

An Incarcerated Internal Hernia of the Small Intestine through a Defect of the Broad Ligament: A Case Report

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ABSTRACT

Internal hernias through broad ligament defects are very rare and difficult to diagnose preoperatively. We report the case of a 92-year-old woman who was admitted to our hospital for abdominal pain. The contrast-enhanced multi-detector CT (MDCT) showed a dilated small intestine in the left lower abdomen. The proximal and distal transition point of the small intestine was adjacent to the left broad ligament. The uterus was compressed right ventrally. The penetration of the small intestine through the left broad ligament from ventral to dorsal was also visualized. From these findings, an internal broad ligament hernia with incarcerated bowel was suspected. Despite our strong recommendation several times of an exploratory laparotomy, the patient flatly refused surgery because of her advanced age. We thus unwillingly chose conservative treatment with the transnasal placement of a drainage catheter. The following morning, she consented to surgery due to worsening abdominal pain and underwent a laparotomy 33 hr after onset. A 120-cm long loop of small bowel had herniated through a defect in the left broad ligament. This necrotic segment of bowel was resected and end-to-end anastomosis was performed. The defect in the broad ligament was closed to avoid recurrence. The postoperative course was unremarkable. MDCT is useful in the preoperative diagnosis of this disease.

Key words: *Internal hernia, Broad ligament, Computed tomography*

Internal herniation causes only 1% of all intestinal obstructions⁷⁾. Defects of the broad ligament account for only 5% of all internal herniations¹¹⁾. Preoperative diagnosis is often difficult because clinical symptoms and abdominal plane films are nonspecific. In recent years, computed tomography (CT) in patients with signs and symptoms of intestinal obstruction has improved the preoperative diagnosis of internal abdominal hernias^{4,8,9,18)}. We report a case of small bowel obstruction due to broad ligament hernia, in which CT findings facilitated the diagnosis.

CASE REPORT

A 92-year-old multi-parous woman with no history of abdominal surgery complained of abdominal pain at 5 a.m. and was admitted to our hospital at 7 a.m. The abdomen was mildly distended with diffuse tenderness, however there were no peritoneal signs or high-pitched bowel

sounds. Laboratory findings showed a slight elevation of the white blood cells (10,100/mm³), LDH (342 IU/L), and CPK (279 IU/L). A plain abdominal radiograph demonstrated dilated small bowel loops and no gas in the colon. The contrast-enhanced MDCT showed a dilated small intestine in the left lower abdomen. The wall of the intestine was enhanced by the contrast medium (Fig. 1A). The proximal and distal transition point of the intestine was adjacent to the left broad ligament (Fig. 1B, 1C, Fig. 2A). The uterus was compressed right ventrally (Fig. 1D, Fig. 2B).

The penetration of the small intestine through the broad ligament from ventral to dorsal was also visualized (Fig. 3). A moderate amount of ascites was also detected (Fig. 1-3). The patient was diagnosed with small bowel obstruction likely resulting from internal herniation through a defect in the left broad ligament. Despite our recommendation of an exploratory laparotomy several times, the patient flatly refused surgery

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Fig. 1. Contrast-enhanced CT (coronal image)

- A. The dilated small intestine is seen in the left lower abdomen.
- B, C. Proximal and distal transition point of the small intestine (B, white arrow) is adjacent to the left broad ligament (C, black arrow)
- D. Uterus (white arrow) is displaced towards the right side.



Fig. 2. Contrast-enhanced CT (axial image)

- A. Transition point of the small intestine (white arrow) is adjacent to the left broad ligament (black arrow).
- B. Uterus (white arrow) is compressed right ventrally.

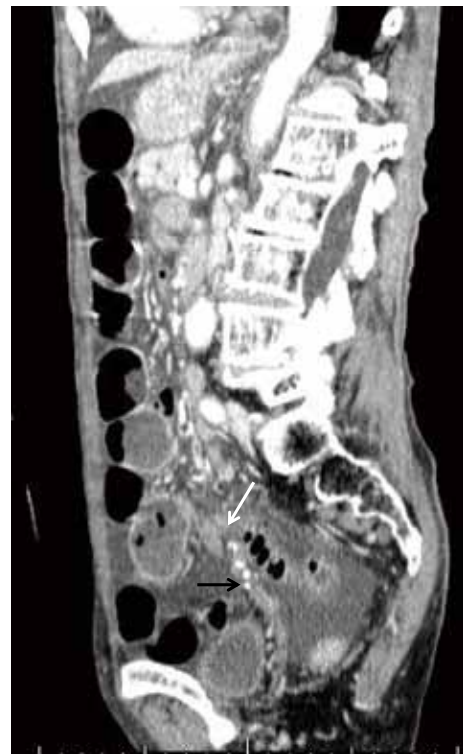


Fig. 3. Contrast-enhanced CT (sagittal image)

- The small intestine (white arrow) is penetrating through the broad ligament (black arrow) from ventral to dorsal.

because of advanced age. We unwillingly chose conservative treatment with decompression of the obstructed loop by insertion of a transnasal drainage tube.

The following morning, 27 hr after onset, the patient's leukocyte count had decreased to 2,100/mm³ and she had positive peritoneal signs. Laboratory findings showed 199 IU of LDH, and 206 IU/L of CPK. She consented to surgery finally and underwent a laparotomy 33 hr after onset. A 120-cm long closed loop of small bowel was seen to be herniating through a 3 cm defect in the left broad ligament. The proximal bowel was markedly dilated and the incarcerated portion was necrotic (Fig. 4). The ischemic bowel was resected and an end-to-end anastomosis was performed. The defect in the broad ligament was also closed with three stitches using the absorbable string (2-0 Vicryl) to avoid recurrence. The postoperative course was unremarkable.

