

Small bowel obstruction due to mesodiverticular Band: A case report

Dr. Sugavasi Githesh Kumar¹, Dr. Madhu S Kikkeri², Dr. Vidhya Rani³, Dr. Krushik T R¹, Dr. Mirza Sanaulla¹

¹ Junior Resident, Department of Radiodiagnosis, Sapthagiri Institute of Medical Sciences and Research Centre, Bangalore, Karnataka, India

² Assistant Professor, Department of Radiodiagnosis, Sapthagiri Institute of Medical Sciences and Research Centre, Bangalore, Karnataka, India

³ Professor, Department of Radiodiagnosis, Sapthagiri Institute of Medical Sciences and Research Centre, Bangalore, Karnataka, India

Corresponding Author: Dr. Sugavasi Githesh Kumar

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Abstract

A 20-year-old male presented to the emergency department with acute abdominal pain and repeated vomiting aggravated after food intake. Ultrasound, erect abdominal radiography, and contrast-enhanced CT demonstrated small bowel obstruction with dilated jejunal and ileal loops, a short-segment ileocaecal intussusception with a small-bowel faeces sign, and a diverticular outpouching arising from the terminal ileum with a thin band extending toward the mesentery, suggestive of a mesodiverticular band arising from a Meckel's diverticulum. Emergency exploratory laparotomy confirmed entrapment of an ileal loop by the mesodiverticular band; resection of the Meckel's diverticulum with division of the band and bowel closure was performed. Histopathology confirmed a Meckel's diverticulum showing gastric metaplasia and lymphoid hyperplasia. The patient recovered uneventfully and was discharged on the fifth postoperative day. This report highlights entrapment by a mesodiverticular band as a rare but important cause of small bowel obstruction and underscores the role of CT in its preoperative diagnosis.

Keywords: Meckel's diverticulum, Mesodiverticular band, Small bowel obstruction, Intussusception, Computed tomography, Case report

Introduction

Clinical History

A 20-year-old male presented to the Emergency Department with abdominal pain for two days associated with 6-7 episodes of vomiting which aggravated after food intake.

Imaging Findings

Ultrasound of the abdomen was performed which showed dilated jejunal loops with to-and-fro peristalsis in the central abdomen with mild interbowel fluid (Fig. 1). Erect abdominal radiograph (Fig. 2) showed dilated small bowel loops with multiple air-fluid levels, without free subdiaphragmatic air.

CT of the abdomen was performed which revealed multiple dilated jejunal and ileal loops with a maximum diameter of 3.3 cm (Fig. 3a, 3b). Short-segment intussusception was seen with telescoping of the terminal ileum into the caecum with a small-bowel faeces sign in the terminal ileal loop (Fig. 4a, 4b). A diverticular outpouching was noted arising from the terminal ileal loop with teat-like thickening at the tip. A thin band-like structure was noted extending from the thickened tip towards the mesentery, suggesting a mesodiverticular band (Fig. 5a, 5b). The appendix was normal (Fig. 6). Mild free fluid was seen in the pelvis (Fig. 7). There was no intraperitoneal free air to suggest pneumoperitoneum.



Fig 1: Ultrasound of the abdomen shows fluid-filled, dilated small bowel loops



Fig 2: Erect radiograph of the abdomen shows dilated loops of small bowel with air-fluid levels

