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Laparoscopic Management of Small Bowel Incarceration Caused by a Broad Ligament Defect: Report of a Case

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Abstract
We report the case of a 94-year-old woman who presented with signs of a small bowel obstruction many years after an appendectomy. Abdominal computed tomography (CT) scan showed discontinuity of the small bowel at a point next to the uterus. We made a provisional diagnosis of an internal hernia through a defect in the broad ligament and performed laparoscopic exploration, which revealed a viable ileal loop incarcerated through the broad ligament. Thus, CT scan may be useful for diagnosing this type of defect preoperatively, whereby open surgery can be avoided.

Key words Broad ligament · Incarceration · Small bowel · Laparoscopy

Introduction

Internal herniation, as a cause of small bowel obstruction, accounts for only 1% of all intestinal obstructions.[1] Broad ligament internal herniation is extremely rare and constitutes 5% of all internal herniations.[2] Laparoscopy is not usually recommended for small bowel obstruction because of the difficulty associated with identifying the point of obstruction. A literature search revealed only one case report describing the successful management of a broad ligament defect.[3] However, once a broad ligament hernia has been diagnosed, we believe that the laparoscopic approach is better than an open procedure. We report a case of small bowel obstruction diagnosed preoperatively, which was managed successfully by laparoscopic surgery. To our knowledge, this is only the second such report to be documented.

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Case Report

A 94-year-old woman with a past history of appendectomy was admitted to our hospital with vomiting and epigastric pain. The patient was afebrile and her vital signs were within normal limits. Clinical examination disclosed a diffuse, mild tenderness without peritoneal signs. A scar from the appendectomy was evident over the right lower quadrant and we palpated a soft left inguinal mass. The abdomen was mildly distended without metallic sounds. Laboratory findings suggested slight inflammation. The findings of physical examination suggested a small bowel obstruction caused by a left incarcerated inguinal hernia; however, an abdominal computed tomography (CT) scan showed discontinuity of the small bowel, not at the point of scarring from the appendectomy or left inguinal region, but near the right broad ligament (Fig. 1). Initially, we thought that the left inguinal mass was a salpingian cyst based on the CT scan findings, and despite the indications of a broad ligament internal hernia, we chose not to perform open surgery since the patient was elderly and there was no sign of bowel necrosis. We inserted a transnasal drainage tube as conservative therapy. After 4 days we added contrast to the transnasal drainage tube, but the contrast stopped at the intrapelvic region close to the uterus. Thus, we performed laparoscopic surgery the following day, with the patient under general anesthesia. First, we made three trocar incisions in the abdomen: one 10-mm incision in the umbilicus, one 5-mm incision in the right lower quadrant, and one 5-mm incision in the left lower quadrant (Fig. 2). Since the transnasal drainage tube reduced the bowel distension, the intrapelvic region was clearly visible through the laparoscope and we confirmed an incarcerated small bowel herniation into the right broad ligament (Fig. 3). The incarcerated bowel was slightly edematous, but not ischemic (Fig. 4), and we were able to reduce it gently using laparoscopic bowel forceps. The broad ligament defect

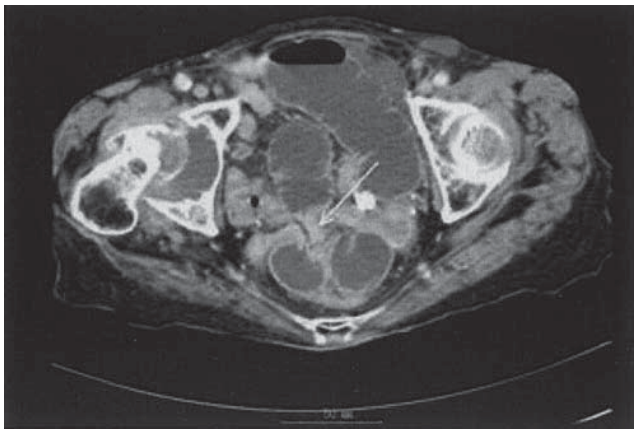

Fig. 1. Computed tomography scan showed the point of discontinuity in the small bowel immediately to the right of the adnexum

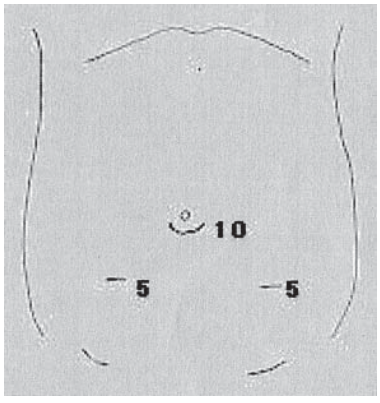

Fig. 2. We inserted three trocars in the abdomen: one 10 mm in the umbilicus; one 5 mm in the right lower quadrant; and one 5 mm in the left lower quadrant

