ABSTRACT

Small bowel obstruction (SBO) results from several different etiologies. The leading cause is adhesions from previous abdominal surgery. There are also rare causes of SBO requiring attention, especially in patients without previous surgical history. A multiparity female patient without a history of abdominal surgery presented with persistent cramping pain of the lower abdomen. She had an abdominal computed tomographic scan as she was unresponsive to medication, and it disclosed diffuse loop dilatation of the small intestine with transitional zone in the pelvic region and a moderate amount of ascites. Small bowel obstruction was diagnosed, and the patient underwent emergent exploratory laparotomy. Internal herniation with strangulation of small intestine into the type I defect of left-sided broad ligament was noted. Segmental resection with primary anastomosis of the small intestine along with repair of broad ligament defect was undertaken. Broad ligament hernia, though rare, should be taken into consideration in the differential diagnosis of small bowel obstruction in surgery-naïve patients.

Keywords: Broad ligament herniation, exploratory laparotomy, small bowel obstruction

INTRODUCTION

Small bowel obstruction (SBO) is a condition characterized by intraluminal flow blockage that is caused by several different etiologies. First, postlaparotomy adhesion accounts for about 75% of intestinal obstruction. The second most common cause of SBO is incarcerated hernia. The third most frequent etiology of SBO is neoplasm.

Internal herniation, though rare, accounts for about 1% of all intestinal obstructions. Broad ligament hernia is an even more unusual form of internal herniation, reported in 4%–5% of internal herniation cases. Here, we report a case of broad ligament herniation leading to strangulated small bowel obstruction.

CASE HISTORY

A 68-year-old multiparity female without a history of abdominal surgery presented to the emergency room (ER) with acute onset of lower abdominal pain. The pain was intermittent, colicky, and located between the infraumbilical and suprapubic region. It lasted for 6 h before she sought medical attention. Because her symptom did not respond to analgesics, the patient visited the ER. At triage, vital signs were relatively stable, except blood pressure of 188/81 mmHg. Physical examination showed tenderness over the left lower quadrant and hypoactive bowel sound. Hemogram, liver function, and renal function were within normal limits, except for a slightly elevated serum lactate level of 13.2 mg/dl. Supine kidney ureter bladder radiograph (KUB) showed a mildly dilated bowel loop. The initial impression was ileus, and she was kept on bowel rest with intravenous fluid repletion after an enema.

After 24 h of medical treatment, her symptoms persisted with several vomiting bouts, while physical examination revealed muscle guarding over the left lower quadrant of abdomen. Due to unresponsiveness to medical treatment, she received contrast-enhanced computed tomography (CT), which disclosed diffuse loop dilatation of the small intestine with the transitional zone in the pelvic region and a moderate amount of ascites [Figures 1 and 2]. Under the impression of small bowel obstruction, the patient underwent emergent exploratory laparotomy. Internal herniation of the small intestine into a 3-cm defect in the left broad ligament was noted intraoperatively, resulting in strangulation of the small bowel involving a section measuring approximately 40 cm in length [Figures 3 and 4]. The nonviable segment of the small intestine was resected, followed by primary anastomosis which was performed with the hand-sewn method. In addition, the defect of the left broad ligament was repaired, and the right-sided broad ligament was examined as well. The patient had an uneventful postoperative recovery and was discharged on postoperative day 9.

