



Case Report

Transmesenteric hernia with closed-loop small bowel obstruction: A case report

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ABSTRACT

Background: Transmesenteric hernia is a subtype of internal abdominal hernia (IAH) and a rare cause of small bowel obstruction in adults. Difficulty in reaching a definitive diagnosis due to non-specific clinical and imaging findings often cause life-threatening bowel ischemia.

Case report: We report a case of a 37-year-old female who presented with clinical and imaging features of small bowel obstruction. She underwent an emergency laparotomy where the diagnosis of transmesenteric hernia causing closed-loop obstruction was made. The non-viable portion of the intestine was resected, anastomosis of the ileum along with the closure of the mesenteric defect was performed.

Discussion: IAH is the protrusion of abdominal viscera, most commonly small bowel loops through a peritoneal or mesenteric defect into the abdominal or pelvic cavity. Considered common in children, it is rare in adults and is most common after abdominal surgeries like Roux-en-Y gastric bypass surgery. Clinical features and imaging findings are non-specific causing delay in the diagnosis.

Conclusion: A high index of suspicion is required while assessing the patient with symptoms suggestive of acute bowel obstruction as the preoperative diagnosis of a transmesenteric hernia is challenging.

1. Introduction

An internal abdominal hernia (IAH) refers to the protrusion of abdominal viscera, most commonly small bowel loops, through a peritoneal or mesenteric defect into the abdominal or pelvic cavity [1]. IAH are rare causes of acute abdomen and intestinal obstructions in adults. Although IAHs have an overall incidence of less than 1%, transmesenteric hernias account for only 5–10% of all internal hernias and about 0.6–5.8% of all small bowel obstructions are attributed to IAH [2]. Mesenteric herniation causes vascular insufficiency to the bowel, leading to an array of possibilities, including obstruction, strangulation, and bowel ischemia [3–5].

We report a case of a 37-year-old male with a right-sided transmesenteric hernia of the ileum due to a mesocolic defect along with the review of relevant literature. This case has been reported in line with SCARE criteria [6].

2. Presentation of case

A 37-year non-alcoholic and non-smoker Tamang female with a known case of hypertension without any other significant medical conditions presented to our emergency with a complaint of progressive abdominal pain for five days. The pain was initially in the right iliac fossa which later became generalized and was associated with progressive abdominal distention, multiple episodes of bilious vomiting, and absolute constipation for a similar duration. However, there was no complaint of difficulty in swallowing, weight loss, fever, anorexia, or abdominal trauma. There was no personal/family history of malignancy.

On examination, she was afebrile, hemodynamically stable, tachycardic, and dehydrated. The abdomen was distended and diffusely tender without guarding and rigidity but with hyperactive bowel sounds. Per rectal examination revealed an empty rectum and finger stained with stool. All the hernial orifices were intact. Examination of other

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organ systems was unremarkable. Laboratory parameters including complete blood count, renal function test, liver function test, and arterial blood gas analysis were normal. An erect plain abdominal X-ray revealed air-fluid levels with valvulae conniventes (Fig. 1). Chest X-Ray didn't reveal pneumoperitoneum.

With suspicion of acute small bowel obstruction likely due to the intra-abdominal collection following appendicular perforation, decompression with the nasogastric tube was done which contained feculent material. Owing to financial and time constraints, a CT scan of the abdomen was not performed, and thus following resuscitation, the patient was taken for urgent laparotomy. Intraoperatively, there was 100ml of hemorrhagic fluid in the peritoneal cavity and an approximately 7cm × 4cm defect in mesentery near the ileocecal junction (IC) through which proximal ileum was herniating along with a band 40cm proximal to IC junction causing closed-loop obstruction of herniating bowel (Figs. 2 and 3). The segment of the bowel was non-viable and segmental resection with end-to-end anastomosis of the ileum was done along with the closure of the defect by a team of gastrointestinal surgeons.

The post-operative period was uneventful and the patient recovered well. The patient is doing well with no complaints at nine months of follow-up.

3. Discussion

IAH, the protrusion of viscera through mesenteric or peritoneal defect can be retroperitoneal or formed from congenital anomalous openings. IAHs due to congenital defects can be transmesenteric, those through the broad ligament, or transomental, with transmesenteric being the commonest IAHs [7,8]. Mesenteric defects are found in 0.5% of all autopsies, but adult cases of transmesenteric hernias are rare.



Fig. 1. X-Ray abdomen (erect) shows air-fluid levels with valvulae conniventes.



