

Case Report

Laparoscopic Surgery for Small Bowel Obstruction due to Paracecal Hernia

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Internal hernia related to paracecal hernia is a rare disease and is difficult to confirm by preoperative diagnosis. We recently encountered a case of an 83-year-old woman who had lower abdominal pain in her right quadrant. Based on physical findings and CT findings she was diagnosed as having small bowel obstruction by internal hernia around the cecum. She underwent emergency operation with laparoscopic surgery and was diagnosed with a paracecal hernia and treated laparoscopically. After we dissected the ventral wall of the hernia sac and enlarged the hernia orifice, we reduced the trapped small intestine into the abdominal space. We determined that the herniated portion of the small intestine was not necrotic and therefore did not resect it. Although paracecal hernia is a rare internal hernia, physicians should be aware of it as a differential diagnosis for small bowel obstruction because of its rapid progression to strangulation and necrosis. We highlight the importance of recognizing CT findings of paracecal internal hernia. Laparoscopy was effective both for making a definitive diagnosis and treating paracecal hernia with relatively little invasion.

Key words: paracecal hernia, laparoscopic surgery, internal hernia, small bowel obstruction

Internal hernia is one of the few causes of small bowel obstruction, with an incidence 0.6% to 5.8% of all cases of small bowel obstruction [1, 2]. A paracecal hernia is a type of internal hernia that develops in the protrusion around the cecum and is a relatively rare cause of small bowel obstruction. Nonetheless, paracecal hernia is the second most common type of internal hernias with a reported incidence of 13% among the differentiated types of internal hernia [2, 3]. Although few studies have reported on paracecal hernia, it is vital to secure a definite diagnosis for internal hernia in the early stage because irreparable damage can be caused by any delay in diagnosis and treatment.

We recently encountered a case of laparoscopic surgery for paracecal hernia. When the characteristic find-

ings were observed on abdominal CT scan—namely, a dilated small intestine behind the cecum and exclusion of the cecum toward the abdominal wall—paracecal hernia was suspected. Laparoscopic surgery was effective for both making a diagnosis and treating the paracecal hernia. We report a case of paracecal hernia with a review of the literature.

Case Report

An 83-year-old woman complained of such symptoms as nausea, vomiting, and abdominal pain that had lasted for 3 days, she was referred to our hospital from her previous doctor for further evaluation. She was routinely taking the anticoagulant warfarin, along with oral medications such as an antihypertensive drug and

hypoglycemic agent for diabetes mellitus. She had no history of previous abdominal surgical procedures.

When she visited our hospital, she had abdominal bloating and lower right quadrant pain. Physical examination revealed abdominal tenderness in the right lower quadrant, with no rebound tenderness or muscular defense. Hematological values suggested an inflammatory reaction, with white blood cell numbers reaching 17,000 / μ l and her C-reaction protein level elevated to 7.0 mg/dl. Blood urea nitrogen and creatinine levels were elevated to 44 mg/dl and 1.15 mg/dl, respectively, so that we suspected renal dysfunction associated with dehydration. Lactate dehydrogenase was elevated to 412 IU/l and creatine kinase was within the normal limit. An abdominal CT showed the dilation of the small intestine and stomach, the finding of a beak sign around the cecum, and small bowel loops lying on the back of cecum and forcing the cecum to the anterior and lateral side (Fig. 1A, 1B). These findings led us to suspect small bowel obstruction caused by the internal hernia around the cecum; thus, she underwent emergency laparoscopic surgery based on the diagnosis of internal hernia around the cecum.

Laparoscopic surgery was performed in the spinal position and under general anesthesia. When the first trocar port (12 mm) was placed in the umbilicus by minimum laparotomy and the abdomen was insufflated to a pressure of 10 mmHg, the intraperitoneal condition was observed by a laparoscope. Dilation of the small intestine and the accumulation of bloody ascites in the intraperitoneal cavity were seen. Two more trocar ports (5 mm) were added in the lower median region and in the right lower region. When the dilated

small intestine was shifted to the middle and left side, a hernia orifice with a diameter of 20 mm was recognized in the retrocecal pouch (Fig. 2A). The ileum, which was at a point about 100 cm proximal to Bauhin's valve, was trapped in the retrocecal pouch for about 17 cm of its length (Fig. 2B). Because we could not remove the trapped intestine from the hernia sac, which was localized on lateral site of cecum, we made an incision in the hernia orifice by an ultrasonic dissection and coagulation device and took out the trapped intestine from the hernia sac. In addition, we enlarged the incision of the hernia sac to the hepatic flexure to prevent recurrence of internal hernia (Fig. 2C). Next, we confirmed that there was no intestinal necrosis in the incarcerated ileum, so that resection of small intestine was not needed. She has not had a recurrence of internal hernia in her postoperative course.

Discussion

Internal hernia is defined as the protrusion of an abdominal organ into a foramen or recess. This mesenteric or peritoneal aperture may be formed by trauma, surgical procedure or congenital anomalies within the abdominal or pelvic cavity, and the hernia results in abnormal bowel rotation [3]. The pathogenesises are believed to include congenital intestinal malformation in embryonic development, fragility accompanied by aging, elevated internal pressure in the abdominal cavity and adhesions to the retroperitoneum, but there is no fixed view [3-5].

