

# Transmesosigmoid hernia with small bowel strangulation

Ji Won Kim, Dae Hyun Yang

## ABSTRACT

**Introduction:** Internal herniation of the small bowel is difficult to diagnose before surgery. Delayed laparotomy is related to high morbidity and mortality. We present a rare case of a transmesosigmoid hernia to demonstrate the importance of high suspicion and early laparotomy. **Case Report:** A 44-year-old female patient had severe abdominal pain of acute onset. A CT scan at six hours after onset of the symptom showed a dilated small bowel loop of diminished attenuation. Her severe pain was not controlled even with narcotics. An emergency laparotomy eight hours after onset revealed about a 150 cm strangulated closed loop of the mid small intestine, herniated through a small mesenteric defect of the sigmoid colon. The defect in the mesosigmoid was about three cm in diameter without a sac, and functioned similarly to a napkin ring; therefore the reduction of the herniated closed intestine loop was difficult without division of the intestine. The patient recovered well after resection anastomosis and closure of the mesenteric defect. **Conclusion:** Congenital internal hernia is rare, but early development of incarceration and strangulation is associated with increased morbidity and mortality. Early

suspicion and urgent or emergent laparotomy or laparoscopic exploration and surgical management are necessary.

**Keywords:** Transmesenteric hernia, Sigmoid colon, Internal hernia, Transmesosigmoid hernia

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Kim JW, Yang DH. Transmesosigmoid hernia with small bowel strangulation. International Journal of Case Reports and Images 2012;3(12):25–28.

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doi:10.5348/ijcri-2012-12-232-CR-6

## INTRODUCTION

Small intestinal obstruction is a frequent cause of surgical emergency. The most common cause of small intestinal obstruction is postoperative adhesion. Internal hernia is a rare cause of intestinal obstruction with nonspecific symptoms and signs, and high suspicion is therefore necessary in the evaluation of abdominal symptoms suggestive of intestinal obstruction. Although abdominal computed tomography (CT) scan is believed to facilitate the diagnosis and early surgical exploration, the diagnosis of internal hernia remains a challenge for surgeons and radiologists. We present a case of internal hernia, through a congenital defect of the sigmoid mesocolon in a 44-year-old female who presented at our hospital with acute cramping abdominal pain.

## CASE REPORT

A 44-year-old female patient visited the emergency department of our hospital with a 2-hour history of severe cramping abdominal pain. It began as low

Ji Won Kim<sup>1</sup>, Dae Hyun Yang<sup>2</sup>  
**Affiliations:** <sup>1</sup>Fellow Surgeon, Department of Surgery, Kangnam Sacred Heart Hospital, Hallym University College of Medicine, Seoul, Korea; <sup>2</sup>Professor, Department of Surgery, Kangnam Sacred Heart Hospital, Hallym University College of Medicine, Seoul, Korea.  
**Corresponding Author:** Dae Hyun Yang, MD 948-1, Daerim 1-dong, Yeongdeungpo-gu, Seoul, 150-950, Korea; Ph: 82-2-829-5130; Fax: 82-2-834-6526; Email: Kimjiw96@naver.com

Received: 12 March 2012  
Accepted: 08 May 2012  
Published: 01 December 2012

abdominal pain after dinner and developed as whole abdominal pain. Also, she was experiencing nausea and the desire to defecate, and vomited once after a small amount of ingested food. She had a history of laparotomy for tubal ligation 20 years prior. Her vital signs were stable with a blood pressure of 120/50 mmHg, body temperature of 36.1°C, pulse rate of 66/min, and respiratory rate of 14/min. She was acutely ill-looking and complained of intractable abdominal pain. Abdominal physical examination revealed generalized tenderness. There was no pronounced rebound tenderness or guarding. A plain abdominal X-ray showed a mild ileus without significant bowel dilation (Figure 1). A hematologic profile at the time of hospitalization showed only an increased white blood cell count of  $12.94 \times 10^3/\text{mm}^3$  with neutrophil predominance of 78.4%, and the results of blood gas analysis and serum bilirubin, creatinin and amylase were within normal limits. Abdominal CT scan demonstrated ascites, dilated small bowel loop with a cut-off at the level of mid-ileum, and intestinal wall thickening (Figure 2). The cause of the abdominal pain was difficult to identify. The abdominal pain was not controlled even with narcotics and it was becoming worse. The second complete blood count test at four hours interval showed a more increased white blood cell count of  $2.05 \times 10^3/\text{mm}^3$  with neutrophil predominance of 94.2%. With the suspicion of bowel strangulation, an emergent laparoscopy was performed. Intraoperative evaluation was performed using a laparoscope inserted through the lower abdominal region. Hemorrhagic ascites and a dark strangulated dilated small intestinal loop were found; we, therefore, converted to open laparotomy of the lower midline incision. A long loop of small bowel with strangulation had herniated through a small defect of the sigmoid colon mesentery from left to right (Figure 3). There was no hernia sac. The strangulated small bowel loop of about 150 cm, of which the distal portion was 170 cm from the ileocecal valve, was entrapped at the hernia defect, mimicking the shape of a napkin ring. The defect was about 3x3 cm and was located near the base of the mesentery of the sigmoid colon. The incarceration could not be relieved without resection of the herniated bowel. After anastomosis of the bowel, the mesocolic defect was repaired by primary closure with nonabsorbable sutures. The patient had an uneventful postoperative course and was discharged on postoperative day 7.

