Case Report

Access this article online
Website: www.afrjpaedsurg.org
DOI: 10.4103/0189-6725.78934
Quick Response Code:

Small bowel obstruction caused by congenital transmesenteric defect

F. Nouira, Ben M. Dhaou, A. Charieg, S. Ghorbel, S. Jlidi, B. Chaouachi

ABSTRACT

Transmesenteric hernias are extremely rare. A strangulated hernia through a mesenteric opening is a rare operative finding. Preoperative diagnosis still is difficult in spite of the imaging techniques currently available. The authors describe two cases of paediatric patients presenting with bowel obstruction resulting from a congenital mesenteric hernia. The first patient had a 3-cm wide congenital defect in the ileal mesentery through which the sigmoid colon had herniated. The second patient is a newborn infant who presented with symptoms and radiographic evidence of neonatal occlusion. At surgical exploration, a long segment of the small bowel had herniated in a defect in the ileal mesentery. A brief review of epidemiology and anatomy of transmesenteric hernias is included, along with a discussion of the difficulties in diagnosis and treatment of this condition.

Key words: Bowel obstruction, children, congenital, internal hernia

INTRODUCTION

An internal hernia is defined as the herniation of viscera through an anatomic or pathologic opening within the confines of the peritoneal cavity. Transmesenteric hernia is a form of internal hernia through a congenital defect in the mesentery. It is a rare but serious cause of intestinal obstruction. Although dated, the largest review of this subject reported a morality rate of up to 45%.[1] Despite the congenital nature of the mesenteric defect, this phenomenon can present at any age, with adults making up most of the cases reported.[2] We report two cases of transmesenteric herniation in the paediatric population.

Department of Pediatric Surgery, Children's Hospital, Tunis, Tunisia

Address for correspondence:
Dr. Nouira Faouzi, Department of Pediatric Surgery, Tunis Children's Hospital Bab Saadoun Jebbari 1007, Tunis, Tunisia.
E-mail: nouirafaouzi@yahoo.fr

CASE REPORTS

Case 1

A 12-year-old female presented to the emergency department with a 1-day history of lower abdominal pain with bilious emesis. Her past medical history was significant for recurrent constipation and abdominal pain during her first year of life. On presentation to our institution, her abdomen was soft, although tender and mildly distended. No masses were palpable. The laboratory findings showed a high white blood cell count (40×10^3 per cubic millimeter), and an elevated C-reactive protein level (100.7 mg/L). Plain abdominal radiograph showed gaseous distension of the small bowel. Abdominal sonography (AS) showed fluid-filled dilated small bowel loops. Subsequently, the patient underwent computed tomography scan (CTS). Because of vomiting and abdominal distension, no oral contrast agent was administered and intravenous enhanced CTS showed diffuse dilatation of small intestinal loops with fluid retention. The patient was brought to the operating room for emergent laparotomy. At the exploration, a long segment of the small bowel (1.5 m) and the sigmoid colon were infracted. The sigmoid colon was found to pass through a wide defect in the mesentery of the terminal ileum with compression of vascularisation of the small bowel [Figures 1, 2]. The mesenteric defect was enlarged and the herniated intestine was carefully reduced. Although the sigmoid colon and the long segment of the small bowel were completely resected. A descending colostomy was created, leaving a Hartman pouch inside and an end-to-end ileal anastomosis was performed. The mesenteric defect was localised to the distal ileal mesentery and measured 5 cm in diameter. The mesenteric defect was repaired by suturing the mesenteric sides of the bowel together, forming an ileal loop. The patient was recovered uneventfully in the intensive care unit. She was discharged on postoperative day 11. The reconstruction and restoration of bowel continuity was perfomed succesfully 2 months later.