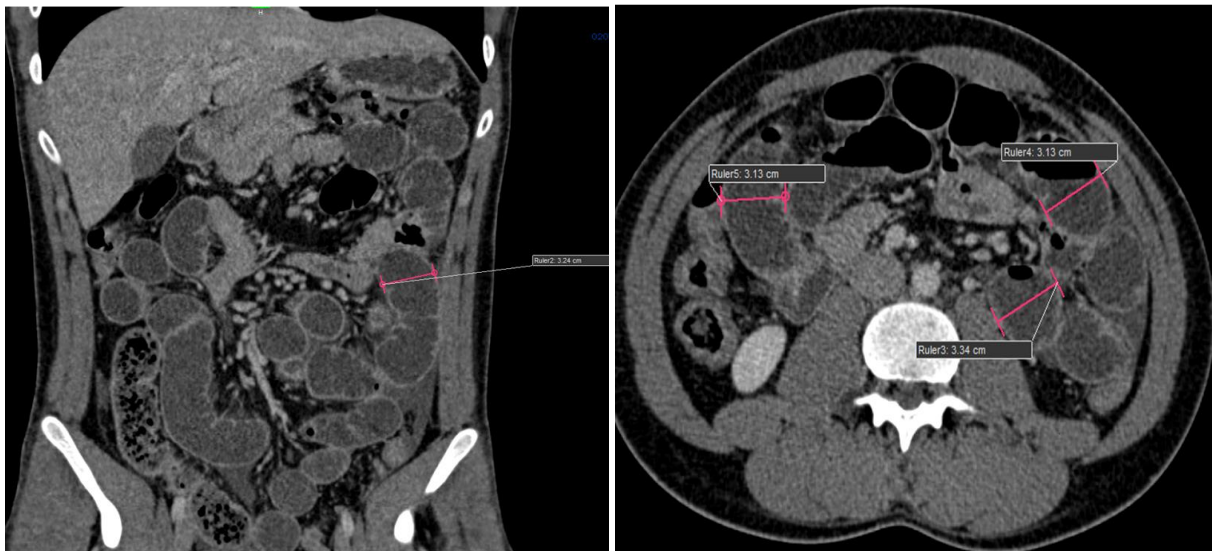


Fig 3a, 3b: Contrast-enhanced CT of the abdomen shows multiple dilated small bowel loops



Fig 4a, 4b: Contrast-enhanced CT of the abdomen shows a small-bowel faeces sign in the terminal ileal loop with telescoping of the terminal ileal loop into the caecum, likely ileocaecal intussusception

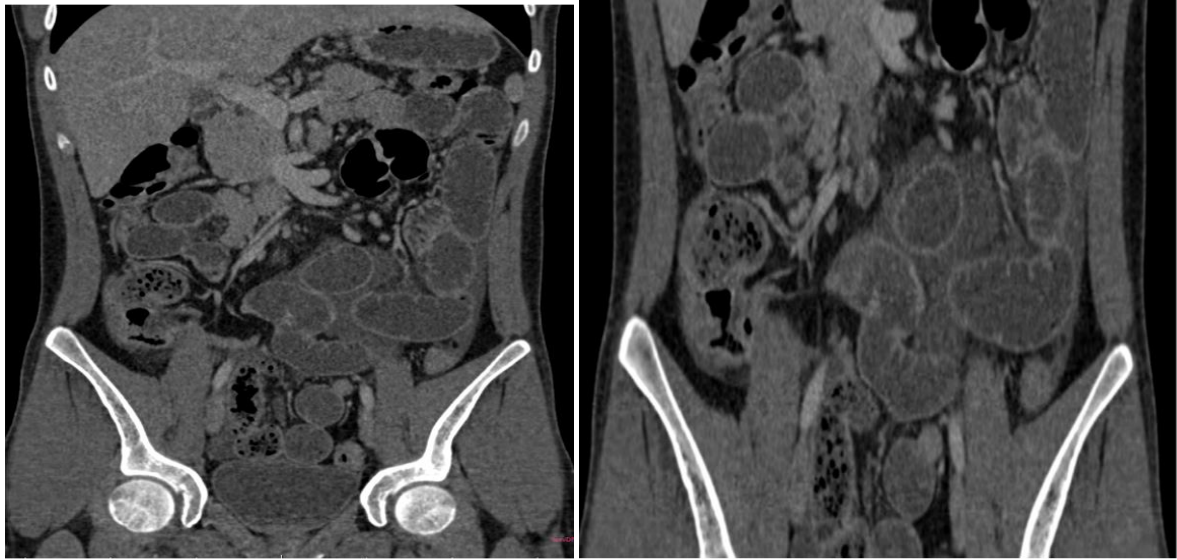


Fig 5a, 5b: Contrast-enhanced CT of the abdomen showing a diverticular outpouching from the terminal ileal loop with teat-like thickening at the tip. A thin band-like structure is noted extending from the thickened tip towards the mesentery, suggesting a mesodiverticular band



