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Case report

A rare case of a superior lumbar hernia secondary to penetrating injury

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ABSTRACT

Lumbar hernias are rare occurrences, with only 300 cases reported in the literature. We present a unique case of a superior lumbar hernia secondary to penetrating trauma to the right flank. We performed a herniorrhaphy using porcine mesh, and provided additional support by mobilizing the external oblique and latissimus dorsi into the defect. At follow up three months after repair, the patient was asymptomatic and exam revealed an intact lumbar abdominal wall with normal contour. Although literature displays a consensus on the need for lumbar hernia repair, specific repair techniques must be tailored to defect etiology, size, location, and contents.

Introduction

Lumbar hernias are rare occurrences, with only 300 cases reported in the literature [1]. Traumatic lumbar hernias are even less frequent, with fewer than 100 cases described [2]. There are two susceptible areas of the posterolateral abdominal wall, defined by the superior and inferior lumbar triangles. The superior Grynfeltt-Lesshaft triangle is an inverted triangle bordered superiorly by 12th rib and serratus posteroinferior muscle, laterally by the quadratus lumborum, and medially by the erector spinae muscles. The floor of the triangle is composed of the transversalis fascia and the roof is the external oblique muscle. The more inferior Petit's triangle is an upright triangle bordered by the iliac crest inferiorly, the external oblique laterally, and the latissimus dorsi muscle medially. The floor is formed from the lumbodorsal fascia extending from the aponeuroses of the internal oblique and transversus abdominis. The superior triangle consists is more susceptible to herniation as no muscles support the triangle floor [3]. Herniation through the inferior triangle is more difficult due to the posterior musculature. We present a unique case of a superior lumbar hernia secondary to penetrating trauma repaired with mesh and muscle rotation flaps.

Case presentation

We present the case of a 60-year-old Caucasian male who suffered an impalement injury to the right flank when he fell from a ladder onto a tree branch. He sustained a 12th rib fracture and right kidney laceration, which were managed non-operatively. CT imaging at the time showed that he developed a 2.0 × 1.3 cm deep fat-containing defect of the right posterolateral chest wall at the level of the 12th rib. The patient did not undergo operative intervention to repair the defect at the time of injury.

Four years later, he presented to our institution's Plastic Surgery Clinic with complaints of intermittent pain along his right flank. Examination revealed a 2 × 2 cm firm, mobile mass at the scar site with evidence of bleeding from a punctum at the medial edge of the scar, but no residual gross open wound. Working diagnosis included a foreign body granuloma, and CT of the abdomen and pelvis

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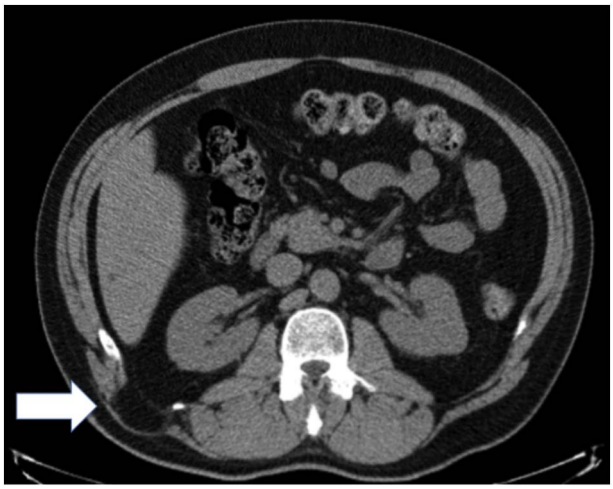

Fig. 1. CT abdomen and pelvis four year after the initial injury, showing the 3.4 cm wide × 2.6 cm deep defect (white arrow) in the right posterolateral abdominal wall.

revealed interval enlargement of the chest wall defect to 3.4 cm wide × 2.6 cm deep (Fig. 1). As the hernia was minimally symptomatic, the patient deferred repair.

The patient returned to clinic one year later. He stated that a month prior, he had started to experience increasing pain from the hernia site, and upon manipulation of the scar, a retained wood material had extruded. He was now experiencing right flank soreness that limited his activity, and he expressed desire for repair. The hernia remained reducible throughout this time but the decision was made to pursue operative intervention given the patient's symptoms.

