

## Case Report

# Cecal Volvulus: Report of a Case

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A rare case of cecal volvulus that was preoperatively diagnosed and surgically treated is herein reported. An 85-year-old woman was admitted to our hospital because of abdominal pain and distension concomitant with nausea and vomiting. She had no past history of laparotomy. Her abdomen showed distention with muscle rigidity and positivity for Blumberg's sign. Plain abdominal X-ray showed a markedly air-distended bowel segment in the right lower abdomen associated with dilated small intestine. An abdominal computed tomography showed extremely dilated bowel in the right lower abdomen that resembled a "coffee bean" in appearance. However, there was no evidence of air-distention in the descending colon. A colonoscopy did not show any bowel obstruction of the left side colon. We diagnosed a cecal volvulus associated with intestinal strangulation. An emergency laparotomy was thus performed. During the laparotomy, the ileocecal region, which was unfixed at the retroperitoneum, was found to be twisted clockwise 360° around the mesentery with the terminal ileum, thus resulting in a diagnosis of cecal volvulus. Since the colonic wall demonstrated vascular compromise and patchy gangrene, we therefore conducted an ileocecal resection without detorsion and reperfusion, followed by primary anastomosis. The patient recovered with minor complication. This case demonstrates the need for clinicians to consider cecal volvulus as a possible cause of acute abdomen. Abdominal computed tomography studies in such patients may enable early diagnosis. Resection without detorsion and reperfusion is the favored option for gangrenous bowel.

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## Introduction

Cecal volvulus is an uncommon cause of intestinal obstruction and accounts for approximately 1% of all intestinal obstructions and 25% to 40% of all colonic volvulus.<sup>1-3</sup> It is an axial twist of the cecum, ascending colon, and terminal ileum around a mesenteric pedicle. The original description of cecal volvulus was by Rokitsansky in 1837 as a cause of intestinal strangulation.<sup>4</sup> Despite many scholarly discussions on etiology, symptoms, radiographic findings, morbidity, and mortality, it remains a clinical debate as to the optimal surgical treatment for cecal volvulus.<sup>2,3,5,6</sup> In addition, cecal volvulus is easily overlooked as a source of intestinal obstruction because of its rarity, although it carries increased risk of vascular compromise and gangrene, and demand urgent surgical

option.<sup>1-3,5,6</sup> We report herein a case of cecal volvulus with vascular compromise and gangrene that was preoperatively diagnosed and surgically treated.

## Case report

An 85-year-old woman presented with a 5-day history of abdominal pain and distension concomitant with nausea and vomiting. She had previously undergone a bipolar hip arthroplasty for right femoral neck fracture, and an endoscopic polypectomy for colonic polyp. She also had a past history of non-tuberculous mycobacterial infection of the lung which had been eradicated with medical treatment. Upon physical examination, vital signs were

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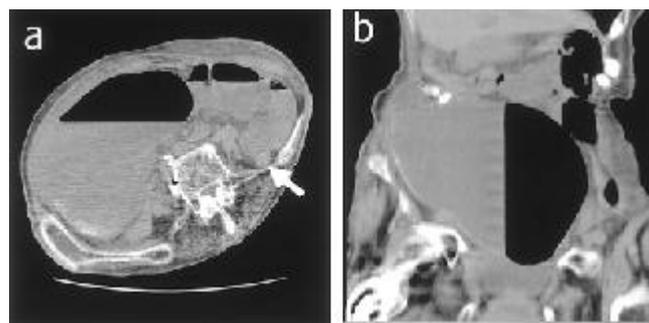
normal except for mild fever (body temperature, 37.2 °C), although her abdomen showed distention with muscle rigidity and positivity for Blumberg's sign. Laboratory studies were within normal limits except for hypoalbuminemia (2.9 g/dL; normal range, 3.8-5.2 g/dL), hyponatremia (133 mEq/L; normal range, 135-147 mEq/L), hypochloremia (90 mEq/L; normal range, 96-108 mEq/L), and elevated serum levels of C-reactive protein (22.1 mg/L; normal range 0.3 mg/L).

Plain abdominal X-ray examination in supine position showed a markedly air-distended bowel segment in the right lower abdomen associated with laterally-shifted dilated small bowel (Figure 1), but these findings were not specific enough to lead to a diagnosis. A subsequent abdominal computed tomography (CT) without contrast enhancement showed extremely dilated bowel in the right lower abdomen that resembled a "coffee bean" in appearance. However, there was no evidence of air-distention in the descending colon (Figure 2a). Coronal reformatted CT also revealed a markedly dilated bowel filled with air and fluid in the right lower abdomen (Figure 2b). Although a colonoscopy was advanced via the descending colon, any obstruction could not be found. Further intubation of the colonoscopy failed due to a lack of the patient's cooperation.

Based on these findings, we gave a diagnosis of cecal volvulus associated with intestinal strangulation. An emergency laparotomy was thus performed. During the laparotomy, the ileocecal region, which was unfixed at the retroperitoneum, was found to be twisted clockwise by 360° around the mesentery with the terminal ileum,



**Figure 1.** Plain abdominal X-ray examination showed a markedly air-distended bowel segment in the right lower abdomen associated with laterally-shifted dilated small bowel.