Fig 6: Contrast-enhanced CT of the abdomen showing a normal appendix



Fig 7: Mild free fluid in the pelvis

Intraoperative Findings

Following the CT, the patient was taken up for emergency exploratory laparotomy under general anaesthesia. On

entering the peritoneal cavity, gross distension of the small bowel and collapsed large bowel was identified. The small bowel was subsequently delivered carefully and examined.

Loops of distended small bowel were identified extending proximally from the duodenojejunal junction to the distal ileum. The distal part of the ileum was found to be markedly compressed by the mesodiverticular band (Fig. 8a, 8b) within an area 50 cm proximal to the end of the ileum. Ileal loops were dilated at the superior part of the mechanical obstruction. The obstruction was caused by trapping of a bowel loop by the mesodiverticular band. After separating

the mesodiverticular band from the mesentery, the ileal loop was released from the diverticulum. Resection of the Meckel's diverticulum with closure of the bowel was performed. The small bowel was then decompressed and the contents were gently milked into the stomach before being aspirated via the nasogastric tube. The loops of bowel were then returned into the abdomen in sequence. Closure of the abdomen was performed using loop sutures.

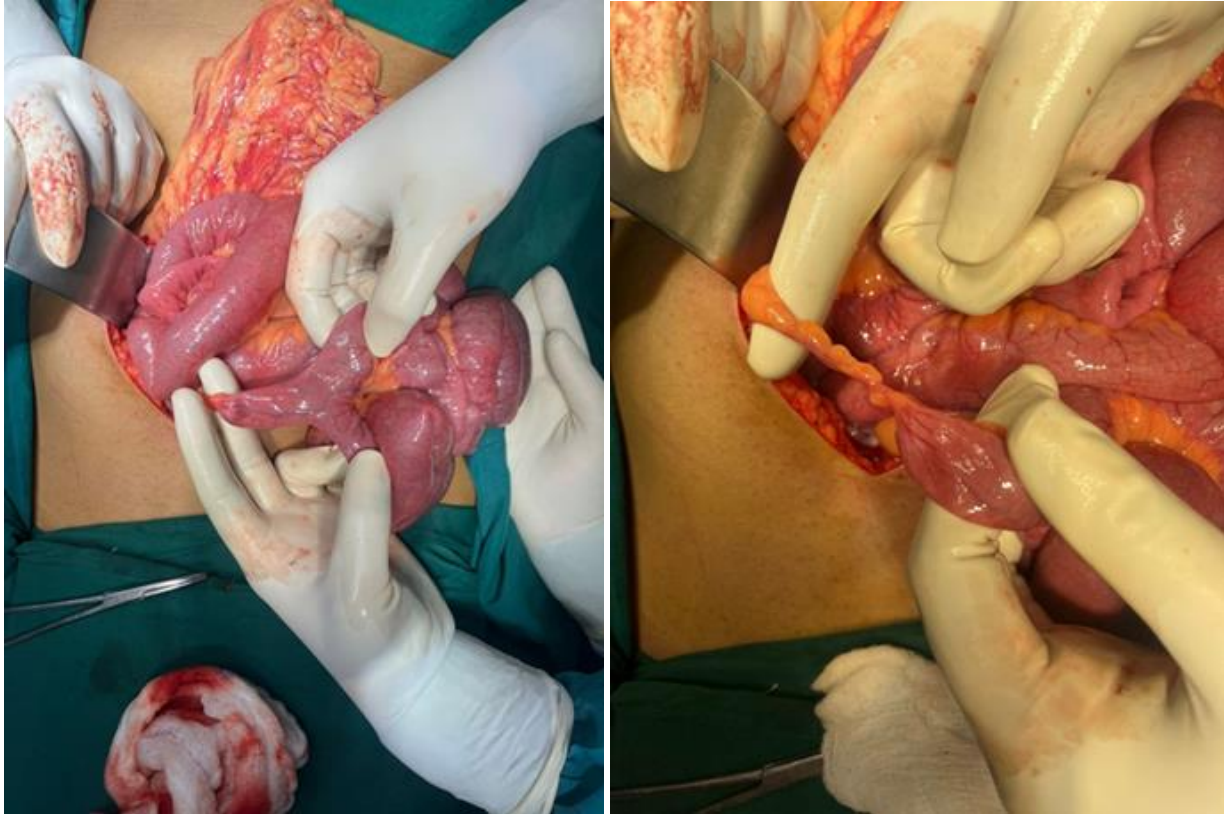


Fig 8a, 8b: Intraoperative images showing dilated small bowel loops and the mesodiverticular band

Discussion

Background: Meckel's diverticulum is the most common congenital anomaly of the gastrointestinal tract, occurring in approximately 1-3% of the population. It results from incomplete obliteration of the vitelline duct and is a true diverticulum containing all layers of the bowel wall. It is typically located on the antimesenteric border of the ileum, most often within 100 cm of the ileocaecal valve, with the distance varying according to age ^[1].

Most Meckel's diverticula remain asymptomatic and are frequently discovered incidentally. The estimated lifetime risk of complications is about 4%, with a higher incidence in males ^[1,3]. The most common complications include gastrointestinal bleeding, intestinal obstruction, and diverticulitis ^[2].

