

Recurrent Lateral Abdominal Wall Hernias: Options for Reconstruction

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Summary: Management of lateral abdominal wall hernias presents a surgical challenge, and best management is controversial. Flank hernias as a surgical sequela occur more commonly, whereas flank hernias resulting from trauma are a rare occurrence. In this article, we present a review of the literature and a case of flank hernia presenting after trauma and recurring after repair. An anchored suture repair was performed and reinforced by the addition of a polyester underlay mesh. (*Plast Reconstr Surg Glob Open* 2023; 11:e5007; doi: [10.1097/GOX.0000000000005007](https://doi.org/10.1097/GOX.0000000000005007); Published online 22 September 2023.)

Traumatic hernias are uncommon, diagnosed in 0.17% of blunt trauma admissions in a recent study.¹

Lateral abdominal wall or flank hernias represent a complex surgical problem, and the repair of these hernias is a topic of controversy in the field of abdominal wall reconstruction. Numerous techniques have been detailed, ranging from sutures alone to mesh placement to anchoring sutures in the pelvis (Table 1). We describe a case of a recurrent lateral flank hernia that presented after a blunt abdominal trauma from a motor vehicle accident.

CASE PRESENTATION

A 50-year-old woman with a history of open cholecystectomy was involved in a high-speed, head-on motor vehicle collision. Her injuries included an ankle fracture, pulmonary contusions, and blunt intestinal perforation, necessitating exploratory laparotomy with bowel resections. A year later, she presented to general surgery clinic with a painful lump over her left abdomen. Her physical examination was significant for fullness and tenderness of the left lateral abdomen. An abdominal CT scan demonstrated a moderate zone of laxity of the left flank, consistent with a left lateral abdominal wall hernia, 5.2 cm in the greatest dimension.

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The patient underwent exploratory laparotomy by general surgery. Intraoperatively, the left internal oblique muscle was found to be avulsed from the pelvic girdle. An advancement muscle flap was utilized to secure the internal oblique to the pelvic girdle with periosteal sutures to the iliac crest. Layered closure of the abdominal wall was performed, and the patient recovered uneventfully.

Seven months later, the patient presented to clinic with recurrence of her left lateral abdominal bulge. A repeat CT demonstrated a hernia, 5.8 cm in the greatest dimension (Fig. 1). Given her complex surgical history and a previous attempt at reconstruction, plastic surgery was consulted. In conjunction with general surgery, an exploratory laparotomy with lysis of adhesions was performed, and the patient was found to have a recurrent lateral abdominal wall hernia with weakness and bulging of the lateral wall musculature. The previous repair appeared intact with sutures in place in the prior muscular advancement; however, the recurrent hernia occurred adjacent to the left lateral iliac wing. A 20×30 cm Symbotex (Medtronic, Minneapolis, Minn.) mesh was selected for repair and size 0-Ethibond anchoring sutures were placed along the left iliac crest (Fig. 2). Pro-Tacks (U. S. Surgical/Tyco Corporation, Norwalk, Conn.) were then utilized for placement and securing of the mesh between the anchoring sutures. The mesh was secured with polypropylene transfascial sutures placed with an Endoclose device (USSC, Covidien) (Fig. 3). The midline incision was then closed in a layered fashion, bringing the mesh across the midline during fascial closure. The patient was discharged 2 days later, and at 5-month follow-up was found to have no further hernia recurrence.

DISCUSSION

Blunt abdominal trauma-related hernias are rare and have previously been reported to present in only 1% of all blunt trauma admissions.¹ The low number may be due to distracting injuries, such as intraabdominal trauma, which

Disclosure statements are at the end of this article, following the correspondence information.