Paracecal hernia types have been divided into 4 subtypes: 1) superior ileocecal fossae, 2) inferior ileocecal

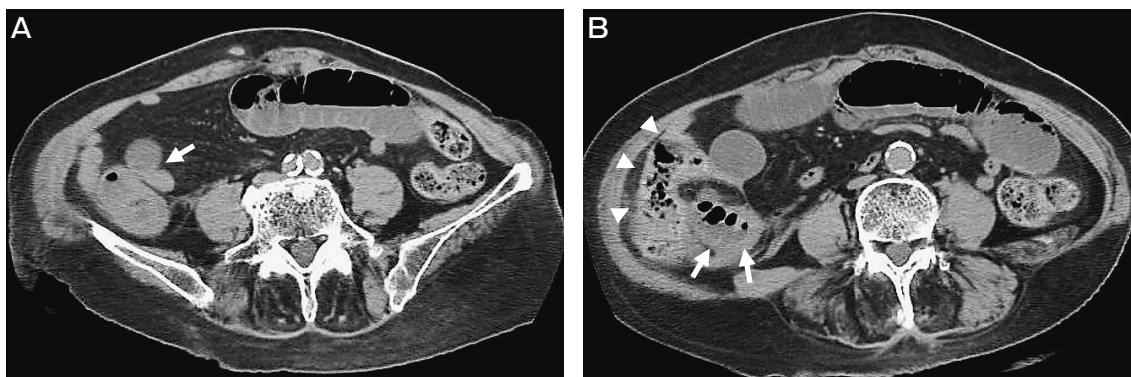


Fig. 1 A, Abdominal CT scan shows the stenotic lesion of small intestine, the finding of a "beak sign" around the cecum (arrow) and the dilation in the oral side of the small intestine obstruction; B, A dilated small intestine on the back of cecum forced the cecum to the anterior and lateral sides. (arrow, small intestine; arrowhead, cecum)

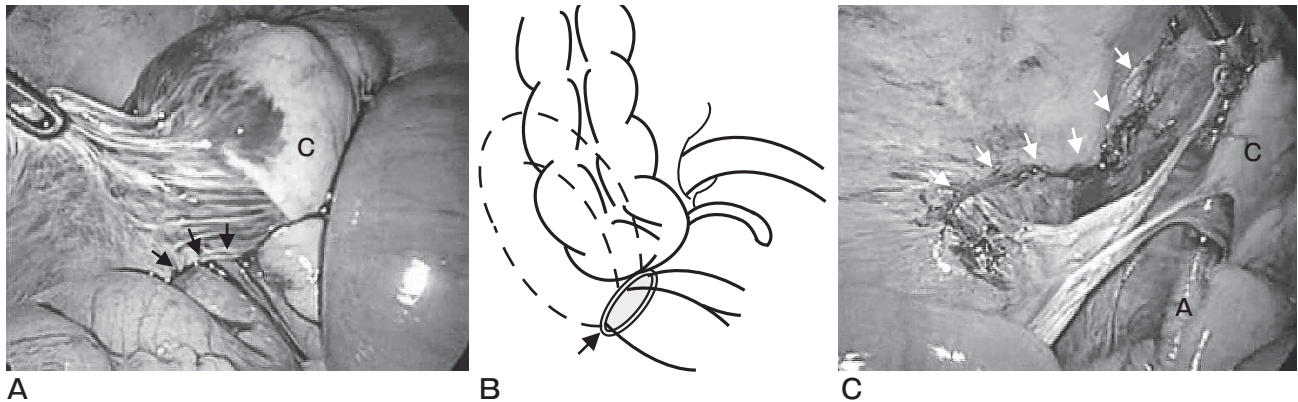


Fig. 2 **A**, A hernia orifice with a diameter of 20 mm was recognized in the retrocecal pouch. The ileum was trapped in the hernia orifice. (arrow, hernia orifice; C, cecum); **B**, Schema of Intraoperative findings: The ileum, which was at a point about 100 cm proximal to Bauhin's valve, was trapped in the retrocecal pouch for about 17 cm of its length. (arrow, hernia orifice); **C**, The hernia orifice was enlarged to the right colic gutter, and the trapped small intestine was removed from the hernia sac. The incision of the hernia sac was enlarged to the hepatic flexure to prevent recurrence of the internal hernia. (C, cecum; A, appendix; arrow, enlarged hernia sac)

