu, PhD; Robyn Broach, PhD; Adrienne Christopher, MD; John P. Fischer, MD, MPH

Background:
While there are many patient-reported outcome measures used for ventral hernia (VH), disease-specific instruments, like the Hernia-related Quality-of-Life (QoL) Survey (HerQLes) and Abdominal Hernia-Q (AHQ), have shown greater accuracy in capturing all VH-related QoL. We present a novel calibration that allows providers to convert scores between the AHQ and HerQLes, enabling unification of QoL data.
Methods:
VH patients were prospectively identified and simultaneously administered both the AHQ and HerQLes pre- and post-operatively. To ensure validity of the calibration, responses were excluded if patients answered instruments on different dates or the responses were discordant on corresponding questions on each instrument. The calibration was estimated using a linear mixed-effects model, including linear and quadratic scores, timing of survey relative to surgery and their interactions as fixed effects, and patients as random effects to account for multiple surveys from the same patient.
Results:
In total, 109 patients were included, responding to 300 pairs of surveys (112 pre-operative and 188 post-operative), of which 17 (5.6%) were excluded due to discordant responses. Conversion of the HerQLes to AHQ was most accurate when including whether the survey was completed pre-or post-operatively, with a mean square error (MSE) of 0.0091. Similarly, converting the AHQ to HerQLes was most accurate when factoring in the timing of survey administration, with a MSE of 0.016.
Conclusions:
We present a novel and accurate method to convert scores between the AHQ and HerQLes. Being able to unify QoL data from different PROMs will be crucial in efforts to better understand VH in larger patient cohorts. University of Pennsylvania Health System [1 2 3 4 5]

Comparison of Material Properties of SurgiMend® and Strattice™ Acellular Dermal Matrices In Vitro and In Vivo

Lauren Mitchell, MBA; Robert Martindale, MD, PhD; Eric Stec; Jared Lombardi; Jephte Augustin, PhD; Maryellen Sandor, PhD

Background:
Head-to-head comparisons between the acellular dermal matrices SurgiMend® and Strattice™ were performed in vitro and in vivo to evaluate maintenance of mechanical integrity, which is crucial for successful abdominal wall repair.
Methods:
Strattice (Firm, Extra Thick [EXT], Perforated) and SurgiMend (1.0, 3.0, Microperforated) samples (n=5/product) were tensile tested following collagenase exposure at multiple timepoints. Explant mechanics (maximum load, maximum stress, and stiffness) were also evaluated following 6-week subcutaneous implantation in 15 rats.
Results:
In vitro, Strattice retained 33.4%, 65.7%, and 17.2% of initial strength (Firm, EXT, and Perforated, respectively) at 48 hours, compared with SurgiMend materials, which were completely digested by 48 hours (Figure 1). Six weeks post-implantation, Strattice Firm had higher maximum load (145.85±33.05N/cm vs 24.29±12.35N/cm, p=0.006), maximum stress (8.20±1.91MPa vs 2.24±1.27MPa, p=0.003), and stiffness (7491.00±1981.32N/cm vs 737.56±292.55N/cm, p=0.007) than SurgiMend 1.0. Strattice EXT had lower maximum load (198.54±58.79N/cm vs 303.08±76.76N/cm, p=0.046) than SurgiMend 3.0, but similar maximum stress (6.96±1.78MPa vs 8.73±2.15MPa) and stiffness (13386.11±3123.28N/cm vs 9389.02±4860.67N/cm). Strattice Perforated had higher maximum load (72.65±41.44N/cm vs 10.23±4.67N/cm, p=0.029), maximum stress (4.078±2.08MPa vs 0.44±0.19MPa, p=0.0122), and stiffness (5154.29±3244.06N/cm vs 623.49±139.55N/cm, p=0.036) than SurgiMend Microperforated. Compared with SurgiMend, Strattice had overall higher maximum load, maximum stress, and stiffness retention rates, which exceeded the minimum threshold for abdominal wall repair (Deeken CR, et al. Ann Surg. 2012;255:595-604).
Conclusions:
Compared with SurgiMend, Strattice was significantly less susceptible to collagenase degradation in vitro, contributing to greater retained strength. Greater durability was also supported by more retained strength for Strattice following implantation.
Oregon Health and Science University [1] Allergan Aesthetics, an AbbVie Company, [2 3 4 5]