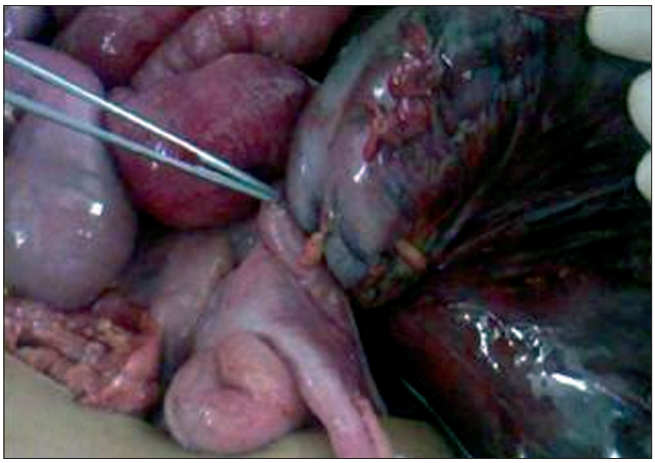


Figure 1: The sigmoid colon through a wide defect in the mesentery of the terminal ileum

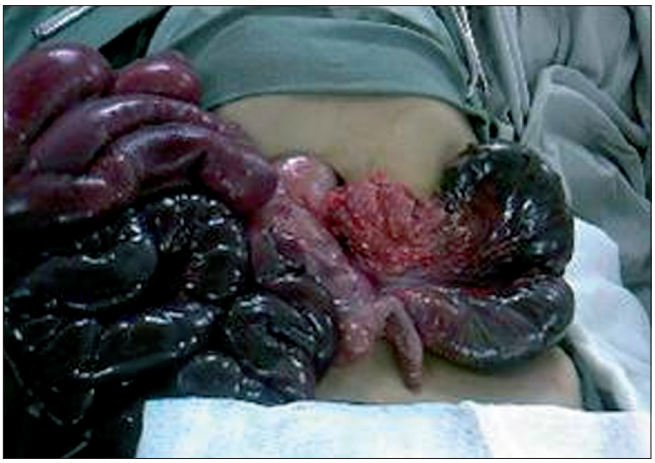


Figure 2: A long segment of the small bowel (1.5 m) and the sigmoid colon were infracted

Case 2

A term newborn infant was transferred to our institution on the first day following birth. He had developed abdominal distension with bilious emesis after beginning oral feedings. Examination revealed a soft but distended abdomen with no palpable masses. Laboratory examination was unremarkable. Plain abdominal radiograph showed gaseous distension of the small bowel. Abdominal sonography performed by the ED paediatrician showed fluid-filled dilated small bowel loops. The child was brought emergently to the operating room for laparotomy. At the exploration, the small intestine was twisted, but there was no evidence of malrotation or malfixation. Rather, there was a transmesenteric defect in the distal ileal mesentery through which long segment of the small bowel had herniated [Figure 3]. Engorged mesenteric vessels and some thrombotic mesenteric veins were also noted. Manual decompression, lysis of the adhesions, and resection of gangrenous small bowel (20 cm) with an end-to-end ileal anastomosis were performed. The mesenteric defect was closed with absorbable suture. The child was transferred back to the neonatal intensive care unit postoperatively. The remainder of his hospital course was uneventful. He advanced quickly to full oral feedings and was discharged to home on fourth postoperative day.



Figure 3: Transmesenteric defect in the distal ileal mesentery through which long segment of the small bowel had herniated

DISCUSSION

Most internal hernias occur postoperatively, resulting from incomplete closure of surgically created mesenteric defects. It is well known that internal hernias in general are rare malformations, especially those that are transmesenteric, because the majority of internal hernias are paraduodenal (53%).[2] It is estimated that internal hernias have an incidence of 0.2–0.9%[3] and account for 0.6–5.8% of all cases of small bowel obstruction.[4] Congenital transmesenteric hernias constitute only 8% of internal hernias, making these a rare cause of obstruction.[2,4] The risk of developing a hernia in the presence of these defects is unknown.[1] In 1836, Rokitansky reported the first case of transmesenteric hernia, found at autopsy, in which the caecum had herniated through a defect in the mesentery near the ileocaecal valve. In 1885, Treves described a part of the mesentery near the terminal ileum that was circumscribed by the junction of the ileocolic artery and the last branch of the ileal artery. This area, later named Treves' Field, was noted to contain no fat, no visible blood vessels, and no lymph nodes, making it highly susceptible to injury during development.[5] The pathogenesis of mesenteric defects is uncertain. One popular theory relates the cause to prenatal intestinal ischaemia and subsequent thinning of the mesenteric leaves because the prenatal intestinal

