



Retained Surgical Sponge after Recurrent Ventral Hernia Repair: All Presumed Failed Meshes Should be Explored

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Introduction

In the United States, around 400,000 ventral hernia repairs are performed every year. The utilization of synthetic mesh has been shown to be the most effective approach in minimizing hernia recurrence [1]. A previous financial analysis found over thirty million dollars savings by reducing recurrence rates alone [2].

The use of minimally invasive techniques, mesh and myofascial release has been demonstrated to increase over time for ventral hernia. Such a change in the practice has been shown to be associated with reduction in reoperation due to hernia recurrence [3]. However, 17% of ventral hernia repairs were found to require reoperation. Seven percent of such patients required mesh explanation due to recurrence or surgical site infection [4]. Furthermore, a nationwide analysis reported wound infection to be the most common indication for mesh removal [5]. Hawn et al. found concurrent abdominal operation to be an additional risk factor for subsequent mesh explanation [6]. However, the literature lacks clarity on the value of routine intraoperative evaluation of failed meshes following ventral hernia repair. It is unclear whether ventrally placed meshes need to be completely explanted, on routine basis, to ensure a documented examination of mesh presence. We present a case of a previously documented placement of mesh during a ventral hernia repair, at a different facility, which required reoperation due to hernia recurrence. In this report, we highlight the discovery of an intraperitoneal foreign body, surgical sponge, which was thought to be a failed ventrally placed mesh preoperatively.

Case Presentation

A 44-year-old male presented to the outpatient office for an evaluation of a large abdominal bulge which was bothering him for about six months. The patient was known to have hypertension, hyperlipidemia and prior cardiac catheterization with a body mass index of 44. There was no documentation of diabetes. The patient had a history of a laparoscopic ventral hernia repair three years ago with mesh placement at an outside facility, for a moderate size paraumbilical hernia (4.7 cm × 6.1 cm × 6.7 cm with the transverse defect in the mid anterior abdominal wall measuring 2.2 cm), Figure 1. Subsequently, the patient underwent an open ventral hernia repair with mesh placement via a large, transverse incision, a year ago at another, different facility. Six weeks later, the patient noticed recurring herniation cranial to the transverse incision. The abdominal bulge was large and occupied the entire central abdominal portion. Preoperative imaging showed large ventral abdominal wall defect containing multiple nondilated loops of bowel, with interval development of a circumscribed thick-walled collection measuring 11 cm cephalocaudal with more than 15 cm defect, with potential presence of intraperitoneal mesh, Figure 2. However, there was no evidence of clinical obstructive symptoms or strangulation upon the patient presentation to the surgical clinic.

Operative Decision Making

A Large, >15 cm, fascial defect, with a mesh likely seen crumpled around small bowel loops on preoperative imaging, suggested the need for elective reoperation. The indication for reoperation was built in view of the defect size, patient symptoms and potential development of future hernia complications. Therefore, a complex ventral hernia repair with mesh, needing for component separation was planned.

Operative Technique

Twenty-centimeter supraumbilical vertical incision using 15-blade scalpel was made. Large irreducible hernia sac noted through a wide midline fascial defect: 15-cm × 20-cm, with the defect/sac occupying the entire upper midline. Hernia sac was then mobilized off its subcutaneous dense

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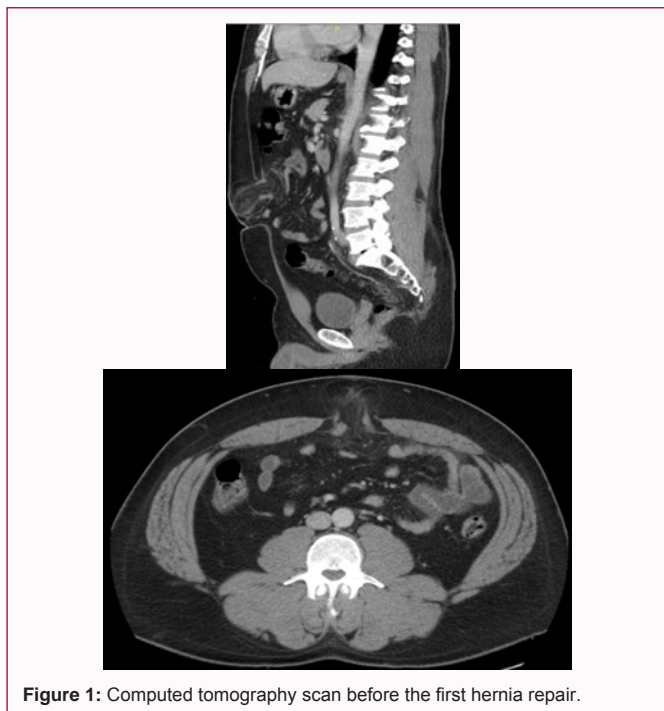


Figure 1: Computed tomography scan before the first hernia repair.