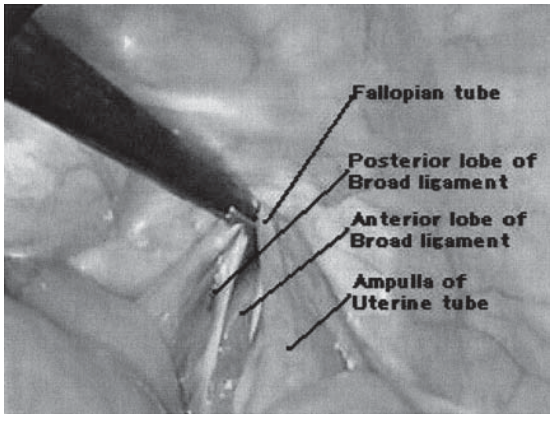

Fig. 3. The defect in the right broad ligament was limited to the posterior peritoneum. The broad ligament was shaped like a broad sack

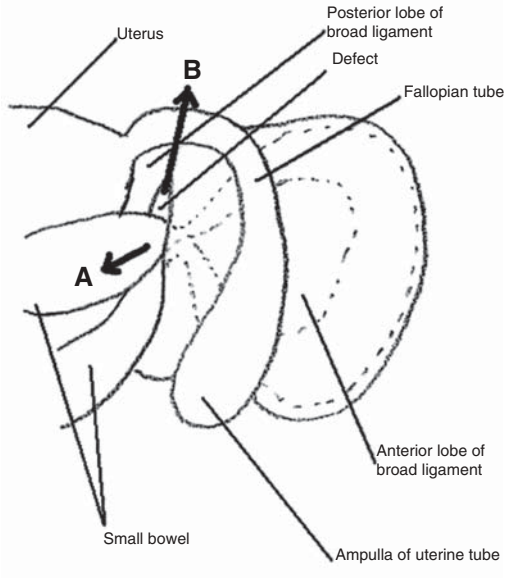

Fig. 4. Surgical procedure. First, we pulled out the incarcerated ileum (*A*). Next, we incised from the broad ligament defects to the fallopian tube with the round ligament using laparoscopic coagulating shears (*B*)

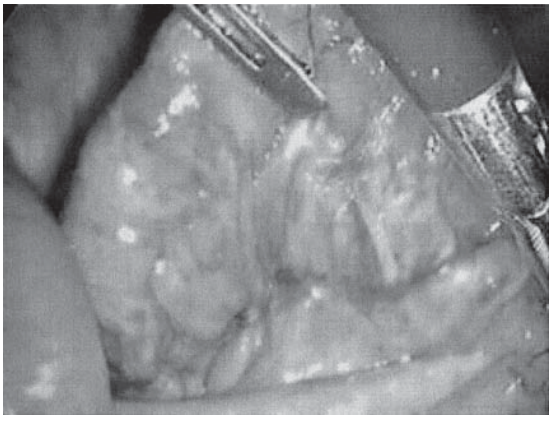

Fig. 5. There was a clear strangulation line in the mesoileum. The incarcerated ileum showed only mild congestive change

existed only in the posterior peritoneum. After the hernia reduction, we cut the ligament with laparoscopic coagulating shears to prevent reincarceration (Fig. 5). The patient was discharged 5 days later, after an uneventful postoperative course.

Discussion

An internal broad ligament hernia is unusual. The ileum is the most common part of the intestine to herniate, although a case of colonic herniation was reported.[4] Defects in the broad ligament can be congenital or ac-

quired. The causes of acquired defects include previous surgery, as well as trauma and pelvic inflammatory disease. Defects can also be classified by the nature of the defect and their location on the broad ligament. Hunt classified defects into two types: a fenestra with defects in both peritoneal layers, and a pouch type with defects in only one of the two layers.[5] Occasionally, the defect involves a double layer of attenuated peritoneum covering the visceral structures and represents a true hernial sac.[6] Another classification system based on the location of the defect defines Type I defects as those that occur throughout the entire broad band ligament; Type II defects as those that occur through the mesosalpinx and mesovarium; and Type III defects as those that occur through the mesoligamentum teres.[6] Our patient had a Type I, pouch-type defect affecting only the posterior peritoneal layer. To prevent recurrence, we cut the broad ligament about 3 cm from the edge of the defect to the nearest point of the fallopian tube with the round ligament. Cutting the ligament was easier than repairing it. Conversely, if this patient had been premenopausal, we would have repaired the defects without injuring the fallopian tube: However, there was no reason to repair fallopian tube defects in this elderly patient; a shorter operative time was a higher priority. Although the preoperative diagnosis of an internal hernia was previously thought to be very difficult, in recent years CT imaging has proven useful for preoperative diagnosis[7] and for evaluating bowel discontinuity. We used a high-resolution liquid crystal CT monitor, which allowed us to trace the whole bowel continuously and quickly by scrolling with the mouse. In fact, we have been able to predict the obstruction point using this system preoperatively in several other patients with a bowel obstruction. In this patient, we could find only one point of discontinuity in the ileum and suspected broad ligament herniation. A search of the literature revealed one other case report of laparoscopic management of this defect. Computed tomography is likely to be useful for confirming the diagnosis of this unusual cause of obstruction, which may then be treated laparoscopically after decompression of the small bowel by a transnasal drainage tube. This technique may be particularly effective for elderly women without peritoneal signs, since the repair requires only cutting the ligament. We were able to treat the defect in our patient based on a CT diagnosis, which led to a minimally invasive outcome. In conclusion, if a diagnosis of broad ligament internal herniation is suspected, laparoscopic reduction is a safe and effective form of management.

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