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Research Article

The Brother Who Betrayed: A Rare Case of Strangulated Ileal Obstruction Due to Perforated Meckel's Diverticulum in a Post-Gastrectomy Patient – A Case Report

Dr. Krithika[1], Dr. Rohith Kumar M.S.[2], Dr. D. Chandramohan, M.S., D.A.[3], Dr. Yingli Semdok[4], Dr. Malarvizhi, M.S., D.A.[5*]

[1]Postgraduate, Institute of General Surgery, Rajiv Gandhi Government General Hospital, Chennai, Tamil Nadu, India.
[2]Assistant Professor, Institute of General Surgery, Rajiv Gandhi Government General Hospital, Chennai, Tamil Nadu, India.
[3]Assistant Professor, Institute of General Surgery, Rajiv Gandhi Government General Hospital, Chennai, Tamil Nadu, India.
[4]Post graduate, Institute of General Surgery, Rajiv Gandhi Government General Hospital, Chennai, Tamil Nadu, India.
[5*]Professor, Institute of General Surgery, Rajiv Gandhi Government General Hospital, Chennai, Tamil Nadu, India.
Corresponding Author: Dr. Malarvizhi, M.S., D.A.
Professor, Institute of General Surgery, Rajiv Gandhi Government General Hospital, Chennai, Tamil Nadu, India.
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ABSTRACT
Background: Small bowel obstruction (SBO) is a common surgical emergency. In patients with a history of major abdominal surgery, postoperative adhesions account for 60–75% of cases and are routinely presumed to be the underlying etiology. However, congenital anomalies such as Meckel's diverticulum can occasionally complicate in adulthood, mimicking adhesive intestinal obstruction and posing a significant diagnostic challenge.
Case Presentation: A 66-year-old male with a history of subtotal gastrectomy with Roux-en-Y reconstruction for gastric carcinoma presented with clinical and radiological signs of acute mechanical small bowel obstruction. Given his surgical history, adhesive bands were highly suspected. Emergency exploratory laparotomy, however, revealed a perforated Meckel's diverticulum forming a constricting fibrous band around the distal ileum, leading to closed-loop strangulation, compromised bowel viability, and a localized mesenteric hematoma. Segmental ileal resection with a double-barrel ileostomy was performed. The postoperative course was uneventful.
Conclusion: This case highlights that previous abdominal surgery should not automatically rule out rare congenital etiologies like Meckel's diverticulum in adults presenting with SBO. Maintaining a broad differential diagnosis and performing a meticulous intraoperative exploration are critical to avoiding diagnostic delays and mitigating bowel ischemia.

Keywords: Meckel's Diverticulum, Small Bowel Obstruction, Strangulation, Perforation, Gastric Carcinoma, Ileostomy, Case Report.

INTRODUCTION

Meckel's diverticulum (MD) is a true diverticulum containing all layers of the intestinal wall, resulting from the incomplete obliteration of the embryonic omphalomesenteric (vitelline) duct [2]. It traditionally follows the classical Rule of Twos:

- Occurs in approximately 2% of the population.
- Measures about 2 inches in length.
- Situated within 2 feet of the ileocecal valve.
- Commonly presents before 2 years of age.
- Frequently contains 2 types of ectopic mucosa (most commonly gastric and pancreatic tissue) [2].

Although usually asymptomatic, approximately 4–6% of individuals develop complications requiring surgical intervention during their lifetime [3]. While gastrointestinal bleeding secondary to ulceration from ectopic gastric mucosa predominates in pediatric populations, adults more frequently present with intestinal

obstruction, diverticulitis, or perforation [2]. Obstruction can occur through several mechanisms: persistent fibrous vitelline bands, volvulus around the diverticulum, intussusception, Littre's hernia, inflammatory adhesions, or internal herniation [4].

Postoperative adhesions account for the vast majority of small bowel obstructions in patients who have undergone prior abdominal procedures [1]. Consequently, preoperative diagnosis of a complicated Meckel's diverticulum in these patients is exceptionally rare, and the true pathology is almost universally identified intraoperatively [5].

We report a highly unusual presentation where a perforated Meckel's diverticulum formed a constricting band, causing closed-loop strangulation and a mesenteric hematoma in a patient previously operated for gastric carcinoma.

