Case Report

Small Bowel Obstruction due to Paracecal Hernia on the Lateral Side of the Cecum: A Case Report

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Abstract

Introduction: Paracecal hernia on the lateral side of the cecum is one of the least common types of internal hernia. We report herein a case of paracecal hernia on the lateral side of the cecum that was successfully diagnosed preoperatively by computed tomography (CT) and treated laparoscopically.

Case presentation: A 95-year-old man with a history of appendectomy was referred to our hospital for further evaluation. He was admitted with a diagnosis of small bowel obstruction (SBO) and was treated conservatively with placement of a long intestinal tube. Symptoms and abdominal findings immediately improved, but a large amount of fluid continued to be drained. We therefore carefully re-evaluated the obstruction. CT revealed SBO caused by paracecal hernia resulting from intestinal invagination into a pouch on the lateral side of the cecum. Laparoscopic surgery was performed on hospital day 8, and we intraoperatively confirmed and repaired lateral paracecal hernia. The patient was discharged without major complications.

Conclusions: Preoperative diagnosis of internal hernia, including paracecal hernia, is relatively difficult. CT represents the most successful diagnostic modality, but requires careful examination, and laparoscopic surgery can play a useful role in definitive diagnosis and repair of SBO. Moreover, preopera-

tive decompression facilitates safe laparoscopic surgery.

Key words: paracecal hernia; internal hernia; laparoscopic surgery

Introduction

Internal hernia is an infrequent cause of small bowel obstruction (SBO), with an incidence of 1-17 per 500 cases of SBO¹⁻³⁾. Internal hernia is a rare form of paracecal hernia, and accounts for only 0.1-6.6% of SBO-related internal hernias^{4,5)}. The diagnosis and treatment of internal hernia usually requires operative/emergency intervention, because this pathology is associated with significant mortality and morbidity⁶⁾.

We report herein a case involving a patient with SBO due to paracecal hernia on the lateral side of the cecum. The hernia was preoperatively diagnosed with computed tomography (CT) and successfully treated using laparoscopic surgery.

Case Report

A 95-year-old man was referred to the gastrointestinal endoscopy division of our hospital for further evaluation. He had intermittent nausea and lower abdominal pain on the previous day, and had been diagnosed with SBO at another hospital. Medical history included appendectomy in childhood, vascular dementia, and hypertension. In our hospital, physical examination revealed abdominal distension and periumbilical pain, but no tenderness with peritoneal signs and no visible or palpable abdominal masses or wall hernias. Plain abdominal radiography showed dilated loops of small bowel in the mid-

Received: July 21, 2017/ Accepted: October 25, 2017
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Fig. 1 Findings from contrast-enhanced radiography. A stenotic region and dilation of the small intestine are evident in the right lower abdominal region (arrow).

abdomen, and CT showed dilation of the small intestine, but no ascites or intestinal ischemia. Based on the results of clinical examination, the presumptive diagnosis was SBO caused by adhesions in the ileocecal area subsequent to appendectomy. The patient was treated conservatively by placement of a long intestinal tube.

Improvements in symptoms and abdominal findings were seen immediately after tube placement and lasted a few days, but the amount of fluid being drained remained at >500 mL/day for more than 1 week. We therefore re-evaluated the SBO using contrast-enhanced radiography with water-soluble iodinated radiopaque contrast medium (Gastrografin; Bayer Yakuhin, Ltd., Osaka, Japan), revealing dilation and obstruction of the small intestine at the iliac fossa and slight passage of Gastrografin to the anal side (**Fig. 1**). CT showed dilation of the small bowel loops, a short region of stenotic small intestine in the low density area which seemed to be the hernia sac on the lateral side of the cecum, and inward displacement of the cecum (**Fig. 2, 3**). As a result, strangulation of around the ileocecal region was suspected, and these abdominal findings strongly suggested the incarceration of small intestine secondary to paracecal hernia on the lateral side of the cecum (**Fig. 4**). Laparoscopic surgery was performed on hospital day 8 to explore the cause of internal herniation and reduce the lesion.

