

Imaging the Cecal Volvulus: Two Case Report and Literature Review

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Abstract

Case Report

Cecal volvulus is a rare but significant cause of colonic obstruction. It typically arises in individuals with an abnormally mobile cecum. This article presents two clinical cases of cecal volvulus, including one associated with an incomplete common mesentery. Three types of cecal volvulus are described: axial, loop, and cecal bascule, each with distinct radiological features. Urgent surgical intervention is necessary to prevent severe complications such as ischemia or perforation. These cases highlight the importance of early recognition and imaging in the management of cecal volvulus.

Keywords: Cecal volvulus, Colonic obstruction, Incomplete common mesentery, Whirlpool sign, Surgical intervention.

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INTRODUCTION

Cecal volvulus is a rare cause of colonic obstruction due to strangulation, ranking as the second most common volvulus after sigmoid volvulus. The main complications to be concerned about are ischemia and perforation. We report the cases of two patients with cecal volvulus, one occurring in the context of an incomplete common mesentery.

CLINICAL OBSERVATION

Case 1

We report the case of a 29-year-old male, married with one child, with no prior surgeries, who was being followed for Takayasu disease and had a history of peritoneal tuberculosis. He presented to the emergency department with acute onset of obstructive symptoms. Laboratory results revealed leukocytosis (22,390 cells/mm³) and elevated CRP (165 mg/L). Abdominal X-ray showed colonic air-fluid levels. A CT scan revealed significant cecal distension with malposition of the cecum in the left hypochondrium, associated with marked thickening and lack of parietal enhancement. The transition point was identified at the cecum–ascending colon junction, showing a “whirlpool sign.” There was also considerable mesenteric fat infiltration and moderate peritoneal effusion, suggesting intestinal compromise, but no pneumoperitoneum (Figures 1, 2). Surgical exploration revealed a 3.5 cm dilated loop of

small bowel upstream of a clockwise rotating cecal volvulus. The cecum appeared ischemic, and moderate peritoneal effusion was noted. The patient underwent an ileocecal resection with removal of the volvulus and a termino-lateral ileocolic anastomosis (Figure 3).

Case 2

The second patient, a 44-year-old male with a history of chronic smoking and alcohol use (now abstinent), previously operated on for a left inguinal hernia 10 years ago, presented with a two-day history of obstructive symptoms. Laboratory tests showed major leukocytosis (23,530 cells/mm³) and a CRP of 6.9 g/L. Abdominal X-ray showed no significant air-fluid levels. A CT scan revealed cecal distension in the hypogastric region without significant parietal thickening and a median spiral sign at the level of the aortic bifurcation, with no pneumoperitoneum (Figure 4). There was also malposition of the mesenteric vessels, with the superior mesenteric vein (SMV) positioned to the left of the superior mesenteric artery (SMA), suggesting an incomplete common mesentery (Figure 5). Surgical exploration revealed two counterclockwise rotations at the cecum–ascending colon junction, causing significant cecal distension and proximal small bowel dilation. Anomalous mobility of the right colon was noted, along with an incomplete common mesentery. No signs of ischemia were observed. The patient underwent a right ileohemicolectomy with resection of the ascending colon

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and a termino-lateral ileotransverse anastomosis, along with retroanastomotic drainage using a Delbet blade (Figure 6).

DISCUSSION

Cecal volvulus is rare, accounting for 25–40% of colonic volvulus cases, and typically occurs in individuals with an abnormally mobile cecum. This condition often results from incomplete rotation of the primitive intestine or from a defect in the adhesion of the right Toldt fascia, which is observed in 11–25% of the population, as seen in our patients [1,2].

Three forms of cecal volvulus have been described: axial type, loop type, and cecal bascule. Approximately half of the cases involve the cecum rotating either clockwise or counterclockwise around its long axis in the axial plane, typically located in the right lower abdomen. In the remaining cases, a “loop type” occurs, where the cecum not only twists but also inverts, shifting to the left upper quadrant of the abdomen. This type often involves the terminal ileum being twisted along with the cecum. The presence of a gas-filled appendix on imaging can confirm the diagnosis. Another variant, known as the cecal bascule, occurs when the cecum folds forward without any twisting.

