



Especial internal herniation through mesentery of Meckel's diverticulum

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ABSTRACT

Acute intestinal obstruction is a common surgical emergency worldwide, and it is a result of different causes. Meckel's diverticulum is a well - established cause of intestinal obstruction in adults. However, cases of intestinal obstruction arising from internal herniation of bowel through the mesentery of Meckel's diverticulum is a very atypical entity. Precise diagnosis of internal herniation of bowel through the mesentery of Meckel's diverticulum is not possible preoperatively owing to its rarity. We reported a very rare and especial case of a young gentleman with intestinal obstruction as a complication of herniation through mesentery of Meckel's diverticulum diagnosed intraoperatively and managed successfully by timely and immediate surgical intervention.

Key words: Meckel's diverticulum, Internal hernia, Small bowel obstruction

Introduction

Meckel's diverticulum is a frequently seen congenital anomaly of the small intestine. The studies of the autopsy have found its incidence to be about 2%, one of the constituents of the famous rule of two for Meckel's diverticulum [1]. Most of the symptomatic patients are below two years of age with bleeding per rectum as the most common symptom. In a lifetime risk of developing various complications associated with Meckel's diverticulum is estimated to be about 4% and the average mortality rate of the patients developing symptoms is 6% [2]. These figures reflect that the incidence of Meckel's diverticulum is high. However, subsequent development of symptoms is low and is most often seen in younger people.

Intestinal obstruction in relation to the Meckel's

is the most common complication of the adults. Various reasons leading to obstruction are volvulus of the small gut as a result of a persistent band between the umbilicus and the diverticulum, herniation of small bowel in between the mesentery or persistent vitelline or mesodiverticular vessel, or adhesions of Meckel's to adjacent mesentery and forming a potential defect for herniation. Thorough knowledge of this omphalomesenteric duct remnant is helpful in dealing various associated life-threatening complications. Our case is a young gentleman with acute intestinal obstruction due to internal herniation of small bowel through the mesentery of Meckel's diverticulum diagnosed intraoperatively and managed successfully by timely and immediate surgical intervention.

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Case Report

A 19-year-old male was admitted to the emergency room for absolute constipation for two days and colicky abdominal pain, which he experienced for one day, which was localized in the lower abdomen, intermittent and of moderate intensity. It was accompanied by three episodes of bilious vomiting and fever since one day. The patient did not give any positive history regarding previous surgical exposure, trauma or comorbid conditions. On physical examination, the patient had dehydration with a pulse rate of 110 per minute, Blood Pressure of 110/68 mm of Hg. On performing the abdominal examination, distention was seen with tenderness in the right lower quadrant without guarding and rebound tenderness.

On auscultation, the bowel sounds were hyperperistaltic. The digital rectal examination had no positive findings. Laboratory investigations were within normal limits. Abdominal X rays in supine and standing position revealed multiple air-fluid levels with dilated jejunal loops. Ultrasonography of the abdomen revealed dilated small intestine measuring up to 46 mm with minimal inter-loop fluid.

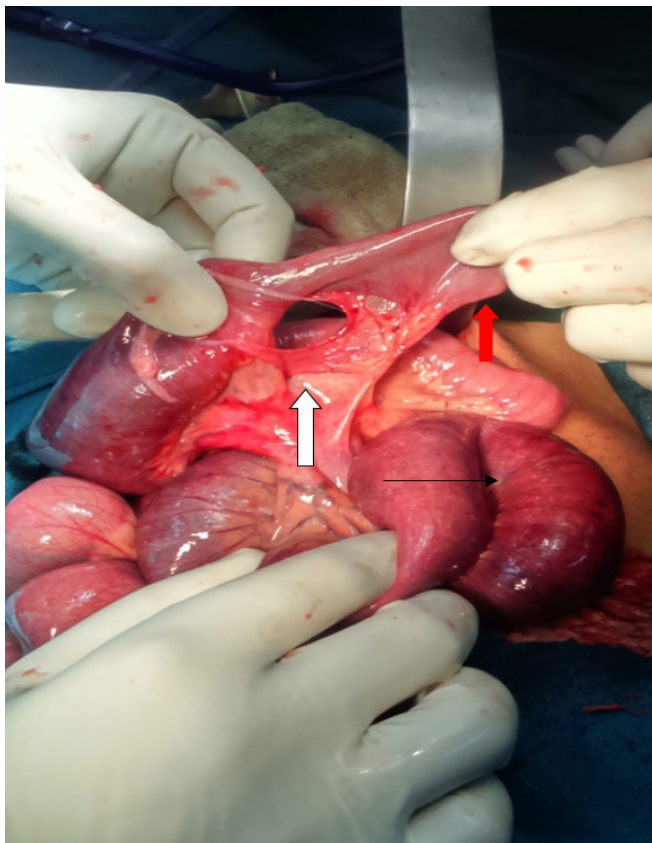


Figure 1. An internal hernia (White arrowhead) of the mesentery of Meckel's diverticulum (Red arrowhead) with reduced viable bowel (Black arrow).

