



Contents lists available at ScienceDirect

International Journal of Surgery Case Reports

journal homepage: www.casereports.com

Meckel's diverticulum mesentery along with its band forming a hernial sac: A rare case of internal herniation



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ARTICLE INFO

Article history:

Received 5 October 2014

Received in revised form 4 March 2015

Accepted 4 March 2015

Available online 7 March 2015

Keywords:

Adhesion band

Internal herniation

Meckel's diverticulum

Mesentery of Meckel's

Obstruction

ABSTRACT

INTRODUCTION: Meckel's diverticulum is the most common congenital gastrointestinal anomaly. However, only 2% of cases are symptomatic. It can cause intestinal obstruction by various mechanisms as volvulus, adhesions, Littre's hernia, intussusception.

CASE PRESENTATION: An unusual case of internal herniation of small bowel loops into complete hernia sac formed by unusual mesentery of Meckel's diverticulum which was present upto the adhesive band, extending from tip of the Meckel's diverticulum to the adjacent mesentery of small intestine leading to small bowel obstruction (SBO). Diverticulectomy with resection of adjacent ileum with ileo-ileal anastomosis was done.

DISCUSSION: Internal herniation by MD leading to SBO is an extremely rare complication. In literature, cases of internal hernia through mesentery of Meckel's diverticulum, through mesodiverticular band, adhesion of inflamed end of MD to corresponding base of mesentery, fibrous cord extending upto umbilical wall have been reported but in our case, patient had both adhesion band along with internal herniation into sac formed by unusual mesentery of the meckel's diverticulum and the adhesion band. Preoperative diagnosis is often difficult with only 6–12% of cases diagnosed correctly. Surgical intervention is indicated for patients with intestinal obstruction or high risk of incarceration.

CONCLUSION: Meckel's diverticulum causing internal hernia is rare event. It's presentation due to herniation of bowel loops into sac formed by mesentery attached to diverticulum and the adhesion is rarest, with non specific signs and symptoms. Early diagnosis and prompt treatment prevent further complications.

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1. Introduction

Meckel's diverticulum (MD) is the most common congenital malformation of gastrointestinal tract [1–4]. It is the remnant of omphalomesenteric duct which is normally obliterated by 7th week of gestation. Most patients are asymptomatic. Those patients who develops symptoms are due to its complications which could be bowel obstruction, hemorrhage, diverticulitis, perforation or other umbilical lesions [1,3,4]. Small bowel obstruction is the most common presentation in adults accounting for 1/3rd of all symptomatic cases [4].

2. Case report

A 14 year old male presented to Emergency with complaint of pain abdomen with history of constipation with passage of flatus, vomiting (5–6 episodes) and mild abdominal distension since 3 days. Patient also gave history of minor blunt trauma abdomen 4 days back and subsequently, a day later patient developed the symptoms. On abdominal examination, the abdomen was soft, non tender and bowel sounds were present with soft stools on per rectal examination. Ultrasound abdomen revealed dilated gut loops with fluid in pelvis suggestive of SBO. X-ray abdomen revealed multiple air fluid levels.

Fluid resuscitation and antibiotics were started and patient was put on conservative management and patient had relief of symptoms with passage of stools and flatus but again after 2 days developed the features of SBO for which exploratory laparotomy was undertaken for the persistent feature of SBO. Intra-operatively, jejunum was collapsed with proximal ileal loop distension. About 50 cm away from ileo-caecal junction, was herniated loops of bowel through unusual mesentery of Meckel's extending from base

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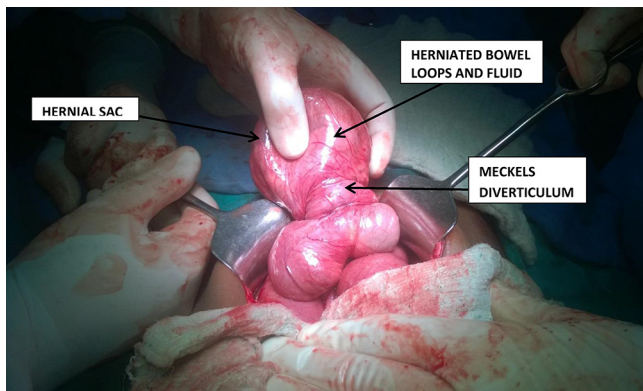


Fig. 1. Showing hernial sac formed by the unusual mesentery with herniated bowel loops and fluid and Meckel's diverticulum encircling the sac.