"Delayed-Immediate" Staged Hernia Repairs in CDC Class IV Wounds: A Focus on Clinical and Economic Outcomes

Paige Hackenberger, MD; Daniel Eiferman, MD, MBA; Jeffrey E. Janis, MD

Background:
The Centers for Disease Control (CDC) wound class in hernia repairs impacts both surgical technique and outcomes. Hernia recurrence and associated complications are elevated when class IV ("contaminated/dirty") wounds are treated in a single step. We hypothesize patients who undergo novel "delayed-immediate" staged repairs are less likely to experience these adverse outcomes.
Methods:
Patients undergoing delayed-immediate as well as traditional single-step hernia repair in class IV wounds

were identified by retrospective chart review. Patient characteristics as well as postoperative outcome variables were collected and compared between groups. An economic analysis of pertinent cost data was performed to differentiate index operation and complication-related costs within each repair pathway.

Results:

There were 8 patients in the delayed-immediate repair group and 10 patients in the control group. Length of stay was 14.9 days (± 8.8), and 8.7 days (± 6.4), respectively. Rate of hernia recurrence within 1 year was 16.7% and 50%. Rate of mesh infection at 30 days was 0% and 10%. Delayed-immediate repairs had a total expected savings of $19,850 compared to the control group.

Conclusions:

Hernia repair within an infected abdominal wound bed can pose a unique challenge and limit the complete reconstructive menu. Our delayed-immediate repair strategy allows for down-classification of the wound bed and intra-abdominal surveillance by performing a planned, single-admission, multi-stage repair of these complex defects. Although there is an increased index cost associated with our staged repairs, this cost is offset by decreased infection and hernia recurrence rates which necessitate future interventions.

Northwestern Feinberg School of Medicine [1] The Ohio State University Wexner Medical Center [2 3]

A Flexibel Approach to Fluid Management

Kimberly Mauck, MSN; Anne E. McArdle, CRNP

Background:

Managing a retracted ostomy seated within an open, infected wound can present challenges for the care team and the patient. Management approaches require innovative ideas to adapt to the changing presentation of the stoma and peristomal landscape.

Methods:

45 year old female with Crohn's disease and newly diagnosed endometrial cancer. Complex surgical history: 19 abdominal procedures including multiple abdominal wall hernias; exploratory laparotomies; small bowel resections since 2002. Hemicolectomy with resection of rectum and colostomy 18 years ago. She presented in May 2019 for total abdominal hysterectomy, right salpingo-oophorectomy, repair of parastomal hernia and revision of ostomy. Post-op course complicated by wound dehiscence resulting in retracted stoma. She had 3 wound debridement's of abdominal wall to increase size of wound bed to accommodate negative pressure wound therapy and allow use of one-piece, compressible isolation device to isolate stoma and control effluent.

Results:

Methods used assisted with managing excessive output and maintained wound integrity which promoted wound healing.

Conclusions:

The use of one-piece compressible isolation device and negative therapy allowed for healing of wound, controlled stoma output, promoted pain management, increased patient satisfaction and decreased cost.

