

Transmesosigmoid hernia: Case report and review of literature

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Abstract

Transmesosigmoid hernia has previously been considered as a rare condition. The clinical symptoms can be nonspecific. Here, we report a case of acute intestinal obstruction because of transmesosigmoid hernia. In addition, after a comprehensive review of PubMed and China National Knowledge Infrastructure, we present a review of 22 cases of transmesosigmoid hernia. We summarize several valuable clinical features that help early recognition of transmesosigmoid hernia. As a result of easy strangulation, in patients without a history of surgery or abdominal inflammation who present with symptoms of progressive or persistent small bowel obstruction (SBO), surgeons should consider the possibil-

ity of transmesosigmoid hernia. In addition, based on our data, in patients with SBO because of transmesosigmoid hernia, the defect is usually 2-5 cm in diameter. Furthermore, because of the high risk of strangulation with transmesosigmoid hernia, it is mandatory to reassess the condition timely and periodically when patients receive conservative treatment.

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Key words: Transmesosigmoid hernia; Acute intestinal obstruction; Internal hernia

Core tip: Transmesosigmoid hernia is a rare condition. We report a case of transmesosigmoid hernia. In addition, we carried out a comprehensive literature analysis and summarized the important clinical traits. Our data indicated for the first time that small bowel obstruction due to transmesosigmoid hernia can easily lead to strangulation, with the defect being 2-5 cm in diameter. It is necessary to reassess the condition timely and periodically if patients receive conservative treatment.

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INTRODUCTION

Internal hernia is the protrusion of a viscus through a mesenteric or peritoneal aperture. It causes up to 5.8% of cases of small bowel obstruction (SBO)^[1,2]. Sigmoid-related hernias are especially rare, and account for 6% of internal hernias^[3]. There are three main types of sigmoid-related hernias^[4,5]. One is the intersigmoid type, which develops when herniated bowel protrudes into the inter-



Figure 1 Abdominal computed tomography showed dilated loops of small bowel with multiple air fluids levels and collapsed distal small bowel, consistent with small bowel obstruction.

sigmoid fossa. This is actually a normal congenital variant, and the hernias are often easily reducible. Whether there is a true aperture of the intersigmoid fossa is still debatable. The other two types are transmesosigmoid hernia and intersigmoid hernia. The difference between them is that the former type involves a complete defect involving both layers of the sigmoid mesocolon, while the latter has an incomplete defect involving only one of the layers (usually the left leaf). Due to the lack of herniatic sac, transmesosigmoid hernia is assumed to progress rapidly, with a higher incidence of strangulation. The clinical presentation is often featureless until frank obstruction or strangulation occurs. Additionally, imaging changes can also be nonspecific, such as abdominal X-ray, contrast series, or computed tomography (CT)^[6]. Without a heightened awareness and understanding of this hernia, it can always be misdiagnosed, with subsequent significant morbidity and mortality. To the best of our knowledge, only a few cases have been reported regarding this topic. We present a case and review of the literature to give an up-to-date perspective on transmesosigmoid hernia.

CASE REPORT

A 59-year-old man came to the emergency department complaining of acute severe colicky abdominal pain, with no flatus and feces passed for five consecutive days. This patient had a history of an episode of painful abdomen lasting for 1 d 2 years previously. When he was 29 years old, he underwent surgery for inguinal hernia repair (total extraperitoneal repair). He had no history of abdominal trauma. On examination, his temperature was normal, pulse rate was 90 beats/min, and blood pressure was 125/92 mmHg. Heart and lungs were clinically normal. Observation of the abdomen showed a surgical scar about 5 cm in length in the right lower quadrant. There was mild tenderness in the lower abdominal region with hyperactive bowel sounds. He was negative for intestinal peristalsis, rebound tenderness, hepatosplenomegaly, or shifting dullness. The external hernia orifices were normal bilaterally. Rectal examination was inconclu-