Diagnosis of acute small bowel obstruction was made, and the patient was resuscitated and taken up for exploration. On laparotomy dilated small gut was found from the ligament of Treitz up to 2.5 feet proximal to the ileocaecal junction. The ileum was seen herniating through a defect of approximately 3 cm in size in the mesentery of Meckel's diverticulum (Figure 1). The ileum was dusky in color which was reduced manually and was viable. Meckel's diverticulectomy was done with removal of its attached mesentery along with defect in it. Postoperative period of the patient was uneventful and was discharged on the seventh postoperative day.

Discussion

Meckel's diverticulum is a remnant of omphalomesenteric (Vitellointestinal) duct, which usually gets obliterated by 5th to 8th week of gestation. Meckel's diverticulum is a true diverticulum involving all the layers of the bowel, arising from the antimesenteric border of the small bowel and is usually located 45 to 60 cm proximally to the ileocecal junction. Hildanus was the first to report it in the year 1598, and Johan Meckel elaborated it in detail in 1809 [2,3].

It derives its blood supply from persistent vitelline vessels, which run in a distinct mesentery and arise from the superior mesenteric artery or sometimes from the ileocolic artery. The size of the Meckel's diverticulum ranges from 1 to 2 cm in width and 1 to 12 cm in length. Embryologically vitelline duct's cell lining retains pluripotent potential, which may give rise to heterotopic tissue inside the diverticulum [4].

Meckel's diverticulum is seen in approximately 1-3% of the population with the same frequency in males and females. However, symptoms are usually seen in males [5]. It is considered as the most common congenital anomaly of the gastrointestinal tract. Most patients remain asymptomatic; however, a few develop symptoms as a fallout of complications which could be hemorrhage, small bowel obstruction, diverticulitis, perforation, peptic ulcer - like pain, and sometimes, malignancy and umbilical lesions. Hemorrhage is more common in children, while small bowel obstruction, which is mostly seen in adults, accounts for one-third of all symptomatic cases [6]. Several reasons leading to obstruction are volvulus of the small gut as a result of a persistent band between the umbilicus and the di-

verticulum. The other being herniation of small bowel in between the mesentery or persistent vitelline or mesodiverticular vessel. Adhesions of Meckel's to adjacent mesentery with formation of a potential defect for herniation and intussusceptions of the inverted diverticulum, malignancy, bezoars, stricture and very rarely internal herniation through the mesentery of Meckel's diverticulum being the other few causes [7].

Internal hernias comprise up to 5.8% of intestinal obstructions with paraduodenal being the most common [8]. Internal herniation through the mesentery of Meckel's diverticulum leading to obstruction is a very rare entity. A similar rare case of internal herniation within the mesentery of Meckel's diverticulum has been reported in literature almost half a century back by Dalinka et al. [9] Another unusual case of internal herniation was reported by Pandovea et al., in 2015 consisting unusual adhesion band with internal herniation of gut into the mesentery of Meckel's diverticulum [10]. Our case seems to be the third similar case reported in the literature.

Diagnosis of small bowel obstruction is based upon detailed history, thorough clinical examination, abdominal radiographs, and CT scan, however, to delineate Meckel's diverticulum and its various mechanisms leading to obstruction is not possible preoperatively. Preoperative diagnosis of internal herniation of bowel through the mesentery of Meckel's diverticulum is not possible owing to its rarity. The decision to explore is based on clinical and radiological findings of obstruction. The bowel is reduced, its viability assessed, resection if nonviable with Meckel's diverticulectomy and if the bowel is viable only, Meckel's diverticulectomy, after reduction of the bowel, along with its mesentery.

Conclusion

Meckel's diverticulum is a rare, but also, a known reason behind the intestinal obstruction, however, cases of intestinal obstruction arising from internal herniation of the bowel through the mesentery of Meckel's diverticulum is an especial entity. Internal herniation into the mesenteric defect of Meckel's diverticulum is hardly thought of in the differential diagnosis of intestinal obstruction. This extremely rare case depicts the importance of early surgical intervention in cases of acute

intestinal obstruction of unknown etiology to prevent associated morbidity and mortality instead of delaying and searching for the precise cause of obstruction.

Conflict of interest statement

The authors have no conflicts of interest to declare.

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