Table 1. Summary of Literature Review of Reconstructive Cases of Flank Hernias with Outcomes

Authors	Technique	Approach	Sample Size	Mesh Used	Outcomes
Francis et al (1994) ²	Overlay mesh with bone anchors to iliac crest and pubis, after three failed attempts with overlay polypropylene mesh sutured to fascia/periosteum	Previous incision	N = 1	Polyester (n = 1)	No recurrence at 12 mo for final repair (n = 1)
Pineda et al (2013) ³	Internal oblique myofascial advancement flaps with mesh onlay	Previous incision	N = 8	Unspecified type (n = 8)	No recurrence (n = 6), minimal bulge (n = 2) at 12 mo
Hoffman et al (2004) ⁴	Suture plication and mesh overlay	Abdominoplasty incision	N = 3	Polypropylene (n = 3)	No recurrence at 17wk (n = 1), no recurrence at 5 mo (n = 1), recurrence postoperative requiring revision (n = 1)
Zieren et al (2007) ⁵	Preperitoneal or over transversus abdominis mesh repair	Flank incision	N = 7	Polypropylene (n = 7)	Recurrence (n = 2), persistent bulge (n = 7) at 5 y
Zieren et al (2007) ⁵	Retromuscular mesh repair	Median laparotomy	N = 8	Polypropylene	No recurrence at 5 y
Baumann et al (2012) ⁶	Inlay mesh, fasciocutaneous advancement flaps	Existing defect	N = 1	Unspecified type (n = 1)	No recurrence at 6 mo
Baumann et al (2012) ⁶	Mesh onlay repair, pedicled superior gluteal artery perforator flap and reverse pedicled latissimus dorsi flap	Existing defect	N = 1	Unspecified type (n = 1)	No recurrence at 12 mo
Baumann et al (2012) ⁶	Mesh inlay interposition repair	Existing defect	N = 1	Bioprosthetic (n = 1)	No recurrence at 6 mo
Phillips et al (2012) ⁷	Retromuscular mesh repair	Previous incisions	N = 16	Polyester (n = 11) Polypropylene (n = 4) Biologic (n = 1)	No recurrence at mean 16.8 (range 2–49) mo (n = 16)
Mukherjee, Miller (2017) ⁸	Underlay mesh with suture anchors to iliac crest	Flank incision	N = 10	Polyester collagen composite (n = 7), porcine (n = 3)	Recurrence at 4 mo (n = 1), recurrence at 9 mo (n = 1), no recurrence at mean 43.5 mo [95% CI, 24.2–62.8 mo] (n = 8)

**Fig. 1.** Our patient's recurrent left lower abdominal wall hernia on CT.

can be common in patients diagnosed with traumatic hernia. Denervation of musculature may be a contributing factor to delayed presentation of blunt abdominal hernias. Given their infrequent occurrence, only a small body of literature exists on evaluation and management (Table 1).

Management of flank hernias is controversial. The lateral abdominal wall has a large surface area, a lower

proportion of fascia to muscle, and is closely associated with the pelvic girdle. Described techniques in the surgical literature fall under open and laparoscopic approaches. Options include suture alone, overlay or underlay mesh placement, bone anchors to the iliac crest, and flap-based repairs.^{2–9} Along with the wide range of techniques available, reported outcomes of repairs are highly variable. Petersen and colleagues utilized an underlay mesh technique to repair hernias in four patients, although bulges remained.⁹ Zieren et al also utilized an underlay mesh in eight patients with an approach through a midline incision, with no recurrences.⁵ Abdominoplasty with plication, in addition to overlay mesh, was performed on three patients by Hoffman et al, resulting in one recurrence.⁴

The first instance of anchoring sutures to pelvis for hernia repair was reported in 1994.² Recently, Mukherjee and Miller published the largest case series to date of suture anchor technique on 10 cases in eight patients, reporting one recurrence at 12-month follow-up.⁸

The case report described bears several noteworthy points. First, the hernia was not diagnosed or present at the time of trauma and initial exploratory laparotomy; rather, the patient presented a year later with a symptomatic lateral abdominal bulge. Second, the hernia presented