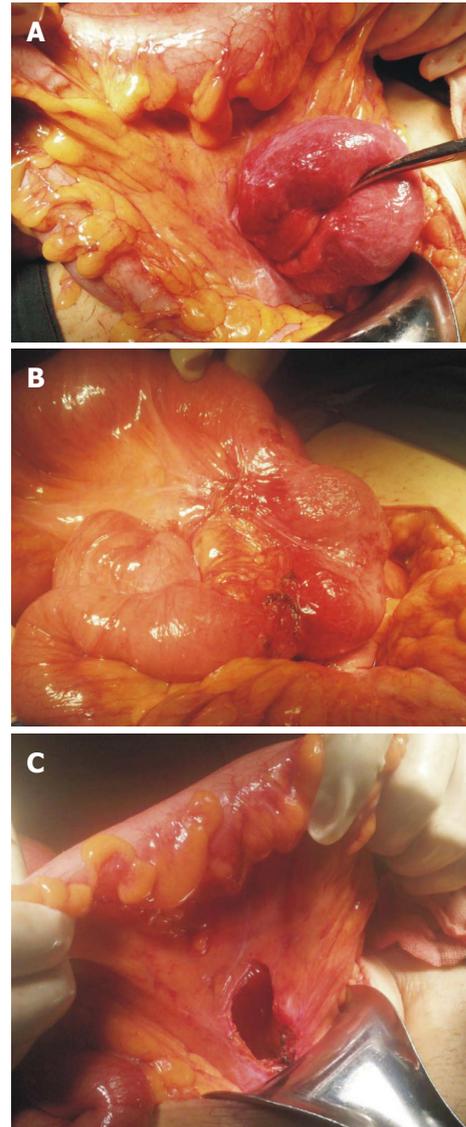


Figure 2 Sigmoid mesocolic hernia during laparotomy, with 15-cm loop of ileum herniated into the hiatus of the sigmoid mesocolon (A), herniated loop showing no gangrene, but the presence of a constriction ring (B), orifice about 2.5 cm in diameter (C).

sive. Blood counts revealed a white blood cell count of 68000/L 68000 with neutrophil leukocytosis of 71.1%. Metabolic panel and liver function tests were within normal limits. Abdominal CT showed dilated loops of the small bowel with multiple air fluid levels and collapsed distal small bowel (Figure 1). Preoperative provisional diagnosis was acute intestinal obstruction/adhesive ileus. Emergency exploratory laparotomy was carried out. We found a mechanical SBO due to an incarcerated internal hernia. Proximal ileum was dilated while the distal ileum was collapsed. A loop of ileum about 15 cm had herniated through a congenital defect in the sigmoid mesocolon (Figure 2A). The herniated loop and the other parts of the ileum were viable, with no gangrene, but there was a constriction ring over the bowel wall (Figure 2B). The herniated loop was reduced successfully and the defect was approximated. No bowel resection was done. No

