14th Annual

Abdominal Wall Reconstruction 2023

MedStar Georgetown University Hospital

ABSTRACTS

June 23 to 24, 2023

Grand Hyatt Washington • Washington, D.C.

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Enteric Fistula Management Using Pure Hypochlorous Acid Wound Cleanser

Mary Anne Obst, RN, BSN, CCRN, CWON

Background:
Enteric fistulas can challenge patients and providers on multiple fronts. Peri-fistular skin breakdown related to effluent leakage can result in moisture-associated skin damage, infection, long-term stays and hospital readmission. Treating adjacent wounds and controlling effluent to enable wound healing or wound bed preparation for skin grafting is the goal. We present 15 enteric fistula cases to illustrate advances in therapy using pure Hypochlorous Acid (pHA) wound cleanser*. The cleanser has a pH (3.5-5.5) that is conducive for wound healing and is non-cytotoxic. We report our experience using pHA with and without negative pressure wound therapy with instillation (NPWT-i).

Methods:
The wound and peri-wound skin of all fistula patients was washed with pHA. The pHA was placed on these areas for three to five minutes with pHA soaked gauze while we assembled the dressing systems. After preparing the skin edges we applied either a pouching system around the wound with pHA moistened rolled gauze inside the pouch, or a fistula isolation device** and negative pressure wound therapy with intermittent instillation of pHA. Patient demographics included five women and ten men with an age range from 27-69 years old. Initial injuries were related to trauma, soft tissue infection, inflammatory bowel disease and infected mesh after hernia repair.

Results:
Patients treated with pouching systems and pHA had wound bed healing with no signs of a wound or skin infection. The patients treated with negative pressure wound therapy with intermittent instillation of pHA had accelerated tissue granulation and wound healing without infection or chronicity. Seven patients out of the 15 have completed the final procedures and are completely healed, seven are preparing for surgery and one was lost to follow up. No patients had documented peri-fistular wound or skin infection.

Conclusions:
In our experience, enteric fistula patients benefit from the use of pHA. We find this therapy effective in healing surrounding wounds and preventing chronic or infected wounds. Also, our experience and patient feedback is that the use of pHA decreases odor. Odor is a significant concern for fistula patients and reducing odor can help improve quality of life.

Parastomal Hernia Repair Using A "Top Hat" Construct

Mary Brady, MD, FACC; Luis Romero Padilla, MS

Background:
Parastomal hernias are common following the creation of a permanent stoma. Successful surgical repair remains challenging. We adopted a novel approach to repair called the "top hat" repair. The "top hat" construct consists of an underlay portion attached to a cylinder of xenograft wrapped around the stoma loop. It is shaped like an inverted "top hat" with the "brim" against the undersurface of the abdominal wall and the "crown" open to allow passage of the stoma. This occludes the most common site of failure as it obliterates the angle between the stoma loop and abdominal wall.

Methods:
We report our experience with open parastomal hernia repair using a "top hat" construct. This represents a single institution experience from 2010 to the present. Patients were maintained in a prospective database and records and radiologic images were reviewed to determine recurrence rates and factors associated with recurrence. We modified the top hat construct over time as we gained experience and report our results with three groups of patients undergoing repair with different top hat constructs.

Results:
We performed 50 "top hat" repairs in 47 patients from 2010 to the present. Most patients were male (29/50 procedures) and the median age was 71 years (range 48-89). Most procedures were performed for hernias around urinary conduits (39/50 procedures). Six of 50 procedures were performed for recurrent parastomal hernias. Parastomal hernia recurred in 18% of patients overall, at a median follow up of 33 months. We modified the top hat construct over time to address recurrence. After noting recurrences in 5/11 procedures using xenograft alone (median follow up 34 months) we created the construct with synthetic composite mesh for the underlay portion and bovine xenograft (n=10) or Alloderm (n=1) for the wrap. In these 11 patients we noted 3 recurrences, with a median follow up of 38 months. We subsequently modified that construct by substituting a crosslinked porcine xenograft for the wrap (which is stronger and less likely to dissolve) when we noted dissolution of the bovine xenograft wrap in two patients at re operation. This modification has resulted in a low risk of recurrence, only 1/28, 4%, with a median follow up 26 months.

