

## Recurrent Bowel Obstruction Caused by Cecal Volvulus: A Case Report

Masaki Miyao<sup>1</sup>, Tsubasa Takahashi<sup>1</sup>, Mikihiro Okusa<sup>2</sup>, Makoto Kusakabe<sup>2</sup>,  
Ryotaro Takano<sup>2</sup>, Yuka Masuda<sup>2</sup>, Mampei Kawashima<sup>2</sup> and Hiroshi Yoshida<sup>2</sup>

<sup>1</sup>Department of Pediatric Surgery, Nippon Medical School Musashi Kosugi Hospital, Kanagawa, Japan

<sup>2</sup>Department of Surgery, Nippon Medical School, Tokyo, Japan

The preoperative diagnosis of cecal volvulus (CV) is rare and difficult and emergent laparotomy is frequently performed. Here, we report a case of CV that was diagnosed by preoperative computed tomography in a patient with an intellectual disability. In addition, we demonstrate that elective laparoscopic cecopexy can be performed following conservative treatment, such as the use of an ileus tube per anus. (J Nippon Med Sch 2019; 86: 183–186)

**Key words:** cecal volvulus, cecopexy, mobile cecum, intellectual disability

### Introduction

A mobile cecum is prevalent in 10%-20% of the population<sup>1,2</sup>. Symptomatic cases, such as those with a cecal volvulus (CV), are rare. The preoperative diagnosis of CV is difficult and often requires emergency surgery. Here, we report a case of CV caused by repeated bowel obstruction in a patient with an intellectual disability. In this case, CV was diagnosed by a preoperative computed tomography (CT) and elective laparoscopic cecopexy could be performed following conservative treatment.

### Case Report

A 25-year-old woman presented with a sudden onset of abdominal dilation and vomiting and was admitted to our hospital. She was referred to our department by her pediatrician because of ileus, which she occasionally experienced. She presented with a history of chromosomal aberration in 46,XX,17q+, a ventricular septal defect, laryngomalacia, scoliosis, gastroesophageal reflux disease, chronic bronchitis, and intellectual disability.

Her intellectual disability was severe so she was bedridden and had difficulty communicating except through facial expression. She underwent laryngotracheal separation at 17 years of age and was administered H<sub>2</sub> blockers, laxatives, and sedatives.

On physical examination, her body temperature was 37°C and her abdomen was distended but without mus-

cle rigidity. No masses were palpated. Her white blood cell count was  $16.34 \times 10^3/\mu\text{L}$ , C-reactive protein level was 2.62 mg/dL, and other laboratory data were all within the normal ranges. An abdominal radiograph revealed a dilated colon without colonic gas (Fig. 1). A CT scan revealed an axial torsion from the cecum to the ascending colon, a dilated cecum in the left upper quadrant of the abdomen, and the split-wall sign, representing the split wall appearance of a twisted loop caused by invagination of surrounding pericolic fat (Fig. 2). No ischemic change of the intestine was detected. CV was suspected. The patient exhibited no symptoms of clinical peritonitis; therefore, a gastrographin enema was performed which revealed the bird beak sign, the tapering of the lumen at the upper ascending colon (Fig. 3). An ileus tube per anus was inserted without colonoscopy and her bowel obstruction improved. Her condition improved following the initiation of conservative treatment for 2 weeks and elective laparoscopic surgery was performed 2 months later.

Laparoscopic findings demonstrated that her CV was twisted 180° clockwise and the cecum to the ascending colon was not adhered to the intrapelvic peritoneum. Ischemic changes or adhesions of the intestine were absent (Fig. 4a, b). The patient was diagnosed with CV and laparoscopic cecopexy and appendectomy were performed. Cecopexy was performed by the fixation of the

Correspondence to Tsubasa Takahashi, Department of Pediatric Surgery, Nippon Medical School Musashi Kosugi Hospital, 1-396 Kosugi-cho, Nakahara-ku, Kawasaki, Kanagawa 211-8533, Japan

E-mail: tsubasa1215@nms.ac.jp

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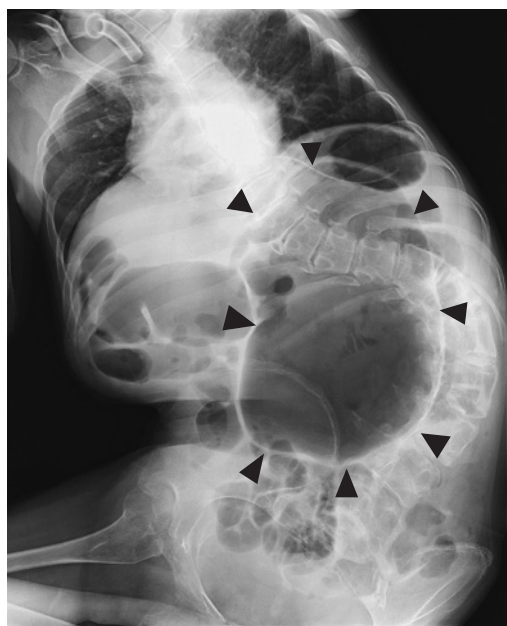


