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Intestinal Obstruction Due to Necrotic Torsion of a Meckel's Diverticulum: A Case Report in a Young Adult

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ABSTRACT: Meckel's diverticulum is recognized as the most prevalent congenital anomaly of the gastrointestinal system. While frequently asymptomatic, it can occasionally result in serious complications such as gastrointestinal hemorrhage, diverticulitis, or bowel obstruction. We present the case of a 20-year-old male who developed acute small bowel obstruction, initially resembling mesocoeliac appendicitis. Surgical intervention revealed a necrotic Meckel's diverticulum twisted around a viable loop of ileum, creating an internal constrictive band and causing the obstruction. Treatment included segmental resection of the diverticulum, a double-barrel ileostomy, and peritoneal lavage. This case underscores the need to consider Meckel's diverticulum as a differential diagnosis in intestinal obstruction, particularly among young adults with no prior abdominal surgeries.

KEYWORDS: Meckel's diverticulum, vitelline duct remnant, small bowel obstruction, exploratory laparotomy.

INTRODUCTION

Meckel's diverticulum (MD) arises from the incomplete regression of the omphalomesenteric (vitelline) duct during embryonic development and is the most common congenital abnormality of the digestive tract, with an estimated incidence ranging from 2% to 4% in the general population. Although most individuals with MD remain asymptomatic, complications can occur at any age, including gastrointestinal bleeding, inflammation, perforation, or bowel obstruction. Obstructive complications may result from mechanisms such as volvulus, intussusception, internal herniation, or traction from fibrous bands. This report describes a rare presentation of intestinal obstruction caused by the necrotic torsion of a Meckel's diverticulum.

Case Presentation

A 20-year-old man with no previous medical or surgical history was admitted with signs and symptoms consistent with small bowel obstruction lasting four days. He reported cessation of bowel movements and flatus, diffuse abdominal pain initially localized to the right iliac fossa, increasing abdominal distension, and bilious vomiting. He remained afebrile and was both hemodynamically and respiratorily stable. Physical examination revealed a markedly distended, tympanic abdomen without peritoneal signs or palpable masses. Hernial sites and digital rectal examination were normal.

Abdominopelvic CT imaging demonstrated dilated small bowel loops (up to 40 mm in diameter), multiple air-fluid levels, localized thickening of the distal ileal wall with mucosal edema, a discrete transition point at the L5 level, and moderate free intra-abdominal fluid. No pneumoperitoneum or radiologic indicators of bowel ischemia were present.

A decision was made to proceed with exploratory laparotomy. Intraoperatively, turbid peritoneal fluid and fibrinous adhesions were encountered. A necrotic Meckel's diverticulum was found twisted around an adjacent viable ileal loop, forming an internal constrictive band. The diverticulum was located 2.90 meters from the ligament of Treitz and 10 cm proximal to the ileocecal valve. The proximal bowel was dilated but showed no signs of ischemia.

Surgical management included wedge resection of the diverticulum, creation of a double-barrel ileostomy, peritoneal lavage, and placement of a pelvic drain. The postoperative course was uneventful. The patient was discharged on the fourth postoperative day and reviewed one week later without complications. A follow-up letter was provided for further outpatient care.

Intraoperative Images:

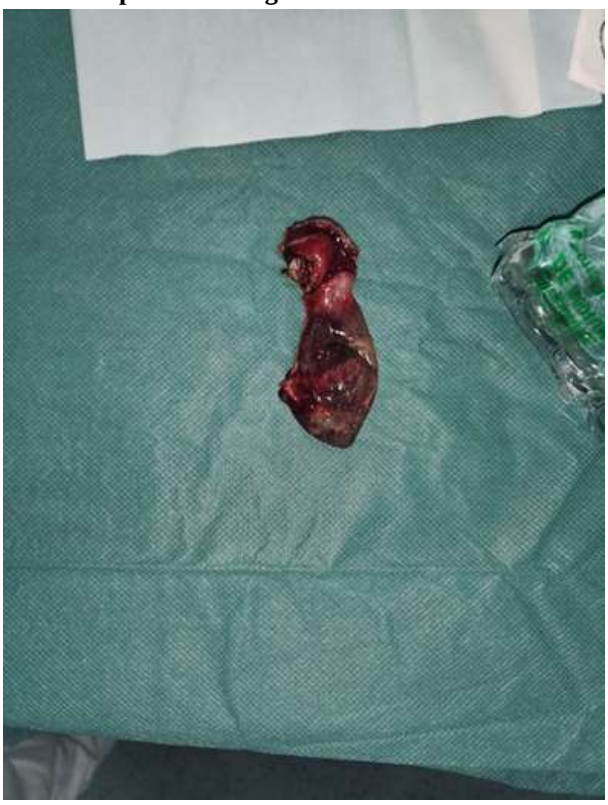

Figure 1 : Wedge resection of a Meckel's diverticulum.

