Primary Fascial Closure with Mesh Reinforcement Is Superior to Bridged Mesh Repair for Abdominal Wall Reconstruction

Justin H Booth, MD, Patrick B Garvey, MD, FACS, Donald P Baumann, MD, FACS, Jesse C Selber, MD, MPH, FACS, Alexander T Nguyen, MD, Mark W Clemens, MD, Jun Liu, MD, PhD, Charles E Butler, MD, FACS

BACKGROUND: Many surgeons believe that primary fascial closure with mesh reinforcement should be the goal of abdominal wall reconstruction (AWR), yet others have reported acceptable outcomes when mesh is used to bridge the fascial edges. It has not been clearly shown how the outcomes for these techniques differ. We hypothesized that bridged repairs result in higher hernia recurrence rates than mesh-reinforced repairs that achieve fascial coaptation.

STUDY DESIGN: We retrospectively reviewed prospectively collected data from consecutive patients with 1 year or more of follow-up, who underwent midline AWR between 2000 and 2011 at a single center. We compared surgical outcomes between patients with bridged and mesh-reinforced fascial repairs. The primary outcomes measure was hernia recurrence. Multivariate logistic regression analysis was used to identify factors predictive of or protective for complications.

RESULTS: We included 222 patients (195 mesh-reinforced and 27 bridged repairs) with a mean follow-up of 31.1 ± 14.2 months. The bridged repairs were associated with a significantly higher risk of hernia recurrence (56% vs 8%; hazard ratio [HR] 9.5; $p < 0.001$) and a higher overall complication rate (74% vs 32%; odds ratio [OR] 3.9; $p < 0.001$). The interval to recurrence was more than 9 times shorter in the bridged group (HR 9.5; $p < 0.001$). Multivariate Cox proportional hazard regression analysis identified bridged repair and defect width > 15 cm to be independent predictors of hernia recurrence (HR 7.3; $p < 0.001$ and HR 2.5; $p = 0.028$, respectively).

CONCLUSIONS: Mesh-reinforced AWRs with primary fascial coaptation resulted in fewer hernia recurrences and fewer overall complications than bridged repairs. Surgeons should make every effort to achieve primary fascial coaptation to reduce complications. (J Am Coll Surg 2013;217: 999–1009. © 2013 by the American College of Surgeons)

Many different disease processes result in complex midline, musculofascial abdominal wall defects, but all reconstructions of these challenging defects have the same objectives: preventing recurrence, minimizing morbidity, and protecting the viscera.[1-4] Surgeons have reported acceptable outcomes when mesh is used to bridge the fascial edges of a hernia defect and therefore prevent herniation of abdominal viscera. Advanced techniques such as component separation have allowed surgeons to achieve primary fascial closure of the hernia defect combined with mesh reinforcement. Although the optimal technique for abdominal wall reconstruction (AWR) remains a subject of continuing debate, a number of anecdotal or cohort studies have suggested that achieving primary fascial closure with mesh reinforcement is particularly advantageous with respect to hernia recurrence.[2,3,5-22] However, to date, no study has directly and comprehensively compared bridged and mesh-reinforced repairs. Given the lack of definitive evidence showing that primary fascial closure is superior to bridged repair, many authors

Disclosure Information: Dr Garvey is a consultant for LifeCell Corporation (Branchburg, NJ). Dr Selber is a consultant for TEI Biosciences, Inc. (Boston, MA). All other authors have nothing to disclose.

Presented at the 4th Annual Abdominal Wall Reconstruction Summit, Breckenridge, CO, January 2013, and the 24th Annual Meeting of the European Association of Plastic Surgeons (EURAPS), Antalya, Turkey, May 2013.

Received June 20, 2013; Revised August 15, 2013; Accepted August 20, 2013.

From the Department of Plastic Surgery, The University of Texas MD Anderson Cancer Center, Houston, TX.

Correspondence address: Charles E Butler, MD, FACS, Department of Plastic Surgery, The University of Texas MD Anderson Cancer Center, 1400 Pressler Blvd, Unit 1488, Houston, TX 77030. email: cbutler@mdanderson.org

© 2013 by the American College of Surgeons
Published by Elsevier Inc.