Fig. 1 An abdominal radiograph revealed a dilated cecum without colonic gas

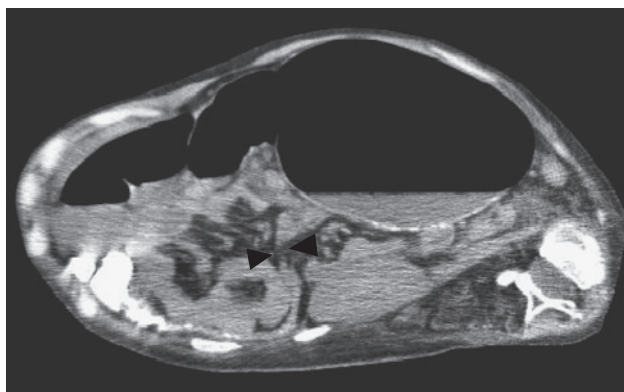


Fig. 2 Computed tomography showing axial torsion from the cecum to the ascending colon and the split-wall sign

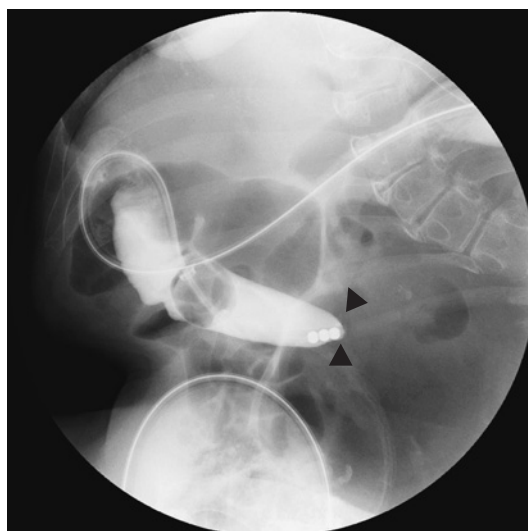


Fig. 3 A colonic contrast study showing the bird beak sign in the ascending colon

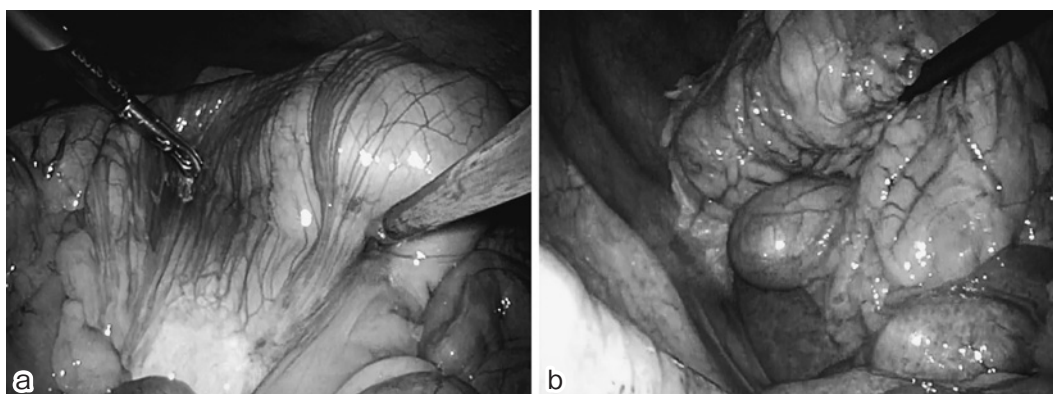


Fig. 4

a Laparoscopy showing that the cecal volvulus was twisted 180° clockwise

b Laparoscopy showing that the cecum to the ascending colon was not adhered to the retroperitoneum

cecum and ascending colon to the intrapelvic peritoneum with four interrupted non-absorbable sutures. The post-operative course was uneventful and no recurrence has been observed for three years.

