



Closed-loop obstruction due to internal hernia: An atypical clinical presentation of acute abdomen — A case report

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Abstract

Internal hernia is the protrusion of a viscus through a normal or abnormal peritoneal or mesenteric aperture within the confines of the peritoneal cavity. They can be congenital or acquired after abdominal surgery. We report a case of a 58-year-old woman who presented with complaints of abdominal pain and nonbilious vomiting for 2 days. She underwent an abdominal hysterectomy 15 years ago. After baseline blood investigations and imaging, a diagnosis of subacute intestinal obstruction was made. As she clinically worsened over 24h, CT imaging was done, which suggested acute small bowel obstruction secondary to adhesions. Surgery revealed herniation with incarceration of distal ileal loops through a defect in the sigmoid mesocolon. Bowel resection was done, and the defect was closed. The clinical presentation of internal hernias, especially transmesosigmoid hernia, is nonspecific, and they rapidly progress to bowel ischemia. Early intervention and surgical correction are prudent for good clinical outcomes.

Keywords:

Closed-loop obstruction, internal hernia, transmesosigmoid hernia

Introduction

Internal hernia (IH) is the protrusion of viscous intestine, usually small bowel, through a normal or abnormal peritoneal or mesenteric aperture within the abdominal or pelvic cavity. IHs have an incidence of less than 1% among all hernias but account for 0.6–5.8% of small bowel obstruction cases.^[1] When strangulation occurs, the mortality rate surpasses 50%.^[2] IH may be congenital or acquired. Acquired IHs stem from surgery, trauma, or inflammation.

In the last 25 years, the prevalence of IH has risen due to the increased frequency of liver transplantations and bariatric surgeries. IH accounts for over half of small bowel obstruction cases, nearly matching those

caused by adhesions.^[3,4] IHs are categorized based on their anatomical location – para-duodenal (53%), peri-caecal (13%), Foramen of Winslow (8%), trans-mesenteric, trans-mesocolic (8%), inter-sigmoid (6%), and retro-anastomotic (5%).^[5] Sigmoid mesocolon hernias comprise 6% of all IH.^[6]

Transmesosigmoid IHs are challenging to diagnose preoperatively due to their nonspecific clinical presentation. Here, we present a case of transmesosigmoid hernia (TMH) and offer insights from recent literature on this topic.

Case Report

A 58-year-old female patient presented with complaints of abdominal pain, nonbilious vomiting, and constipation for 2 days. She had no premorbid conditions and had

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undergone an abdominal hysterectomy 15 years ago for a fibroid uterus. She had a history of similar complaints 2 years ago and was managed conservatively. She had a BMI of 24 kg/m².

On arrival, vitals were stable. The abdomen was distended with diffuse guarding. A tympanic note was present on percussion. A Pfannenstiel scar was seen and healed with primary intention. A rectal examination revealed hard stools with the normal anal tone with no bleeding or melena. The rest of the systemic examination was normal.

Laboratory investigations showed random blood sugar of 250 mg/dl, positive urine sugars urine ketones, serum lactates of 38.4 mmol/L, and the rest of the investigations were normal. She was admitted and started on initial conservative management with nil-per-oral, IV fluids, input-output monitoring, nasogastric tube with continuous drainage, and hyperglycemia correction. After 24h of observation, she had tachycardia, persistent abdominal distension, guarding, and obstipation.

Contrast-enhanced CT [Figures 1, 2] of the abdomen revealed multiple dilated, fluid-filled jejunal and ileal loops (max. caliber ~4 cm) noted, with a transition point in the distal ileal loops in the pelvis showing a beaking appearance likely secondary to adhesions: no pneumoperitoneum/pneumatosis intestinalis/gangrenous changes.

She was taken up for emergency exploratory laparotomy. Due to diffuse abdominal distension and dilated bowel loops, the laparoscopic approach was not chosen. Intraoperatively [Figures 3, 4], a 3 cm x 4 cm diameter defect was noted in the sigmoid mesocolon with a 10 cm loop of distal ileum herniating through the defect, creating a closed-loop obstruction. On reduction of the hernia, a 10 cm ischemic segment of the ileum, 10 cm proximal to the ileocecal junction, was

noted. The rest of the bowel was normal. A diagnosis of transmesosigmoid IH with closed-loop obstruction and incarceration of distal ileal loops was made intraoperatively. The ischemic distal ileal segment was resected. A side-to-side ileo-ascending colon stapler anastomosis was done. The defect in the sigmoid mesocolon was primarily closed. The intraoperative time was three-and-a-half hours. The post-operative period was uneventful. Histopathological examination of the resected specimen was suggestive of intramural ischemic necrosis.