Conclusions:
The "top hat" repair performed using a construct of synthetic composite underlay sewn to a cross-linked porcine xenograft wrap represents a potential solution to the high risk of recurrence associated with surgical repair of parastomal hernia. Iterative modification of the construct has allowed us to report low rates of recurrence post repair in our most recent experience, albeit with shorter follow up.

A Single Center's Three-Year Experience Utilizing The Polypropylene T-Line® Mesh For Abdominal Wall Reconstruction

Angela Volk, MD; David Tran, MD; Flavio Malcher, MD; Jamie Levine, MD

Background:
The T-Line® Hernia Mesh (Deep Blue Medical Advances, Durham, North Carolina), a polypropylene mesh with incorporated mesh extension sutures, offers tension distribution to prevent hernia recurrence. This study reports a large, single center's experience utilizing the T-Line® mesh in abdominal wall reconstruction.

Methods:
A retrospective study identified patients receiving the TLine® mesh at a single academic center from 2021-2023. Patient demographics and medical comorbidities were recorded. Outcomes were evaluated including operative details, complications, and hernia recurrence. Additionally, a post-operative survey was administered to analyze patient reported outcomes.

Results:
18 patients underwent open abdominal wall reconstruction utilizing an onlay TLine® mesh. Mean age was 61.7 years (range 37-80) with an average BMI of 30.9 (range 22.1-42.1). Comorbidities included hypertension (13 patients) and diabetes (3 patients). 8 patients had a prior abdominal hernia repair. Average mesh surface area was 455.5cm2 (range 190-600cm2). There were no hospital readmissions, and no significant post-operative complications. The average follow-up was 184 days with no evidence of hernia recurrence. Survey response rate was 61% at an average time of 410 days since surgery (range 132-477 days). 1 person reported feeling that their hernia recurred; however, no recurrence was noted on follow-up exam. Many patients felt their abdominal wall had a great impact on their lives, however, there was little reported interference with activities of daily living.

Conclusions:
This study reveals that use of the TLine® mesh for abdominal wall reconstruction is safe, with no observed complications, and effective in preventing hernia recurrence.

Age Is Just A Number: The Role Of Advanced Age In Predicting Complications Following Ventral Hernia Repair With Component Separation

Lauren Berger; Samuel Huffman; Parag Bhanot, MD; Karen Evans, MD; Yewande Alimi, MD

Background:
While advanced age is often considered a risk factor for complications following many common abdominal surgeries, its effect on outcomes following complex open ventral hernia repair (VHR) with component separation technique (CST) remains unclear. The aim of this study is to assess the influence of advanced age on short- and long-term postoperative complications following VHR with CST.

Methods:
A single-center retrospective review of patients who underwent abdominal wall reconstruction with CST from November 2008 to January 2022 was performed. Cohorts were stratified by presence of advanced age (age = 60 years). Data regarding comorbidities, perioperative details, and postoperative complications was compared between cohorts.

Results:
Of 219 patients who underwent VHR with CST, 114 patients (52.1%) were aged >60 years. Mean age and follow-up of the overall population were 59.1 ± 11.3 years and 9.9 ± 7.8 months, respectively. Mean body mass index (BMI) was lower in the advanced-age cohort (30.8 vs. 33.2 kg/m2, p=0.004), and less patients in this group were obese (54.4% vs. 72.4%, p=0.007). Chronic obstructive pulmonary disease (COPD) was more prevalent among the advanced-age cohort (8.8% vs. 1.9%, p=0.035). The advanced-age cohort underwent concurrent procedures less frequently (p<0.001), and received composite mesh (p<0.001) of a smaller size (p<0.001) more often. Controlling for these differences via multivariate analysis demonstrated BMI to be an independent predictor for any complication (OR 1.1, p=0.002), dehiscence (OR 1.2, p=0.004), any surgical site occurrence (SSO; OR 1.1, p=0.026), and 90-day SSO (OR 1.1, p=0.015). A history of COPD was positively associated with seroma development (OR 20.1, p=0.012), while advanced age did not independently predict postoperative outcomes, including hernia recurrence (OR 0.8, p=0.766).