Case Presentation

Patient Information & Clinical Findings

A 66-year-old male presented to the emergency department with a 2-day history of severe, sudden-onset, diffuse abdominal pain, accompanied by progressive abdominal distension, multiple episodes of bilious vomiting, and absolute constipation.

His past surgical history was significant for locally advanced carcinoma of the stomach, for which he had undergone a subtotal gastrectomy with Roux-en-Y gastrojejunostomy and feeding jejunostomy one year prior (October 2025). His postoperative recovery had been uneventful, and he had no history of recurrent malignancy, chronic inflammatory bowel disease, or prior episodes of bowel sub-obstruction.

On admission, the patient appeared acutely ill and dehydrated. Vital signs revealed tachycardia:

- **Pulse Rate:** 110 beats/minute
- **Blood Pressure:** 110/70 mmHg
- **Respiratory Rate:** 22/minute
- **Temperature:** Afebrile
- **Oxygen Saturation:** 98% on room air

Physical examination of the abdomen demonstrated generalized abdominal distension and diffuse tenderness that was more pronounced over the lower abdomen. Guarding was present, though generalized rigidity was absent. Percussion revealed a tympanic note, and bowel sounds were hyperactive. A well-healed upper midline laparotomy scar was noted. Digital rectal examination revealed an empty rectum with no palpable masses or blood. A provisional diagnosis of acute mechanical small bowel obstruction with impending strangulation was made.

Clinical Timeline

- **Prior Oncological Surgery**

October 2025

Patient underwent subtotal gastrectomy with Roux-en-Y reconstruction and feeding jejunostomy for locally advanced gastric carcinoma.

- **Onset of Symptoms**

2 Days Pre-Admission

Sudden onset of severe, continuous, diffuse abdominal pain accompanied by bilious vomiting, progressive abdominal distension, and obstipation.

- **Emergency Evaluation**

Day of Admission

Presented to the emergency department. Clinical examination indicated acute mechanical small bowel obstruction with signs of impending strangulation.

- **Radiological Assessment**

Day of Admission

Plain radiographs and contrast-enhanced CT (CECT) of the abdomen confirmed a mechanical distal ileal obstruction with a distinct transition point and suspected bowel compromise.

- **Surgical Intervention**

Day of Admission (Emergency)

Emergency exploratory laparotomy revealed closed-loop strangulation and a mesenteric hematoma caused by a perforated Meckel's diverticulum acting as a constricting band. Segmental ileal resection and double-barrel ileostomy were executed.

- **Postoperative Recovery**

Post-Op Days 1–7

Managed in the surgical ICU and ward. Stoma became fully functional, oral intake was successfully re-established, and inflammatory markers normalized. Discharged stable.

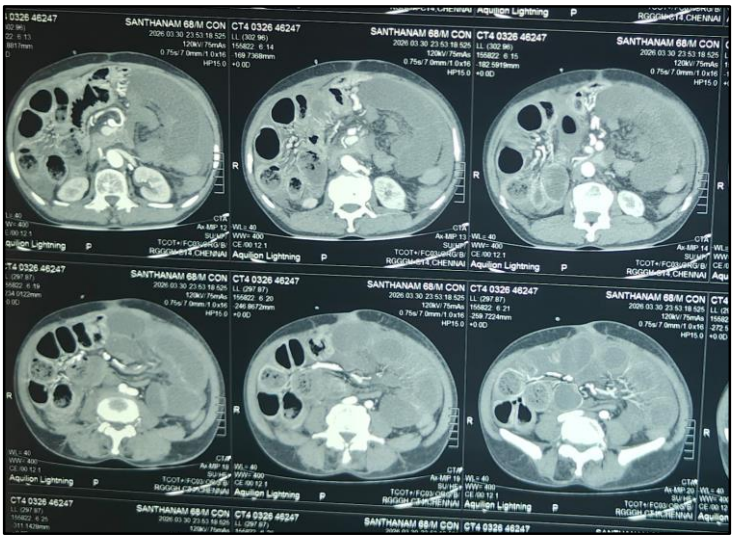
Diagnostic Assessment

Routine laboratory workup demonstrated marked leukocytosis with neutrophilic predominance, signaling an acute inflammatory or ischemic process. Serum electrolytes and renal function parameters were optimized preoperatively.

- **Plain Abdominal Radiograph:** Demonstrated multiple centrally located dilated small bowel loops with multiple air-

fluid levels, highly consistent with mechanical SBO.