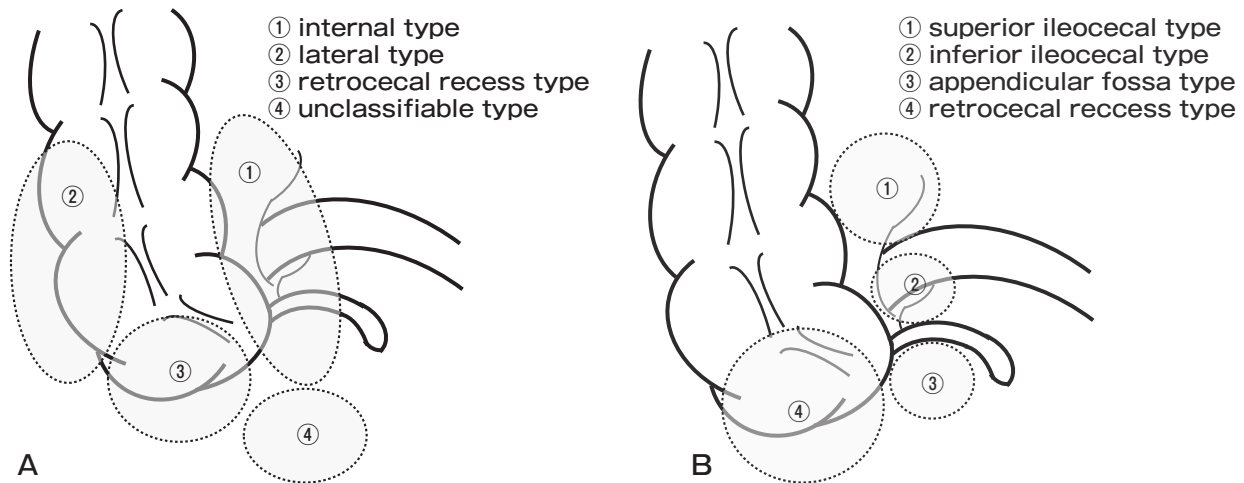


Fig. 3 **A**, Meyer's classification, one of the classification systems of paracecal hernias. ① internal type ② lateral type ③ retrocecal recess type ④ unclassifiable type; **B**, Endo's classification, another classification system of paracecal hernias and the one used in Japan and the U.S. ① superior ileocecal type ② inferior ileocecal type ③ appendicular fossa type ④ retrocecal recess type.

fossae, 3) appendicular fossae, and 4) retrocecal fossae [6]. The most common site for paracecal hernia is the retrocecal fossae, with a reported incidence of 74% in paracecal hernias [7]. In our case, the hernia orifice was presented behind the cecum and there was a hernia sac from the back side to the lateral side of cecum, or a right colic gutter, in which the small intestine was laparoscopically observed to be trapped. Therefore, although our case was classified as a retrocecal hernia according to Endo's classification [6], our case was more aptly considered a lateral paracecal hernia type according to Meyer's classification [3] (Fig. 3).

The clinical symptoms and signs of paracecal hernia are not pathognomonic, and include almost all complaints associated with digestive obstruction, including abdominal pain, nausea, vomiting, obstipation [4]. Although the symptoms may sometimes include chronic digestive complaints, the onset and progression of symptoms are almost always rapid, quickly leading to strangulation of hernia contents. Therefore, we must make early and certain diagnosis for paracecal hernia as the cause of intestinal obstruction.

Abdominal CT scan has been the most useful test for diagnosing the location and cause of small bowel

obstruction, when that is the tentative diagnosis. CT findings of our paracecal hernia revealed that the trapped dilated small bowel loops were located on the back side of the cecum and ascending colon. In addition, the mesenteric vascular pedicle that supplied the incarcerated small bowel within the hernia sac had an engorged and stretched appearance on CT examination [8,9]. In our case, we could diagnose small bowel obstruction due to internal hernia which had developed around the cecum, because the patient had not previously undergone operation and the CT revealed that the dilated small bowel loops were located on the back side of the cecum and pushed up to the ventral side; a “beak sign” was also obtained. Recent advances in high-accuracy CT scans have enabled preoperative diagnosis of paracecal hernia and other internal hernias.

The only treatment for internal hernia such as paracecal hernia is immediate surgery. When we searched Medline using the keyword “paracecal hernia”, we identified 23 other cases that had been diagnosed and treated as paracecal hernia; of these, four cases—plus ours—were treated by laparoscopic surgery [10–13]. In all 5 cases, laparoscopic findings led to the definitive diagnosis of small bowel obstruction caused by paracecal hernia, and each trapped intestine was reduced by opening their hernia orifice in a laparoscopic surgery. In all cases, the trapped intestine had not shown ischemic change and had not been resected. In one of the five cases, the hernia orifice was intracorporeally sutured and closed [13]; in the other four cases including our own, the strategy was to enlarge the hernia orifice to prevent recurrence. Considering that none of the cases showed recurrence of trapped intestine by paracecal hernia, we suggest that the treatment for a hernia orifice should be selected so as not to prevent recurrence using the easiest and safest treatment possible.

In conclusion, we describe a case in which laparoscopic surgery was used for a paracecal hernia.

Although paracecal hernia is a rare type of internal hernia, it remains a distinct possibility in patients with intestinal obstruction, and should be considered as a differential diagnosis for small bowel obstruction. Laparoscopic surgery is effective for making a definitive diagnosis and for treating paracecal hernia with minimal invasion, depending on the case.

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