ISSN 1072-7515/13/$36.00
http://dx.doi.org/10.1016/j.jamcollsurg.2013.08.015

Abbreviations and Acronyms

AWR = abdominal wall reconstruction
BADM = bovine acellular dermal matrix
BMI = body mass index
CS = component separation
HADM = human acellular dermal matrix
HR = hazard ratio
PADM = porcine acellular dermal matrix

maintain that equivalent outcomes can be achieved in complex AWR by simply bridging the fascial edges with mesh.[23-26] We hypothesized that abdominal defects reconstructed with bridged repairs, even when controlling for fascial defect size, would result in higher hernia recurrence rates than nonbridged, mesh-reinforced repairs that achieved primary, midline fascial coaptation.

METHODS

We performed a retrospective cohort study evaluating all consecutive patients who underwent midline AWR with underlay (preperitoneal or intraperitoneal) mesh of an abdominal wall hernia or oncologic defect for which the fascia could or could not be primarily closed without undue tension at The University of Texas MD Anderson Cancer Center between February 2000 and October 2011. When the fascial defect could not be closed primarily over the underlay mesh, the prosthesis was left in place as a bridge to span the residual defect. We compared outcomes between patients who underwent AWR with mesh-reinforced primary fascial closure (control group) with patients whose fascia could not be coapted in the midline and who underwent a bridged fascial closure with mesh (experimental group). We excluded patients with defects that did not involve the midline (lateral defects), primary closure of their abdominal wall fascia without mesh, onlay mesh reconstructions, defects bridged with the fascia from free or regional musculocutaneous or fasciocutaneous flaps, defects reconstructed with autologous fascial grafts, and less than 1 year of postoperative follow-up. Surveillance CT imaging was obtained according to each patient's tumor protocol, typically quarterly for the first year and then annually thereafter. We obtained data both from a prospectively maintained departmental database and from the patients' electronic medical records. Our Institutional Review Board approved this study.

Patient, treatment, and defect characteristics were analyzed, and surgical outcomes were directly compared between the experimental and control groups. Wounds were considered contaminated if they met the American College of Surgeons' National Surgical Quality Improvement Program (ACS NSQIP) criteria to be classified as contaminated or infected (class 3-4).[27] Obesity was defined as a body mass index (BMI) $\geq$ 30 kg/m^2.[28,29] Any patient who smoked tobacco within 1 month of surgery was considered an active smoker. Violation of the rectus abdominis complex was considered to have occurred if the patient had a previous or current ostomy, previous or current gastrostomy/jejunostomy tube placement, a transversely divided rectus abdominis muscle, and/or a resected rectus abdominis muscle.[7]

The primary outcomes measure was the relationship between the fascial closure technique and the development of a recurrent hernia after AWR. Secondary outcomes measures were the relationships between the fascial closure technique and the following postoperative complications: bulging or laxity of the abdominal wall and wound healing complications (skin dehiscence, skin necrosis, fat necrosis, cellulitis, abscess, intra-abdominal sepsis, enterocutaneous fistula, hematoma, and seroma). Recurrent hernia was a contour abnormality associated with a fascial defect; bulging was a contour abnormality without a fascial defect. Hernia and bulge were considered mutually exclusive conditions and were diagnosed by physical examination and/or CT imaging.

Surgical technique

At our institution, AWR is typically performed by a plastic surgeon after laparotomy, adhesiolysis, and/or tumor resection performed by an extirpative surgeon.[7] Our surgeons used a similar general technique for all AWRs. Briefly, reconstruction began by defining the defect, including excision of the hernia sac and debridement of devitalized tissue and fascia, and determining whether lateral release was necessary to medialize the rectus muscles. Anterior open or minimally invasive[30-32] component separation (CS), including release of the external oblique aponeurosis from pubis to the costal margin, was performed to provide lateral release and to reduce tension from the midline fascial closure.[7,33] To reinforce the midline fascial repair, our surgeons used underlay mesh with 3 to 5 cm of abdominal wall overlap, fixed circumferentially with interrupted #1 polypropylene sutures, followed by midline primary fascial closure over the prosthesis with interrupted #1 polypropylene sutures[21,34,35] (Fig. 1). Our surgeons generally use synthetic mesh (eg, polypropylene) for clean cases in which mesh is not required to be placed against bowel and there is reliable overlaying skin coverage. Bioprosthetic mesh is used for complex, contaminated cases that did not meet the criteria for synthetic mesh.[3,6,35] When the fascial defect could not be closed primarily over the mesh, the prosthesis was left in place as a bridge to span the residual defect using an underlay technique secured with

Download English Version:

https://daneshyari.com/en/article/6252945

Download Persian Version:

https://daneshyari.com/article/6252945

Daneshyari.com