- **Contrast-Enhanced Computed Tomography (CECT):** Confirmed multiple dilated proximal small bowel loops, a sharp, abrupt transition point involving the distal ileum, and collapsed distal bowel loops. Features strongly suggested mechanical bowel compromise, though explicit free air (pneumoperitoneum) was not observed.



Given the surgical history, postoperative adhesive bands were initially deemed the most likely culprit. However, the presence of a distinct transition point, localized fluid, and rapid clinical deterioration underscored the need for immediate surgical exploration [1].

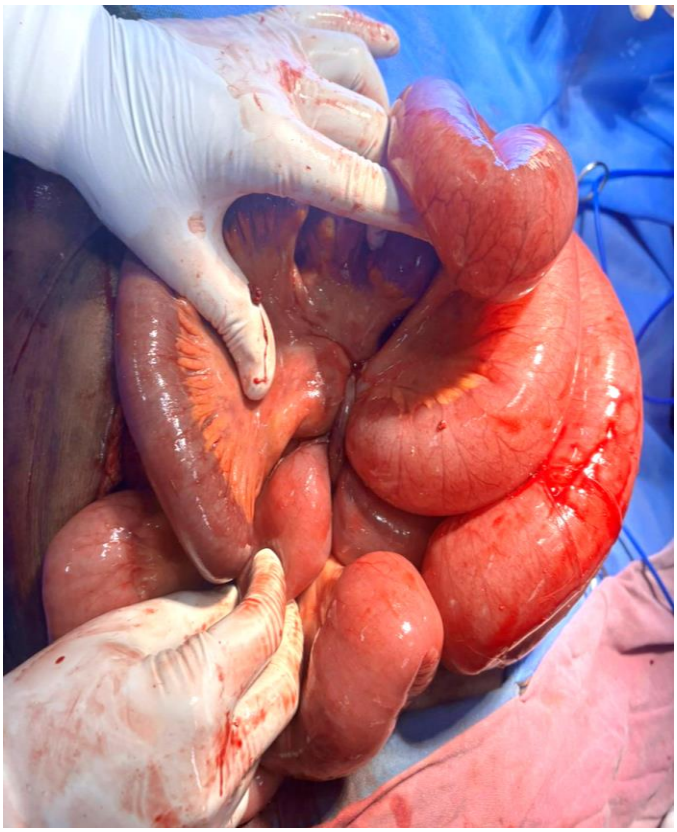
Therapeutic Intervention & Operative Findings

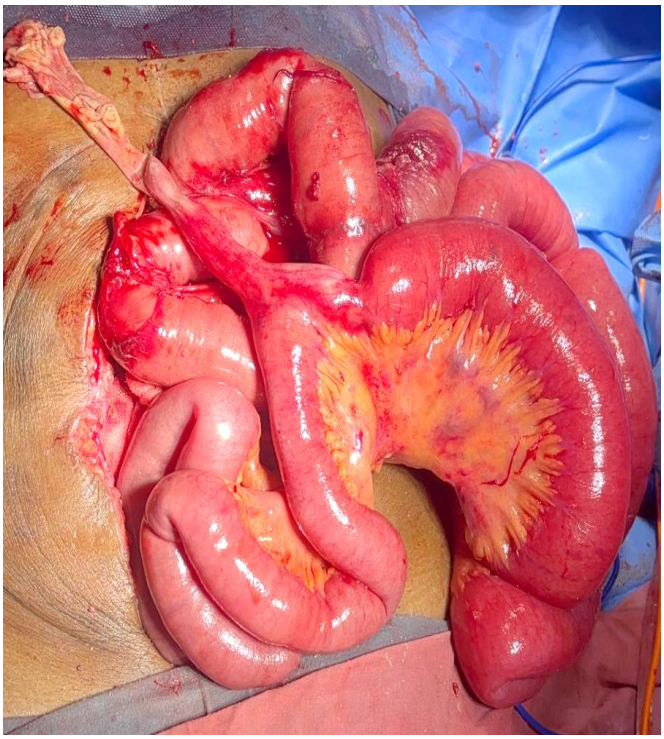
Following resuscitation with intravenous crystalloids, electrolyte correction, nasogastric tube decompression, and broad-spectrum antibiotic coverage, the patient was taken for an emergency exploratory laparotomy.