Table 1 Case reports of transmesosigmoid hernia

Ref.	Age/sex	History of surgery or inflammation	Time from onset to operation	Acute bowel obstruction	Chronic abdominal pain	Peritonitis	Sepsis	Ascites (hemorrhagic or turbid)	Imaging before operation	Diagnosed preoperatively	Diameter of defect (cm)	Bowel resection (cm)	Exploratory laparotomy
Papanikolaou <i>et al</i> ^[12]	3/F	N	12 h	Y	Y	Y	Y	Y	U/S	SBO	5	60	Y
Collins <i>et al</i> ^[13]	60/M	N	48 h	Y	N	N	N	N	CT	SBO	4	0	Y
Van der Mieren <i>et al</i> ^[14]	Postpartum woman	N	Early	Y	N	N	N	N	CT	SBO	-	0	Y
Yang <i>et al</i> ^[15]	66/M	N	48 h	Y	N	N	N	N	CT	SBO	-	0	Y
Yu <i>et al</i> ^[16]	81/F	N	12 h	Y	1 time of SBO	Y	N	Y	CT	SBO	5	5	Y
Sasaki <i>et al</i> ^[17]	63/M	Appendicitis	-	Y	N	Y	N	Y	CT	SBO	3.5	30	Y
Johnson <i>et al</i> ^[18]	20/F, 14 wk gestation	N	1 wk	Obstruction and vaginal bleeding	N	Y	N	Y	AXR	SBO	5	160	Y
Benson <i>et al</i> ^[19]	42/F	N	1 wk	Y	N	N	N	N	AXR	SBO	2	0	Y
¹ Li <i>et al</i>	59/M	N	5 d	Y	Y	N	N	N	CT	SBO	2.5	0	Y
Yao <i>et al</i> ^[20]	60/M	N	7 h	Y	N	Y	N	Y	U/S	SBO	4	30	Y
Guo <i>et al</i> ^[21]	39/M	N	9 h	Y	N	Y	Y	Y	CT	SBO	4	65	Y
Yang <i>et al</i> ^[22]	62/M	N	9 h	Y	N	Y	N	Y	CT	SBO	5	20	Y
	48/M	N	24 h	Y	N	Y	Y	Y	CT	Appendicitis, SBO	4	30	Y
Bao <i>et al</i> ^[23]	62/F	N	37 h	Y	N	Y	N	Y	CT	SBO	3	12	Y
Zhou <i>et al</i> ^[24]	57/M	N	48 h	Y	N	Y	N	Y	CT	SBO	3	20	Y
Yang <i>et al</i> ^[15]	50/M	N	48 h	Y	N	Y	N	Y	CT	SBO	2	0	Y
He <i>et al</i> ^[25]	55/M	N	72 h	Y	N	Y	N	Y	AXR	SBO	3	100	Y
Luo <i>et al</i> ^[26]	69/F	Hysterectomy	24 h	Y	N	Y	N	Y	AXR	Appendicitis, SBO	3	40	Y
Zhang <i>et al</i> ^[27]	51/M	N	37 h	Y	N	Y	N	Y	AXR	SBO	3	40	Y
Mo <i>et al</i> ^[28]	59/M	N	10 d	Y	Y	Y	N	Y	AXR	SBO	3	40	Y
Li <i>et al</i> ^[29]	69/F	N	6 h	Y	N	Y	Y	Y	AXR	SBO	4	30	Y
Li <i>et al</i> ^[30]	62/F	hysterectomy	4 d	Y	N	Y	N	Y	AXR	SBO	2	30	Y
Average	53.04	13.6%	-	100%	18.2%	77.3%	18.2%	77.3%	-	9%	3.39	44.5	100%

¹Present case report, laparoscopy converted to laparotomy; U/S: Ultrasound. CT: Computed tomography; SBO: Small bowel obstruction; AXR: Abdominal X-ray.

hernia sac was present. The hernia orifice measured 2.5 cm in diameter and consisted of two leaves of the sigmoid mesentery (Figure 2C). The operation was successful, lasting about 40 min, with minimal blood loss. The patient started to take liquids orally at 72 h after surgery. The suture was removed at day 7 after surgery. The patient recovered well with no complications at 6 wk follow-up.

Literature review

The studies were identified by searching the PubMed database using the terms (transmesosigmoid hernia) OR (sigmoid mesocolon hernia) or (mesosigmoid hernia) with no time limitation. Five reports with no abstract available were excluded^[7-11]. We also searched the China National Knowledge Infrastructure database from January 1989 to December 2013 with the terms transmesosigmoid hernia. For each eligible report, the information was extracted as shown in Table 1, including the first author with year of publication, age and sex of the patients, history of surgery, symptoms, preoperative diagnosis, and some characteristics about the sigmoid mesocolon defect and herniation.

