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Case Report

The teenage twist: Meckel's diverticulum masquerading as a closed loop small bowel obstruction

R. Vishnu*, Sumathi Ravikumar, F. Grey Bernard, Deepika

Department of General Surgery, Government Thanjavur Medical College and Hospital, Thanjavur, Tamil Nadu, India

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***Correspondence:**
Dr. R. Vishnu,
E-mail: stanvish88@gmail.com

ABSTRACT

Meckel's diverticulum is a congenital anomaly that is often clinically silent but can present with life-threatening complications. In adolescents, its presentation as acute intestinal obstruction due to a closed loop is extremely rare and diagnostically challenging. We report a case of a 15-year-old male who presented with acute abdominal pain, vomiting, and distension. Clinical and imaging features suggested closed-loop small bowel obstruction. Emergency exploratory laparotomy revealed a gangrenous segment of the distal ileum and a Meckel's diverticulum associated with dense adhesions. The patient underwent resection of the gangrenous ileum and cecum with end ileostomy. Postoperative recovery was uneventful, histological examination revealed coagulative necrosis with ectopic pancreatic tissue in Meckel's diverticulum and he was discharged in a stable condition. This case emphasizes the importance of considering Meckel's diverticulum in the differential diagnosis of intestinal obstruction in adolescents, especially in the absence of previous abdominal surgeries. Early surgical intervention is essential to prevent ischemic complications and optimize outcomes.

Keywords: Meckel's diverticulum, Closed loop obstruction, Adolescent, Small bowel gangrene, Ileostomy

INTRODUCTION

Meckel's diverticulum is the most common congenital anomaly of the gastrointestinal tract, resulting from incomplete obliteration of the vitelline duct.[1] It is typically located on the antimesenteric border of the ileum, approximately 60–100 cm proximal to the ileocecal valve. Although present in nearly 2% of the population, the majority of individuals with Meckel's diverticulum remain asymptomatic throughout life. When symptoms do occur, they often mimic other abdominal pathologies, leading to significant diagnostic challenges.[2]

In children, the most common presentation is painless rectal bleeding, whereas in adults, intestinal obstruction and inflammation are more frequently observed.[3] The clinical manifestation in adolescents can be particularly deceptive, as it may resemble more common causes of acute abdomen such as appendicitis or adhesive bowel obstruction. In rare cases, Meckel's diverticulum may lead to complications like volvulus, intussusception, or perforation, further complicating timely diagnosis.[4]

Radiological imaging often yields nonspecific findings, and the condition is frequently diagnosed intraoperatively.[5] Thus, a high index of suspicion is essential, particularly in younger patients with unexplained signs of small bowel obstruction and no prior surgical history. This case report highlights a teenage patient presenting with features suggestive of small bowel obstruction, ultimately found to have Meckel's diverticulum as the underlying cause. Through this case, we aim to bring attention to the atypical presentation of Meckel's diverticulum in adolescents and underline the

importance of including it in the differential diagnosis of acute abdomen. Early recognition and surgical management are crucial to prevent complications and ensure favorable outcomes.

CASE REPORT

A 15-year-old male presented with acute onset abdominal pain lasting one day, associated with bilious vomiting and constipation. The pain was progressive and diffuse. On examination, the patient was afebrile, hemodynamically stable, with generalized abdominal tenderness and guarding. No rigidity was noted. Bowel sounds were present.

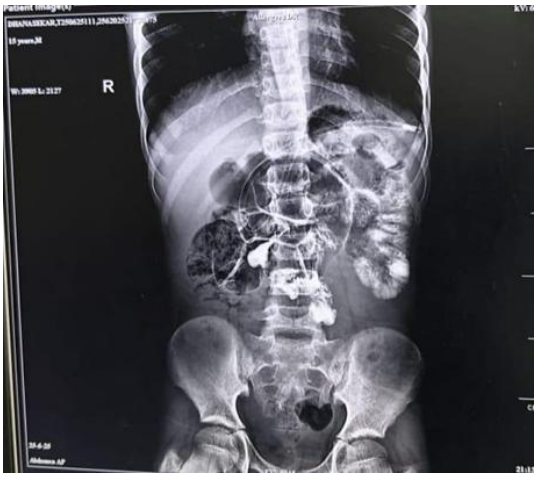

Figure 1: Xray erect abdomen showing dilated bowel loops.