In the loop-type form, abdominal X-ray shows significant cecal dilation with a “coffee bean” sign in the left hypochondrium. On CT, a highly distended cecum is seen in the left hypochondrium, with a pathognomonic whirlpool sign at the cecum–ascending colon junction, along with small bowel air-fluid levels. CT imaging typically shows the characteristic “whirlpool sign,” with twisted mesenteric vessels visible around the cecum. The cecum itself appears markedly dilated, often exceeding 10 cm in diameter, and may be located in an unusual position depending on the volvulus type. In the axial type, the cecum rotates along its long axis, either clockwise or counterclockwise. In the loop type, the cecum may be displaced to the left upper quadrant, with both twisting and inversion present. The terminal ileum is often involved. A gas-filled appendix may also be visualized, supporting the cecal origin of the volvulus. In cases of cecal bascule, the cecum folds anteriorly without torsion, and its position relative to surrounding structures is key to diagnosis [1–4].

The association of cecal volvulus with an incomplete common mesentery, as seen in our second case, is possible. Complications include perforation and transmural ischemia. Imaging signs of severity include pneumoperitoneum, parietal pneumatosis, and lack of parietal enhancement. Treatment is urgent and requires surgery with detorsion and resection of any ischemic bowel if present [5,6].

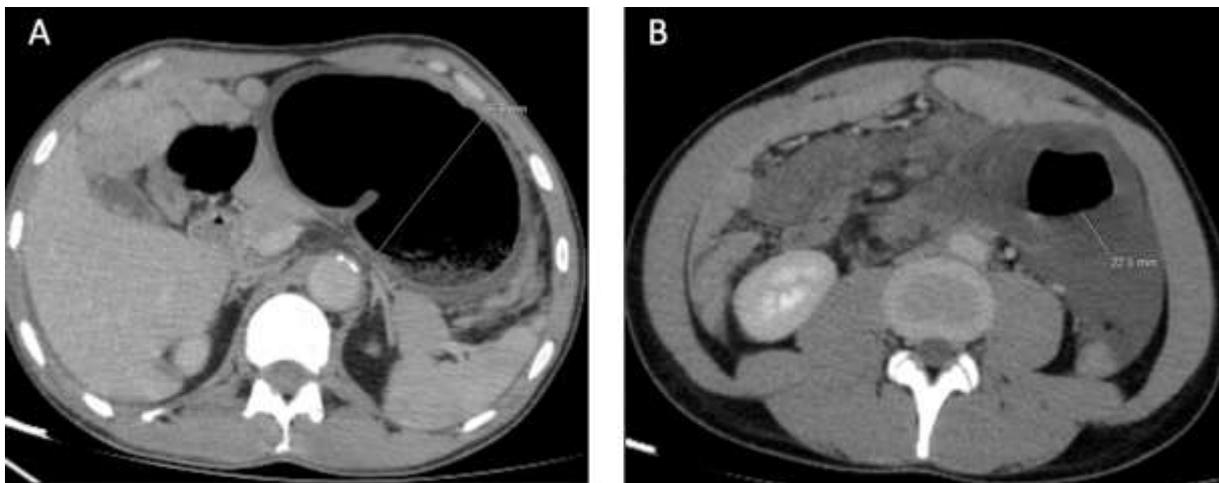


Figure 1: Axial CT scans at the portal phase of the first patient at two different levels: superior (figure A) and inferior (figure B), showing cecal distention in figure A (the lumen diameter measures 85.6 mm) and thickening with lack of wall enhancement in figure B (the wall's thickness is 22.5 mm)