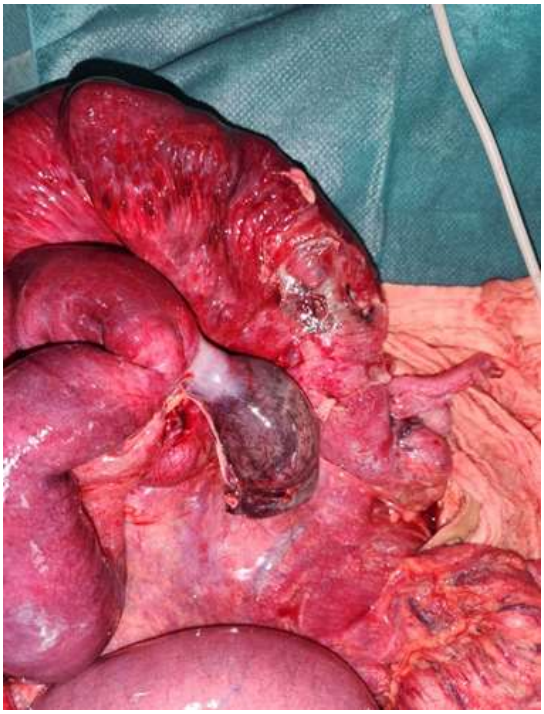

Figure 2 : Torsion of Meckel's diverticulum encircling a viable ileal loop.

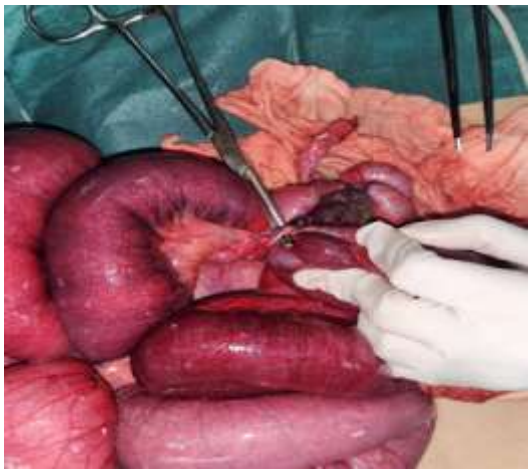

Figure 3 : Close-up view showing the twisted diverticulum forming a constrictive band.

DISCUSSION

Meckel's diverticulum results from incomplete involution of the omphalomesenteric duct and stands as the most prevalent congenital anomaly affecting the gastrointestinal tract, with an estimated incidence of around 2% in the general population [1]. While it is usually silent, it can occasionally manifest with acute complications such as gastrointestinal bleeding, inflammation, perforation, or, less frequently, intestinal obstruction [2].

In the case presented, a 20-year-old man with no significant medical or surgical history developed signs of mechanical small bowel obstruction that progressed over several days. Both clinical evaluation and abdominal CT findings indicated a single transition point and upstream bowel dilation, with no definitive signs of ischemia.

During surgery, a necrotic Meckel's diverticulum was found to be twisted, forming a localized volvulus around a nearby segment of ileum—a rare but documented cause of obstruction. Mechanical obstruction due to a fibrous band originating from the diverticulum is a recognized mechanism, especially when the diverticulum is abnormally tethered to the mesentery or umbilicus [3]. Torsion involving the diverticulum itself or adjacent bowel loops is even more uncommon, though it has been described in the literature, particularly in pediatric and young adult populations [4].

The surgical approach is largely dictated by the viability of the involved bowel and the extent of contamination within the peritoneal cavity. In this case, a wedge resection of the necrotic diverticulum along with a double-barrel ileostomy was performed, which was appropriate given the presence of turbid peritoneal fluid and a potential risk of sepsis. The choice to construct a temporary stoma can vary depending on institutional protocols and surgical judgment, but it is generally indicated in settings of localized or generalized peritonitis, uncertain bowel viability, or compromised patient condition [5].

The patient's smooth postoperative recovery confirms the appropriateness of the chosen management. The ileostomy is expected to be closed secondarily once clinical and local conditions permit, usually between the sixth and eighth postoperative week.

This case provides several valuable insights:

- The preoperative identification of complicated Meckel's diverticulum remains difficult, even with advanced imaging techniques. Fewer than 10% of cases are diagnosed prior to surgery [6].
- Prompt surgical intervention is critical in young adults presenting with bowel obstruction of unclear origin, particularly in the absence of prior abdominal surgery.
- Given the diverse presentations associated with Meckel's diverticulum, it should be actively sought during laparotomy when no obvious cause of obstruction is found.

CONCLUSION

This case reinforces the importance of including Meckel's diverticulum in the differential diagnosis of small bowel obstruction, particularly in young patients without previous surgical history. Timely and tailored surgical intervention plays a key role in preventing severe complications such as bowel perforation or diffuse peritonitis.

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