Medstar Georgetown [1]

Analysis of Adverse Effects of Multimodal Gabapentin in Abdominal Wall Reconstruction

Benjamin Sarac, MD; Anna Schoenbrunner; Kristin Brower, PharmD; Girish Joshi, MD; Jeffrey E. Janis, MD

Background:

Multimodal analgesia (MMA), a key component of enhanced recovery after surgery (ERAS) protocols, emphasizes the use of non-opioid analgesics. Pre- and postoperative gabapentin is often included within MMA because it has been shown to reduce postoperative opioid use. However, the role of gabapentin has been questioned due to concerns of adverse effects, particularly in the elderly. In an effort to better understand the specific role of gabapentin within the context of an established ERAS protocol, the authors studied the prevalence of its adverse effects in patients undergoing abdominal wall reconstruction.

Methods:

Following institutional review board approval, a retrospective review of a prospectively collected database of 267 consecutive patients who underwent abdominal wall reconstruction by a single surgeon was performed. Demographic variables, operative details, postoperative analgesic use, the presence of dizziness, lightheadedness, or altered mental status (AMS), hypotension, negative Richmond Agitation Scale Scores (RASS), and postoperative falls were recorded and analyzed according to postoperative gabapentin administration.

Results:

Two hundred and thirteen patients (80%) met inclusion criteria, of which 138 (65%) received postoperative gabapentin. Postoperative gabapentin use was not associated with dizziness, lightheadedness, AMS, hypotension, negative RASS scores, or falls. Further, even among those =65 years of age, postoperative gabapentin use was not significantly associated with these adverse events.

Conclusions:

In patients undergoing abdominal wall reconstruction, postoperative gabapentin administration was not associated with an increase in adverse effects. Further prospective analysis may better allow the characterization of the adverse effects of perioperative gabapentin.

The Ohio State University [1 2 3 5] University of Texas Southwestern [4]

Characterizing Hernia Centers in the United States: What Constitutes a Hernia Center?

Jared Shulkin; Joseph Mellia; Viren Patel; B. Todd Heniford, MD; John P. Fischer, MD, MPH

Background:
A universal definition for what constitutes a hernia center does not exist. The purpose of this study was to characterize hernia centers in the United States by analyzing hernia centers and their non-hernia center counterparts.
Methods:
A web-based search was conducted to identify defining features of hernia centers including faculty demographics and composition, research output, research funding, clinical trials, and website content. Hernia centers and non-hernia centers were compared.
Results:
Most hernia centers (n=36) are in urban areas (89%) and distributed evenly across regions of the United States. Hernia centers are associated with University program types (p=0.001) while non-hernia centers are associated with University-Affiliate (p=0.001) and Community (p=0.02) program types. Hernia centers are associated with Abdominal Core Health Quality Collaborative participation (p=0.01) and Center of Excellence by the Surgical Review Corporation certification (p=0.005). Hernia centers are associated with presence of active clinical trials (p<0.001) and number of clinical trials (p<0.001). Hernia centers are associated with industry-sponsored trials (p<0.001) but are not associated with NIH-sponsored trials. Fifty percent of hernia centers have PRS faculty. The vast majority of hernia center websites describe hernias treated (92%) and repair techniques (89%). The majority of hernia center mission statements emphasize an individualized care plan (61%) and multidisciplinary care (57%). Only 39% of websites and 17% of mission statements mention research.
Conclusions:
In the United States, hernia centers are clinically oriented, multidisciplinary surgical teams at predominantly urban, University programs that may use this title to attract patient referrals and industry sponsorship of clinical trials.
Perelman School of Medicine [1] [3] University of Pennsylvania [2] [5] Carolinas Medical Center [4]

Wound and Limb Salvage Outcomes for Normal Saline and Anti-Microbial Solution in Negative Pressure Wound Therapy with Instillation

Dean Meshkin, MS; Christine Hill; Kenneth Fan,MD; Karen Evans, MD; Christopher Attinger, MD