Upon entering the peritoneal cavity via the previous midline incision, markedly dilated and edematous proximal small bowel loops were encountered. Systematic tracing of the small bowel revealed:

1. A true Meckel's diverticulum arising from the antimesenteric border of the distal ileum.
2. The diverticulum had anomalously adhered back onto the mesentery or adjacent tissue, forming a tight, constricting fibrous band directly encircling adjacent ileal loops.
3. This resulted in a tight closed-loop strangulation of the involved ileum, characterized by significant venous congestion and compromised bowel wall viability.
4. A distinct mesenteric hematoma was present adjacent to the strangulated segment, indicating advanced vascular compromise.

5. The diverticulum itself was acutely perforated, with localized, purulent contamination.





Key Operative Observation: Despite the patient's previous major upper abdominal surgery, no adhesions or bands related to the prior gastrectomy were responsible for the obstruction. The pathology was entirely congenital and mechanical, driven by the complicated diverticulum.

Because of the severe bowel wall edema, localized fecaloid/purulent contamination, overt diverticular perforation, and questionable viability of the strangulated segment, a simple diverticulectomy was contraindicated [2]. Instead, a formal segmental resection of the affected ileal loop (including the perforated diverticulum) was performed. To minimize risks in an unstable, contaminated emergency field, primary anastomosis was deferred in favor of a double-barrel ileostomy. Thorough peritoneal lavage was conducted, hemostasis secured, and a pelvic drain placed prior to mass closure of the abdominal wall.

Histopathological Examination

The resected specimen consisted of an edematous segment of distal ileum measuring approximately 15 cm, featuring an antimesenteric outpouching with macroscopic evidence of distal transmural perforation and adjacent ischemic changes.

Final histopathology confirmed ileal diverticulum suggestive of Meckels diverticulum without any ectopic mucosa within the diverticular wall. Acute transmural neutrophilic inflammation and ischemic necrosis noted. No neoplastic changes within the diverticulum seen.

Follow-up and Outcome

The patient was monitored closely in the surgical intensive care unit postoperatively. Management consisted of fluid balance optimization, broad-spectrum antibiotics, multi-modal analgesia, early mobilization, deep vein thrombosis prophylaxis, and stoma monitoring. The double-barrel ileostomy became functional on postoperative day 2. The patient's abdominal distension resolved, pain abated, and oral feeds were gradually introduced and tolerated well. He was discharged in stable clinical condition on postoperative day 7, with customized stoma care education and a plan for elective reversal of bowel continuity in 3 months.

Discussion

Meckel's diverticulum represents the most frequent congenital anomaly of the gastrointestinal tract, affecting about 2% of the general population, though only 4–6% manifest clinical symptoms during adulthood [2,3]. While hemorrhage is the leading presentation in pediatric populations due to acid secretion from ectopic gastric tissue, intestinal obstruction is the predominant presentation when it surfaces in adults [2].

The mechanisms by which Meckel's diverticulum induces adult bowel obstruction are diverse. They include axial volvulus around a persistent omphalomesenteric band, intussusception where the diverticulum acts as a lead point, internal herniation through a vitelline loop, Littre's hernia, or entrapment beneath a mesodiverticular band [4,6]. Closed-loop strangulation driven by a constricting diverticular band—as observed in this patient—is exceptionally rare. This variant is highly dangerous because the early closing of the mesenteric arcade rapidly precipitates venous infarction, arterial compromise, localized mesenteric hematoma, gangrene, and subsequent perforation [7,8].

A major clinical pitfall in this case was the patient's history of subtotal gastrectomy for stomach cancer performed a year prior. Postoperative adhesions are responsible for 60–75% of all mechanical small bowel obstructions globally [1]. As a result, cognitive bias frequently leads clinicians to attribute SBO symptoms in such patients entirely to surgical adhesions, potentially delaying definitive surgical care. This case strongly underscores that the presence of a previous laparotomy scar does not exclude the coexistence of an undiagnosed congenital anomaly capable of causing an acute surgical abdomen.

Preoperative diagnosis of a complicated Meckel's diverticulum on CT imaging is notoriously difficult because the uninflamed or fluid-filled outpouching perfectly mimics normal loops of small bowel. Radiologists and surgeons typically rely on secondary, indirect signs of strangulation on CECT: an abrupt, distinct transition point, a "whirl sign" of twisted mesentery, asymmetric bowel wall thickening, localized mesenteric edema, a target sign, or compromised wall enhancement [9]. In our patient, while the CECT correctly confirmed a high-grade mechanical SBO with suspected vascular compromise, the exact culprit—the perforated Meckel's diverticulum—was only unmasked upon surgical exploration.