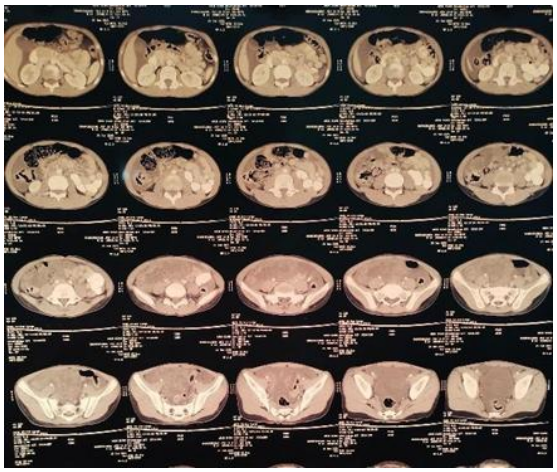

Figure 2: CECT abdomen showing ileal clutering with loss of bowel wall enchancement and free fluid.

Laboratory investigations revealed leukocytosis (TLC 19,400 on admission). Initial imaging with abdominal ultrasound suggested a subacute closed-loop distal ileal obstruction with minimal interbowel fluid. Contrast-enhanced CT of the abdomen revealed clustered ileal loops with mesenteric edema, stretching of mesenteric vessels, and reduced bowel wall enhancement, consistent with a closed-loop obstruction likely due to a transmesenteric internal hernia (Figure 2). Gross ascites was also noted. The patient was taken for emergency exploratory laparotomy. Intraoperative findings were, approximately 70 cm proximal to the ileocecal junction, a Meckel's diverticulum was identified on the antimesenteric border. An adhesive band originating from the diverticulum extended to the ileocecal junction, forming a closed-loop obstruction (Figure 3). About 70 cm of the distal ileum and part of the cecum appeared gangrenous. The involved segment was resected, and an end ileostomy was created (Figure 5). The proximal ileal end was brought out via the right iliac fossa.

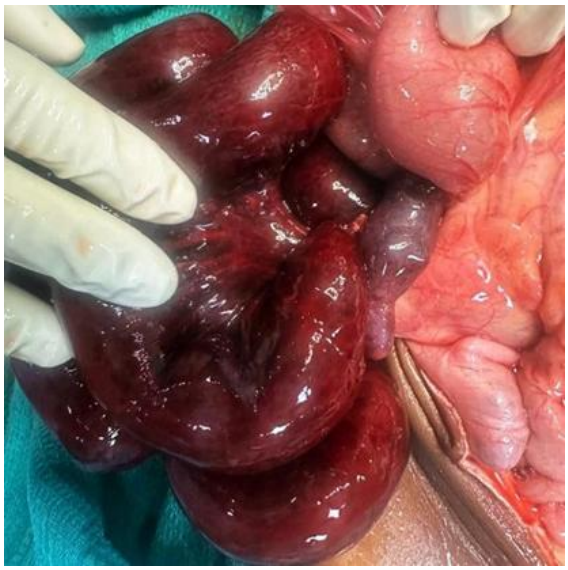

Figure 3: Mesodiverticular band causing closed loop obstruction.

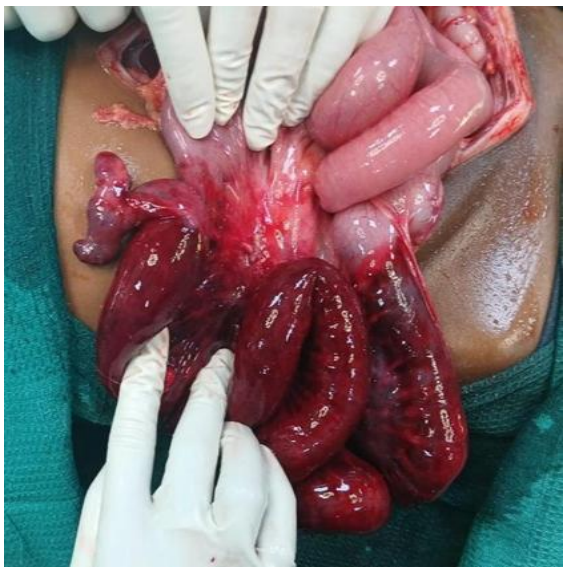

Figure 4: Intraoperative image showing gangrenous segment of distal ileum extending up to the ileocecal junction and meckel's diverticulum on the antimesenteric border.

Histological examination of the resected specimen revealed features of coagulative necrosis consistent with gangrenous changes. The Meckel's diverticulum showed ectopic pancreatic tissue at its tip, confirming the rare pathology (Figure 7).

The patient had an uneventful postoperative recovery. Ileostomy functioned well from postoperative day 1. No signs of wound infection or dehiscence were observed. The patient was discharged on postoperative day 8 in stable condition and was scheduled for follow-up and eventual stoma closure.