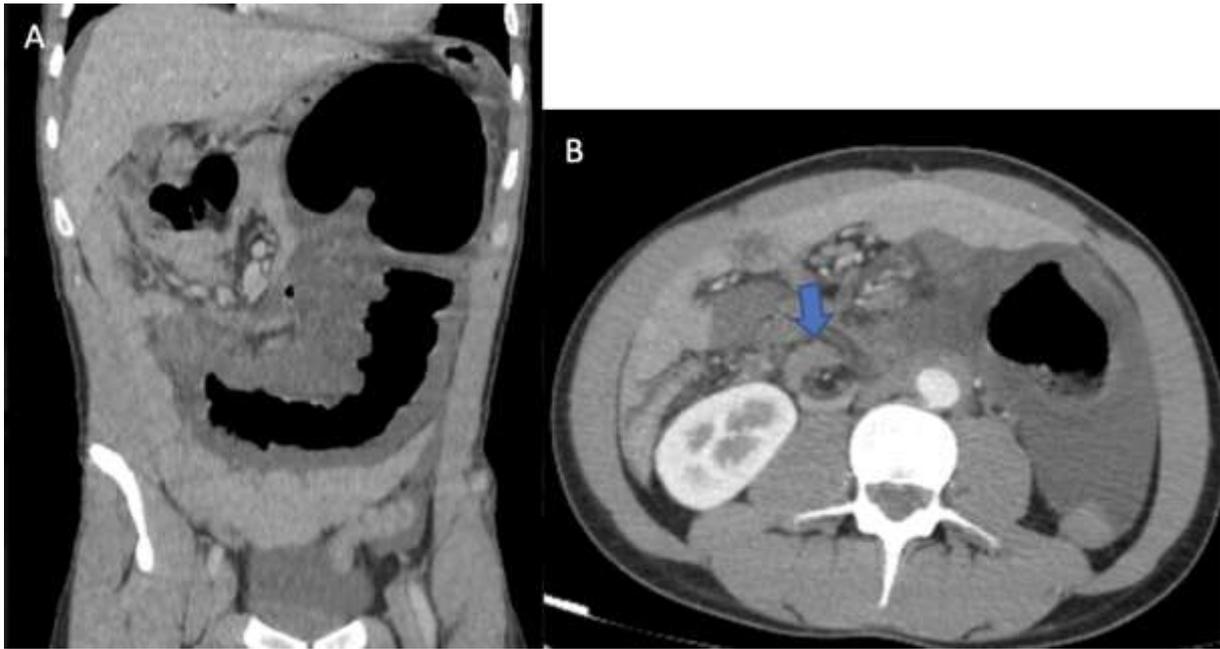


Figure 2: Portal phase CT scan of the first patient in the coronal plane (figure A) and axial plane (figure B), showing significant cecal distention and the 'whirlpool sign' (arrow in figure B)

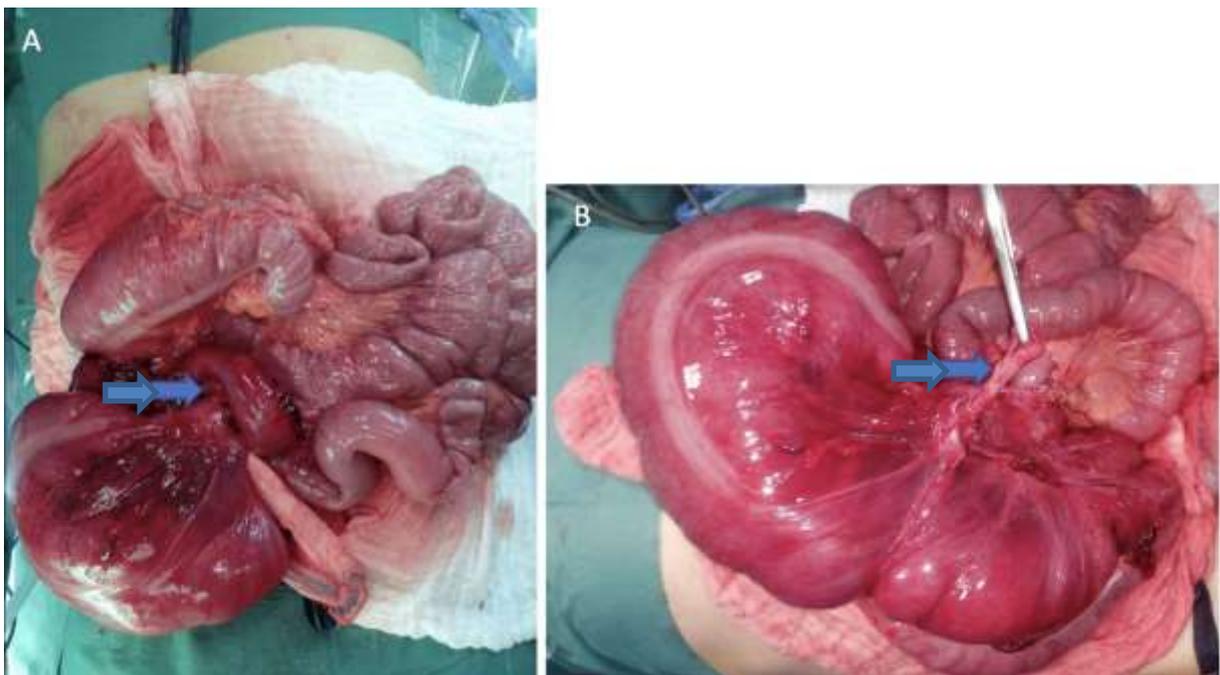


Figure 3: Per operative image of the first patient before detorsion, showing a necrotic distended cecum and the whirlpool sign (arrow in figure A), followed by post-detorsion imaging revealing the appendix (arrow in figure B), confirming the cecal origin of the twisted segment



Figure 4: Axial (Figure A) and coronal (Figure B) CT scans at the portal phase of the second patient, showing significant cecal distention (10 cm in diameter) with the cecum in a midline hypogastric position (arrow in B)

