



Encasement of Ventral Hernia Mesh within Small Bowel: A Case Report

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Case Report

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Abstract

Ventral hernia repairs are one of the most commonly performed surgical interventions, with low overall complication rate of 15 percent of cases. Complications with wound healing account for over half of all complications associated with ventral hernia repairs. There is a risk, albeit low, of other such complications, including enterectomy, intra-abdominal infections, and mesh erosion into surrounding structures. We present a case of a 73-year-old male who presented to the hospital with a history of abdominal pain of one week duration. The patient was originally diagnosed with an abdominal wall abscess and recurrent hernia. Upon exploration of the abdominal cavity, it was noted that the mesh from previous ventral hernia repair had eroded into the lumen of the small bowel, requiring small bowel resection for removal of the mesh and repair of the hernia. Ventral hernia repairs are relatively safe, and complications of mesh erosion into the lumen of the small bowel are extremely rare, with minimal cases reported. This case highlights a rare complication associated with ventral hernia repairs and the importance of early recognition and appropriate repair when complications are found.

Keywords: Ventral Hernia Mesh; Small Bowel; Enterectomy, Intra-Abdominal Infections; Mesh Erosion

Introduction

Ventral hernia repairs are one of the most common surgical procedures performed worldwide. Standard of care for ventral hernias with a defect of greater than 2 cm in a clean field involves the use of mesh [1,2]. Mesh, often a required element in laparoscopic and robotic repairs, has been shown to decrease recurrence after previous open repair of ventral hernias [3]. The types of mesh used in any particular hernia repair can vary based on the location, operative approach, surgeon expertise and preference, and available resources and materials [4,5]. Hernia repair meshes generally fall into one of three categories: synthetic, biological, or biosynthetic. Synthetic meshes are either woven

from an extruded monofilament or created from expanded polytetrafluoroethylene [6,7]. Biological meshes are derived from human or animal tissues and function as an cellular biological matrix for incorporation with the recipient's native tissues. The native tissue will eventually replace the biological mesh as the biological mesh is fully incorporated over time. For this reason, biological meshes are mainly used as reinforcing layers rather than as a fascial replacement due to the high risk of hernia recurrence when used alone [6].

The last group of mesh is biosynthetic, which act as long-acting resorbable mesh that is synthetically derived with biological components. This composition allows them to vary in their reabsorption profiles, where they can reabsorb over

a longer period of time, up to 36 months, and, in theory, lay a framework for native collagen to create a strong and durable repair [6]. With less of a concern of failure than biologic mesh and lower risk of mesh infection than that of a synthetic mesh. Each of these three broad groups of meshes can then be further subcategorized by their different characteristics, such as weight/density, composition, pore characteristics, tensile strength, elasticity, material, etc. It is also worth noting that only certain types of mesh are approved for intraperitoneal use, and all mesh types carry different risks in terms of bowel risk of adhesions, erosion, and infection. All surgeries come with some risk of complication, and ventral hernia repairs are no exception to this. According to a large cohort study, the likelihood of one or more complications is reported to be 15 percent in patients undergoing ventral incisional hernia repair. Wound healing complications account for over half of these at 51%. Mesh infection is another potentially serious complication. However, the risk following laparoscopic ventral hernia repair is less than 1 percent [8]. The risk of enterotomy is the most common intraoperative complication of a laparoscopic ventral hernia repair, occurring in up to 14 percent of laparoscopic ventral hernia repairs [9]. The case we have chosen to present has a combination of complications, including enterectomy, mesh infection, and erosion of the mesh into the lumen of the small bowel, making the nature of this case particularly rare.

Case Review

We present a case of a 73-year-old male who presented to the hospital with a history of abdominal pain that started a week prior. The patient initially presented to the emergency department with the chief complaint of abdominal pain. The patient stated that over the last two days, he had been experiencing progressively worsening lower abdominal pain and swelling. He reported a history of an umbilical hernia repair over ten years prior. He endorsed associated fevers and chills. When the patient was initially evaluated at bedside, he had a firm area on the right lower abdomen with rubor, calor, and mild tenderness. The patient was hypotensive, with leukocytosis of 17 and lactic acid at 2.6. A computed tomography scan was obtained, and it showed a right-sided abdominal wall abscess with extension into the abdominal cavity. Previously, the patient had a laparoscopic ventral hernia repair with mesh at the apparent site of the abscess, which looks to have recurred with concern for fistulous communication adjacent to the ileum, as well as possible mesh erosion into the bowel. There were no signs of strangulated hernia on the imaging. The patient was started on antibiotics, and an interventional radiology drain was placed. The patient would be discharged on home intravenous antibiotics and scheduled for outpatient surgery. A plan was made for laparotomy, hernia repair, and probable partial small bowel resection.

