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Delayed laparoscopic repair of a traumatic flank hernia: A case report and review of the literature

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ABSTRACT

INTRODUCTION: The traumatic abdominal wall hernia is a rare injury typically due to a high-energy blunt trauma mechanism. There is a lack of consensus on the appropriate management of these patients.

PRESENTATION OF THE CASE: A 43-year-old male was evaluated for a left flank bulge eight months after a motorcycle collision. He was diagnosed with a traumatic abdominal wall hernia at time of injury that was managed non-operatively. He noticed a left flank bulge two months after his collision that progressively worsened in size and in discomfort. The patient underwent laparoscopic repair of the traumatic flank hernia. His postoperative course was uneventful and there was no recurrence at 3 years.

DISCUSSION: Historically, exploratory laparotomy was considered necessary in patients diagnosed with a traumatic abdominal wall hernia at time of injury due to the high-percentage of concomitant intra-abdominal injuries. More recent studies suggest that some patients with a traumatic abdominal wall hernia may be safely managed non-operatively. A minority of these patients will require surgery for symptoms or complications related to the hernia and laparoscopic repair performed in a delayed fashion appears to have improved outcomes when compared to those that undergo repair at time of injury.

CONCLUSION: There is growing evidence supporting a non-operative management strategy in patients with a traumatic abdominal wall hernia who do not have a clear indication for abdominal surgery. These patients may be safely observed with delayed laparoscopic repair using synthetic mesh reserved for traumatic abdominal wall hernias that become symptomatic.

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1. Introduction

The traumatic abdominal wall hernia (TAWH) is an acquired defect resulting from the disruption of the abdominal wall musculature due to trauma. There is a lack of consensus on the appropriate management of the TAWH despite it first being described by Selby in 1906 [1]. This is likely because TAWHs are uncommon affecting less than 1% of traumatically injured patients [2–4]. With the ubiquitous use of computed tomography (CT) in the evaluation of trauma patients, surgeons more often must make decisions on the treatment of TAWHs at the time of injury. Several retrospective studies have provided a better understanding of their clinical significance. Nevertheless, the appropriate management of TAWHs remains unclear. We present a patient with a TAWH who underwent delayed laparoscopic repair with mesh and suggest a management strategy based on a review of the literature. This work has been reported in line with the SCARE guidelines [5].

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2. Presentation of case

A 43-year-old male was evaluated in clinic for a left flank bulge. He was involved in a motorcycle collision (MCC) eight months prior with fractures of the left acetabulum and femur and a TAWH (Fig. 1). He had no associated intra-abdominal injuries. The patient required operative treatment of his orthopedic injuries and was ultimately discharged to home. He noticed an abdominal bulge two months after his MCC that progressively worsened in size and in discomfort. On physical examination, he had a reducible left flank hernia. CT showed an enlarging left flank hernia involving colon and small intestine (Fig. 2). Due to his symptoms, elective repair was offered to the patient and he decided to proceed with surgery. Laparoscopic repair with synthetic mesh was performed. Operative steps included reduction of the hernia sac, mobilization of the descending and sigmoid colon, retroperitoneal dissection defining the boundaries of the defect, and wide synthetic mesh overlap of the defect (Fig. 3). The defect measured 12 cm × 6 cm (Fig. 4). Parietex™ polyester mesh (Covidien, New Haven, CT, USA) measuring 25 cm × 20 cm was used for the repair in a sublay intraperitoneal fashion. It was secured to the abdominal wall with transfascial sutures and absorbable tacks and to the iliac crest with titanium

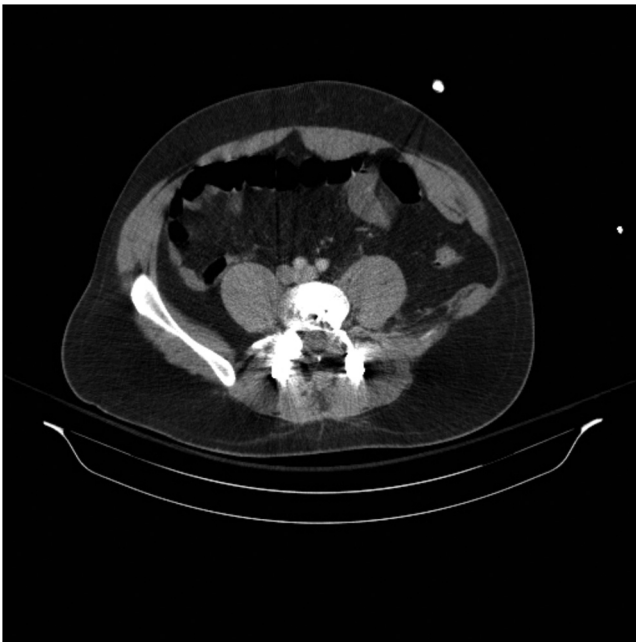


Fig. 1. Axial CT with evidence of left-sided traumatic flank hernia and no associated intra-abdominal injuries after motorcycle collision.