Background:
Negative-pressure wound therapy with instillation is a widely utilized adjuvant in the treatment of complex wounds. Anti-septic solutions are often preferred for instillation, however the mechanism of this therapy may be independent of instillation compounds. In addition, little is known on the cytotoxic potential of anti-microbial agents on endogenous tissue and the process of wound healing. This is the first study to provide long-term comparison of non-surrogate outcomes after NPWTi with normal saline or 0.1% polyhexanide plus 0.1% betaine instillation in patients requiring surgical intervention for treatment of infected wounds.
Methods:
This was a single-center retrospective study comparing the long-term course of patients receiving 0.9% normal saline or 0.1% polyhexanide plus 0.1% betaine as instillation for wounds requiring hospital admission and operation. No exclusions were set for wound characteristics, patient demographics or comorbidities. Outcomes were measured over a 5-year period and included rates of wound healing, dehiscence, recurrence, additional operations, amputations, and mortality. Mortality was obtained using electronic medical records as well as a commercial obituary database. Statistical significance was set at $p < .05$.
Results:
42 patients received normal saline instillation and 41 the anti-septic solution. Rates of dehiscence, wound recurrence, and additional operations in the normal saline and anti-septic cohorts were 6.3% and 5.6%, 9.4% and 5.6%, and 14.3% and 9.8%, respectively, with no statistically significant differences. In patients requiring further surgery, mean time to wound closure was 104 and 130 days in the normal saline cohort and anti-septic cohorts, respectively (p=0.81). 14.3% and 22% of the normal saline and anti-septic cohorts required amputations over 5 years (p=0.36). Amputations were predominantly minor (83% and 55% of amputations in the normal saline and anti-septic cohorts, respectively). 5-year mortality was 24% and 17% in the normal saline and anti-septic cohorts, respectively (p=0.45).

This is the first evaluation of non-surrogate outcomes for varying instillations in negative pressure wound therapy in infected wounds. The results indicate that outcomes for normal saline instillation are comparable to that of 0.1% polyhexanide 0.1% betaine. The clinical success, cost benefit and accessibility of normal saline can potentially expand the utilization of this therapeutic approach for larger patient populations.
Georgetown University School of Medicine [1] [2] Medstar Georgetown University Hospital - Department of Plastic & Reconstructive Surgery [3] Medstar Georgetown University Hospital - Center for Wound Healing [4] [5]

A Case Series of Locally Delivered Antibiotics to Porcine Submucosa Hernia Graft in Single Stage Repair of Incisional Hernia in Contaminated Settings

Pooja Patel, MD; Ashley Drohan, MD; Samuel Minor, MD

Background:
Patients with incisional hernia repair in contaminated surgical fields represent a population with a high risk of post-operative infection, subsequent morbidity and mesh explantation. Local delivery of antibiotics directly onto the mesh is a novel concept with limited experience in the literature. Two newly developed forms of local antibiotic delivery include gentamicin/PGLA discs and calcium sulfate antibiotic impregnated(vancomycin and gentamycin) beads(CSAB).
Methods:
This is a prospective case series of consecutive patients by a single surgeon who underwent single stage incisional hernia repair with porcine submucosa hernia graft in grade 3 Ventral Hernia Working Group Modified Scale wounds combined with gentamicin/PGLA discs or CSAB.
Results:
Thirty-two patients were enrolled using gentamycin/PGLA discs(N=10) and CSAB(N=22). The average defect width was 15.05 cm(range=5-25 cm) and length was 18.33 cm(range=7-35 cm). For all patients, the hernia graft was placed in the intraperitoneal position with complete facial coverage. On post-operative day one, patients had low systemic gentamycin(CSAB mean=1.20 mg/L;gentamycin/PGLA discs mean=1.11 mg/L) and vancomycin levels(mean=3.27 mg/L). Mean follow up time was 16 months(range=2-52 months). Seven patients developed culture positive wound infections(CSAB=22.72%;gentamycin/PGLA discs=20.0%). Five infections involved the hernia graft and two were superficial. One mesh infection required explant secondary to an anastomotic leak. All other infections were treated conservatively with percutaneous drainage, wound packing and/or antibiotics. Three patients developed hernia recurrence(10%) and one underwent repeat operative repair.
Conclusions:
Gentamicin/PGLA discs and CSAB are promising novel technologies allowing for local antibiotic delivery with low systemic absorption and lower rate than reported in literature for surgical site infection and hernia recurrence.
Dalhousie University [1] [2] [3] [4]