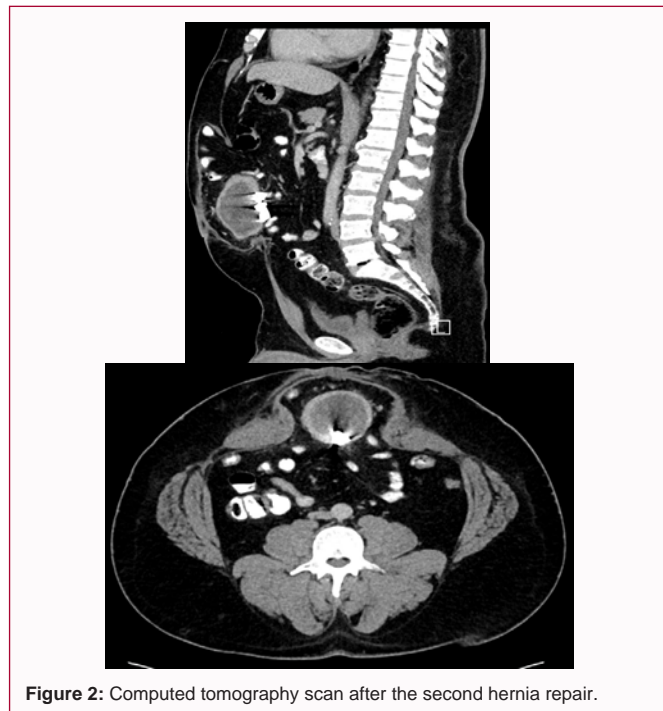


Figure 2: Computed tomography scan after the second hernia repair.

attachment with the intention to avoid entering into the peritoneum while dissecting off the sac from its attachments. Peritoneum was entered. Large mass (thought to be a crumpled/previously placed mesh) wrapped by omentum and small bowel mesenteric loops noted and delivered into the incision. Meticulous dissection carried out; omental attachments taken down with LigaSure. Small bowel mesentery gently and painstakingly peeled off the mass, enabling us to completely excise the mass which was then passed off table as a specimen. The specimen was opened at the back table. A retained surgical sponge noted with sequestered suppuration. Afterwards, the posterior myofascial flap competent separation with TAR was achieved bilaterally. The rectus sheath was opened at its medial edge using cutting electrocautery. Rectus muscle was then lifted anteriorly and the retro-rectus space was bluntly created. Posterior rectus sheath was then incised starting in the upper part of the incision, lateral to neurovascular bundles. The space between transversus abdominis muscle fibers and transversalis fascia was developed by gentle blunt dissection towards flank. After completing the step on both sides, the posterior retro-rectus midline closure achieved by suturing both the posterior rectus sheaths to each other using a running 2-0 Vicryl suture. Extra Large rectangular Heavy-weight Prolene 26 cm × 36 cm mesh was then placed above the posterior rectus sheath and transversalis fascia and fixed transfascially using #1 PDS sutures. Bilateral myofascial flap anterior competent separation was then performed. Lateral dissection deep to the external oblique allowed creation of a “sliding myofascial flap” consisting of internal oblique and transversus muscles. Anterior midline fascia was then closed by suturing the medial edge of anterior rectus sheath to re-create Linea alba using #1 looped-PDS continuous suture, supplemented by a series of interrupted, figure-of-eight #1 PDS internal retention sutures.

Discussion

The previous literature has shown surgical site infection and recurrence to be the most common cause of mesh explanation after

ventral hernia repair [5,6]. Such an observation drives a significant interest in minimizing reoperations, given the significant financial burden of these cases [2,3]. However, there was no clear description of the outcomes of routine mesh examination or removal for patients who needed reoperation due to failed mesh after ventral hernia repair. Furthermore, the inability to discern radiographically whether the failed mesh is a synthetic material versus potential foreign body, is another drawback of the current literature.

In this report, we present a rare case of multiple reoperations due to recurrent ventral hernia that was initially thought to be due to failed mesh placement. In the preoperative analysis of patient's symptoms, physical examination and imaging, it was thought that the abdominal wall defect entailed several dilated small bowel loops around a failed mesh. The lack of clinical evidence of obstructive and infectious signs and symptoms was another factor that placed the consideration of retained foreign body at the bottom of the differential diagnoses list. The primary operative focus aimed towards avoiding an entry to the peritoneal cavity, by creating the component separation planes anteriorly. In addition, the placement of the mesh was planned to be outside the peritoneal cavity. However, the peritoneum was entered accidentally during the creation of the anterior dissection planes. The expression of the yellow suppurative peritoneal fluid along with the omental mass around the surgical sponge, made the excision of the mass indicated. The small bowel loops were able to be dissected off the omental mass without the need for small bowel resection.

The main concern of leaving such a retained foreign body without a complete exploration may place the surgeon in a medico-legal challenge. It is the surgeon's responsibility to document the presence of the foreign body during the last open ventral hernia repair. Otherwise, it may be impossible to prove that the intraperitoneal foreign body was placed during any of the prior hernia repairs.

Conclusion

Ventral hernia repair with mesh placement is a common operation

that ensures lower risk of hernia recurrence. However, patients with multiple reoperations need to be approached differently. The potential presence of a failed mesh for patients with hernia recurrence must be addressed by complete exploration of the mesh, in order to exclude the presence of any foreign body. Such an approach may be crucial as preoperative imaging may not clearly demonstrate the difference between synthetic mesh and other foreign bodies.

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