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A Case Report on Cecal Volvulus: Approach to Management

Alyssa Katrin O. Chang, MD and Manuel Francisco T. Roxas, MD, FPCS, FACS

The Medical City, Ortigas Avenue, Pasig

Cecal volvulus is a rare cause of intestinal obstruction caused by axial twisting of the cecum that occurs in 1–1.5 % of all intestinal obstruction, with an incidence of 2.8–7.1 cases per million annually. Cecal volvulus is potentially life-threatening without prompt surgical intervention. A 57-year-old woman presented with severe abdominal pain and distention. Laboratory examinations revealed normal white blood cell count with neutrophilic predominance. Diagnosis of acute cecal volvulus was made from a "whirl sign" on abdominal computed tomography. An exploratory laparotomy confirmed the diagnosis of cecal volvulus and a segmental ileocolic resection with primary anastomosis was carried out. The patient was discharged improved and returned to her normal activities of daily living.

Key words: Cecal volvulus, ileo-colectomy, whirl sign

Cecal volvulus is axial twisting involving the cecum, terminal ileum, and ascending colon. It is a rare condition, and its incidence is reported to range from 2.8 to 7.1 per million people per year. Colonic volvulus constitutes 10% to 15% of all cases of large-bowel obstruction. The most common location is the sigmoid colon (80%), the cecum (15%), transverse colon (3%), and splenic flexure (2%).[1] Risk factors for colonic volvulus are advanced age, chronic constipation, and a preponderance for a high fiber diet. Interestingly, patients with psychiatric conditions taking psychotropic drugs have a higher incidence of volvulus as these drugs can deter intestinal mobility.[2]

The aim of this report is to emphasize the importance of rapid diagnosis and appropriate treatment in cases of volvulus. In this particular case, the patient benefited from an early surgical intervention without further complications.

This case is reported in line with the SCARE guidelines.[3]

The Case

A 57-year-old female, married, Roman Catholic, college graduate, who came in with a chief complaint of vague abdominal pain, crampy in character, with pain score rated as 4-5 out of 10, associated with bloatedness. Twelve hours prior, patient noted abdominal distention, associated with one episode of vomiting of previously ingested food, approximately amounting to one cup. Patient then sought consult at a different institution where work up was done. However, she opted to seek a second opinion hence consult in the institution. She was diagnosed with hypertension and type 2 diabetes mellitus, both controlled. No history of food and drug allergies. Her family history was unremarkable. She had open cholecystectomy and hernioplasty done on the right approximately 20 years ago. She was a non-smoker, non-alcoholic beverage drinker, and denied illicit drug use.

Physical examination revealed a distended tympanitic abdomen, with hypoactive bowel sounds. A palpable mass and tenderness was present in the right upper quadrant. There was no organomegaly. On digital rectal exam, the rectal vault was noted to be empty, no palpable masses, with good sphincter tone. There was no blood on examining finger. Given the history and physical examination, primary working impression of complete gut obstruction probably secondary to colonic neoplasm versus post op adhesion was made.

The team then proceeded with the work up. Laboratory tests revealed normal complete blood count (hemoglobin 126 g/dL, hematocrit 0.36, white count 9.9/L, platelet count 289/L, neutrophil 0.76 and lymphocyte 0.19), electrolytes (sodium 137 mmol/L,

potassium 3.9 mmol/L), and liver function tests (ALT 46 U/L, AST22 U/L).

Working impression was partial gut obstruction probably secondary to a colon mass versus volvulus. These were considered plausible given the presentation of abdominal pain and bloatedness with associated nausea and vomiting. Since patient was stable, the team requested for a whole abdomen CT scan.

A plain computed tomography (CT) scan of the whole abdomen revealed a dilated cecum with a maximal diameter of 7.2 cm, filled with fecal material, which appears inverted occupying the right upper quadrant (Figure 1). There is whirled appearance at the right lower quadrant, point of transition between the cecum and the rest of the ascending colon (Figure 2). With the history, physical examination, laboratory and diagnostic findings, primary working impression was closed loop obstruction secondary to cecal volvulus.

At the emergency room, patient was placed on bowel rest. IV fluids started using plain lactated Ringer's 1L at 120 cc per hour for adequate hydration. A nasogastric tube and Foley catheter were inserted. Initial NGT output was bilious and was noted to be minimal. Urine output was clear and adequate in amount. IV antibiotics started because prophylactic administration of antibiotics greatly diminishes surgical site infection. Given the assessment of cecal volvulus, the team planned to do an exploratory laparotomy, possible bowel resection with diversion.

The patient underwent exploratory laparotomy, where a severely distended cecum of approximately 12 cm in diameter, with several serosal tears were noted at the antimesenteric region of the cecum. A right

Figure 1. Non-contrast whole abdomen radiograph showing dilated cecum (arrow) occupying the right upper quadrant.

