Paraduodenal herniation: An internal herniation in a virgin abdomen

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INTRODUCTION: A paraduodenal hernia is an uncommon hernia that results from an abnormal rotation of the midgut. Commonly, these hernias are congenital in nature, and are reported to cause 1.5–5.8% of intestinal obstructions. These hernias occur when a part of the jejunum herniates through the posterior portion of the ligament of Treitz. Diagnosing these hernias preoperatively has been shown to be difficult, despite the studies that are available. Early diagnosis is imperative to the patient in order to avoid strangulation of the bowel, which is associated with a high mortality.

PRESENTATION OF CASE: In this case, we present a case of a left-sided paraduodenal hernia in a virgin abdomen in a 38-year-old African American male with a herniation of a loop of jejunum through a defect of the posterior portion of the ligament of Treitz. The patient also had a volvulized segment of the proximal jejunum, and part of this bowel was found to be ischemic.

DISCUSSION: Acute intestinal obstruction caused by a left paraduodenal hernia is a rare cause of intestinal obstruction. A literary search of PubMed between 1980 and 2012 indicated only 44 cases of intestinal obstruction secondary to a left paraduodenal hernia.

CONCLUSION: The patient underwent exploratory laparotomy, and the herniated bowel was found to be ischemic. The hernia was reduced, and the ischemic bowel resected. The defect was closed, and the patient had a non-complicated recovery.

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1. Introduction

Paraduodenal hernias, also known as Treitz hernias, are uncommon hernias that are caused by an abnormal rotation of the midgut. These type of hernias are more commonly due to a congenital cause, and cause 1.5–5.8% of intestinal obstructions. Further, 30–50% of all internal hernias are paraduodenal. In this case, we present a 38-year-old African American male who developed a small bowel obstruction due to a herniation of the jejunum through the posterior portion of the ligament of Treitz. It is important to efficiently diagnose a paraduodenal hernia in order to avoid complications such as bowel ischemia, which is associated with a high mortality.

2. Case report

A 38-year-old African American male presented with an acute onset of left epigastric pain. The pain was associated with vomiting and bloody emesis. Since the onset of pain, the patient was unable to pass flatus, and the patient stated that the pain decreased in severity upon standing. The patient stated he was having intermittent fevers and chills, and stated that he had one episode of bloody stools in the past year, prompting him to get a colonoscopy, in which the findings were normal.

Blood investigations indicated thrombocytopenia of 11.7, and ALT and AST of 85 and 62, respectively. CT of the abdomen with contrast suggested closed small bowel loop obstruction in the left upper quadrant possibly in the lesser sac. There was focal bowel wall thickening likely indicating ischemia (Figs. 1 and 2). Abdominal X-ray showed dilated small bowel loop in the left mid abdomen with differential air-fluid levels, suggesting focal obstruction (Fig. 3). These findings were consistent with a small bowel obstruction. A naso gastric tube was placed for decompression.

The patient has a negative past medical history and family history, and only has a history of a colonoscopy in the prior year. Social history was positive for regular alcohol use and negative for drug use. The patient quit using tobacco three months prior to presentation.

The patient underwent an exploratory laparotomy. Upon entering of the peritoneal cavity, a nonodorous purulent fluid was expressed from the peritoneal cavity. Upon examination of the abdominal cavity, a counter-clockwise volvulized segment of the proximal jejunum was observed. The volvulized segment was irreducible due to adhesions, which tethered the mesentery of the jejunum to the ligament of Treitz. Further inspection of the abdominal cavity indicated another portion of the jejunum herniated through a defect on the posterior portion of the ligament of Treitz, pushing through posterior to the fourth portion of the

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Further, the presentation to surgery was noted. After hemostasis, the bowel was resected. Upon examination, the herniated bowel appeared to have ischemic changes. The hernia was reduced, and the bowel was twisted back in to its anatomical position, and the bowel was left to set. After observing the bowel for approximately 5 min, it was noted that there was 1 area of the bowel that had herniated through the ligament of Treitz. Resuscitation of the ischemic bowel segment was attempted, and the non-responsive bowel segment was then resected. The small adhesive band tethering the mesentery of the jejunum to the ligament of Treitz was taken down carefully with Metzenbaum scissors. The mesenteric defect at the ligament of Treitz was then closed with multiple 3-0 silk sutures between the mesenteric flap and the duodenum at that site in a circumferential fashion. After closing the mesenteric defect, attention was then turned back to the small bowel resection. Windows were created in the mesentery on either side of the ischemic portion of the proximal jejunum, and GIA 60 blue load stapler was used to transect the small bowel on either side of the ischemic area. The mesentery was then transected with the LigaSure device, and the mesenteric edges were then over sewn in multiple places with 3-0 silk sutures to ensure adequate hemostasis. The two cut ends of the bowel were lined up in proper anatomic position for a side-to-side anastomosis. Two stay sutures were placed at the proximal and distal extents of the anastomosis site with 3-0 silk sutures. The small bowel was entered with electrocautery in a kissing fashion on each of the proximal and distal limbs. These were then dilated with Kelly clamps to allow the placement of a GIA 60 blue load stapler, which was then fired to create the anastomosis. A 3-0 chromic suture was then used to close the common channel in a running channel stitch suture. This was then imbricated with interrupted 3-0 silk sutures. The staple line was then reinforced in multiple areas with 3-0 silk sutures in a Lembert fashion. The mesenteric defect from the resection site was closed with a running 3-0 Vicryl suture. An inspection of our anastomosis revealed good hemostasis with no evidence of ischemia. Culture of the peritoneal fluid was negative. The patient tolerated the procedure well and had a non-complicated recovery.