The patient was brought to the operating room and general anesthesia was induced. After induction, the pigtail drain was removed. A midline incision was made over the hernia defect, and intraperitoneal access was gained. Extensive adhesions were noted upon entry and carefully lysed to allow further inspection.

On exploration of the abdominal cavity, it was noted that a loop of small bowel was densely adherent to the abdominal wall where the prior mesh was placed. An attempt was made to free this loop of bowel from the abdominal wall, but during dissection, it was noted that the mesh had eroded into the lumen of the small bowel. Mesh explanation and partial resection of peritoneum was required to dissect the small bowel from the abdominal wall. Once the small bowel was dissected entirely away from the abdominal wall, the involved portion of the small bowel was resected, and hand-sewn anastomosis was completed. The hernia sac was resected until facial edges were clear. The facial defect was closed using a figure eight interrupted sutures. The skin was closed with staples.

Postoperatively, the patient recovered well. He had a quick return of bowel function and was advanced and tolerated a regular diet. Pain was well controlled with oral medications, and there were no wound-healing complications. This has remained the case at follow-up appointments, with no signs of apparent hernia or abscess recurrence.

Discussion

Cases of mesh growing into visceral organs are extremely rare, and only a handful of cases have been reported. The mechanism of how mesh may erode into visceral organs, such as the small bowel in this case, is currently unknown. However, with continued reporting of these cases, a better understanding of these complications can be made. The largest difficulty of diagnosing mesh erosion into visceral organs is that imaging typically does not bring mesh integration into visceral organs into the differential.

Presenting symptoms of the patients vary widely, if they present with symptoms at all. This is due not only to the visceral organs impacted by erosion mesh, with the bladder and bowels being the most commonly affected in the limited number of cases published, but also presentation tends to vary broadly from patient to patient in case reports. In our case, the presentation was a patient with persistent abdominal pain for over a week due to an abdominal abscess. However, prior to the formation of the abscess and after resolution of this infection, the patient had no other symptoms related to erosion of mesh into his small bowel. We did not have details regarding prior mesh that was placed for repair of this patient's ventral hernia repair; however, if

mesh is placed intraperitoneal, it should be coated on the side adjacent to the visceral organs.

A case report by Lutfi W, et al. [10] discussed a patient with weekly episodes of self-resolving obstructive symptoms with decreased ostomy output. Wokup, which included computed tomography scan, showed a recurrence of hernia and intraluminal density of unclear significance. Intraoperatively, mesh was found to be incorporated into the ileum [10]. Another case of mesh erosion into small bowel and bladder reported by Aggarwal S, et al. [11] presented with persistent urinary tract infection, and a computed tomography scan showing inflammatory changes in the inguinal region with abscess formation and thickening of the wall of the urinary bladder and adherence of a thickened bowel loop to an area of inflammation [11]. An additional case of mesh erosion into the colon was discussed by Chan RH, et al. [12]. This patient presented with three months of intermittent bloody stools and changes in bowel habits [12]. It has also been seen in other cases that patients can be completely asymptomatic from the mesh migration, such as in the case where mesh had migrated into the proximal ileum lumen and was found incidentally during a laparotomy for a colon cancer [13].

Review of these cases shows no clear and absolute commonality that could be used to diagnose mesh erosion into visceral organs. Operative exploration was the method of definitive diagnosis in all the above cases, including our own. When viewing our case in context of other published cases, it is clear that mesh erosion into visceral organs should be considered in patients with past hernia repair and with new genitourinary or gastrointestinal issues with no other clear pathological causes.

Conclusion

This case highlights the complexity of complications that can occur with ventral hernia repairs while also highlighting extremely rare complications, such as mesh erosion into visceral organs. It is essential to recognize mesh erosion as a part of the differential diagnosis when patients present with intraabdominal abscesses and mesh infections of previously repaired hernia sites. Patients with nonspecific symptomatic presentation should also be given special consideration when no other clear pathological causes of new complaints can be diagnosed in the context of prior hernia repairs.

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