Robotic vs Laparoscopic vs Open Umbilical Hernia Repair: A Single-Institution Analysis of 151 Consecutive Robotic Cases

Chad Burkholder; Zachary Holtzapple; Jeremy Heffner, MD

Background:
Umbilical hernia repairs are common procedures performed by general surgeons with nearly 175,000 performed annually with various repair procedures identified. This retrospective study examined 151 patients in a rural setting that were categorized as an umbilical hernia repair conducted by a single surgeon.
Methods:
The purpose of this study was to assess surgical methods in comparison to industry averages in other used methods. Specific areas of interest include: 30 Day Readmission, Length of Stay, and Conversion from Procedure Method to Open Procedure. The procedures were performed from 2013 to 2018 for a total robotic hernia repair sample size of 750 patients. Robotic procedures were stratified into separate repair procedures.
Results:
0% of patients were converted in robotic surgeries which is lower as compared to 2.9% in laparoscopic surgeries ($p = 0.03$). The rate of thirty-day readmission was lower in robotic surgeries at 2.7% (4 patients) as compared to 4.9% in open surgeries ($p = 0.24$) and 10.5% in laparoscopic surgeries ($p = 0.004$). Length of stay of admitted patients was lower in robotic surgeries at a mean of 0.01 days when compared to a mean of 0.17 days in open surgeries and 0.29 days in laparoscopic surgeries.
Conclusions:
Conversion rates and thirty-day readmission were significantly reduced with robotic procedures compared to laparoscopic procedures. General trends show in an improvement of robotics over laparoscopic and open inguinal hernia repairs, but increased power of the study in the robotics population may lead to statistical significance.
University of Toledo College of Medicine [1] [2] Lima Memorial Hospital System [3]

Robotic vs Laparoscopic vs Open Inguinal Hernia Repair: A Single-Institution Analysis of 214 Consecutive Robotic Cases

Zachary Holtzapple; Chad Burkholder; Jeremy Heffner, MD

Background:
Inguinal hernia repairs are one of the most common procedures performed by general surgeons with 500,000 performed annually. The literature has not established a preferred method for inguinal hernia repairs, especially between laparoscopic and robotic surgery. This retrospective study examined 214 patients conducted by a single surgeon. The purpose of this study was to assess robotic surgical methods in comparison to industry averages in laparoscopic and open procedures. The specific areas of interest include: 30 Day Readmission, Length of Stay, and Conversion from Procedure Method to Open Procedure.
Methods:
The procedures were performed from 2013 to 2018 for a total robotic hernia repair sample size of 750

patients. Robotic procedures were stratified into separate procedures (ventral incisional, umbilical, unilateral and bilateral, and hiatal hernia repairs).

Results:

0.9% of patients (2 patients) were converted in robotic surgeries which is lower as compared to 15.2% in laparoscopic surgeries ($p < 0.001$). The rate of thirty-day readmission was lower in robotic surgeries at 3.3% (7 patients) as compared to 6.0% in open surgeries ($p = 0.10$) and 6.0% in laparoscopic surgeries ($p = 0.13$). Length of stay of admitted patients was lower in robotic surgeries at a mean of 0.6 days when compared to a mean of 2.4 days in open surgeries and 1.6 days in laparoscopic surgeries.

Conclusions:

There was a non-significant decrease in thirty-day readmission and length of stay, which may indicate the need for a larger patient population. Conversion rates were significantly reduced with robotic procedures compared to laparoscopic procedures.

University of Toledo College of Medicine [1] [2] Lima Memorial Hospital [3]