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Laparoscopic Surgery for Internal Hernia Through a Peritoneal Defect in The Pouch of Douglas: A Case Report

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Abstract

Background: Internal hernia is an uncommon cause of small bowel obstruction, and herniation through a peritoneal defect in the pouch of Douglas is exceedingly rare. This condition is often confused with hernias of the pouch of Douglas, which are external hernias associated with pelvic floor weakness. In contrast, herniation through a peritoneal defect represents a true internal hernia with a different pathophysiology. Because of its rarity and nonspecific imaging findings, preoperative diagnosis remains challenging. Only a limited number of cases have been reported in the English literature, and laparoscopic management has rarely been described.

Methods: We report the case of a 28-year-old woman with no history of abdominal surgery or pregnancy who presented with acute lower abdominal pain and symptoms of small bowel obstruction. Physical examination showed mild abdominal tenderness without peritoneal signs. Laboratory findings revealed leukocytosis, while abdominal radiography demonstrated multiple air–fluid levels in the small intestine. Contrast-enhanced computed tomography revealed dilated small bowel loops, a small amount of ascites, and displacement of the uterus to the left side of the pelvis. An internal hernia, possibly through the broad ligament, was suspected, and emergency laparoscopic surgery was performed for both diagnosis and treatment.

Results: Laparoscopic exploration revealed a Richter's hernia of the ileum incarcerated through a peritoneal defect located between the uterus and rectum on the right side of the pouch of Douglas. The defect measured approximately 1.5 cm in diameter. The herniated bowel was difficult to reduce, and the defect was carefully enlarged to facilitate release. A 3-cm segment of distal ileum, located approximately 40 cm proximal to the ileocecal valve, was reduced successfully. The bowel showed no signs of ischemia, and resection was not required. The peritoneal defect was closed primarily using laparoscopic sutures without mesh placement. The operative time was 58 minutes. The postoperative course was uneventful, and the patient was discharged on postoperative day 3. No recurrence has been observed during six months of follow-up.

Conclusions: Internal hernia through a peritoneal defect in the pouch of Douglas is an extremely rare but important cause of small bowel obstruction in women without prior abdominal surgery. Preoperative diagnosis is difficult due to the lack of specific radiological findings. Laparoscopic surgery provides excellent visualization in the deep pelvic cavity and allows both definitive diagnosis and treatment. Primary laparoscopic closure of the peritoneal defect appears to be a safe and effective management strategy for this rare condition.

1. Introduction

An internal hernia is defined as herniation of a viscus into a usually large fossa, fovea, or foramen within the body cavity [1]. It is a rare cause of small bowel obstruction, ranging from 0.5% to 4.1% of all hernia causes [2]. The most common type of internal hernia is the paraduodenal hernia, which accounts for 53% of cases, and internal hernia within the pelvis accounts for 7% [3]. Pelvic hernias are separated into three functional types: obturator, sciatic, and perineal hernias. A perineal hernia is the protrusion of a viscus through the floor of the pelvis (pelvic diaphragm) into the perineum due to weakness of the endopelvic fascia and musculature. Perineal hernias are equivalent to hernias of the pouch of Douglas. The difference between hernias through a peritoneal defect in the pouch of Douglas and hernias of the pouch of Douglas are often misunderstood. Internal hernias due to peritoneal defects of the pouch of Douglas are also extremely rare. To our knowledge, only eight cases of hernia through a peritoneal defect of the pouch of Douglas have been reported in English literature [4-11]. Of these, only two patients underwent laparoscopic surgery. Here, we present a case of hernia through a peritoneal defect of the pouch of Douglas treated with laparoscopic surgery.