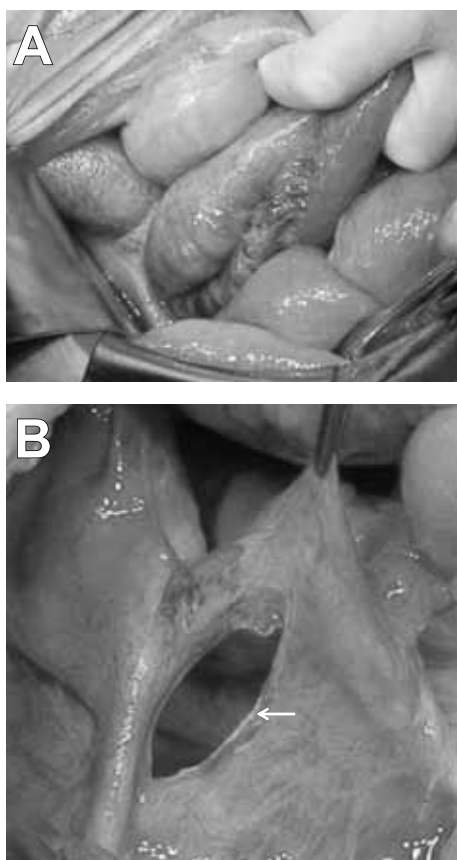


Fig. 4. Intra-operative photograph

- A. Small intestine is herniating through a defect of the left broad ligament.
 B. 3 cm hiatus in the broad ligament (white arrow).

DISCUSSION

Internal hernias originating in broad ligament defects are very rare. The classic patient is a middle-aged, multi-parous woman with no history of abdominal surgery, and clinical symptoms of a small bowel obstruction³. The etiology of the broad

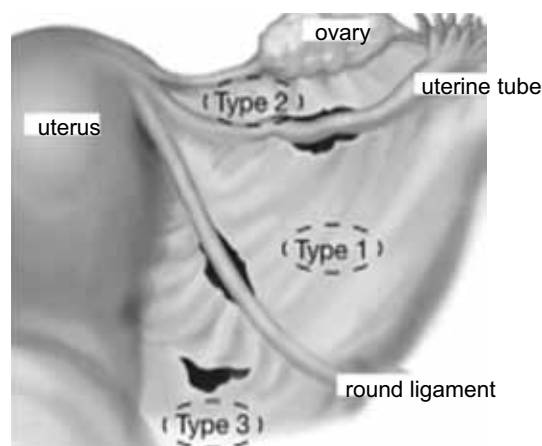


Fig. 5. Illustration of the broad ligament, showing locations of associated defects (Quotation from reference 12).

ligament defect is frequently unknown, although congenital and acquired origins have been proposed. The latter include previous surgery, pregnancy and birth trauma, endometriosis and pelvic inflammatory disease^{15,17}. The defect is often unilateral and rarely bilateral^{10,14}. Cilley classified the broad ligament hernias based on the anatomical location of the defect⁶: type I defects, the most common, occur throughout the entire broad ligament, type II defects occur throughout the mesosalpinx and mesovarium, and type III defects throughout the mesoligamentum teres (Fig. 5). Our patient had a type I defect.

An intestinal herniation through a defect of the broad ligament is difficult to diagnose preoperatively. Abdominal plain radiography usually suggests a small bowel obstruction, but is often nonspecific⁹. CT is more useful as the bowel loops may be specifically localized relative to the defect. The characteristic CT findings of an internal hernia through a defect in the broad ligament have been reported as follows¹⁶: (1) a cluster of dilated small bowel loops with air-fluid levels in the pelvic cavity, and (2) bowel loops compressing the recto-sigmoid dorso-laterally and the uterus ventrally. In recent years, MDCT has played an important role in the diagnosis of acute intestinal obstruction and planning of surgical treatment. MDCT can generate large numbers of thin axial sections with short slice intervals, and multiplanar reformatting (MPR) methods, such as sagittal, coronal and oblique reformatting, provide useful preoperative information regarding internal hernia¹³. Furthermore, MDCT is able to delineate the broad ligament and has been proven to be useful in the preoperative diagnosis of internal hernia through a defect of the broad ligament^{13,15}. In our case, the dilated small intestine was seen in the left lower abdomen and the uterus was displaced towards the right ventral side on MDCT. In addition, the small intestine, penetrating through the broad ligament, was observed.

The management of an internal hernia through the broad ligament is two-fold. First, the incarcerated contents are reduced, and, if necessary, non-viable bowel is resected. Second, the defect is repaired or the ligament completely divided to prevent a recurrence¹²⁾. In past reports, the defect was closed with purse-string suture using 2-0 monofilament absorbable suture¹⁾, or simple stitches using 2-0 non-absorbable suture¹⁹⁾, 2-0 absorbable suture, or laparoscopic absorbable clips²⁾. We resected the non-viable bowel and closed the defect with simple stitches using 2-0 absorbable suture. Recently, cases with laparoscopic treatment have been reported^{1,2,17,19)}. Early diagnosis by MDCT could increase the probability of a minimally invasive surgery.

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