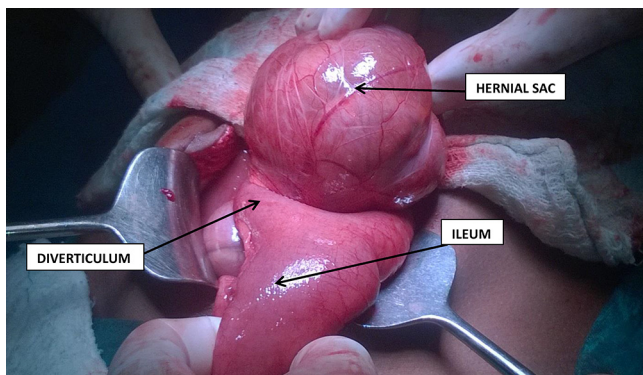


Fig. 2. Another view showing Meckel's diverticulum arising from ileum along with hernial sac and its contents.

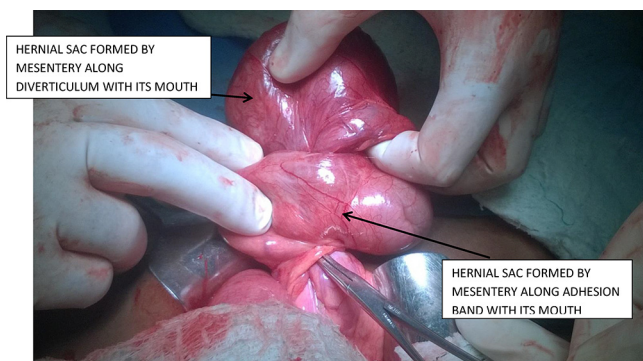


Fig. 3. Showing two parts of sac with its content, one formed by mesentery along adhesive band with its mouth and other by mesentery along diverticulum with its mouth.

of diverticulum to the band which was running from its tip to adjacent mesentery encircling the herniated loops of intestine forming a complete hernial sac (Figs. 1–3). The attachment of the diverticulum along with its adhesive band was rotated over the hernial sac in such a way thus giving the appearance of bilobed sac (Fig. 5b).

Careful manual reduction of herniated loops was done (Fig. 4) and the band was released which revealed Meckel's diverticulum with its mesentery forming the hernial sac (Fig. 5a). Diverticulectomy with its mesentery and adjacent portion of the ileum with ileo-ileal anastomosis was done in single layer. After proper peritoneal toileting, abdomen was closed over an abdominal drain. Post operative period was uneventful and patient remained asymptomatic in subsequent follow ups. Biopsy of diverticulum revealed ectopic gastric and pancreatic tissue with inflammatory cells.

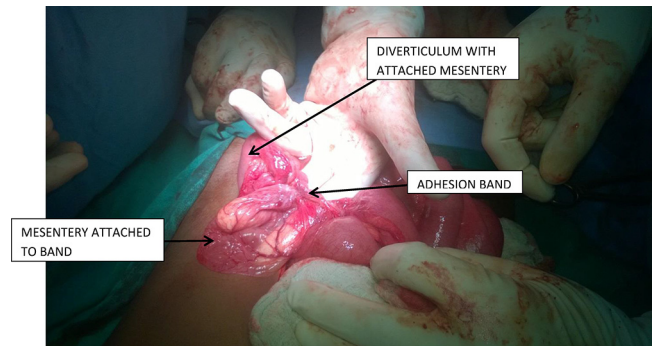


Fig. 4. After reduction of hernial contents, showing diverticulum, adhesion band and the attached mesentery.

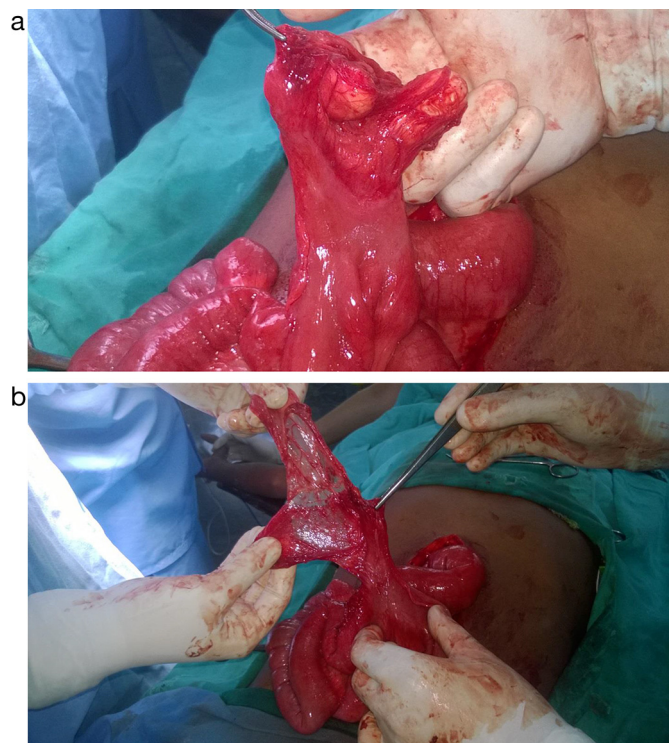


Fig. 5. (a) After division of the band showing the diverticulum and attached mesentery. (b) Showing bilobed appearance of the sac.