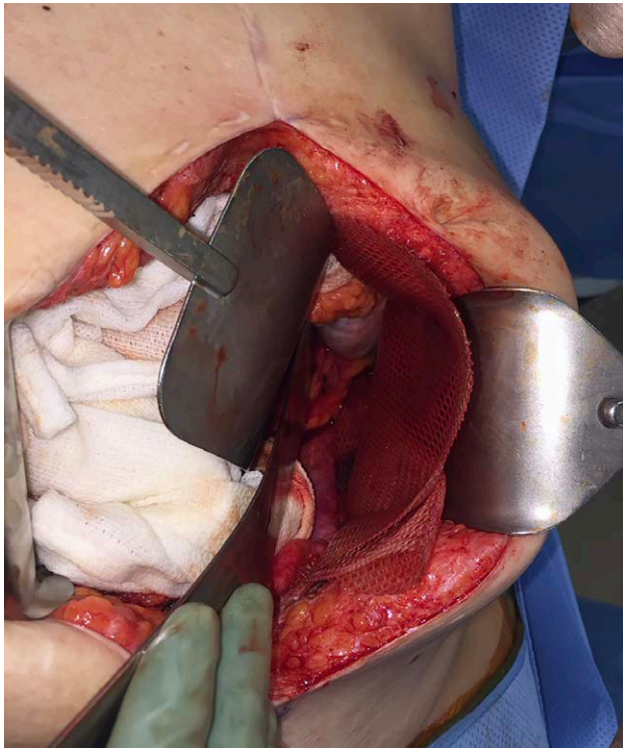


Fig. 2. Placement of the 20×30cm Symbotex (Medtronic, Minneapolis, Minn.) underlay mesh.

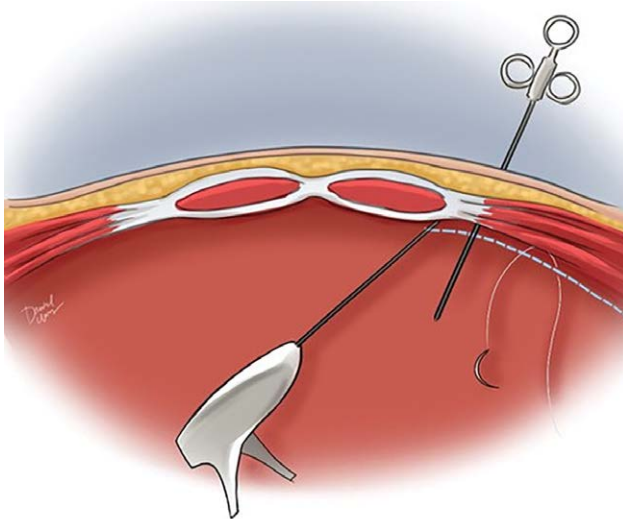


Fig. 3. A combined technique, through an open incision, was utilized for securing the underlay mesh, including, from left to right, tacking, transfascial sutures, and anchoring sutures along with the periosteal anchoring sutures. The dotted line illustrates the underlay mesh.

laterally, in a region with no prior surgical intervention. This indicates a high likelihood that the lateral hernia was a result or sequelae of the traumatic abdominal injury. Finally, even with initial repair, including muscle advancement and tacking sutures to the iliac crest, the patient experienced recurrence of her hernia within 1 year. It is possible that the delayed presentation and sequelae

were due to denervation of the muscle, causing gradual weakening and laxity. This process could potentially have contributed to failure of the initial hernia repair with recurrence due to continued worsening muscle laxity over time. The repair, which was ultimately successful, utilized a combination of multiple techniques, including tacking and transfascial sutures to the underlay mesh, effectively combining instruments and tools from laparoscopic and open techniques in an overall open approach (Fig. 3).

CONCLUSIONS

This case details a recurrent flank hernia originally caused by blunt abdominal trauma, repaired by an underlay mesh with anchoring sutures, transfascial sutures, and tacks. These injuries remain rare, with limited reports in the literature. Additional clinical data and review continue to contribute to our knowledge and improved management of these complex hernias.

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DISCLOSURE

The authors have no financial interest to disclose in relation to the content of this article.

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This study conforms to the World Medical Association Declaration of Helsinki and subsequent amendments. Ethical approval by the institutional review board was not required for this article.

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