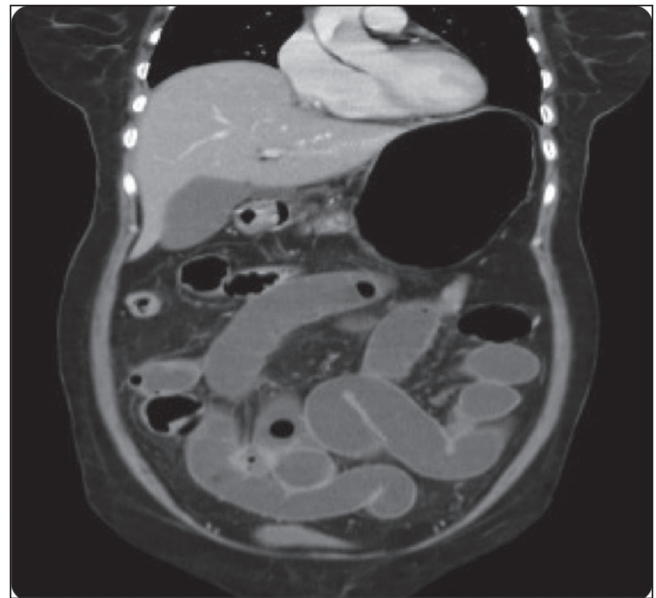


Figure 2: Coronal view of CECT depicting dilated small bowel loops with transition point in the distal ileum

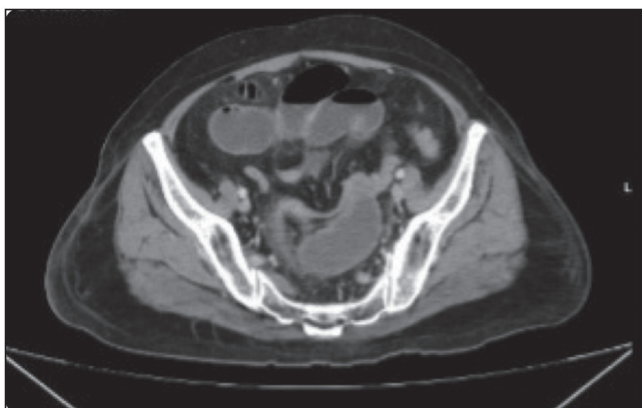


Figure 1: Axial view of CECT depicting dilated bowel loops with transition point in distal ileum