Conclusions:
VHR with CST is generally safe to perform in patients of advanced age. Conversely, a patient's comorbidity profile, including BMI or COPD history, should be thoroughly assessed preoperatively, as these factors appear to have a stronger independent effect on postoperative outcomes.

Prescription Opioid Use Increases Resource Utilization Following Ventral Hernia Repair

Skyler Palmer; Margaret Plymale, DNP; Anthony Mangino, PhD; Daniel Davenport, PhD; John Roth, MD, FACS

Background:
Previous studies have shown that preoperative opioid use is associated with increased morbidity in patients undergoing ventral hernia repair. Orthopedic research has found preoperative opioids are associated with increased postoperative resource utilization. The purpose of this study is to determine the impact of preoperative opioid use upon resource utilization following open ventral hernia repair.

Methods:
A retrospective IRB approved study of ventral hernia repairs from a single tertiary care practice between 2013 and 2020 was performed. Medical records, National Surgery Quality Improvement Program (NSQIP) database, and Kentucky All Scheduled Prescription Electronic Reporting (KASPER) data were reviewed for patient demographics, comorbidities, dispensed opiate prescriptions, hernia characteristics, and outcomes. Univariate logistic regression analyses assessed the impact of patient demographics and clinical characteristics. Multivariate logistic regression models analyzed significant factors from univariate analyses. Primary resource utilization outcomes included readmissions, emergency department visits, and >2 postoperative clinic visits within 45 post-discharge.

Results:
381 ventral hernia repair patients were identified, of which 101 had preoperative dispensed opioids. Patient sex, obesity status, dyspnea, and COPD history were predictive of one or more outcomes. Preoperative opioid use was associated with increased readmissions (1.93, $P<0.05$) and ED visits (2.19, $P<0.05$), particularly ED visits for pain (3.31, $P<0.05$), and remained so after multivariable adjustment.

Conclusions:
Preoperative opioid use is a risk factor for post-discharge ED visits and readmission. An understanding of drivers of increased utilization of resources is essential in developing strategies to improve healthcare value. Future research will focus upon strategies to reduce utilization of resources in patients with opioid use.

The Effect Of Clinically Significant Weight Loss Prior To Ventral Hernia Repair

Samuel Huffman; Lauren Berger; Karen Evans, MD; Parag Bhanot, MD; Yewande Alimi, MD

Background:
Patients are often counseled to lose weight prior to undergoing ventral hernia repair (VHR) due to associated risks of poor outcomes, including hernia recurrence. Yet, ideal weight loss targets have not been established, nor has the impact of clinically significant weight loss (CSWL; >5% weight reduction) on postoperative outcomes. The study aim was to assess the influence of CSWL on postoperative complications following abdominal wall reconstruction for VHR with component separation technique (CST).

Methods:
A single-center retrospective review of patients who underwent abdominal wall reconstruction with the component separation technique for VHR from November 2008 to January 2022 was performed. Cohorts were stratified by presence of CSWL from baseline weight at preoperative consultation. Data regarding comorbidities, perioperative details, and postoperative complications was compared between cohorts.

Results:
Of 180 total patients, 40 (22.2%) achieved CSWL prior to VHR. Mean age was 59.6 ± 11.2 years. Patients in the CSWL cohort represented a higher average body mass index (BMI) (33.6 vs. 31.7 kg/m2, $p=0.076$), and were obese more frequently (80.0% vs. 56.4%, $p=0.007$). The CSWL cohort had a higher proportion of patients in Ventral Hernia Working Group (VHWG) classification II (82.5% vs. 63.6%) while the non-CSWL cohort had more VHWG classification III/IV (20.0% vs. 10.0%, $p=0.078$). Mean follow-up duration was 6.1 ± 13.4 months. Complications, including 30- and 90-day surgical site occurrence (SSO), return to operating room, readmission, and hernia recurrence (CSWL: 5.0% vs. non-CWL 1.4%, $p=0.179$), were comparable between cohorts. Multivariate analysis demonstrated that BMI was an independent predictor of any complication (OR 1.07, $p=0.044$) and 90-day SSO (OR 1.10, $p=0.043$) while CSWL did not independently predict postoperative outcomes.