We found 27 reports, and five with no English abstract available were excluded. Twenty-two reports of surgically proven transmesosigmoid hernias were identified; eight in English and 14 in Chinese. Among these, there were 13 men (59.1%) and 9 women (40.9%; M:F = 1.44:1), with a mean age of 53.1 (SD = 17.55, range 3-81 years) (Table 1). All the patients presented with acute intestinal obstruction. The associated obstructive symptoms included abdominal pain, nausea, vomiting, constipation, and obstipation. There were two patients with a history of hysterectomy and one with previous appendicitis. Three patients had chronic intermittent abdominal pain. However, this abdominal pain had no relation to the history of surgery or appendicitis. The interval between the development of symptoms and onset of surgery ranged from several hours to 10 d (median 1.5 d, mean 2.9 d). There were nine patients (40.9%) who received conservative treatment first, converting to surgery because of worsening conditions. Physical examination revealed that 18 (77.3%) patients had signs of peritonitis, including acute abdominal pain and tenderness, rebound, and abdominal guarding. All these patients had hemorrhagic or turbid ascites during laparotomy. Four patients developed sepsis (18.2%). Preoperatively, 12 (50%) patients underwent CT scanning of the abdomen; eight with abdominal X-ray (AXR) and two with ultrasound examination. The classical finding of CT scanning was dilated loops of small bowel and collapsed distal small bowel. AXR showed multiple, dilated small-intestinal loops. Ultrasound examination of the abdomen revealed dilated fluid-filled loops with free intraperitoneal liquid, suggesting bowel obstruction. Two patients were misdiagnosed with appendicitis. All the others were diagnosed with SBO of unknown etiology. Not a single case was considered as internal hernia preoperatively.

For management, all patients received exploratory laparotomy. One case received laparoscopy first, and then converted to laparotomy. The average diameter of the mesosigmoid orifice in the 20 available cases was 3.39 cm (SD = 0.99, range 2-5 cm). Sixteen patients had gangrenous bowel and underwent bowel resection. Sixteen (72.7%) patients had gangrenous bowel and underwent bowel resection. The average length of bowel resection was 44.5 cm (SD = 38.31, range 5-160 cm). The longest was in a gestational woman who had SBO symptoms with vaginal bleeding for 1 wk and had intestinal resection of about 160 cm.

DISCUSSION

Transmesosigmoid hernia is rare and characterized by the small bowel herniating through a complete defect involving both layers of the sigmoid mesocolon. To date, only a few cases of transmesosigmoid hernia have been reported. The general opinion is that the clinical presentation is featureless and the imaging tests nonspecific. Here, we summarize several valuable clinical features to help early recognition of transmesosigmoid hernia.

According to the current study, transmesosigmoid hernia may be underdiagnosed. Our data showed that the male to female ratio is 1.44:1, with an average age of 53.1 years. The interval between the development of symptoms and onset of surgery is 1.5 d (median). We suggest that, in patients without a history of abdominal surgery or inflammation, who present with progressive or persistent SBO, internal herniation or transmesosigmoid hernia should be considered as one of the differential diagnoses.

Generally, abdominal CT scan is important for SBO, which provides information of obstructive location, content, and the possible underlying causes, such as malignancy, strictures, and congenital atresia and stenosis within the bowel wall, and other intraluminal problems such as intussusception, gallstone ileus, feces or meconium, or Bezoar^[1]. There are some traits that are especially meaningful for transmesosigmoid hernia: (1) CT scan showing dilated loops of small bowel with collapsed distal segments suggests the possibility of internal hernia; and (2) CT scan revealing anteromedial displacement of the sigmoid colon due to entrapped bowel loops behind the left posterior or lateral aspect of the sigmoid colon^[5]. Therefore, for patients with SBO, after comprehensive history taking and physical examination, abdominal CT scan is important for early acute diagnosis.