Fig. 2. Axial CT with enlarging left-sided traumatic flank hernia involving colon and small intestine eight months after motorcycle collision.

tacks. The fascial defect could not be closed (Fig. 5). The patient's postoperative course was uneventful and there was no recurrence at 3 years.

3. Discussion

TAWHs typically result from high-energy blunt trauma such as motor vehicle collisions and MCCs although they have been described in low-energy blunt trauma as with bicycle handlebar injuries [6]. The mechanism of injury involves rapid deceleration with tangential shearing forces to the abdominal musculofascial

structures and an acute rise in intra-abdominal pressure [7,8]. TAWHs may be further classified based on the affected muscle group with anterior abdominal involving the rectus abdominis, flank involving the oblique muscles, and lumbar occurring in the superior and/or inferior lumbar triangles [3]. The presence of concomitant intra-abdominal injuries can complicate the timing and the technique of hernia repair. Additionally, surgical repair is made more challenging in traumatic flank and lumbar hernias due to their lateral location, proximity to bony structures, and the general lack of healthy tissue for primary closure and/or mesh fixation [8].

Historically, exploratory laparotomy was considered mandatory at the time of diagnosis for all high-energy TAWHs due to a high-percentage of associated intra-abdominal injuries. This is no longer thought to be necessary. There is an increasing trend towards initial observation of TAWHs that do not have a clear indication for operative intervention at time of injury such as hemodynamic instability or peritonitis. This is inclusive of some TAWHs with associated intra-abdominal injuries, specifically solid organ injuries. Studies have shown that these patients may be safely observed with very few expected to fail non-operative management and go on to require surgery in the acute post-traumatic period [3]. And while it was previously argued to repair TAWHs immediately due to a 25% risk of incarceration and a 10% risk of strangulation; more recent studies demonstrated greater than 70% of TAWHs being managed non-operatively with few to no patients developing complications related to the hernia necessitating repair [3,4].

Retrospective studies have shown that TAWHs undergoing delayed repair have fewer perioperative complications and a decreased recurrence rate [2,4]. This may be due in part to the patients that undergo immediate repair more commonly have associated intra-abdominal injuries and require laparotomy; some of which are performed in a damage control fashion. Additionally, primary closure of acutely traumatized musculofascial structures is suboptimal and the use of synthetic mesh is often limited due to intra-abdominal contamination. A recent study suggested that patients with a TAWH undergoing immediate surgery have either no intervention or placement of biologic mesh and evaluation at a later date for possible definitive hernia repair [3]. This was based on the improved outcomes they found in the TAWHs undergoing delayed repair.

There are no definitive recommendations on the technique for TAWHs undergoing delayed repair, but a laparoscopic approach has been shown to be safe and to have several advantages when compared to open surgery. Laparoscopic repair of TAWHs is associated with a shorter hospital length of stay, decreased postoperative pain and consumption of narcotics, and earlier return to normal activities [8,9]. Similar to what is reported in the literature, our patient was appropriate for discharge to home on postoperative day two and returned to work two weeks after surgery. As with ventral hernia surgery, the use of synthetic mesh in TAWH repair is recommended to decrease the risk of recurrence. Furthermore, just as we found in our patient, mesh placement is often necessary to cover a large fascial defect in a location that often lacks healthy soft tissue to perform a tension-free primary closure.

4. Conclusion

Despite the high-percentage of concomitant intra-abdominal injuries, there is growing evidence that supports a non-operative management strategy in patients with a traumatic abdominal wall hernia and no clear indication for abdominal surgery at time of injury. Based on our experience and review of the literature, these patients may be safely observed with delayed laparoscopic repair using synthetic mesh reserved for the traumatic abdominal wall hernia that becomes symptomatic.

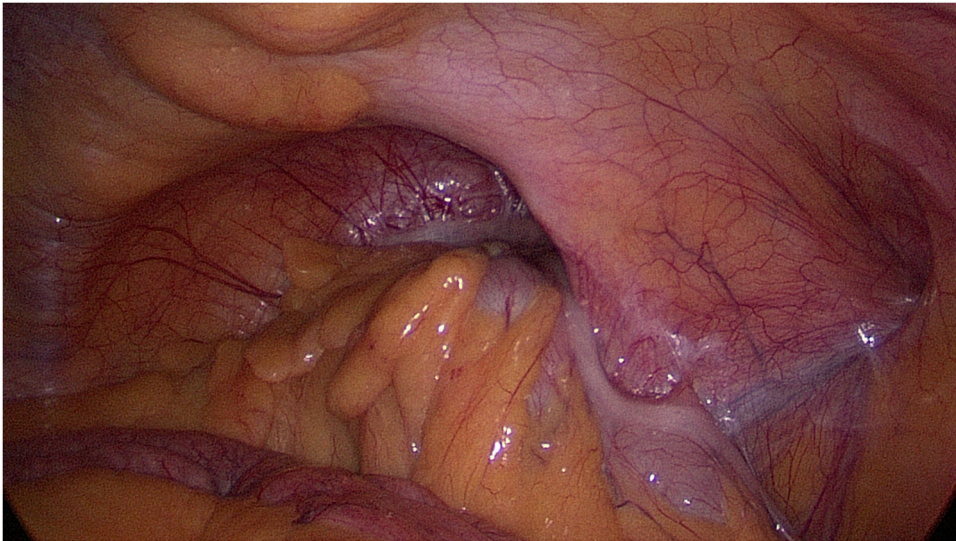


Fig. 3. Intraoperative laparoscopic view of left-sided traumatic flank hernia involving the descending and sigmoid colon.