3. Discussion

Meckel's diverticulum is the remnant of the Vitello intestinal duct. It normally regresses between the fifth and seventh week of fetal life. If this regression fails, various anomalies can occur which includes Meckel's diverticulum with/without fibrous cord attached to the abdominal wall, an umbilical intestinal fistula, enterocystoma or an umbilical adenoma [3,4]. Of these MD is the most common congenital gastrointestinal anomaly. MD is present in approximately 1–3% of the population with equal incidence in males and females [3] but symptoms are commonly present in males [5]. It is a true diverticulum containing all layers of the ileal wall containing heterotrophic tissue [5]. It arises from the anti-mesenteric border of the ileum, situated between 30 and 150 cm s from ileo-caecal valve [6] and receiving its blood supply from a remnant of the vitelline artery [7]. Most of these are clinically silent and often an incidental finding at laparotomy. Symptoms arises when associated with complications which occurs in 4% of cases [5] including gastrointestinal bleeding, diverticulitis, and small bowel obstruction [2–5]. Clinical

manifestations of complicated M.D. are frequently non specific and can mimic other pathologic conditions such as appendicitis, crohns disease, cholecystitis and peptic ulcer [7]. Various mechanisms by which it can cause intestinal obstruction [3,5,6].

- Volvulus of small intestine around fibrous band extending from Meckel's diverticulum to umbilicus.
- Intussusception.
- Littre's hernia: incarceration of the diverticulum in inguinal and femoral hernia.
- Entrapment of small bowel beneath mesodiverticular band.
- Adhesions secondary to diverticulitis.
- Enterolithiasis causing impaction inflammation.
- Herniation of gut through loop formed by adhesion band extending between the diverticulum and base of the mesentery.
- Neoplasm obstruction.
- Bezoar lodged in diverticulum in Y shaped pantaloons pattern [7].

Internal hernia caused by entrapment of the small intestine accounts only 0.5–4.1% of intestinal obstruction cases [1]. Most commonly, it occurs through mesentery of small intestine. Internal herniation by MD leading to SBO is an extremely rare complication [8] and it should be considered in patients with obstructive symptoms, especially in younger people without previous abdominal surgery. A case of internal hernia through mesentery of Meckel's diverticulum has been reported by Dalinka et al. [9]. Several other cases have been reported of internal herniation due to adhesion of inflamed end of MD to corresponding base of mesentery by Papaziosgas et al. [7] and Lin et al. [1], through mesodiverticular band by Jain and Sahi [5] and Srinivas and Cullen [6], fibrous cord extending upto umbilical wall by Maia et al. [2] and Aggarwal et al. [4]. But in our case patient had both adhesion band extending from tip of diverticulum to adjacent mesentery along with internal herniation of gut into a sac formed by unusual mesentery of the meckel's diverticulum and the adhesion band. Such unusual presentation has not been reported so far in the literature. Preoperative diagnosis is often difficult with only 6–12% of cases diagnosed correctly [10]. Abdominal radiographs may be useful if enteroliths are present, which can be seen as peripheral calcification with a radiolucent center ultrasonograms may suggest evidence of a round or tubular cystic lesion, however, this can often mimic a dilated bowel loop. The use of barium studies is limited, due to poor barium filling of the obstructed bowel [7]. Computed tomography is usually the gold standard imaging modality however, identifying MD as the cause of obstruction can be difficult. Though, in internal hernia, clustering of bowel loops and stretched crowded and engorged mesenteric vessels may be suggestive features [2]. However, due to emergency situation and limitations of the imaging modalities in identifying complications of MD, typically the diagnosis is made only at laparotomy. Surgical intervention is indicated for patients with intestinal obstruction or high risk of incarceration. The treatment option is surgical resection with diverticulectomy and reduction of internal herniation.

4. Conclusion

Meckel's diverticulum causing internal hernia and intestinal obstruction is rare event. Its presentation due to herniation of bowel loops into sac formed by mesentery attached to diverticulum and the adhesion is rare, with non specific signs and symptoms. Therefore, there is high mortality rates associated with this type of internal hernia [2]. Early diagnosis and prompt treatment prevent further complications and prolonged hospitalization.

Conflict of interest

There is no conflict of interest among all the authors.

Presentation details

None.

Funding details

Self funded.

Consent of patient

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.

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