Internal Hernia Through A Defect of Broad ligament

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ABSTRACT

Internal hernia is a rare cause of small bowel loop obstruction. Hernia through a defect of the broad ligament is extremely rare. A female patient who had received laparoscopic oocyte retrieval 20 years ago suffered from intermittent lower abdominal cramping pain and vomiting. Internal hernia through the defect of the broad ligament is confirmed through a series of imaging studies and surgical exploration. To the best of our knowledge, this is the first case of internal hernia through a defect of the broad ligament in which the small bowel loop inside the herniated sac is collapsed rather than dilated, as noted on the computed tomography and surgical finding.

CASE REPORT

A 58 year-old female patient suffered from intermittent lower abdominal cramping pain and vomiting for 2 days. Tracing her past history, she received laparoscopic oocyte retrieval half year apart for two times 20 years ago. Physical examination was unremarkable. Blood analysis revealed WBC = 11540/μl (neutrophils = 85.5%, lymphocytes = 9.5%). The other biochemical blood data and urine analysis were within normal limit. A series of imaging studies was performed. Supine and standing KUB revealed distended small bowel loop in the middle abdomen (not shown). Abdominal sonography showed fluid-filled small bowel loop associated with ascites in the pelvic cavity (not shown). Abdominal computed tomography (CT) was performed using a 64-detector row multi-detector CT (MDCT, Brilliance CT 64-channel by Philips Medical Systems, Netherlands). Contrast-enhanced CT with axial images and reformatted coronal and sagittal images showed small intestinal dilatation with a transition point at ileum, just lateral to the left aspect of the uterus. (Fig. 1). Rightward displacement of the uterus and right dorsal displacement of the rectosigmoid colon were seen. The air content inside the efferent loop implies a partial obstruction of the ileal loop. These findings were consistent with internal hernia through a defect of the left broad ligament.

Emergent exploratory laparotomy uncovered a segment of ileum herniated through a 3 × 3 cm\(^2\) defect of the left broad ligament from posterior to the anterior direction (Fig. 2). The involved ileum showed ischemic change but became revascularized again after pressure relief. Repair of the defect was performed. No bowel infarction was noted.

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**DISCUSSION**

Internal hernia is a rare cause of small bowel loop obstruction and accounts for about 1% of all intestinal obstruction [1-6]. Hernia through a defect of the broad ligament is extremely rare and constitutes less than 7% of all internal hernias. The ileum is most commonly involved. Herniation of colon, ovary and ureter has also been described [3].

The etiologies may be congenital or acquired [1-8]. Congenital defects are the result of a developmental defect in the broad ligament. Acquired causes consists of prior surgery (as in our case), perforation following vaginal manipulation, trauma (including birth trauma) and pelvic inflammatory disease. Low body mass index may be a contributory factor because it may lead to a very thin mesoovarium and mesosalpinx and cause the patient more prone to a rupture of the broad ligament, with resultant bowel herniation through this defect [7].

The defect of the broad ligament may be unilateral but may occasionally occur bilaterally [2, 4]. Hunt et al defined two types of internal herniation through the broad ligament [9]: the fenestra type that involves the anterior and posterior leaves of the broad ligament and the pouch type in which the defect involves one layer of the anterior or posterior leaf. The more common fenestra type has the complete defect and may allow passage of the small bowel loop and cause potential strangulation of the herniated bowel loop [8]. The defect in our case was of the fenestra type but no bowel ischemia was noted after reduction. The pouch type having

**Figure 1.** Axial contrast-enhanced MDCT images with two sequential axial planes (a is 1cm cranial to b) reveal a defect in the left broad ligament with twisted ileal loop (black arrow in a), the dilated afferent ileum (thick white arrow in b) with a beak sign (black arrow in b), the collapsed herniated loop (thin white arrows). Right dorsal displacement of the rectosigmoid colon (curve arrow) and rightward displacement of the uterus (U) are found. Reformatted coronal images (d is 4cm anterior to c) and sagittal images (e) are obtained. The defect has a diameter of 2.5cm (between the black arrows in c). Note the non-dilated ileal loops clustered inside the herniated sac (the white arrows in d and e).
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Single-layer defects may cause the bowel loop to enter and entrapped in the parametrial tissue.

The direction through the defect of the broad ligament may be from posterior to anterior [2] (as in the present case) or from anterior to posterior direction [6]. The CT appearance in the former condition shows the herniated loop on the left upper side of the uterus, causing rightward deviation of the uterus. In the anterior-to-posterior herniation, the bowel loop herniates into the pouch of Douglas causing ventral displacement of the uterus and dorso-lateral deviation of the rectosigmoid colon. In both directions, a cluster of dilated small bowel loops with air-fluid levels may be present.

Hernia through a defect of the broad ligament may cause closed-loop obstruction (incarceration) or even strangulation (ischemia) [3, 10-12]. Several CT signs may confirm closed-loop obstruction. The incarcerated small bowel loop shows radial distribution with stretched mesenteric vessels converging toward the point of torsion. The dilated bowel loop has U-shaped or C-shaped appearance. At the site of torsion, the dilated loop may show a “beak” sign as a fusiform tapering of the bowel loop imaged in longitudinal section.

Although many internal hernias cause dilatation of the incarcerated bowel loop, some remains nondilated and shows a cluster of collapsed small bowel loops inside the herniated sac [13-15], such as a left-side paraduodenal hernia [13], internal hernia through a peritoneal defect of the pouch of Douglas [14] and herniation through a defect of the broad ligament (as in our case). The collapsed herniated bowel loops implied incomplete obstruction of the efferent loop [14]. To the best of our knowledge, this is the first case of internal hernia through a defect of the broad ligament with the collapsed (rather than dilated) small bowel loop inside the herniated sac, as noted on the computed tomography and verified during surgical exploration.

In conclusion, internal hernia through a defect of broad ligament is a very rare form of all internal hernias. Preoperative recognition and specific CT characteristics of this rare form of internal hernia prompt emergent operation and reduce the mortality and morbidity of the patient.

REFERENCES

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