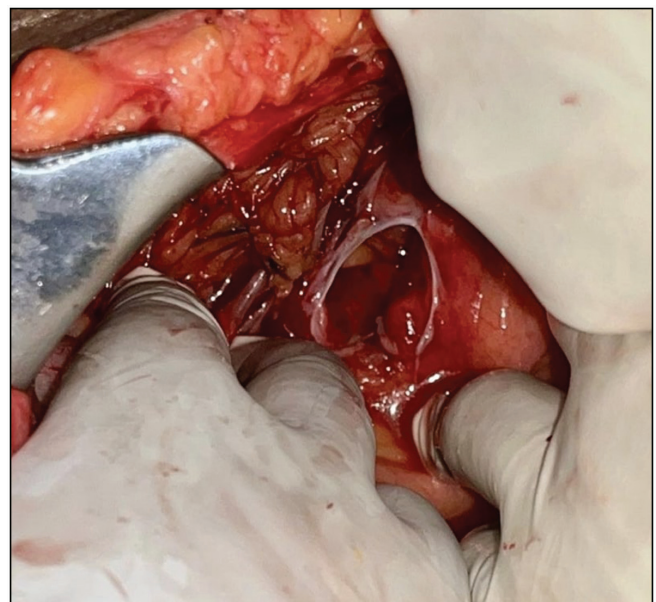


Figure 3: 3 cm x 4 cm diameter defect in the sigmoid mesocolon

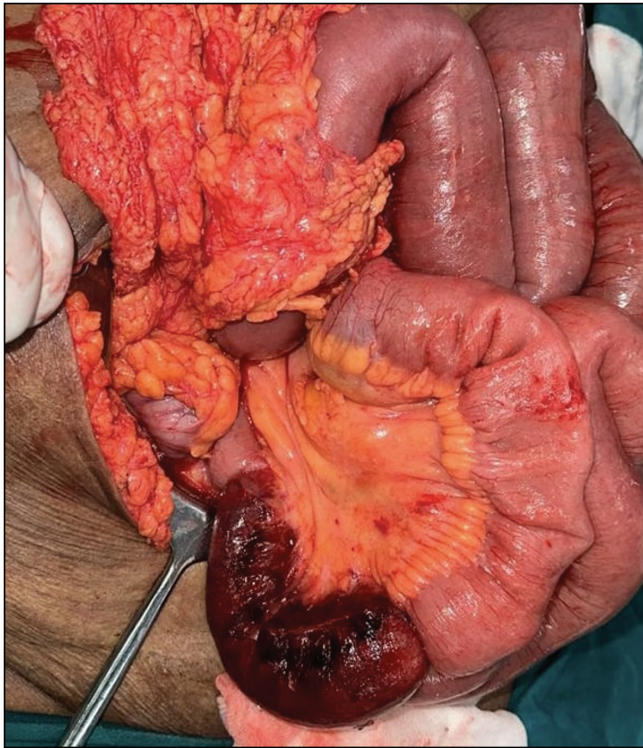


Figure 4: Ischemic ileum (10 cm in length) 10 cm from the ileocecal junction

Discussion

Sigmoid-related IHs can be categorized into three types:^[7]

- 1) Inter-sigmoid hernia: herniation of bowel loops through the inter-sigmoid fossa typically contains a hernial sac.
- 2) Transmesosigmoid hernia (TMH) [Figure 5]: as depicted in the current case, isolated oval defect in the sigmoid mesocolon involving both the layers, through which there is herniation of bowel loops.
- 3) Intra-mesosigmoid hernia: isolated defect in the sigmoid mesocolon, involving only one layer, herniated bowel loops lie within the mesocolon.

TMHs could be congenital due to partial regression of the dorsal mesentery or inadequate vascularisation during fetal development or acquired caused by trauma, inflammation, or surgery. Case reports suggest that changes in uterine size during puerperium could contribute to TMH development, involving a significantly long intestinal loop herniated into the opposite side of the mesocolon.^[8] An isolated oval defect in the sigmoid mesocolon involving both layers is seen. Small bowel loops along the mesentery herniate through the defect to lie retroperitoneally. There is no hernial sac. Hence, there is a swift progression of herniated bowel loops toward incarceration and ischemia. The diameter of the defect significantly influences the likelihood of strangulation in TMH.^[9]

- >5 cm: hernia may reduce spontaneously.
- <2 cm: partial herniation of bowel may occur, but can be restored spontaneously.
- 2–5 cm: lower chance of spontaneous restoration, higher risk of strangulation.

The presentation is nonspecific. Patients may present with repetitive subacute intestinal obstruction or acute obstruction. If in acute obstruction, emergency laparotomy is the preferred treatment as patients rapidly deteriorate to peritonism and sepsis. A literature review in 2014 found only 22 reported cases between 1989 and 2013.^[9] Twenty were initially diagnosed with small bowel obstruction of unknown origin, while two were misdiagnosed as appendicitis. None of them received a pre-operative diagnosis of internal hernia.

Diagnosing internal hernias preoperatively can be challenging due to various factors:

- 1) Peritonism may not initially manifest, as the inflamed or incarcerated bowel loop may be situated retroperitoneally, pelvic, within the lesser sac, or within the mesocolon.
- 2) X-ray might reveal dilated small bowel loops with collapsed large bowel, leading to suspicion of small bowel obstruction or paralytic ileus.
- 3) CT findings in internal hernias are not well-established but generally include features of small bowel obstruction.