2. Case Presentation

A 28-year-old woman without a history of abdominal surgery or pregnancy was transferred to our hospital complaining of sudden lower abdominal pain. On physical examination, she presented a slight tenderness and distension on the lower abdomen but rebound tenderness and muscle guarding were not apparent. Her perineum showed no hernia. The laboratory values were within normal limits, except for leukocytosis (WBC, 11.2 × 103/μl). An abdominal X-ray revealed air fluid level of the small intestine. She was diagnosed with small bowel obstruction, excluding any symptoms of strangulation, and conservative treatment was started. On the third day of hospitalization, abdominal tenderness and distention persisted. Abdominal Computed Tomography (CT) demonstrated a dilated small bowel loop and ascites (Figure 1). In addition, the uterus seemed to be shifted to the left in the pelvis. We further suspected small bowel obstruction due to incarcerated internal hernia through the right broad ligament and emergency laparoscopic operation was performed. Operative findings showed an incarceration as a Richter's hernia of the ileum through a peritoneal defect between the uterus and rectum. The defect was approximately 1.5 cm, and it was identified in the right side of the pouch of Douglas. The herniated ileum was so hard to be pulled out from the pouch that the peritoneum was cut and widened. Then, a 3-cm length Richter's hernia of the distal ileum (40 cm from the ileocecal valve) was released from the peritoneal defect. As the impacted ileum was not ischemic, only hernia repair by an elective suture of the hernia defect was performed (Figure 2). The operation time was 58 min, and her postoperative course was uneventful. She was discharged from our hospital on the third postoperative day. She has been free from recurrence as of six months after the operation.

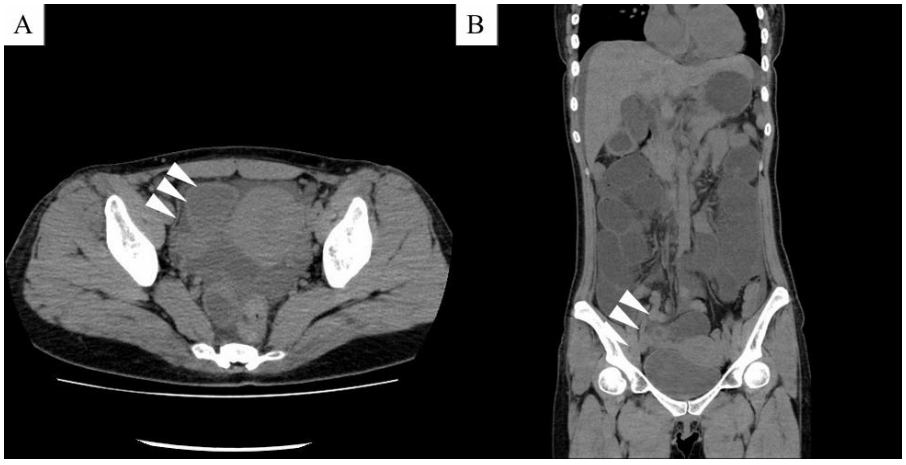

Figure 1: Abdominal computed tomography revealed the presence of small amount of ascites and the uterus (A, B, arrowhead) shifted to the left in the pelvis. A dilated small bowel loop (B, white arrow) was detected widely.

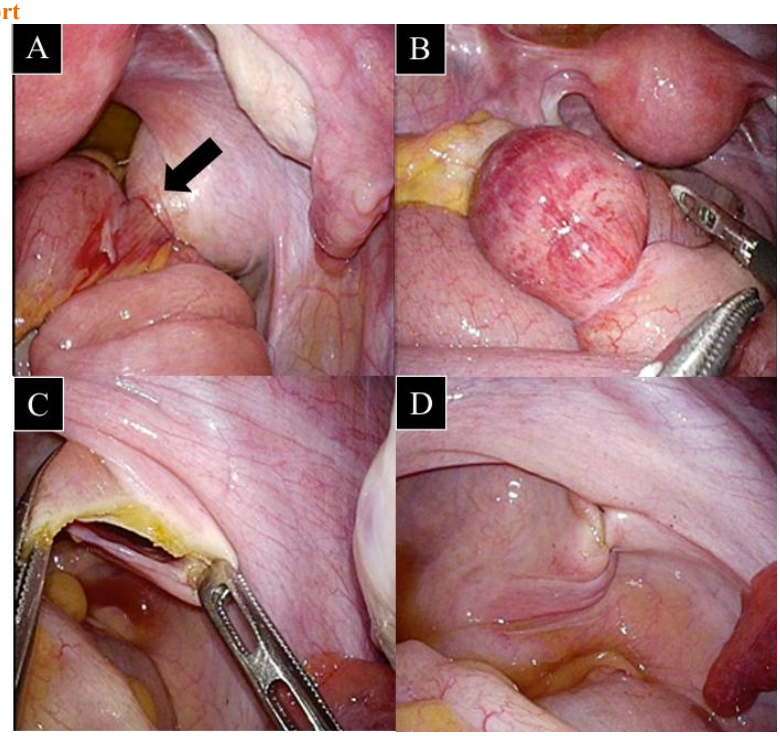

Figure 2: Intraoperative findings: a peritoneal defect was identified in the right of the pouch of Douglas (A, black arrow) and Richter's hernia of the ileum through the defect (B). The peritoneal defect presented between the uterus and rectum (C) and was repaired by an elective suture.