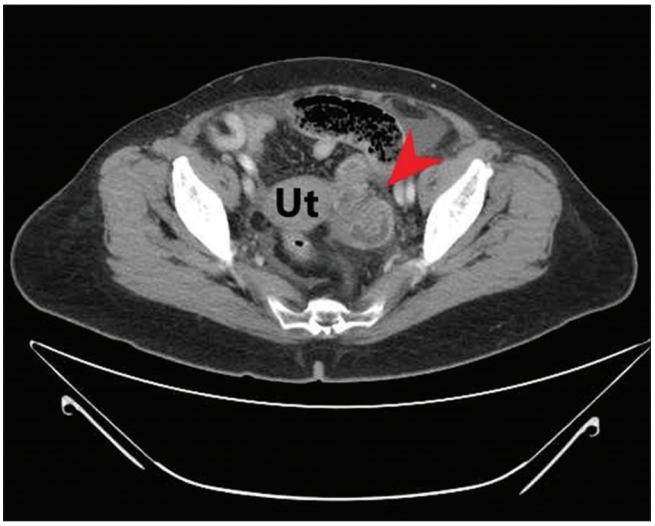

Figure 1: The arrow head indicates the transitional point. Ut: uterus

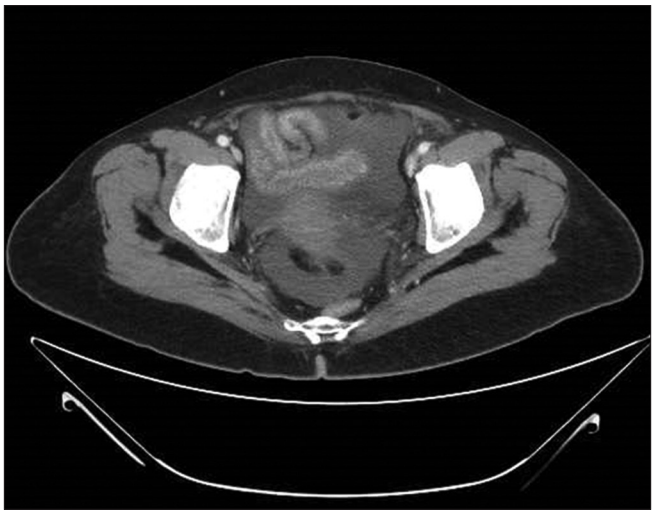

Figure 2: Much ascites in pelvis

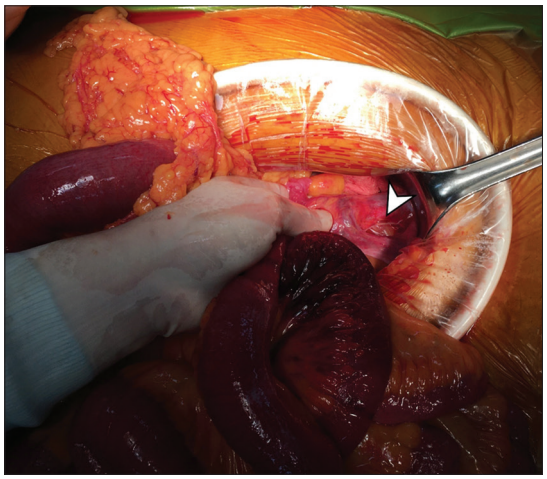

Figure 3: The arrow head indicates the defect of left broad ligament

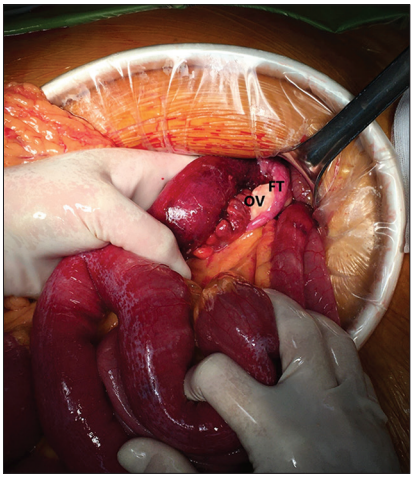

Figure 4: Herniation of small intestine into the defect of left broad ligament. OV: ovary, FT: Fallopian tube

DISCUSSION

Internal herniation is defined as protrusion of the abdominal viscera through the aperture or defect of peritoneum or mesentery. Broad ligament hernia is relatively rare, with a prevalence rate of 4%–5% for internal hernias.

The broad ligament is a double layer of peritoneum and consists of the mesometrium, mesosalpinx, and mesovarium.[1] The etiology of broad ligament defect is either congenital or acquired. Congenital causes of broad ligament defect are thought to manifest as a spontaneous rupture of cystic structures within the broad ligament. The cystic structure could be the remnants of the mesonephric or Müllerian ducts. This may occur in nulliparous patients. Moreover, acquired causes of broad ligament defect are a consequence of trauma, resulting from pregnancy or delivery, pelvic inflammatory disease, or surgical intervention, and mostly occur in multiparous females, as in the present case.[2,3]

Two classification systems of broad ligament defect have been proposed. In 1934, Hunt proposed a system that involves the layers of the peritoneum. In Hunt's system, there are two types: fenestration type with complete fenestration of the double layer peritoneum, and pouch type involving one layer that forms a pouch from either the anterior or posterior side of the broad ligament.[4] In 1986, Cilley *et al.* described another classification based on anatomic location. Type 1 defect is located caudal to the round ligament of the uterus; Type 2 defect is located above the round ligament; and Type 3 defect is located between the round ligament and the remainder of the broad ligament, through the mesoligamentum teres.[5] Later, Type 4 defect was added by Fafet *et al.*, which describes defects involving the mesosalpinx only.[6] Our case was the fenestrated type in Hunt's classification and was Type I according to Cilley's classification.

Contrast-enhanced CT is the imaging modality of choice. Some signs have been mentioned in the literature, including mechanical small bowel obstruction with double transitional zone, bowel loops herniated beside the uterus with slight deviation of uterus to the contralateral side, enlargement of the distance between the uterus and one of the ovaries, and presence of free fluid in the pelvis.[7] The CT image of this case showed closed loop obstruction with double beak sign, bowel loops beside the right-shifted uterus, and ascites accumulation in the pelvis. These findings suggested broad ligament herniation, causing mechanical small bowel obstruction.

A standard therapeutic intervention has not yet been established.[8] Diagnostic laparoscopy could be performed if the preoperative diagnosis is uncertain. Once the broad ligament defect with internal herniation has been found, it can be managed with the laparoscopic approach. However,

the laparoscopic approach still has its limits. Laparoscopic surgery is contraindicated in the following situations: when the diameter of small bowel is over 4 cm, there is evidence of bowel ischemia, history of severe adhesion, or presence of inflammatory bowel disease.[9] In this case, peritoneal signs developed due to failure of conservative treatment, while CT scan revealed a large amount of ascites and diffused dilated bowel loops. The above symptoms and signs indicated possible bowel ischemia of the herniated bowel loop. Therefore, laparotomy was chosen to fully explore the peritoneal cavity and release the strangulated bowel.

The surgical intervention should include two parts: reduction of herniated content with resection of nonviable viscera and management of the defect. The defect could be managed by direct primary closure or widening and fenestration. Hashimoto *et al.* reported applying vest-over-pants type sutures (Mayo repair) on the defect.[8] Widening of the defect and direct fenestration could be considered in cases with a larger defect.[10] In this case, we chose nonabsorbable sutures to close the defect directly due to the small size of the defect.

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