Fig. 2. Intraoperative picture shows herniation of the distal ileum through the mesenteric defect.



Fig. 3. Shows a defect in small bowel mesentery (through which herniation had taken place) near the ileocolic junction.

Transmesenteric hernias that occur via defects in the mesentery are more frequently due to congenital mesenteric defects. One popular theory explaining the mechanism of this entails prenatal intestinal ischemia resulting in thinning of mesenteric leaves. Genetic causation is also advised due to the association of transmesenteric hernia with cystic fibrosis and Hirschsprung disease [3,9,10]. Acquired transmesenteric

internal hernias occur commonly after gastrointestinal surgeries like laparoscopic Roux-en-Y gastric bypass surgery, transmesocolic being the commonest [11,12]. The second type occurs when the bowel protrudes through small bowel mesentery, and the third type, commonly called the Peterson type involves small bowel protrusion behind the Roux loop before passing through the defect in the transverse mesocolon [13]. Our patient had not undergone any surgical procedure in the past and had no history of abdominal trauma.

Clinically, IAHs are hard to detect, with constitutional symptoms being abdominal pain and distension which can be thought to be caused by a wide range of etiologies before IAHs [10,14]. Moreover, transmesenteric hernias are often not the cause of small bowel obstruction, constitute a rare cause of small bowel strangulation in adults, and thus pose a diagnostic challenge for the pre-operative diagnosis [15]. Let alone the probability of being clinically diagnosed, lack of specific radiological or laboratory findings preclude IAHs from being diagnosed preoperatively, and misdiagnosis leading to delayed exploration may lead to bowel ischemia and mortality [16]. Most cases are diagnosed very late; many times at the time of laparotomy after clinical picture and radiographic findings suggestive of bowel obstruction. This delay causes life-threatening bowel ischemia [1]. As mentioned, owing to this diagnostic dilemma, a segment of the small intestine was non-viable in our case too.

As there is a rapid progression of intestinal obstruction to bowel ischemia, time-consuming diagnostic workup before surgery may be dangerous for such patients. A careful clinical examination and imaging studies are pivotal. CT scan is the gold standard test in IAHs, but diagnosis of transmesenteric hernia is extremely challenging. A CT scan although not specific can provide some degree of suspicion of transmesenteric hernia. Blachar et al. described small bowel dilation, a cluster of small bowel loops, central displacement of the colon, and a lack of omental fat overlying the cluster and displacement of the mesenteric trunk as the characteristic findings of a transmesenteric hernia [17]. However, the imaging findings don't allow distinction between any IAHs, and specific IAH's presence can only be made after exploration. Unavailability of emergency CT scan and considering life-threatening complications, CT scan was not performed in our case.

Urgent surgical intervention to prevent strangulation, which is responsible for high mortality, is imperative. Delay in doing so can lead to disastrous consequences due to gangrenous bowel [3]. However, identification of this entity is time-consuming and often delays the diagnosis which contributes to high mortality of IH despite medical advances [1]. Early laparotomy, reduction of hernia, and closure of the defect are the operative management for the transmesenteric hernia. When the bowel is incarcerated too tightly to reduce, and the bowel is still viable, it may be necessary to enlarge the defect as well. In the case of necrotic bowel, resection of the concerned bowel segment with anastomosis is done [3,18]. Concluding the operative procedure, the entire mesentery is searched to detect other mesenteric defects to prevent future herniation [19]. In addition, complete closure of the potential defects that may predispose to IAH is essential for prevention and recurrences.

4. Conclusion

Early evaluation and a high index of suspicion are required for clinicians while assessing the patient with symptoms suggestive of acute bowel obstruction as the preoperative diagnosis of a transmesenteric hernia is challenging. Timely surgical intervention and careful exploration of the whole mesentery after reduction of hernia can help prevent recurrences.

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Ethical approval

Not Applicable.

Consent

Written informed consent was obtained from the patients 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 contribution

Bibek Man Shrestha- Study concept, data collection and writing the paper. Suraj Shrestha- Study concept, data collection and writing the paper. Shiva Aryal- Study concept, data collection and writing the paper. Susan Pradhan- Study design, data analysis and surgical therapy of the patient. Romi Dahal- Study design, data analysis and surgical therapy of the patient. Prasan Bir Singh Kansakar- Study design, data analysis and surgical therapy of the patient. Prasan Bir Singh Kansakar = senior author and manuscript reviewer. All the authors read and approved the final manuscript.

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