4. Discussion

Internal hernias through a peritoneal defect in the pouch of Douglas without weakening of the pelvic floor musculature should be distinguished from hernias of the pouch of Douglas. Internal hernia through a defect in the pouch of Douglas is extremely rare and has been reported only eight cases in English literature [4-11]. Details of the previous cases and ours are summarized in (Table 1). All patients were women and their age seemed to be divided into two groups: younger or elderly. Most of the elderly patients had a history of hysterectomy, whereas young patients had no surgical history. Six cases underwent open surgery, whereas the other three cases, including our case, underwent laparoscopic surgery. The peritoneal defect of the pouch of Douglas was treated with primary closure in seven cases, mesh herniorrhaphy in one case, and marsupialization in one case. There are many theories about the causes of this entity, as well as the broad ligament hernias [12], and those included congenital abnormalities, pelvic surgery, trauma caused by pregnancy or delivery, or gynecological infection. In the present case, the patient is of young age and had no history of pelvic surgery, gynecological infection, or pregnancy. Therefore, the etiology of the peritoneal defect was considered to be congenital. As for techniques for hernia repair, it remains to be seen whether a laparoscopic or an open-transabdominal approach and also whether a direct suture or mesh repair should be chosen because of the small number of such cases. Compared with open surgery, laparoscopic surgery can be performed with greater precision by providing a better visibility in a narrow space of the pelvic cavity. In addition, laparoscopic approach can confirm the diagnosis of internal hernias or the cause of bowel obstruction and serve as a therapeutic tool at the same time. Suwa et al. reported that they chose to repair the hernia by an approximation suture without mesh placement because internal hernias are not caused by fragility of musculofascial tissues [11]. We agree with this opinion and in the current case, we performed a primary closure of the peritoneal defect without mesh placement. Since there seems to be no specific finding in abdominal CT for internal hernia through a peritoneal defect in the pouch of Douglas, it is difficult to make a preoperative diagnosis. Here, we suspected internal hernia through the right broad ligament and made a diagnosis at the surgery. With the findings of a cluster of small bowel loops in the pouch of Douglas, an internal hernia should be included in the differential diagnosis.

Table: Reported cases of internal hernia occurring through a peritoneal defect of the pouch of Douglas.

Author (year)	Age/ Gender	History of pelvic surgery	History of pregnancy	Side of the defect	Size of the defect (cm)	Operation approach procedure	Probable cause of hernia
Fiirgaard, et al. (1988)	17/F	None	1	ND	1	Open primary closure	Congenital
Inoue, et al.	80/F	Hysterectomy	ND	ND	ND	Open primary closure	Previous
-2002							hysterectomy
Bunni, et al. (2012)	77/F	None	ND	Right	ND	Laparoscopic mesh herniorrhaphy	Congenital
Suwa, et al.	28/F	None	None	Right	2	Open primary closure	Congenital
-2013							
Apturkar, et al. (2013)	50/F	Hysterectomy	ND	Right	2	Open primary closure	Previous hysterectomy
Pyong, et al.	26/F	None	None	Right	ND	Open primary closure	Congenital
-2017							
Muthukumar, et al. (2017)	74/F	Hysterectomy	ND	Right	2.5	Open primary closure	Previous
							hysterectomy
Hari, et al. (2020)	33/F	Cesarean section	1	Right	ND	Laparoscopic marsupialization	Congenital
Our case	28/F	None	None	Right	1.5	Laparoscopic primary closure	Congenital

Conclusion

We reported an extremely rare case of a patient with successful laparoscopic surgery for an incarcerated bowel obstruction due to a peritoneal defect in the pouch of Douglas. Laparoscopic primary closure seems to be feasible and effective treatment for internal hernia through a peritoneal defect in the pouch of Douglas.

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