Internal Hernia through a Defect in the Broad Ligament of Uterus: Laparoscopic Management Using a Self-Anchoring Barbed Suture

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The occurrence of internal hernia through a defect in the broad ligament is a very rare condition, which may cause small bowel obstruction. This is a case of a 50-year-old woman who developed intestinal obstruction induced by internal hernia and who had undergone laparoscopic myomectomy 7 years prior to visiting our emergency room. Abdominopelvic computed tomography showed luminal narrowing of the ileum and dilatation of the pelvic loop of the small bowel at the left side of the uterus. We detected internal hernia through the defect in the broad ligament and managed it successfully by performing a laparoscopic procedure using a barbed suture, V-Loc (Covidien, Mansfield, MA).

Keywords: Internal hernia, Broad ligament, Small bowel obstruction, Laparoscopy, Barbed suture

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INTRODUCTION

Abdominal hernias consist of external and internal hernias. Most abdominal hernias are external hernia, which is related to the absence or weakness of the abdominal wall. Internal hernia is defined as a visceral protrusion through the defect of the peritoneum or mesentery,¹ accounting for 1% of reported causes of intestinal obstruction. Paraduodenal hernia (50%) is the most common type of internal hernia, followed by pericecal hernia (13%) and hernias through the foramen of Winslow (8%).²

Hernia through a defect in the broad ligament is a very rare type of internal hernia, accounting for only 4% of all internal hernias, and is first reported by Quain during autopsy.³ Preoperative diagnosis is difficult due to lack of typical signs or

symptoms.⁴ Hence, most patients had been diagnosed during surgical exploration.³

We report a case of hernia through a defect in the broad ligament, which was preoperatively diagnosed with computed tomography (CT) and successfully managed by laparoscopic procedure using a barbed suture.

CASE REPORT

A 50-year-old woman visited our emergency room because of lower abdominal pain and vomiting for 3 days. She underwent laparoscopic uterine myomectomy at another hospital 7 years prior to this visit. The patients' vital signs were within normal limits. Abdominal physical examination revealed localized tenderness with tympanitic sound at the lower abdo-

men. White blood cell and neutrophil counts were increased at 20,690/ml and 86.6%, respectively, but other laboratory findings were within normal range. On plain abdominal X-ray, multiple air-fluid levels were found, and CT scan showed luminal narrowing of the ileum and dilatation of the pelvic loop of the small bowel in the left side of the uterus (Fig. 1). We diagnosed the patient as having hernia through a defect in the broad ligament.

Laparoscopic exploration was immediately performed. With the patient in supine position, three trocars were inserted at the umbilicus (11 mm), right lower quadrant (5 mm), and left lower quadrant (5 mm). The incarcerated distal ileum was found at a 3-cm-sized defect in the left broad ligament (Fig. 2A, B). The incarcerated small bowel revealed mild ischemic change, but because vascularity and motility were recovered after reduction, we did not perform resection. The defect in the broad ligament was closed with a continuous suture using barbed suture, V-Loc 3-0 (Covidien, New Haven, US) (Fig. 2C).

Fig. 1. Abdominopelvic computed tomography shows luminal narrowing of the ileum and pelvic loop dilatation of the small bowel in the left side of the uterus.

The postoperative course was uneventful. At postoperative day (POD) 2, flatus was passed, and at POD 3, diet was started. She was discharged at POD 6. The patient had no complaints after 6 months of follow-up.

DISCUSSION

The etiology of the defect in the broad ligament is still unknown, but several factors had been suggested.¹ They were usually considered as two different causes: congenital and acquired. Congenital factors include spontaneous rupture of cystic structures that are remnants of the mesonephric Müllerian ducts and developmental peritoneal defect around the uterus. Acquired factors include operative trauma, pregnancy and birth trauma, and perforations following vaginal manipulation, prior pelvic inflammatory disease, or endometriosis.^{5,6} A typical case of internal hernia through a defect in the broad ligament is reported in middle-aged multi-parous woman without a history of abdominal surgery.⁷ However, the operative trauma, which seemed to occur during laparoscopic uterine myomectomy 7 years prior, could be considered as a possible cause in this case report. To avoid a similar clinical situation, a defect in the broad ligament should be closed when encountered during surgical procedures.

Because this type of internal hernia shows non-specific symptoms and signs, preoperative diagnosis is difficult; hence, some problems may occur before appropriate management.⁴ Making an early diagnosis to prevent complications, such as ischemia, strangulation, and perforation of incarcerated bowels, is important. CT has been known as a useful tool to reveal herniated bowel loops into ectopic locations, and it was also helpful in this case.^{5,8} The herniated bowel loop would be shown as a closed-loop obstruction with C-shaped, U-shaped, or "coffee-bean" configuration, and it ends in close proximity to the uterus. Double-transition zone located in the pelvis, dilated small bowel loops that herniated lateral to the uterus

Fig. 2. (A) Intraoperative findings reveal ileal loop herniation through a defect in the left broad ligament. The small bowel has mild ischemic change. (B) After reduction by laparoscopic procedure, the left broad ligament defect was found between the left round ligament and fallopian tube. (C) After closing the defect with V-Loc 3-0.

in the pelvic cavity, and increased distance between the uterus and ovaries, which are deviated to opposite directions, are also reported in CT findings.⁸ When encountering the small bowel obstruction by unknown origin in female patients, early CT scan would be helpful while considering that internal hernia through a defect in the broad ligament could be one of the possible causes. In our case, CT revealed luminal narrowing of the ileum and pelvic loop dilatation of the small bowel in the left side of the uterus with an anteriorly displaced fallopian tube, and these findings led to early diagnosis.

The treatment for internal hernia through a defect in the broad ligament is surgery, including incarcerated bowel reduction and defect closure. For uncomplicated cases, laparoscopic approach could be thought as a first choice because the reduction and closure are easy even if minimal invasive surgery is tried, and several successful cases have been reported.^{2,3,6,9} For small bowel obstruction with other internal hernias, laparoscopic approach is accepted as a very technique.^{3,4} Laparoscopic surgery is known to have many advantages, such as decreased infection rate, cosmetic superiority, less pain, and shorter recovery period compared with open surgery.⁹ Closing the defect in the broad ligament sometimes could be problematic without laparoscopic suture and tie skill. However, these problems could be overcome by using a barbed suture material, such as V-Loc. Continuous suture using barbed suture makes a solid suture line easily, without tie.¹⁰ When internal hernia through a defect in the broad ligament is suspected, prompt laparoscopic approach should be considered to avoid complications and would be helpful to be performed by using a continuous suture with barbed suture material to avoid complications.

When encountering the small bowel obstruction by unknown origin in female patients, early CT scan would be helpful in diagnosing internal hernia through a defect in the broad ligament. In addition, prompt laparoscopic approach using a barbed suture could be helpful in resolving this issue.

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