

Case Report

Internal hernia and caecal volvulus secondary to adhesion at inguinal preperitoneal mesh

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ABSTRACT

We reported the case of a caecal volvulus in a 52-year-old female which appeared to result from a dense intra-abdominal adhesion from a previous inguinal hernia repair. The patient presented with upper abdominal pain and obstructive symptoms. Computed tomography revealed the caecum in a whirlpool appearance characteristic of a volvulus, and there was resulting proximal bowel dilatation suggesting obstruction. The patient had previously undergone a laparoscopic right inguinal hernia repair 9 years prior to presentation in addition to a hernia repair on the contralateral side, and a left sided Spigelian hernia repair. She was managed operatively with exploratory laparoscopy. Her right iliac fossa had scarring at the peritoneum consistent with an inguinal hernia mesh with no intra-abdominal breach. There was a band adhesion originating from this region, directly posterior to the scarring, with the caecum wrapping around the adhesion and causing an obstruction. The internal hernia was reduced, a right hemicolectomy performed, and the patient successfully discharged after six days. Adhesion formation following inguinal hernia repairs are not a well-documented complication. In this case, there was an obvious adhesion that acted as the fulcrum for a caecal volvulus and clearly originated on the abdominal wall directly behind the previous inguinal hernia mesh suggesting that the hernia repair may have instigated the adhesion. Whilst rare, adhesion formation may need to be a consideration in inguinal hernia mesh repairs.

Keywords: Internal hernia, Inguinal hernia, Mesh, Volvulus, Obstruction

INTRODUCTION

Inguinal hernia repairs remain one of the commonest surgical procedures performed. Adhesions and subsequent bowel obstructions are generally not considered to be a sequelae of inguinal hernia repairs, particularly as mesh is placed outside of the peritoneum. Caecal volvulus is a severe surgical diagnosis which can lead to obstruction, ischaemia, perforation, and death. Though rare, caecal volvulus can indeed result from adhesions, in addition to other abdominal masses or hypermobility of the right colon. Abdominal wall hernia repairs can lead to intra-abdominal scar tissue, particularly if the peritoneum has been breached. In the setting of inguinal hernia repairs with preperitoneal mesh placement, adhesion formation

has not been widely reported and may be secondary to fixation of the mesh with tacks or sutures which could traverse the peritoneal cavity.

CASE REPORT

A 52-year-old female presented to the emergency department complaining of epigastric and right lower quadrant pain for the preceding two weeks that seemed to worsen with oral intake. She had previous laparoscopic preperitoneal hernia repairs with mesh bilaterally; the left side done 14 years ago and the right side 9 years prior. Further surgical history included an open Spigelian hernia repair with mesh in the left lower quadrant and a laparoscopic cholecystectomy 20 years earlier. In addition

to this, she had undergone a colonoscopy three months prior which did not identify any masses or polyps. The patient was haemodynamically stable on review with a soft abdomen. The right lower quadrant was exquisitely tender with rebound. There were no palpable masses. Blood tests revealed a haemoglobin of 155 g/l, a white cell count of $8 \times 10^9/l$, and C-reactive protein of 37 mg/l. Computed tomography (CT) imaging demonstrated a mechanical small bowel obstruction with the terminal ileum and caecum looped around itself in a whirlpool appearance, and the colon collapsed distally, indicating an obstructing caecal volvulus (Figures 1). There was a trace of free fluid in the right paracolic gutter and no abdominal free air. Hernia meshes were visible in the inguinal orifices bilaterally and at the left lower quadrant. The mesh on the right inguinal canal appeared to be displaced intraperitoneally.

The patient then proceeded to an emergency diagnostic laparoscopy. Intraoperatively, there was a caecal volvulus caused by internal herniation underneath a thick band adhesion at the right iliac fossa. This band appeared to arise from the anterior abdominal wall just posterior to the right inguinal hernia preperitoneal mesh (Figure 2). There was no mesh or tacks exposed and there was no recurrent inguinal hernia. The band adhesion was removed, the bowel reduced, and a right hemicolectomy performed with a stapled side-to-side anastomosis. The postoperative course was uncomplicated, and she discharged home at day 6. At follow up two weeks later, the patient was well and bowel function had returned to normal. Histopathology was negative for dysplasia or malignancy.



Figure 1: Coronal view of abdominal CT demonstrating caecal volvulus and dilated loops of small bowel. Orange arrow indicates the caecum which has herniated and twisted into a whirlpool appearance. Green arrow indicates the right inguinal hernia mesh.



Figure 2: Sagittal view of abdominal CT demonstrating caecal volvulus. Orange arrow indicates the caecum which has herniated and twisted into a whirlpool appearance. Green arrow indicates the right inguinal hernia mesh.



Figure 3: Laparoscopic image of right inguinal fossa showing a thick band adhesion originating at the region of a previous inguinal hernia repair with mesh. The peritoneum appears intact and there are dilated loops of small bowel indicating an obstructing.

DISCUSSION

Laparoscopic inguinal hernia repairs are an alternative to the traditional open procedure and have proven to have similar or better outcomes.¹ Regardless of the method of repair utilised, mesh is preferred when possible due to the significantly reduced rates of recurrence.² Mesh placement may be located intra- or extraperitoneal, however, Intraperitoneal onlay mesh placement (IPOM) has largely fallen out of favour in inguinal hernia repairs due to the incidence of recurrence and major complications.³ Access to the preperitoneal space is achieved via a laparoscopic intra-abdominal approach (TAPP) or Totally extra-peritoneal approach (TEP) with both methods leading to similar outcomes depending on surgeon preference and experience.⁴

Intra-abdominal adhesion formation after preperitoneal mesh placement has not been well described in the literature. There has been a study in 2016 which examined the formation of adhesions after ventral hernia repair as detected by MRI and laparoscopic correlation. There was an overall 60% rate of adhesions after ventral hernia mesh, however, the results were not stratified by mesh location and intraperitoneal placement was also included in the study.⁵ There has also been one case report in the literature which describes an adhesional small bowel obstruction that was attributed to a tack that had been placed during a laparoscopic inguinal hernia repair.⁶ *In vitro* animal studies in pigs and rats have demonstrated intra-abdominal adhesion formation following preperitoneal mesh placement of less than 1% at three months, significantly less than in IPOM techniques.⁷⁻⁹

In our case report, there was a band adhesion at the preperitoneal mesh that had led to an internal hernia and caecal volvulus, however, whether the mesh had initiated the adhesion is uncertain. The hernia repair itself remained intact and there was no mesh that had breached the peritoneum. The patient had undergone previous abdominal operations which could have led to scar formation including a laparoscopic cholecystectomy and left sided hernia repairs, however, the culprit adhesion was noticeably originating at the right iliac fossa immediately deep to the extraperitoneal mesh. Surgical management with laparoscopic adhesiolysis and right hemicolectomy was performed to relieve the obstruction and restore bowel function.

CONCLUSION

Inguinal hernia repair with mesh remains a popular general surgical operation with numerous commonly reported complications. Formation of intra-abdominal adhesions secondary to inguinal hernia mesh is presently not well documented in humans and this case remains the first the authors are aware of that describes a caecal volvulus secondary to an adhesion that may have arisen from inguinal hernia mesh placement. While inguinal hernia mesh repair remains the gold standard, formation of intra-abdominal adhesions may need to be a consideration in fixation techniques. Laparoscopic adhesiolysis and bowel resection was successful in managing this presentation.

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