A camera port was created above the umbilicus using an open technique. After establishing pneumoperitoneum using insufflation of carbon dioxide up to a pressure of 8mmHg, laparoscopic surgery was performed using additional trocars (two 5-mm trocars, in the suprapubic region and left iliac fossa, respectively) as working ports for the operator. Neither bloody nor purulent ascites was seen in the peritoneal cavity, and the degree of intestinal distention was relatively mild. An internal hernia orifice with a diameter of about 3 cm was present on the lateral side of the cecum (**Fig. 5a**), and a section of ileum was seen to be incarcerated in the lateral paracecal pouch about 100cm proximal to the ileocecal valve. The incarcerated ileum which was adherent to the internal hernia orifice was reduced by opening the pouch using an ultrasonic dissector. As a result, the hernia orifice was widely opened (**Fig. 5b**). The defect in the retroperitoneum was closed with absorbable surgical sutures and the lateral side wall of the cecum was overlapped over the suture line to prevent recurrence and adhesion. Careful inspection of the bowel revealed no evidence of nonviability, but stenosis was still considered possible, so we resected the strangulated intestine extracorporeally through the small incision that continued to the umbilical port. Reconstruction was also performed extracorporeally using an end-to-end triangulating stapling method. Although superficial

Fig. 2 Serial findings from computed tomography with axial images. Dilation of the small intestine is evident (a, b). Arrows denote the location of small intestinal caliber change on the lateral side of the cecum (Ce) and the ileum end (Ie). Herniation of the small intestine is represented (c). Arrowhead denotes incarceration of the small intestine associated with the lateral-type paracecal hernia.

Fig. 3 Serial findings from computed tomography with coronal images. Dilation of the small intestine is evident (a). Arrowhead points to where the pouch of paracecal hernia sac was seen in the paracecal sulci. Herniation of the small intestine is evident (b, c). Arrow denotes the location of small intestinal caliber change around the cecum. Arrowhead denotes incarceration of the small intestinal associated with the lateral-type paracecal hernia.

Lateral-type paracecal hernia

Fig. 4 The schema derived from CT findings (Fig.2, 3).

Fig. 5 Findings from intraoperative laparoscopy. An incarcerated section of small bowel is seen protruding through the abdominal orifice on the lateral side of the cecum (a). An arrow denotes hernia orifice. The hernia sac is dissected and widely opened (b).

a|b

incisional surgical-site infection developed postoperatively, the patient recovered satisfactorily with incisional drainage. He was discharged on postoperative day 13. About one year after discharge, the patient remains in good health with no postopera-

tive complications such as paralytic ileus or recurrence of SBO.

Discussion

Internal hernia is defined as protrusion of the abdominal viscera into a fossa, foramen, recess, or con-

genital defect within the abdominal or pelvic cavity⁷⁾. Paracecal hernia, also known as pericecal hernia, is a relatively rare protrusion through a defect in the peritoneal cavity. Several mechanisms can contribute to the development of this hernia, including the hernial orifice as a congenital anatomical abnormality related to intestinal malrotation during embryonic development. Four types of peritoneal recess of various depths resulting from imperfect fusion or resorption can occur in the paracecal area (superior ileocecal recess, inferior ileocecal recess, retrocecal recess, and paracolic sulci), all of which may become hernial orifices⁸⁾. An excellent classification for the boundaries of hernias was formulated by Meyer¹⁾. Another possibility is that acquired factors such as aging, elevated intra-abdominal pressure, and retroperitoneal adhesion can induce the development of paracecal hernia. Hirokawa et al.⁹⁾ reviewed 10 English-language reports, involving 15 cases. They reported that three patients had a history of appendectomy, but the appendectomy was found to be unrelated to the paracecal hernia in two of those cases. In our case, no adhesion or incisional herniation was seen in the internal abdomen. We thus do not consider prior appendectomy as a significant factor in the development of paracecal hernia. We assume that the hernia in the present case was a lateral paracecal hernia according to Meyer's clinical classification¹⁾, and prior abdominal surgery did not predispose the patient to the development of paracecal hernia. Rather, congenital and aging factors seemed likely to have played larger roles. Nishi et al.¹⁰⁾ reported lateral paracecal hernia as an exceptionally rare type of paracecal hernia in Japan.