Clinical Perspective: Most Meckel's diverticula remain asymptomatic and are discovered incidentally. Bleeding is usually related to ectopic gastric or pancreatic mucosa, which is present in a significant proportion of symptomatic cases. Intestinal obstruction, the second most common complication, may occur through several mechanisms, including intussusception, volvulus, incarceration in a hernia (Littre's hernia), and entrapment by a mesodiverticular band ^[4,5]. The mesodiverticular band represents a remnant of the vitelline artery and forms a

fibrous or vascular connection between the diverticulum and the mesentery. Although rare, this band can create a narrow aperture through which a bowel loop may herniate, resulting in a closed-loop obstruction and potential ischaemia, as was seen in our case ^[5].

Imaging Perspective: Conventional radiographic examination is of limited value. Although of limited value, sonography has been used for the investigation of Meckel's diverticulum. High-resolution sonography usually shows a fluid-filled structure in the right lower quadrant having the appearance of a blind-ending, thick-walled loop of bowel ^[6]. On computed tomography (CT), Meckel's diverticulum is difficult to distinguish from normal small bowel in uncomplicated cases. However, a blind-ending fluid- or gas-filled structure in continuity with the small bowel may be revealed ^[7]. Abdominal CT is used for complicated cases such as intussusception and obstruction ^[8].

Outcome: Although Meckel's diverticulum is the most prevalent congenital abnormality of the gastrointestinal tract, it is often difficult to diagnose due to the absence of symptoms in most patients. The complications of Meckel's diverticulum should be taken into account in the differential diagnosis of small bowel obstruction. In asymptomatic patients, whether all cases of incidental Meckel's diverticula

should be resected or not is an unresolved question. On the other hand, for symptomatic patients, treatment should always include resection of the diverticulum or the segment of bowel affected by the pathology ^[3,9]. Surgery is a diagnostic and therapeutic method for Meckel's diverticulum presenting with intestinal obstruction. The course depends on early diagnosis. In the present case, small bowel obstruction was caused by entrapment of an ileal loop

by a mesodiverticular band associated with a Meckel's diverticulum. Surgical resection of the diverticulum with division of the mesodiverticular band is curative and usually leads to an excellent outcome.

