Internal Hernia Secondary To Extruded Inferior Vena Cava Filter Limb Causing Small Bowel Volvulus

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Background

Inferior vena cava (IVC) filters have become commonplace treatment modalities for prevention of pulmonary embolism. There are several known intra-peritoneal complications of these devices, including hemorrhage, bowel perforation, and adhesions, leading to small bowel obstruction[1-2]. This case is an example of an extruded IVC filter limb causing an internal hernia and small bowel volvulus.

Case Presentation

The patient is a 31-year-old female with a history of a traumatic brain injury secondary to a motor vehicle accident status post IVC filter placement, who presented to the hospital with abdominal pain and nausea/vomiting. Her computed tomography (CT) scan demonstrated the superior mesenteric artery positioned to the right of the superior mesenteric vein, associated intestinal malrotation, and the majority of the small bowel located to the right of midline. She was diagnosed with acute midgut volvulus, and she was taken to the operating room for diagnostic laparoscopy.

After insertion of the laparoscope, an internal hernia was identified due to a metallic limb of the IVC filter protruding from the retroperitoneum into the small bowel mesentery. The small bowel had passed through this space, causing obstruction and volvulus. To ensure control of the extruded limb and prevent damage to the mesentery, a small, supraumbilical incision was made. The distal end of the IVC filter limb was dissected free from the mesentery. It was traced back to retroperitoneum and transected using a wire cutter. The small bowel was then detorsed. There was no further bowel injury or ischemia. She had an unremarkable postoperative course with tolerance of diet and return of bowel function within 48 hours. She was discharged home and later seen in clinic without complications.



Figure 1: CT Images: The left image shows an axial view with a red arrow indicating the extruded IVC filter limb causing the internal hernia. The right image is a coronal view with a red circle again identifying the extruded IVC filter limb as well as the majority of small bowel in right upper quadrant.

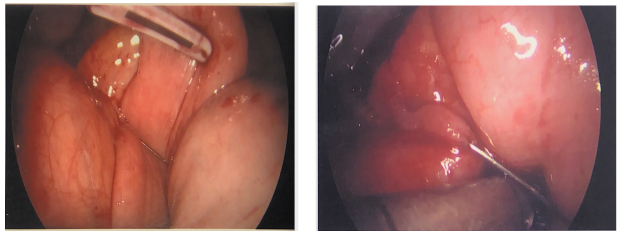


Figure 2: Laparoscopic Images: The left image shows loop of small bowel narrowed and traversing under the IVC filter limb causing obstruction. The right image remonstrates the IVC filter limb, as it dives into mesentery, causing a kink in small bowel.

Discussion

This case is an example of a rare, late complication of IVC filter placement. There have been limited case reports discussing small bowel volvulus secondary to IVC filters. In the literature, the surgical approach to this phenomenon has been via exploratory laparotomy for diagnosis and management[3-5]. Described techniques include complete IVC filter explantation and inferior vena cava reconstruction.[6]

Our approach features initial laparoscopic localization followed by a minimal open approach for control of the IVC filter limb and transection. As the laparoscopic images demonstrate, diagnosis can reliably be made in a minimally invasive fashion. The extruded IVC filter limb can then be dissected and removed laparoscopically, or as in this case, it can be subsequently managed through a smaller open incision due to initial localization. This approach can provide sustainable results while leading to early return of bowel function and reduced hospital stay.

References

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