

Strangulated Small Bowel Obstruction Caused by Broad Ligament Hernia: Report of a Case and Review of Literature

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Abstract Mechanical ileus is a common condition that physicians encounter in the emergency room. Adhesions should be considered first in a patient with a history of surgery, and other causes of bowel obstruction, such as colorectal cancer can be in the differential diagnosis. However, an unusual cause of mechanical ileus can make diagnosis difficult. Internal hernia is a representative unusual condition that is difficult to diagnose preoperatively. Here, we present a case of broad ligament hernia with strangulated small bowel obstruction. A 41-year-old woman presented with abdominal pain and distension since 3 days. Plain abdominal X-ray showed a loop of dilated bowel without free air. Emergent computed tomography revealed diffuse dilatation in the proximal-to-mid-ileal loop, with an abrupt luminal narrowing at the mid-ileum, but there was no evidence of bowel ischemia. Despite conservative management, the symptoms worsened, and peritoneal signs were apparent. During the operation, the terminal ileum was found to be herniated into a defect of the broad ligament. Because gangrenous changes were present, the incarcerated bowel was resected; an end-to-end anastomosis was performed, and the defect of the broad ligament was closed. This was an unusual case of internal hernia that could not be preoperatively diagnosed. Although the preoperative diagnosis was difficult because of its rarity, a high degree of suspicion is necessary; this diagnosis should be included in the differential evaluation of a female patient with mechanical ileus.

Keywords: broad ligament, hernia, ileus

Cite This Article: Pyong Wha Choi, "Strangulated Small Bowel Obstruction Caused by Broad Ligament Hernia: Report of a Case and Review of Literature." *American Journal of Medical Case Reports*, vol. 5, no. 2 (2017): 38-40. doi: 10.12691/ajmcr-5-2-4.

1. Introduction

Mechanical ileus caused by internal hernia is rare, with an incidence of 0.2% to 0.9%. [1] A paraduodenal hernia is the most common type, while paravesical, intersigmoid, and transomental internal hernias have also rarely been reported. [2] The broad ligament is a double fold of peritoneum that extends from the lateral edges of the uterus to the pelvic wall. Congenital or acquired defects of the broad ligament may lead to small bowel herniation, resulting in incarcerated intestinal obstruction. [3] Here, we present the case of a 41-year-old woman with strangulated small bowel obstruction caused by a broad ligament hernia.

2. Case Report

A 41-year-old woman was admitted to the emergency department of Ilsan Paik Hospital with abdominal pain and distension for 3 days. She had no specific medical history and had a history of three cesarean sections.



Figure 1. Abdominal CT image, showing diffuse dilatation in the proximal-to-mid-ileal loop, with abrupt luminal narrowing at the mid-ileum (white arrow)

The patient also complained of nausea, but denied vomiting. Although there was intermittent flatus, abdominal pain and distension was worsened over the time. Abdominal examination revealed mild distension and hyperactive bowel sounds. Even though there was mild tenderness over the whole abdomen, signs of peritoneal irritation were not apparent. The leukocyte count was $17,000 /\text{mm}^3$, but there were no other remarkable laboratory data. Plain abdominal X-ray showed a loop of dilated bowel without free air. Emergent computed tomography (CT) revealed diffuse dilatation in the proximal-to-mid-ileal loop, with abrupt luminal narrowing at the mid-ileum, but no evidence of bowel ischemia (Figure 1).

With the impression of mechanical ileus due to postoperative adhesions, she was managed with intravenous hydration and placement of a nasogastric tube. There was no improvement, and pain increased in intensity; signs of peritoneal irritation were evident on the third hospital stay. An exploratory laparotomy revealed a defect of the left broad ligament. A 25-cm section of the ileum had herniated into the defect. The herniated bowel was reduced and resected, and end-to-end anastomosis was performed, because gangrenous changes were recognized in the incarcerated bowel; the defect of the broad ligament was then closed with primary suture. The postoperative course was uneventful, and the patient was discharged on the eighth postoperative day.