ischaemia is associated with bowel atresia in 5.5% of the paediatric population.[6,7] Although many hypotheses have been advanced including regression of the dorsal mesentery, rapid lengthening of a segment of mesentery, and compression of the mesentery by the colon during foetal midgut herniation into the yolk sac, these causes could be borne out of the foetal environment. Conversely, reported associations of transmesenteric hernia with other anomalies including cystic fibrosis and Hirschprung disease may suggest a genetic aetiology.[8] In patients with mesenteric defects, loops of bowel are thought to pass in and out through the defect, giving rise to intermittent obstructive symptoms of abdominal pain, distension, nausea, vomiting, and constipation. Distension of a herniated loop may result in incarceration with subsequent progression to strangulation and shock. In chronic cases, symptoms are vague and intermittent, and preoperative diagnosis is extremely rare.[9] Recurrent attacks are often misdiagnosed as peptic ulcer, biliary disorders, or abdominal angina.[3] On physical examination, patients typically have abdominal tenderness. A palpable mass is present in 8% and bowel sounds may be normal.[4]

The diagnosis of mesenteric hernia is difficult in part because there are no radiographical or laboratory findings to confirm the suspicion. Laboratory tests might show leucocytosis and metabolic acidosis as the bowel becomes gangrenous but are typically within normal limits.[9] In our cases, only one patient had high white blood cell count and an elevated C-reactive protein level. Plain films may show signs of intestinal obstruction such our cases.[10] An abdominal CT might show a constriction around closely approximated afferent and efferent limbs of the herniated bowel, and superior mesenteric arteriogram may show displacement of vessels as they pass through the defect to supply the herniated segment.[3,6] Additionally, CT is much faster to perform than other diagnostic imaging modalities; however, there are not well-established CT criteria for diagnosing internal hernia. Hence, negative results on radiological examination should not influence the decision to operate if clinical suspicion exists. Misdiagnosis resulting in delayed exploration may lead to small bowel necrosis and subsequent mortality. Currently, surgical exploration is the only means of definitive diagnosis. The difficulty in diagnosis in the paediatric patient is only compounded by the rarity with which this entity is seen in this population.[11] Most patients present in their late teens or as adults. The potential for diagnostic dilemma is evident in the history presented by our first patient who presented with recurrent episodes of constipation and abdominal pain. Although it is speculative to say these symptoms are because of recurrent herniation, in the absence of another diagnosis, a missed mesenteric hernia must be considered. Earlier diagnosis and intervention could have potentially spared the patient a partial colectomy. Most mesenteric defects that lead to herniation occurring in the small bowel mesentery are 2–5 cm wide, and trap a loop of ileum.[12] Previously, Tow *et al*.[13] described the case of a newborn with meconium peritonitis secondary to necrosis of infracted bowel through a mesenteric hernia. The early postnatal presentation and dramatic dilation of the small bowel in our second case similarly suggest prenatal herniation. Despite the low incidence in this age group, our patient reinforces the need to consider this diagnosis in the neonatal population.

Among the three main types of transmesenteric hernias, type one has been reported more frequently in the literature, but the second type that occurs when the bowel prolapses through a defect in the small bowel mesentery was the most common type in this study. Transmesenteric hernias are more likely to develop volvulus and strangulation or ischaemia.[2] The mortality of the transmesenteric hernias is reported to be as high as 50%. In this study, the patient's hospital course was uneventful.