In our case, the diverticulum was confirmed as a Meckel's diverticulum by histological examination (Fig. 9a, 9b). The patient recovered without any complications and was discharged after five days of hospitalization.

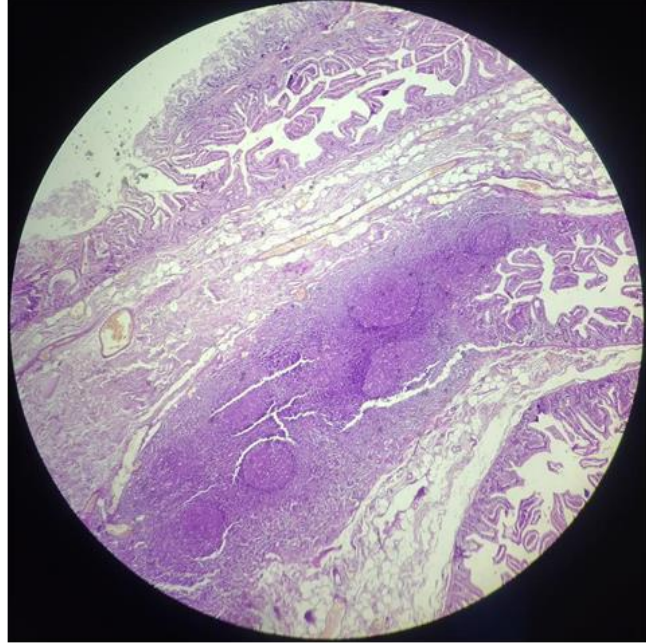
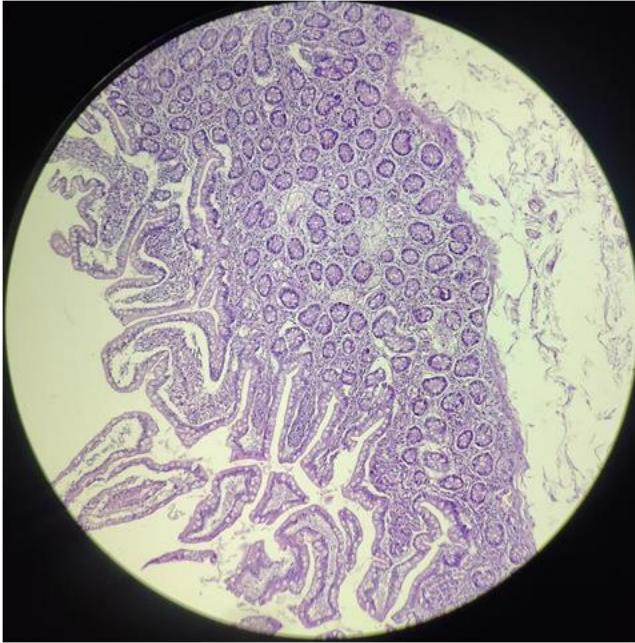


Fig 9a, 9b: Histological findings of the Meckel's diverticulum. Gastric metaplasia and lymphoid hyperplasia found in the Meckel's diverticulum

Conclusion

Small bowel obstruction due to entrapment by a mesodiverticular band is a rare complication of Meckel's diverticulum. Although preoperative diagnosis is challenging, contrast-enhanced CT plays a valuable role in identifying the diverticulum, the associated band, and the resulting closed-loop obstruction. The complications of Meckel's diverticulum should therefore be considered in the differential diagnosis of small bowel obstruction, particularly in young patients. Early diagnosis with prompt surgical resection of the diverticulum and division of the mesodiverticular band is curative and usually leads to an excellent outcome, as demonstrated in the present case.

Final Diagnosis

Small bowel obstruction due to a Meckel's diverticulum with a mesodiverticular band.

Differential Diagnosis

- Small bowel obstruction due to adhesions.
- Acute appendicitis.

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