Conclusions:
CSWL prior to VHR utilizing CST does not independently influence post-reconstruction complications. Delaying surgical intervention for weight reduction in non-obese patients likely offers little protective benefit against the development of postoperative complications. However, surgeons should continue to counsel obese patients to reduce BMI prior to surgery to lower the associated risks of SSO.

Effectively Managing Complex Grade Ii-Iv Abdominal Wall Hernias With The Innovative T-Line Hernia Fixation System

Hobart Harris, MD, MPH; David Ruppert, Ph.D

Background:
Complex, recurrent abdominal wall hernias have high rates of recurrence despite modern repair approaches and careful patient selection. Prosthetic anchor point failure has been hypothesized to contribute to hernia recurrences. The T-Line Hernia Mesh was invented to enhance mesh fixation and thus reduce hernia recurrence. The fixation system consists of a polypropylene hernia mesh with integrated mesh sutures that provide ~3X greater anchoring strength, where mesh sutures can be used to anchor the mesh or be used independent of the mesh to close fascia and provide additional fascia support.

Methods:
T-Line Hernia Mesh was used in a complex ventral hernia repair series from November 2020 to April 2023, including patients with BMI>35, multiple recurrent hernias, flank hernias, and lumbar hernias. Operative details, age, sex, BMI, OR time, blood loss, follow-up, pain, recurrence rates, and adverse events were recorded.

Results:
here were 18 patients (12 women), average age of 62 years (25–83), BMI=35 (24–51), OR time=300mins, estimated blood loss=80ml, with a mean follow up of 16±11 months. All patients did well with two seromas reported in onlay cases and one superficial SSI reported. There was one case of significant pain of undetermined etiology.

Conclusions:
In this study, with 6 patients having over 2 years of follow-up, T-Line Hernia Mesh yielded no hernia recurrences nor increased post-operative pain. These data suggest that enhanced soft tissue fixation may significantly reduce recurrence rate following complex ventral hernia repair. However, further clinical experience and longer follow-up is needed to verify T-Line's value for abdominal wall reconstruction.

Reinforced Biosynthetic Ovine Rumen Improves Postoperative Outcomes After Ventral Hernia Repair Compared To Biologic And Synthetic Mesh

Dominic Henn, MD; Dharshan Sivaraj; Katharina Fischer, MD; Trudy Kim; Gordon Lee, MD, FACS

Background:
The use of mesh in ventral hernia repair (VHR) led to a significant reduction in hernia recurrence rates. Biologic mesh has been proposed as a viable alternative to synthetic mesh, particularly for high-risk patients and in contaminated settings. Recently, hybrid biosynthetic mesh has been developed and aims to combine the advantages of biologic and synthetic mesh; however, outcomes after VHR with biosynthetic mesh have not yet been compared with the standard of care.

Methods:
We performed a retrospective analysis of 214 patients who had undergone ventral hernia repair (VHR) with biologic mesh (n = 105), synthetic polypropylene mesh (n = 59) or reinforced biosynthetic ovine rumen (RBOR, n = 50) at a single institution between 2002 and 2020. Biologic mesh types included non-cross-linked porcine acellular dermal matrix (NC-PADM, n=51), cross-linked porcine ADM (C-PADM, n=17) and bovine ADM (BADM, n=37). Demographic characteristics, comorbidities, postoperative complications, and recurrence rates were analyzed and compared between the groups.

Results:
Overall complications occurred in 52.9% of patients with C-PADM, 47.1% of patients with NC-PADM, 43.2% of patients with BADM, 32.2% of patients with polypropylene mesh, and 16.7% of patients with RBOR (p=0.015). Relative risk for overall complications was higher in patients who had received NC-PADM (RR=2.64, p=0.0182), C-PADM (RR=3.19, p=0.0127), and BADM (RR=2.11, p=0.0773) compared to those who had received RBOR. Patients with RBOR had lower rates of surgical site occurrence (SSO) (16.0 versus 30.5%, p = 0.12) and similar hernia recurrence rates (4.0 versus 6.78%, P = 0.68) compared with patients with polypropylene mesh.

Conclusions:
Our data indicate that RBOR decreases abdominal complications and recurrence rates after VHR compared to biologic and synthetic mesh.