Treves’ field transmesenteric hernia causing acute small bowel obstruction in a 9-year-old girl

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A B S T R A C T

Intestinal obstruction usually occurs as a result of postoperative adhesion; only rarely have there been reports of Treves’ field transmesenteric hernia as a cause of intestinal obstruction in patients without preceding abdominal surgery. A 9-year-old girl presented with recurrent episodes of abdominal pain and vomiting. A plain radiograph showed mechanical bowel obstruction, and abdominal CT failed to show a definitive etiology of the obstruction. Laparotomy revealed Treves’ field transmesenteric herniation without bowel strangulation. Reduction and closure of the defect cured the patient. Recurrent obstructive symptoms and spontaneous resolution can be a presentation of Treves’ field transmesenteric hernia in patients without predisposing factors of intraabdominal adhesion. Diagnosis could be aided by radiological examination, but prompt initiation of surgical exploration on the basis of clinical presentation is mandatory in suspected cases to avoid significant bowel injury.

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In most cases, acute small bowel obstruction occurs as a result of bowel adhesion in patients with previous history of laparotomy; internal hernia accounts for a much smaller proportion of causes of acute small bowel obstruction. We herein report a case of acute small bowel obstruction in a 9-year-old girl who had never undergone abdominal surgery and was ultimately diagnosed with internal herniation through the congenital mesenteric defect in Treves’ field.

1. Case report

A 9-year-old girl presented with abdominal pain and vomiting that had worsened for 24 h prior to arrival. She did not have a history of prior abdominal surgery but had recurrent episodes of abdominal pain and vomiting without definitive diagnosis. She demonstrated normal growth parameters, including height and weight. On physical examination, her abdomen was distended, bowel sounds were hyperactive, but neither tenderness to palpation nor rebound tenderness was present. Simple radiograph of the abdomen showed multiple air-fluid levels suggestive of mechanical bowel obstruction. Abdominal computed tomography (CT) failed to demonstrate the obstructing lesion; only markedly dilated small bowel loops with enhanced wall thickening in the terminal ileum and cecum were noted. Emergency laparotomy was performed, and a short segment of ileum near the terminal ileum measuring 4 × 4 cm was noted to have herniated through the mesenteric defect, causing obstruction (Fig. 1A). Bowel ischemia was absent, and resection was not required. The herniated segment was reduced, and the defect was closed in a primarily interrupted fashion (Fig. 1B). The postoperative course was uneventful, and the patient was discharged five days after the operation.

2. Discussion

The most common cause of bowel obstruction is postoperative adhesion, and patients in whom bowel obstruction is suspected usually have a history of prior abdominal surgery. In the absence of previous laparotomy, various conditions can cause mechanical obstruction, and hernias such as inguinal, ventral, or internal hernias account for about 10% of small bowel obstruction [1]. Among those hernias, transmesenteric hernia through a mesenteric defect accounts for only 8% of all internal hernias [2,3].

In adults, mesenteric defects are usually the result of previous surgery or trauma, but the development of a mesenteric defect has been recognized as congenital in children. Three etiologic hypotheses have been proposed to explain congenital mesenteric defects: (1) partial regression of the dorsal mesentery, (2) fenestration during developmental enlargement of an inadequately vascularized
area, and (3) an ileocecal mesentery with rapid lengthening in fetal life [4]. Most congenital mesenteric defects are usually 2–5 cm in diameter and are located close to the ligament of Treitz or the ileocecal valve [5]. The mesentery near the ileocecal valve is called the field of Treves. Treves, an English surgeon who first defined and characterized this area, noted that the terminal ileal mesentery is occasionally devoid of fat, blood vessels, and lymphatics [6]. Considering the hypotheses suggested above, those mechanical properties make Treves’ field vulnerable to the development of a congenital defect.

Given its rarity, there are few reports of Treves’ field congenital hernia and its clinical characteristics. Vaos and Skondras reported on 4 patients (ages, 28 days–7 years; male to female ratio, 2:2) with intestinal obstruction of unidentifiable causes, all of which were Treves’ field congenital hernia after laparotomy [7]. Non-specific clinical manifestations and limited information (isolated small bowel obstruction) on imaging made the cases difficult to accurately diagnose before operation. As such, diagnostic delay led to irreversible damage of the small bowel, and the mortality rate was 25%. More recently, Saka et al. published a report of 5 patients as well as a literature review and showed that 67.6% of cases were patients aged <5 years (range, neonate – 15 years), neonates comprised 29.4% of cases, bowel was gangrenous in 70% of cases, and resection was required in 17 of 31 cases, with a mortality rate of 26.5% [8]. In our case, early surgical intervention and a relatively short interval between the onset of symptoms and hospital admission might have been contributing factors for a cure without resection.

Although we did not correctly diagnose the patient before surgery, most cases in the literature were also diagnosed by exploration. Abdominal CT has been reported to provide a few radiological clues. As the mesenteric defect itself is not visualized, observation of clustering of small bowel loops and abnormalities of the mesenteric vessels play an important role in the diagnosis of transmesenteric hernia. The abdominal CT shows a characteristically engorged, stretched, and crowded mesenteric vascular pedicle, and there is displacement of the main mesenteric trunk [9,10]. Our patient did not show the typical findings associated with transmesenteric hernia on abdominal CT, but the best result was achieved in this patient by prompt surgical intervention based on clinical decision. We speculate that, in the absence of radiological evidence of transmesenteric hernia, clinicians should decide to proceed to surgical intervention on a clinical basis to prevent irreversible bowel injury. In other words, interpretation of radiological evaluation should not delay surgical intervention. As shown in our case, a history of chronic, intermittent abdominal pain with vomiting, which implies repeated herniation and spontaneous reduction, may be suggestive of the diagnosis of non-complicated Treves’ field transmesenteric hernia in the absence of previous abdominal surgery, trauma, infection, or incarcerated external hernia. Clinicians should bear this rare type of internal hernia that causes small bowel obstruction in mind, and rapid decision regarding timely surgical treatment should be made with or without relevant radiological information.

Most reported cases presented with bowel necrosis; thus, resection was inevitable, and the length of the strangulated small bowel varied from a short loop to almost the entire small bowel [8]. As this type of hernia has no hernia sac, which would otherwise limit the length of herniated bowel, a significant portion of bowel tends to be herniated and strangulated through the narrow defect [11]. Although our case involved a relatively short segmental herniation without strangulation, the “golden time” to save the bowel would have been missed by any delay in surgical treatment.

3. Conclusions

In summary, we successfully treated a Treves’ field transmesenteric hernia causing acute small bowel obstruction in a 9-year-old girl who had no previous history of laparotomy. Abdominal CT failed to give diagnostic information, and definitive diagnosis was obtained after laparotomy. Mesenteric defect was noted at Treves’ field with herniation of ileal loops. Simple reduction and closure of the defect cured the patient. Although rare, Treves’ field transmesenteric hernia could be a cause of acute intestinal obstruction in patients who lack predisposing factors for intra-abdominal adhesion. Diagnosis could be aided by radiological examination, but clinical diagnosis and rapid surgical intervention would be more important to avoid significant bowel resection.

Conflict of interest

There were no conflicts of interest.

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References


Fig. 1. (A) Mesenteric defect, sized 4 × 4 cm, was noted in Treves’ field mesentery (note the appendix in Babcock clamp), and (B) the defect was closed in an interrupted fashion.