## DISCUSSION

Internal hernia is defined as a protrusion of an organ, usually the small intestine, through a normal or abnormal aperture within the abdominal cavity. The incidence of internal hernia is estimated to account for approximately 1–6% of intestinal obstructions [1]. Sigmoid mesocolon hernia is an uncommon type and estimated to account for approximately 6% of internal hernia [2, 3]. Benson classified sigmoid hernia into three types [4].



Figure 1: Plain abdominal X-ray film showed mild ileus without prominent dilation of small bowel.



Figure 2: A computed tomography scan of abdomen demonstrating intestinal dilation with wall thickening.

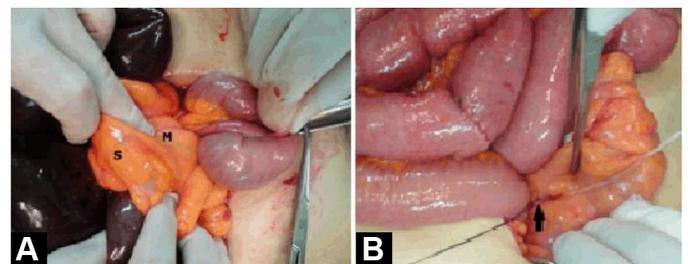


Figure 3: Operative findings (A) Herniation of small bowel through the sigmoid mesocolon. Herniated small bowel was necrotized. (S, sigmoid colon, M, sigmoid mesocolon), (B) Mesocolon defect next to the forcep (black arrow), which is oval and about three cm in diameter.

**Intersigmoid Hernia:** Herniation into an intersigmoid fossa, situated at the attachment of the lateral aspect of the sigmoid mesocolon.

**Transmesosigmoid hernia:** Incarceration of intestinal loops through an isolated, oval defect in the sigmoid mesocolon.

**Intramesosigmoid hernia:** A congenital, oval defect unrelated to the intersigmoid fossa is present in the lateral peritoneal surface of the mesocolon, and herniation occurs. A normal fusion fascia is present, and the right leaf is intact in this setting.

In our report, the patient had transmesosigmoid hernia according to the Benson classification. Pathologic apertures of the mesentery and visceral peritoneum are mostly due to congenital, surgical, traumatic, inflammatory or circulatory etiologies [2]. Congenital causes of sigmoid mesocolon hernias have also been proposed as possible causes [5–7]. However, the role of congenital factors remain obscure and theoretical. Some case reports have documented transmesosigmoid hernias developing during pregnancy or postpartum [5, 8]. The authors of these case reports proposed that dilatation and shrinkage of the uterus concomitant with pregnancy or delivery contributed to the development of transmesosigmoid hernias. The abnormal aperture could have been formed from the sigmoid mesocolon tearing by traction due to postpartum shrinkage of the enlarged uterus, and herniation could have occurred a few decades later through the abnormal aperture formed during the pregnant period. In our case, the patient had a laparotomy for tubal pregnancy 20 years prior, and delivery at 16 years prior. Her mesocolic defect was near the base of the sigmoid mesentery; operative trauma is therefore not suspected as the cause of the deep seated mesosigmoid defect. It could be a naturally occurring abnormal opening related to pregnancy. The key CT scan findings for diagnosis of the transmesosigmoid hernia included:

- (a) a cluster of dilated fluid-filled loops of the small bowel entrapped in the left posterior and lateral aspect of the sigmoid colon through a mesosigmoid defect
- (b) the defect located between the sigmoid colon and the left psoas muscle
- (c) the sigmoid colon showing anterior and medial displacement
- (d) these encapsulated loops of small bowel showing U or C shaped configurations and wall thickening representing closed loop obstruction and ischemic change
- (e) attached mesentery with vessels engorgement and fat obliteration indicating strangulation and
- (f) proximal small bowel showing dilatation [9].

Patients with small bowel obstruction not responding to conservative management requires operation. If an internal hernia is suspected, the operation should be prompt, as strangulation and gangrene of the bowel is likely to occur if the surgery is delayed. The role of laparoscopy in patients with intestinal obstruction is being increasingly recognized. Laparoscopic examination established that there was a strangulated

hernia, and the definite etiology was only confirmed by the open method [10]. In contrast to other types of sigmoid mesocolon hernias, transmesosigmoid hernias are usually associated with a significantly long intestinal loop herniated into the opposite side of the mesocolon, perhaps because of a trend toward protrusion of the intestine due to the absence of the hernia sac [3, 4].

## CONCLUSION

Small bowel obstruction secondary to transmesosigmoid hernia, although rare, may be considered in the differential diagnosis in patients with suspected small bowel incarceration or strangulation. We emphasize that in order to reduce morbidity and mortality from bowel strangulation, it is important to make the decision for surgical intervention by carefully watching the clinical features rather than identifying the precise cause of the acute abdomen.

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## Author Contributions

Ji Won Kim – Substantial contributions to conception and design, Drafting the article, Revising it critically for important intellectual content, Final approval of the version to be published

Dae Hyun Yang – Conception and design, Acquisition of data, Analysis and interpretation of data, Revising it critically for important intellectual content, Final approval of the version to be published

## Guarantor

The corresponding author is the guarantor of submission.

## Conflict of Interest

Authors declare no conflict of interest.

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