3. Discussion

Physicians frequently encounter patients with mechanical ileus in the emergency room. Postoperative adhesions, colorectal cancer, abdominal wall hernias, and Crohn's disease are common causes of intestinal obstruction; these are easily diagnosed, based on history, physical examination, and imaging studies. However, intestinal obstruction caused by unusual causes can complicate diagnosis and treatment strategy. An internal hernia is a condition in which the intestine herniates through a congenital or acquired paraduodenal, mesenteric, foramen of Winslow, omental, or gastrojejunomy site defect. [2] The broad ligament consists of two layers of peritoneum extending from the lateral edges of the uterus to the pelvic side wall. A defect can result in a broad ligament hernia, which is an unusual cause of bowel obstruction, comprising less than 7% of internal hernias. [4]

In general, a patient with a broad ligament hernia is a middle-aged, multiparous woman without a history of surgery, and the defect of the broad ligament may be congenital or acquired. [5,6,7] Even though pathogenesis has not been established, spontaneous rupture of congenital cystic structures within the broad ligament, reminiscent of the mesonephric or Mullerian ducts, have been suggested as the cause of a congenital defect; an acquired defect may result from surgery, trauma, pregnancy, endometriosis, and inflammation. [6,7,8] In the present case, the patient was middle-aged and multiparous, but she had a history of three cesarean sections, which made it difficult to decide whether the cause of the defect was congenital or acquired.

A broad ligament hernia is classified by the nature of the defect or involved anatomic structure. Based on the nature of the defect, a broad ligament hernia is categorized into a fenestra type, with defects of both peritoneal layers, a pouch type, with a defect in only one of the two peritoneal layers, and hernia sac type, with herniation through the weakened peritoneum, but without a peritoneal defect. [3] Depending on the anatomic location of the herniation site, four types of hernias have been described: type 1, through the entire broad ligament; type 2, through the mesosalpinx and mesovarium; type 3, through the mesoligamentum teres; and type 4, through the mesosalpinx only. [8] Considering the nature of the peritoneal defect and the anatomic location of the herniation, our case is consistent with fenestra type and type 3. Since small bowel is redundant in the peritoneal cavity, the ileum is commonly herniated, as in our case, but colon, appendix, ovary, and omentum herniation have rarely been reported. [9]

The primary symptom of a broad ligament hernia is related to small bowel obstruction. Thus, a mechanical ileus pattern can easily be detected on simple radiography. However, simple radiography alone cannot identify the cause of obstruction. In cases with rare causes of obstruction, CT may be useful in making the diagnosis. CT findings in a broad ligament hernia include mechanical small bowel obstruction with two transitional zones, dilated small bowel loops lateral to the uterus in the pelvic cavity, and enlargement of the distance between the uterus and one of the ovaries. [3] Some authors have suggested that multi-detector CT may be a useful modality for diagnosis of a broad ligament hernia because it can enable the radiologist to trace the dilated small bowel around the broad ligament. [5] Nonetheless, preoperative diagnosis is quite difficult, given its rarity. Diagnostic laparoscopy has been suggested, because accuracy exceeds 90% and simultaneous therapeutic laparoscopic surgery may be feasible; however, the role of laparoscopy is not well defined in emergency settings such as abdominal distension and peritonitis. [10] Therefore, when mechanical ileus is detected in a female patient without a history of surgery, suspicion of broad ligament hernia may be necessary.

The treatment options may be surgical or conservative. However, in most cases, particularly those with an incarcerated or strangulated hernia, open or laparoscopic surgery should be considered. One of the surgical options is laparoscopic reduction and defect site repair after decompression through the anus using a rectal tube. [10] However, laparoscopic surgery can be limited in patients with peritoneal irritation signs due to strangulation or perforation. After reduction of the herniated bowel, resection may be performed according to bowel viability, and repair of the defect site with suture or further incision of the broad ligament can be performed for prevention of recurrence. [6,10]

4. Conclusions

Although a broad ligament hernia is extremely rare, and preoperative diagnosis is difficult, a high degree of

suspicion is important for correct diagnosis and management. Thus, a broad ligament hernia should be included the differential diagnosis in a female patient with mechanical ileus.

Statement of Competing Interests

The author has no competing interests.

Acknowledgements

The author has no sources of funding to report.

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