Accurate diagnosis of internal hernia is very difficult, due to the low incidence and unpredictable symptoms. Surgery is historically performed for patients diagnosed with SBO or acute abdomen of unknown origin, and surgery is central to both treatment and diagnosis. Because of the difficulty in achieving an accurate preoperative diagnosis of internal hernia, imaging studies can play a major role if reliable signs can be determined. Plain radiography and angiography can be helpful in the radiological diagnosis in some cases of any type of internal hernia¹⁾, and contrast radiography can also be beneficial. Contrast-enhanced CT of the abdomen allows advanced diagnosis of intestinal obstruction, provid-

ing more information about the cause than either contrast-enhanced radiography or angiography. The greatest advantage of CT is the ability to detect early or partial obstruction, closed-loop obstruction, and multiple-segment obstruction. We were able to identify this lateral paracecal hernia with degree of certainty based on abnormal findings around the ileocecal region on preoperative CT. One of these abnormal CT findings was dilation of small intestinal loops with a transitional zone in the lateral side of the cecum.

Hernial fossae have historically been closed using sutures or left wide open to avoid recurrence⁹⁻¹⁴⁾. Ogami et al. reported that the current trend is to leave the hernia open, because it is technically simple and easy intracorporeally compared with suturing hernia orifice¹³⁾. In our case, the patient was 95 years old, so the hernial orifice was closed intracorporeally with absorbable surgical sutures and the lateral side wall of the cecum was overlapped over the suture line to avoid recurrence or adhesions.

Laparoscopic surgery was previously considered inappropriate for SBO because of the difficulty in establishing a working space and visualizing the site of obstruction, as well as the increased risk of injury to the distended bowel. However, laparoscopic management is currently considered acceptable as a minimally invasive approach for both diagnosis and treatment, allowing faster recovery in terms of shorter hospital stay and fewer postoperative complications^{15,16)}. Laparoscopic treatment has proven successful in 45.0–48.1% of patients with adhesive intestinal obstruction¹²⁾. In our search of English-language articles in the PubMed database as identified using the keywords “paracecal hernia,” “pericecal hernia,” the combination of “paracecal hernia” and “laparoscopic surgery,” and the combination of “pericecal hernia” and “laparoscopic surgery,” we identified five case reports describing the patients diagnosed and treated using laparoscopic procedures between 2000 and 2016. In one of these cases, reported by Hirokawa et al.⁹⁾, the procedure was converted to open surgery based on the risk of injuring the small intestine. Kabashima et al.¹²⁾ and Omori et al.¹¹⁾ reported that the patients were diagnosed and successfully treated using laparoscopic procedures alone. Importantly, the authors pointed out that the key to successful completion of the laparoscopic procedure was preoperative decompression

of the dilated bowel via a long intestinal tube. This point critically applies to our cases. Preoperative decompression is useful to broaden the working space and reduce the risk of injury.

In conclusion, the present case illustrates two essential clinical factors. First, thin-slice abdominal CT with both axial and coronal images is essential to obtain detailed information. Second, awareness and recognition of the rare pathology of paracecal hernia is important. Laparoscopic surgery appears useful for SBO caused by internal herniation, particularly when the obstructive lesion for SBO is properly detected preoperatively.

Acknowledgements: We wish to acknowledge all the ward staff who cared for the patient and the radiological technician who contributed the images used in this study.

Conflict of interest: None.

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