In transmesosigmoid hernia, the herniated loop is easily strangulated, causing necrosis. According to our data, 72.7% patients had bowel necrosis and underwent bowel resection, with the average length of resection being 44.5 cm. Among the patients, 77.3% had peritonism and 18.2% developed systemic compromise (sepsis). Although a conservative approach was attempted in some patients, all eventually underwent exploratory laparotomy. These data are meaningful. On the one hand, during conservative treatment, it is mandatory to reassess timely and periodically the patient's condition. Any persistence or progression of the clinical symptoms and signs should lead to urgent surgical exploration. On the other hand, SBO due to transmesosigmoid hernia has a high incidence of strangulation, which rapidly progresses to gangrene. In contrast, for SBO secondary to postoperative adhesion, a substantial percentage of selected patients can be treated successfully using with a conservative approach^[31]. If strangulation occurs, the risk of complications is high, including fluid leakage, bleeding, and stenosis in the anastomosis.

Based on our data, strangulation of the herniated loops in the transmesosigmoid defect is closely related to the size of the opening. The average diameter of the defect in transmesosigmoid hernia is about 3.39 cm (range 2-5 cm). Two cases with no data about the size of the orifice had no bowel necrosis^[14,15]. It is reasonable to infer that when the orifice diameter is > 5 cm, the bowel may move in and out spontaneously; when it is < 2 cm, it may cause partial herniation of the bowel wall only. For these two conditions, spontaneous restoration occurs, and the symptoms of SBO are mild and vague. When the defect is 2-5 cm, spontaneous restoration is unlikely and the risk

of strangulation is high. In addition, the symptoms of ileus based on transmesosigmoid hernia can always recur because of the congenital defect, even though there is transient subsidence after conservative treatment in a few cases. Therefore, this can explain why all patients in our literature series received laparotomy. To the best of our knowledge, this is a major novel feature of our study.

We suggest that surgeons should consider the possibility of transmesosigmoid hernia in patients without a history of surgery or abdominal inflammation, who present with progressive or persistent symptoms of SBO. We considered the common causes such as postoperative adhesions, abdominal wall hernia, and tumor. After ruling out these conditions, we should maintain a high index of suspicion of transmesosigmoid hernia. We suggest that the orifice diameter because of transmesosigmoid hernia causing SBO is usually 2-5 cm. Timely and periodically re-evaluating the condition of patients who receive conservative treatment is mandatory so as to enable early recognition of bowel ischemia. For treatment, laparotomy is useful and there are no special considerations for SBO due to transmesosigmoid hernia.

COMMENTS

Case characteristics

A 59-year-old man presented with acute severe colicky abdominal pain, with no flatus and feces passed for five consecutive days.

Clinical diagnosis

Transmesosigmoid hernia with small bowel obstruction (SBO).

Differential diagnosis

Postoperative adhesions, abdominal wall hernia, tumor.

Laboratory diagnosis

White blood cell count of 68000/L 68000 with neutrophil leukocytosis of 71.1%; metabolic panel and liver function tests were within normal limits.

Imaging diagnosis

Abdominal computed tomography showed dilated loops of small bowel with multiple air fluids levels and collapsed distal small bowel, consistent with SBO.

Treatment

The patient underwent emergency exploratory laparotomy. The herniated loop was reduced successfully and the defect was approximated. No bowel resection was done.

Related reports

Twenty-two reports of patients with surgically proven transmesosigmoid hernias were identified; 8 in English and 14 in Chinese.

Term explanation

Transmesosigmoid hernia involves a complete defect involving both layers of the sigmoid mesocolon. As a result of the lack of herniatic sac, transmesosigmoid hernia is assumed to progress rapidly, with a high incidence of strangulation.

Experiences and lessons

This case report not only represents the process of diagnosis and treatment of a patient with transmesosigmoid hernia, but also summarizes the important clinical traits that SBO due to transmesosigmoid hernia can easily become strangulated, with the defect being 2-5 cm in diameter.

Peer review

This article reports a case of transmesosigmoid hernia (a rare internal hernia), carries out a comprehensive literature analysis, and summarizes the important clinical traits.

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