3. Discussion

Acute intestinal obstruction caused by a left paraduodenal hernia is a rare cause of intestinal obstruction. A literary search of PubMed indicated that between the 1980 and 2012, there were only 44 reported cases of intestinal obstruction secondary to a left paraduodenal hernia. Although rare, between 30 and 50% of all internal hernias are paraduodenal hernias. Further, paraduodenal hernias are commonly congenital. Paraduodenal hernias have a three times higher chance of occurring in the left paraduodenal fossa than on the right, and these hernias are more likely to occur in men. Most patients who present with a paraduodenal hernia are in the 4th to 5th decades of life. Presentation of the hernia can vary depending on the severity of the hernia sequela. The patient can be asymptomatic with negative physical exam findings or can present with a chronic intermittent abdominal pain. The patient can present with acute intestinal obstruction secondary to the hernia and possibly positive physical exam findings.

In rare circumstances, small bowel obstructions can be caused by a type of internal herniation whereby portions of small bowel loops pass through mesenteric defects. This results in a transfer
of the bowel from a retroperitoneal position to an intraperitoneal, or paraduodenal, location. The paraduodenal hernia can be left- or right-sided, and this depends on the relationship of the mesenteric vessels to the small intestine. A right-sided paraduodenal hernia occurs due to midgut malrotation and failure of fusion of mesentery to parietal peritoneum, resulting in the defect. A left paraduodenal hernia occurs when the midgut rotates behind and then to the left of the superior mesenteric artery, with its final position in the left side of the abdomen behind the mesentry of the descending colon. With a left paraduodenal hernia, the peritoneal defect is to the left of the duodenum, or Fossa of Landzert. The anterior border of the hernia is formed by the inferior mesenteric vein.

Diagnosing a paraduodenal hernia is imperative for a patient in order to avoid complications such as a trapped bowel, which may eventually lead to ischemia. X-ray in a case of a paraduodenal hernia will show a clustering of the small bowel loops in the upper left or right quadrants. Other diagnostic tools that can be used are plain abdominal radiography, which may show a distended fluid filled abdomen, or a barium contrast study, which may show small bowel encapsulation. Computed tomography may show small bowel loop obstruction as well as may show a cluster of small bowel loops at the ligament of Treitz. The mass effect on the posterior gastric wall and distal duodenum cause compression of the transverse colon, resulting in a right shift of the mesenteric trunk and vessels.

Treatment methods include an exploratory laparotomy, repair and reduction of the hernia, as well as laparoscopic repair of the hernia. Minimally invasive repair of the hernia is a relatively new technique, and the first laparoscopic repair of this type of hernia was reported in 1998. A minimally invasive approach can result in decreased post-operative pain and hospital stay for the patient. Laparoscopic repair is recommended for uncomplicated cases, where there is no suspicion of strangulation or perforation. Laparoscopic repair should not be performed if there is evidence of bowel necrosis. In addition to this, laparoscopic repair is not recommended when there is massive distention from the obstruction, significant adhesions, hemodynamic instability, radiation therapy to the abdomen, and any contraindication to pneumoperitoneum such as pulmonary hypertension. If the patient presents with an acute complication, then an open approach is recommended; however if the symptoms subside, then the minimally invasive approach is favored.

Regardless of the surgical technique used in reduction of the hernia, preservation of the inferior mesenteric artery (IMA) and inferior mesenteric vein (IMV) is essential in order to prevent ischemia of the small intestine. The essential singular surgical preservation concept that is central for protecting the vessels depends entirely on the correct identification and awareness of both vessels within the anterior wall of the sac. This must precede any actual reduction of the hernia. Widening of the hernia orifice allows for an avascular plane to the right of the IMV. If unable to widen the orifice, the anterior sac can be opened along the anterior wall. The sac can be excised from the left of the IMV and moved to the left of the colon.

Conflict of interest

There are no conflicts of interest.

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Ethical approval

Written informed consent was obtained from the patient for publication of this case report and accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Author contributions

Dana Kabbani and Ayman Salem wrote the manuscript. Dr. Holloway was the head surgeon of the case.

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