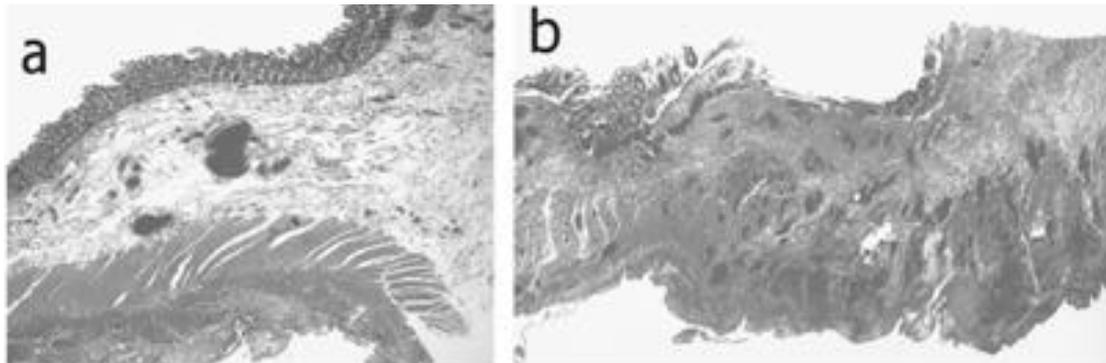


**Figure 2.** a. Axial CT scan of the abdomen showing a "coffee bean" appearance of the right lower abdomen and no air-distention in the descending colon (arrow). b. Coronal reformatted CT scan of the abdomen also revealed a markedly dilated bowel filled with air and fluid in the right lower abdomen.

confirming the diagnosis of cecal volvulus (Figure 3). Since the colonic wall demonstrated vascular compromise and patchy gangrene, we performed an ileocecal resection without detorsion of the cecal volvulus and reperfusion. The surgical procedures were uneventful. Histopathological findings of the resected specimen revealed acute ischemic changes including submucosal edema, vascular congestion, and hemorrhage with partial necrosis throughout the bowel wall (Figure 4). There was no neoplastic lesion in the resected specimens. The patient developed no postoperative complications except for wound infection and was discharged from our hospital without further incidence. She remains free of recurrence 24 months after surgery.



**Figure 3.** Intraoperative view showing unfixed ileocecal region which was twisted clockwise by 360° around the mesentery with the terminal ileum. The colonic wall demonstrated vascular compromise and patchy gangrene.



**Figure 4.** Histopathological findings of the resected specimen revealed acute ischemic changes including submucosal edema, vascular congestion, and hemorrhage (a) and partial necrosis throughout the bowel wall (b).

## Discussion

Cecal volvulus is assumed to develop in association with an abnormal fixation of the cecum to the posterior parietal peritoneum.<sup>1-3</sup> It consists of an axial twist of the cecum on its mesentery, producing intestinal obstruction and potentially, vascular compromise and gangrene. The axial twist usually occurs in a clockwise direction.<sup>1-3</sup> Actually, cecal volvulus often involves the terminal ileum and the ascending colon as well. On the other hand, there is a variant type of cecal volvulus called "cecal bascule", in which the cecum folds on itself in an anterior and superior direction to lie over a fixed ascending colon.<sup>1,7</sup> This present case was the former type with the axial twist occurring in a clockwise direction.

Abdominal CT is being increasingly used for the evaluation of acute abdomen, and for this reason, CT is replacing barium enema as the preferred imaging modality for the diagnosis of acute cecal volvulus in many practice environments.<sup>7-9</sup> The "coffee bean", "bird's beak", and "whirl" signs are three of the common CT findings associated with acute cecal volvulus.<sup>7-9</sup> Circumferential wall thickening, pneumatosis intestinalis, increased density in the mesenteric fat, and pneumoperitoneum are signs of complication.<sup>7</sup> The CT of this case showed only the "coffee bean" sign without air-distended descending colon. Based on findings of the CT, physical examination, and colonoscopy, we preoperatively diagnosed this case as cecal volvulus associated with intestinal strangulation.

Although successful nonoperative decompression by colonoscopy has been reported, it has not been popular because of the high failure rate.<sup>3</sup> The majority of patients with cecal volvulus therefore still subsequently require urgent surgery.<sup>1,2,3</sup> During laparotomy, determination of viability of the bowel is the initial step in the management. Nonviable bowel requires immediate excision of the involved loop, which can be achieved by right hemicolectomy or ileocecal resection. Under these circumstances, detorsion of the cecal volvulus and reperfusion of the bowel are not advised because reperfusion of ischemic or gangrenous bowel can produce metabolic acidosis, intestinal bacterial and toxin translocation, and possible irreversible septic shock.<sup>2,3</sup> We believe that resection of gangrenous cecal volvulus without detorsion and reperfusion is recommended. The patient in this report underwent this latter

operative procedure and had a favorable outcome.

When the bowel is clearly viable, further options are available to the surgeon. Operative detorsion alone is not recommended, since it is associated with high recurrence rates.<sup>1-3</sup> Most surgeons, therefore, will use an additional procedure, which may be resectional or nonresectional, to limit recurrence. The resection is usually followed by a primary anastomosis or occasionally ileostomy and mucous fistula.<sup>3</sup> The most commonly used nonresectional procedures are cecopexy and cecostomy.<sup>3</sup> It is important to note that seromuscular sutures are difficult to place and are poorly retained by atrophic or edematous tissue because of marked distension, thinning out, or edema of the cecal wall. We believe that cecopexy or cecostomy is not an appropriate operative option. The feasibility of laparoscopic cecopexy has been reported.<sup>3,10</sup> Further assessment of these results is required before it can be more widely adopted.

A case of cecal volvulus is presented. Abdominal CT studies enabled early diagnosis and prompt surgical intervention. In conclusion, this case demonstrated the need for clinicians to consider cecal volvulus as a possible cause of intestinal obstruction and abdominal CT is the most useful tool for identifying cecal volvulus. In addition, the majority of patients with cecal volvulus will require urgent surgery because nonoperative decompression is not usually possible. We believe that resection without detorsion and reperfusion is the favored option for gangrenous bowel.

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