Surgical strategies for symptomatic Meckel's diverticulum must be tailored to the intraoperative findings:

- **Simple Diverticulectomy:** Acceptable for uncomplicated diverticulitis or incidental, narrow-necked diverticula.
- **Segmental Bowel Resection:** Explicitly indicated when there is macroscopic perforation, gangrene, severe base inflammation extending to the adjacent ileum, a broad-based diverticulum, or suspected ectopic or neoplastic tissue within the base [4].

In our case, the combination of a macroscopically perforated diverticular tip, localized purulent contamination, advanced bowel wall edema, and a significant mesenteric hematoma meant primary resection and anastomosis carried a high risk of leakage. Constructing a temporary double-barrel ileostomy was the safest, most pragmatic decision to guarantee control of the contamination and ensure rapid patient recovery.

Conclusion

While postoperative adhesions remain the leading cause of small bowel obstruction following abdominal surgery, surgeons must maintain a broad diagnostic horizon. This case illustrates that Meckel's diverticulum can masquerade as standard adhesive obstruction in a post-gastrectomy adult, presenting abruptly as a life-threatening, strangulated, and perforated closed loop. Rapid clinical recognition, prompt CECT interpretation, timely laparotomy, and sound judgment regarding the safety of primary anastomosis versus stoma creation remain the cornerstones of minimizing morbidity and mortality.

Clinical Learning Points

- **Broaden the Differential:** Meckel's diverticulum should remain an important differential diagnosis in adults presenting with acute distal ileal obstruction, even in the presence of prior abdominal surgical scars.
- **Avoid Cognitive Anchoring:** A history of major abdominal surgery should not automatically lead to a definitive diagnosis of adhesive small bowel obstruction.
- **High Risk of Strangulation:** Closed-loop obstructions caused by a Meckel's diverticulum or its persistent fibrous bands carry an exceptionally high risk of rapid

tissue ischemia, mesenteric hematoma, and early perforation.

- **CT Limitations:** CECT is highly accurate in identifying the location and severity of mechanical SBO but frequently fails to definitively delineate a Meckel's diverticulum preoperatively.
- **Resection vs. Diverticulectomy:** Segmental ileal resection is mandatory over simple diverticulectomy when inflammation involves the diverticular base, or when local ischemia and perforation compromise the adjacent bowel.
- **Stoma Prudence:** Temporary diversion via an ileostomy is an appropriate, life-saving strategy in contaminated, emergency settings where primary tissue healing is compromised.

Declarations

- **Patient Perspective:** The patient expressed relief following the emergency procedure, noting the quick resolution of his severe abdominal pain. He and his family engaged actively with the stoma care team and expressed comfort with the planned elective stoma reversal.
- **Informed Consent:** Written informed consent was obtained from the patient for the publication of this case report and any accompanying clinical images.
- **Ethical Approval:** Ethical approval was waived by the institutional review board as this work describes a single, anonymous case report representing standard emergency care.
- **Conflict of Interest:** The authors declare that they have no conflicts of interest.
- **Funding:** No external financial support or grants were received for this study.
- **Author Contributions:** Dr. Krithika was responsible for active patient care, literature review, data collection, and initial manuscript preparation. Dr. Rohith Kumar performed the surgical intervention, provided critical revisions to the manuscript, supervised the case analysis, and gave final approval for submission.
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Figure Legends

- **Figure 1.** Plain abdominal radiograph demonstrating multiple centrally located dilated small bowel loops with multiple air-fluid levels, highly suggestive of an acute mechanical small bowel obstruction.
- **Figure 2.** Contrast-enhanced CT of the abdomen showing multiple dilated proximal small bowel loops with an abrupt transition point in the distal ileum (arrow), consistent with a high-grade mechanical obstruction.
- **Figure 3.** Intraoperative photograph demonstrating the true Meckel's diverticulum forming a rigid, constricting band around the distal ileum, creating a tight closed-loop strangulation.
- **Figure 4.** Intraoperative image showing a distinct, dark mesenteric hematoma adjacent to the strangulated bowel loop, confirming advanced vascular congestion.
- **Figure 5.** Resected surgical specimen demonstrating the macroscopically perforated tip of the Meckel's diverticulum along with its involved, ischemic segment of ileum.

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