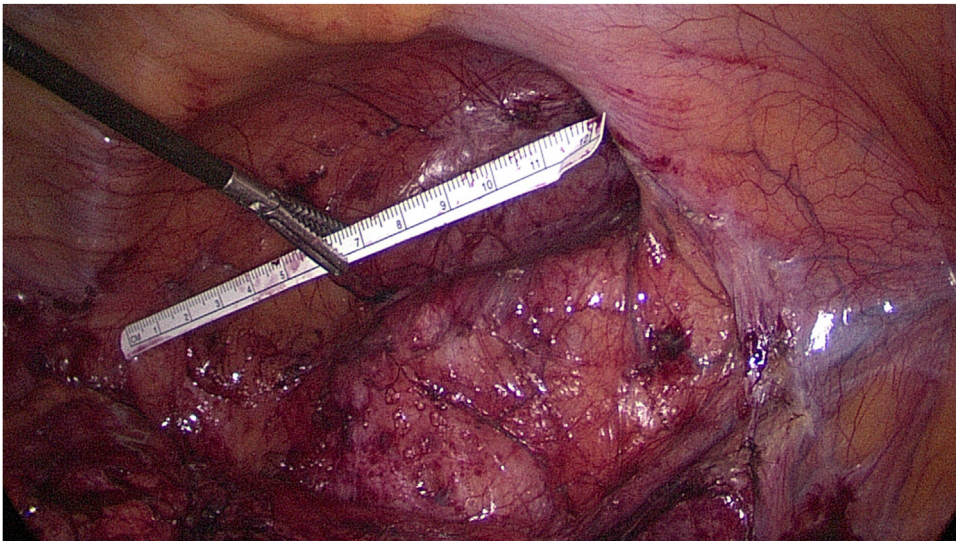


Fig. 4. Intraoperative laparoscopic view of left-sided traumatic flank hernia measuring 12 cm × 6 cm.

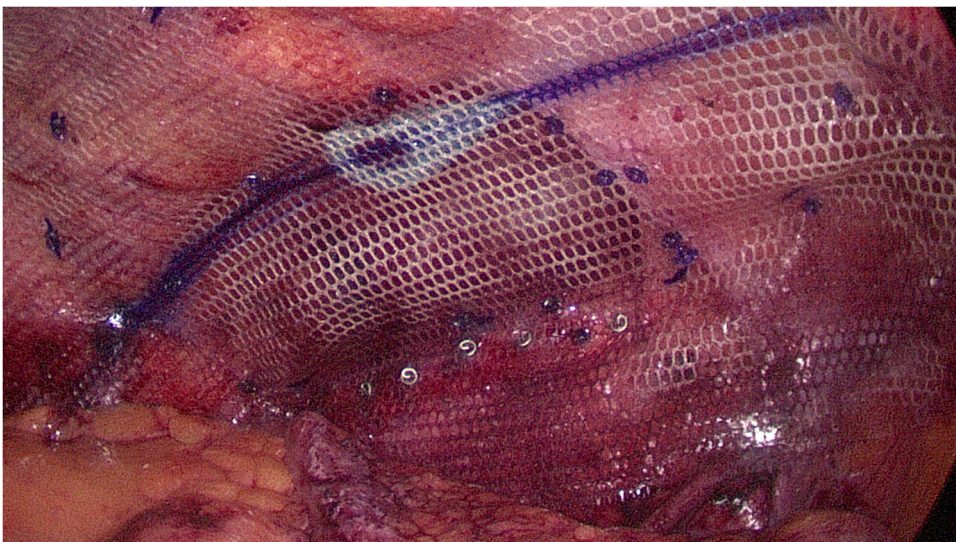


Fig. 5. Intraoperative laparoscopic view of left-sided traumatic flank hernia repair using synthetic mesh secured using a combination of transfascial sutures, absorbable and titanium tacks.

Conflicts of interest

No conflicts of interest.

Funding

No sources of funding.

Ethical approval

This work is exempt from ethical approval.

Consent

Written informed consent was obtained from the patient for the publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author's contribution

Mead Ferris performed a review of the literature, wrote, and edited the paper. Christopher Pirko performed a review of the literature, wrote, and edited the paper. James Nottingham edited the paper.

Registration of research studies

Registration of research is not needed for this work.

Guarantor

Mead Ferris.

Provenance and peer review

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