Figure 5: Image depicting end ileostomy.

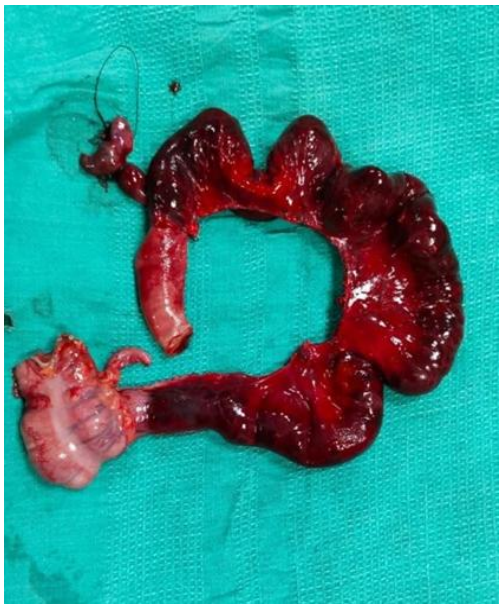

Figure 6: Resected part of gangrenous ileum and cecum with Meckel's diverticulum.

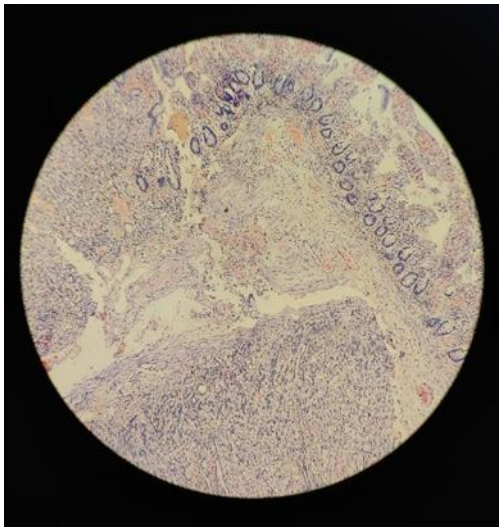

Figure 7: Meckel's diverticulum with ectopic pancreatic tissue at tip.

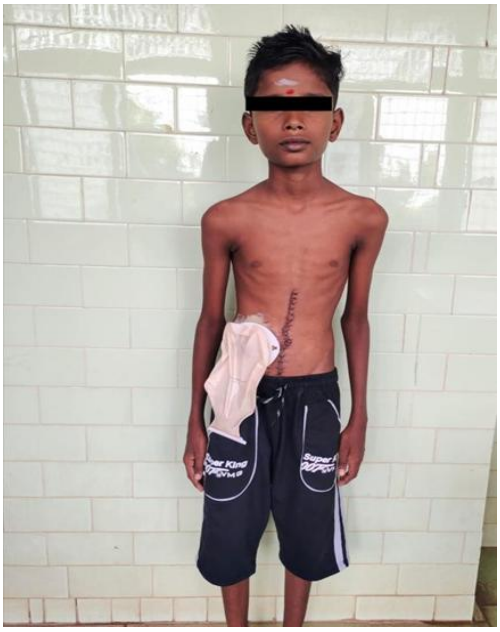

Figure 8: post operative period patient was stable

DISCUSSION

Meckel's diverticulum results from incomplete obliteration of the vitelline duct and may lead to complications, particularly in children and young adults. Intestinal obstruction is the second most common complication, after bleeding. Mechanisms include volvulus around a fibrous band, intussusception, or internal herniation through mesenteric defects.[6]

Closed loop obstruction, as seen in our case, can rapidly lead to ischemia and bowel gangrene, making prompt diagnosis and intervention crucial. In this patient, the presence of dense adhesions and a Meckel's diverticulum caused segmental ischemia and necessitated bowel resection with diversion.

Preoperative imaging plays a key role but is often non-specific. The absence of prior surgeries in young patients with obstructive symptoms should raise suspicion for congenital anomalies like Meckel's diverticulum.[7]

This case reiterates the need to include Meckel's diverticulum in the differential diagnosis of unexplained small bowel obstruction in adolescents, as timely surgical management can prevent fatal outcomes.[8]

CONCLUSION

Meckel's diverticulum, although rare as a cause of small bowel obstruction in adolescents, should be considered especially when imaging suggests closed loop obstruction in a virgin abdomen. Early surgical exploration remains the cornerstone in preventing bowel ischemia and ensuring patient recovery.

Patient consent

Informed written consent was obtained from the patient's guardian for publication of this case report and accompanying images. Identifiable information has been anonymized**.**

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