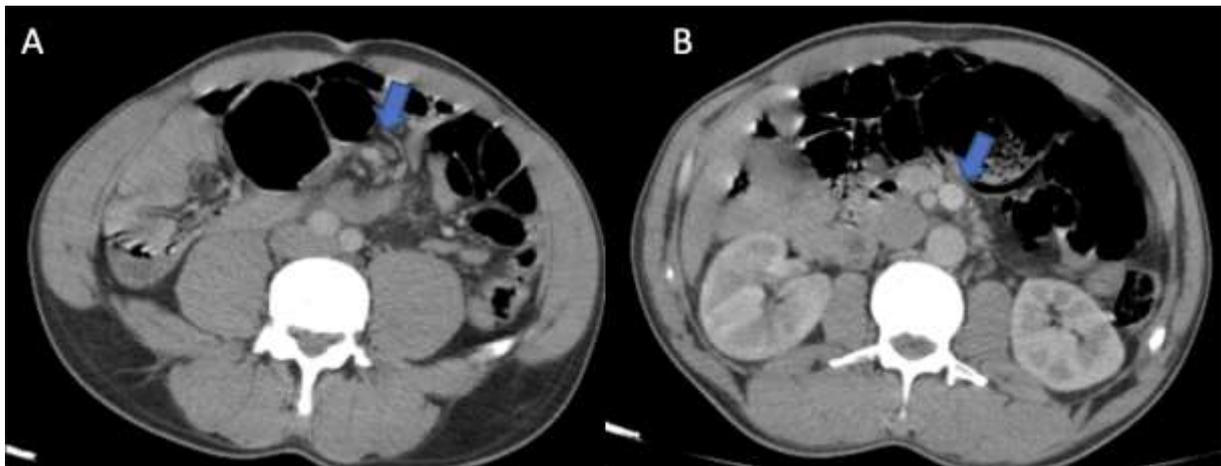


Figure 5: Axial CT scan at the portal phase of the second patient, highlighting the whirlpool sign (arrow in Figure A) and the misplacement of the mesenteric vessels (arrow in Figure B)

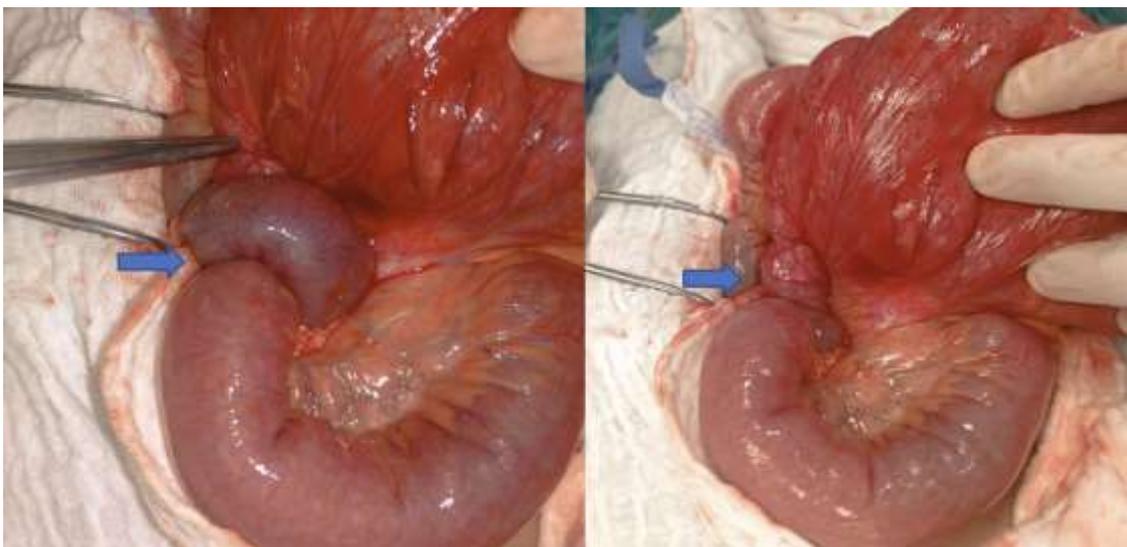


Figure 6: Per operative images of the second patient highlighting the whirlpool sign

CONCLUSION

Cecal volvulus is much rarer than sigmoid volvulus. The mechanism of volvulus involves either twisting or rotation. A good assessment of the cecal position, along with identification of the whirlpool sign, is key to diagnosis. Treatment requires prompt surgical intervention.

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