Surgical technique

The patient was placed in a left lateral decubitus position. A lenticular incision was made over the hernia defect, and soft tissue dissection skeletonized the bulging adipose tissue. The latissimus dorsi was elevated from the external oblique, and the external oblique was dissected from the underlying musculature and fascia. The external oblique flap was elevated, advanced, rotated across the defect, and secured with heavy monofilament sutures.

Herniorrhaphy was performed with Strattice (LifeCell Corp., Branchburg, N.J.) porcine mesh. The mesh was placed over the defect, trimmed to appropriate dimensions, and secured with heavy monofilament sutures along the perimeter. Then, the lateral edge of the latissimus dorsi was dissected free, elevated and advanced to buttress the hernia repair. The muscle was inset with heavy monofilament suture in a buried figure-of-eight fashion. The surgical site was determined to be hemostatic, and was closed. The patient had an uneventful postoperative hospital course.

Post-operative course

On follow-up three months after surgery, the patient denied any pain or symptoms from his prior hernia site. He had resumed all daily activities with no restrictions and returned to his job as a machinist. Physical exam revealed a successfully repaired hernia with no appreciable bulge.

Discussion

The prevalence of traumatic abdominal wall hernias in the literature is only 1% [4]. To the authors' knowledge, this is the first reported case of a superior lumbar hernia secondary to penetrating injury repaired with mesh and muscle flap rotation.

Most lumbar hernias (80%) are acquired through blunt trauma or surgical incision, and an estimated 20% are congenital [5]. Furthermore, such hernias tend to enlarge and become more symptomatic over time [6]. There is a 25% risk of incarceration and 8% risk of strangulation in all lumbar hernias [5,7]. Thus, the general recommendation is for immediate repair [1]. In this case, muscle flap coverage was achieved with the external oblique and latissimus dorsi, further reinforced with a biologic porcine mesh.

Mesh repair of lumbar hernias was first reported by Thorek et al. in 1950 using Tantalum mesh [8]. C.N. Dowd described repair with musculoaponeurotic flaps of the gluteus major and medius muscles in 1907. Since then, various techniques incorporating mesh and muscle flaps have been reported and a transabdominal laparoscopic approach was introduced in 1996 [9]. Laparoscopic treatment now accounts for 9% of reported lumbar hernia repairs [6]. While the open approach allows for complete reconstruction of the parietal surface of the defect, it requires invasive dissection into the planes of defect. A prospective non-randomized study performed by Moreno-Egea et al. showed that the laparoscopic approach decreased operating time, hospital stay, analgesic use, and postoperative morbidity [10]. However, the laparoscopic technique does not enable closure under controlled tension or repair of

parietal surface defects [1]. At the current time, no consensus exists on the optimal surgical approach to lumbar hernia repair among surgeons. Moreno et al. described a four-category classification scheme for lumbar hernias and recommended approaches to each category based on six criteria: size, location, contents, muscular atrophy, origin, and existence of previous recurrence [1]. However, the schematic does not comment on the use of mesh versus muscular flaps, nor does it make recommendations on the approach to a traumatic superior lumbar hernia of the size reported by this paper.

The aforementioned surgical approach incorporated the use of muscular flaps and synthetic mesh repair. We performed a herniorrhaphy using porcine mesh, and provided additional support by mobilizing the external oblique and latissimus dorsi into the defect. At follow up three months after repair, the patient was asymptomatic and exam revealed an intact lumbar abdominal wall with normal contour.

Lumbar hernias are an extremely rare occurrence; a unique case of a superior lumbar hernia acquired by penetrating injury was described. Although literature displays a consensus on the need for lumbar hernia repair, specific repair techniques must be tailored to defect etiology, size, location, and contents. The open approach can be considered for smaller hernias with no history of recurrence or visceral involvement, while larger hernias with visceral contents can be approached laparoscopically for full visualization of the defect. Mesh repair should be considered in hernias of larger size, visceral involvement, and traumatic etiologies.

Conflict of interest statement

None.

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