### Discussion

CV occurs when the mobile cecum accompanies other factors such as adhesive disease, malignancy, pregnancy, trauma, distal colon obstruction, psychiatric disorders, prolonged immobility, and constipation<sup>3</sup>. A mobile cecum is the failure of the fixation of the cecum and ascending colon to the intrapelvic peritoneum, and it is prevalent in 10%-20% of the population<sup>1,2</sup>. Although the prevalence of a mobile cecum is occasional, the development of CV is observed in only approximately 1% of the cases<sup>4,5</sup>. The

mean age of patients with CV in developed countries has been reported to be approximately 50-65 years<sup>6</sup>, indicating that the occurrence of CV in pediatric patients is rare; however, more than half of the reported cases of pediatric CV tend to be observed in children with severe mental retardation<sup>7</sup>. Our patient had prolonged immobility, an intellectual disability, and constipation. Patients who have an intellectual disability tend to have prolonged immobility causing constipation. Although our patient was administered laxatives, it might not have been enough to prevent constipation and administration of sedatives may also have contributed to the development of constipation. Our patient had scoliosis and the ascending colon was displaced by the iliac bone.

The symptoms of CV include abdominal pain, a distended abdomen, and vomiting<sup>8</sup>; however, children with severe mental retardation occasionally exhibit such symptoms and differentiating a distended abdomen and vomiting from the symptoms of CV is difficult. Initially, our patient was suspected of having enterocolitis since she presented with abdominal distension and vomiting. The preoperative diagnosis of CV is difficult, and it is sometimes misdiagnosed<sup>3,9,10</sup>. In the literature, the use of some imaging modalities, including abdominal radiography, barium enema, and preoperative CT, for diagnosing CV has been reported<sup>6</sup>. Reportedly, abdominal radiography could detect the coffee bean deformity in the left upper quadrant of the abdomen, a dilated ectopic cecum, a single air-fluid level in the right quadrant, lateral small bowel dilatation in the dilated cecum, and the absence of gas in the distal colon<sup>11,12</sup>. Although some characteristics have been reported, the diagnosis of CV by abdominal radiography alone is challenging. Reportedly, a barium enema could reveal the bird beak sign, which is a smooth tapering cutoff at the efferent limb of the obstruction<sup>10</sup>. A barium enema can only be performed if the patient is stable because of the risk of perforation during the enema. Reportedly, a CT scan could reveal the whirl sign, the coffee bean sign, the split-wall sign, and the X marks the spot sign<sup>13-15</sup>. In our case, abdominal radiography revealed a dilated colon in the left side of the abdomen and the absence of colonic gas. Therefore, CV was suspected rather than a sigmoid colon volvulus. A CT scan revealed an axial torsion from the cecum to the ascending colon, a dilated cecum in the left upper quadrant of the abdomen, and the split-wall sign. Torsion and no ischemic changes were detected by CT; therefore, CT is a useful imaging modality to diagnose CV and determine its severity.

Detorsion and the prevention of recurrence are important aspects of CV treatment. Immediate surgical intervention is necessary if peritonitis occurs. Necrosis and perforation are often detected in such cases; therefore, hemicolectomy and ileocolic anastomosis or colostomy are often performed<sup>6,8-10,16,17</sup>. In contrast, cecopexy or hemicolectomy and ileocolic anastomosis are performed if the patients show no peritoneal irritation and if their condition is stable, without necrosis, and without perforation<sup>3,6,8-10,16-18</sup>. Although emergency surgery has been often performed in CV in the literature, conservative treatment is performed in patients with stable CV and elective laparoscopy can be safely performed after conservative treatment, as demonstrated in our case. The approaches for detorsion without surgical intervention, such as the use of colonoscopy and ileus tube insertion, have also been reported<sup>3,19-21</sup>. In this case, ileus tube insertion was selected owing to our greater experience in using ileus tubes rather than colonoscopy as well as the feasibility of performing ileus tube insertion without the administration of anesthesia. The use of non-operative interventions in CV has a high recurrence rate<sup>11</sup> so, following detorsion, elective laparoscopic cecopexy was performed rather than hemicolectomy or ileocolic anastomosis because of its minimally invasive nature. Although cecopexy has been reported to be associated with a risk of recurrence, the recurrence rate is only approximately 15%<sup>17</sup>, and other authors have reported no recurrence of CV for approximately 5 years<sup>8</sup>. However, the use of absorbable or non-absorbable sutures during cecopexy is debated<sup>3,18</sup>. Since the recurrence of CV by cecopexy with absorbable sutures has been previously reported<sup>17</sup>, cecopexy with non-absorbable sutures was performed in our case, and no recurrence has been observed for three years.

In conclusion, a case of repeated bowel obstruction caused by CV in a patient with an intellectual disability is reported. Our case demonstrates that CT can be helpful in the preoperative diagnosis of CV and that elective laparoscopic cecopexy can be performed following conservative treatment when CT reveals no ischemic change in the intestine.

**Conflict of Interest:** The authors declare that they have no conflict of interest.

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