One among the limited case reports detailing the findings of TMHs in acute obstruction,^[10] reports the following findings:

- Dilated fluid-filled small bowel loops clustered in the left iliac fossa, trapped posterolateral to the sigmoid colon via a mesosigmoid defect.
- The defect lies between the sigmoid colon and the left psoas muscle.
- Anterior and medial displacement of the sigmoid colon.
- Encapsulated small bowel loops show U- and C-shaped configurations with wall thickening, indicating closed-loop obstruction with ischemia.

X-rays following a barium enema post-evacuation aid in diagnosing TMH without obstruction. Sacculated ileal loops may be observed in the left lower abdomen, accompanied by medial and anterior displacement of the sigmoid colon. This technique might cause chemical peritonitis if used in acute cases.

The primary treatment approach for sigmoid-related IHs involves early intervention, bowel resection if incarceration is present, and closure of the mesocolon defect

Author contributions

VC contributed to concept, manuscript writing and drawing; SKM and VRU contributed to concept and

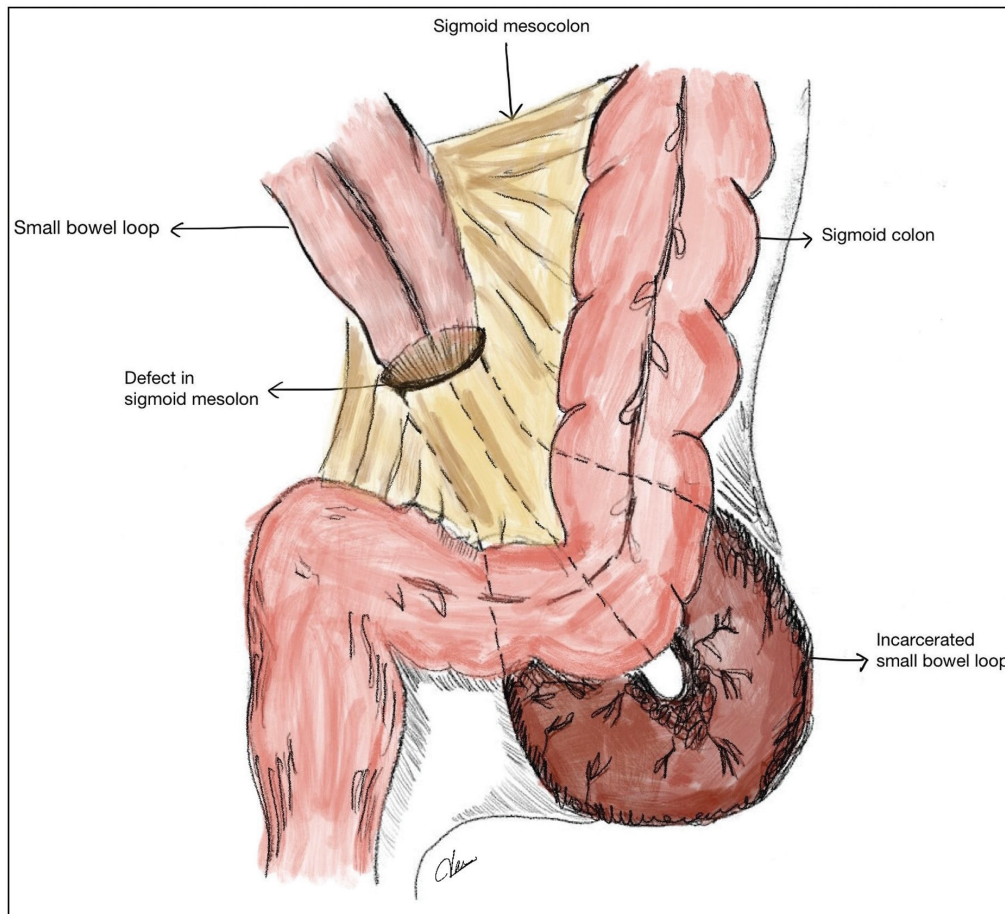


Figure 5: Pictorial representation of transmesosigmoid hernia

manuscript writing; All authors contributed to and approved the final manuscript.

Ethical policy and institutional review board statement

Not applicable.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

Data availability statement

Data sharing not applicable to this article as no datasets were generated and/or analyzed during the current study.

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Conflicts of interest

There are no conflicts of interest.

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Not applicable.

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