In conclusion, transmesenteric hernias usually rapidly progress to bowel ischaemia once strangulated and have no definitive predictors. Because of the difficulty with diagnosis and the potentially disastrous complication of gangrenous and even perforated bowel, symptomatic patients with signs of small bowel obstructions on an abdominal plain film should undergo a rapid evaluation for proper immediate therapy. A high index of suspicion is mandatory to prevent delay.

REFERENCES

1. Janin Y, Stone AM, Wise L. Mesenteric hernia. Surg Gynecol Obstet 1980;150:747-54.
2. Akyildiz H, Artis T, Sozuer E, Akcan A, Kucuk C, Sensoy E, *et al*. Internal hernia: Complex diagnostic and therapeutic problem. Int J Surg 2009;7:334-7.
3. Ghahremani GG. Internal abdominal hernias. Surg Clin North Am 1984;64:393-406.
4. Dowd MD, Barnett TM, Lelli J. Case 02-1993: A three-year-old boy with acute-onset abdominal pain. Pediatr Emerg Care 1993;9:174-8.
5. Veyrie N, Ata T, Fingerhut A. abdominal internal hernia. J Chir 2007,144.
6. Ghahremani GG. Abdominal and pelvic hernias. In: Gore RM, Levine MS, editors. Textbook of gastrointestinal radiology. 2nd ed. Philadelphia, PA: Saunders; 2000. p. 1993-2009.
7. Newsom BD, Kukora JS. Congenital and acquired internal hernias: Unusual causes of small bowel obstruction. Am J Surg 1986;152:279-84.

8. Martin L, Merkle E, Thompson W. Review of internal hernias: Radiographic and clinical findings. AJR Am J Roentgenol 2006;186:703-17.
9. Lamphier T. Incarcerated transmesenteric hernia: A case report. Am J Proctol Gastroenterol Colon Rectal Surg 1982;33:12-3.
10. Arnheim EE, Razin E. Mesenteric hernias in infancy and childhood. J Mt Sinai Hosp N Y 1961;28:543-9.
11. Vaos G, Skondras C. Treve's field congenital hernias in children: An unsuspected rare cause of acute small bowel obstruction. Pediatr Surg Int 2007;23:337-42.
12. Fujita A, Takaya J, Takada K, Ishihara T, Hamada Y, Harada Y, *et al*. Transmesenteric hernia: Report of two patients with diagnostic emphasis on plain abdominal X-ray finding. Eur J Pediatr 2003;162:147-9.
13. Tow A, Hurwitt ES, Wolf JA. Meconium peritonitis due to incarcerated mesenteric hernia: Recovery following operation for intrauterine rupture of intestine. AMA Am J Dis Child 1954;87:192-203.

Cite this article as: Nouira F, Dhaou BM, Charieg A, Ghorbel S, Jlidi S, Chaouachi B. Small bowel obstruction caused by congenital transmesenteric defect. Afr J Paediatr Surg 2011;8:75-7.

Source of Support: Nil, **Conflict of Interest:** None declared.

Author Help: Reference checking facility

The manuscript system (www.journalonweb.com) allows the authors to check and verify the accuracy and style of references. The tool checks the references with PubMed as per a predefined style. Authors are encouraged to use this facility before submitting articles to the journal.

- The style as well as bibliographic elements should be 100% accurate to get the references verified from the system. A single spelling error or addition of issue number / month of publication will lead to error to verifying the reference.
- Example of a correct style
  Sheahan P, O'leary G, Lee G, Fitzgibbon J. Cystic cervical metastases: Incidence and diagnosis using fine needle aspiration biopsy. Otolaryngol Head Neck Surg 2002;127:294-8.
- Only the references from journals indexed in PubMed would be checked.
- Enter each reference in new line, without a serial number.
- Add up to a maximum 15 reference at time.
- If the reference is correct for its bibliographic elements and punctuations, it will be shown as CORRECT and a link to the correct article in PubMed will be given.
- If any of the bibliographic elements are missing, incorrect or extra (such as issue number), it will be shown as INCORRECT and link to possible articles in PubMed will be given.