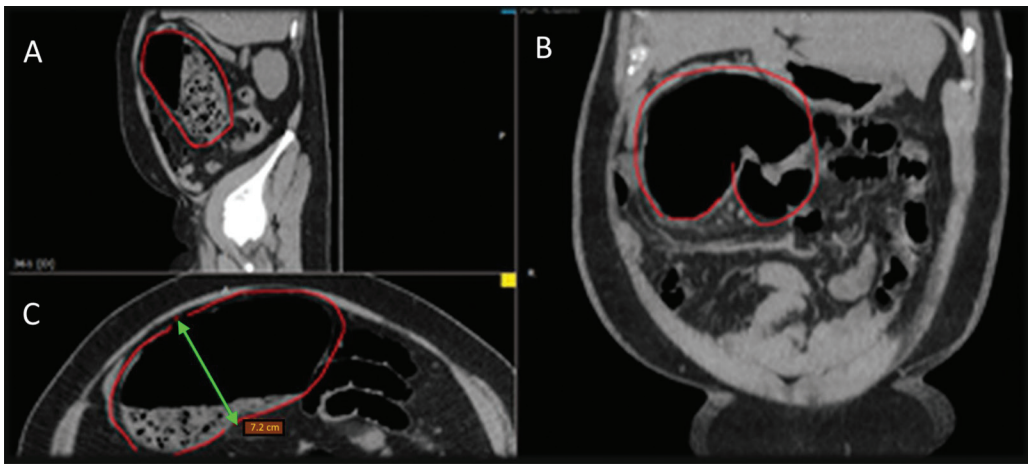

Figure 2. Non-contrast whole abdomen CT scan with representative (A) sagittal, (B) coronal, and (C) axial slices demonstrating a dilated cecum (red outline) filled with fecal material, with maximal diameter of 7.2 cm. In (B), the cecum appears inverted occupying the right upper quadrant. The appendix is not dilated and is seen in the mid epigastric region.

hemicolectomy with side-to-side stapled anastomosis was performed. (Figure 3). The histological findings revealed congestion at the ileal and cecal segments, recent hemorrhages, and acute serositis; acute appendicitis with peri appendicitis was also noted. There were histologically viable surgical lines of resection. Three pericolic lymph nodes seen without diagnostic abnormalities. No postoperative complications occurred. Patient was discharged on post-operative day three. The patient was advised to avoid heavy lifting and strenuous activities. She was also asked to follow up at the clinic after one week, and then every 6 months for the first year and yearly thereafter.

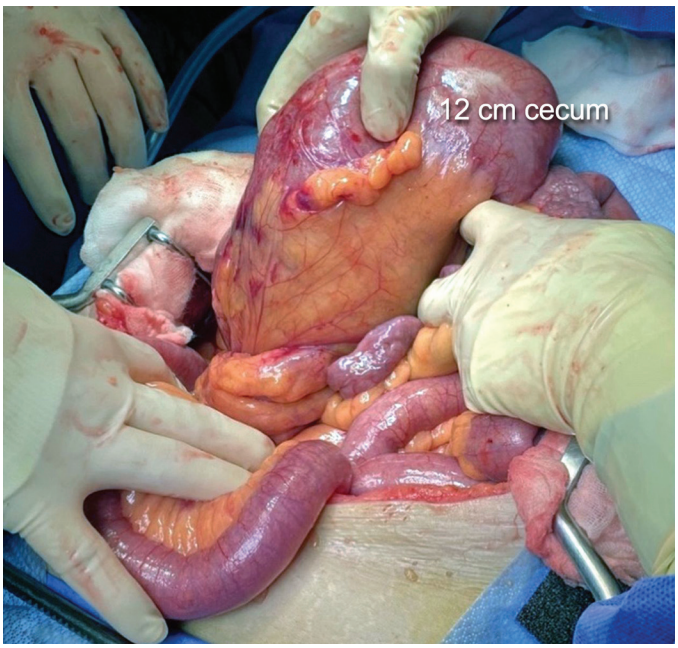

Figure 3. Intraoperative photo showing a severely distended cecum approximately 12 cm in diameter.

Discussion

It was notable that 63,749 cases of colonic obstruction due to volvulus were admitted from 2002-2010 as mentioned in an epidemiologic study in the United States.[4] Cecal volvulus has an incidence of 2.8-7.1 cases per million annually and is responsible for about 1–1.5% of all intestinal obstructions and about 11% of all volvulus-related intestinal obstructions.[5]

With no predisposition related to sex, the disease predominantly present in the 6th to 8th decade of life. Earlier reports, along with recent evidence from two large studies from the United States, one from France and one from New Zealand, indicate a 3:1 predominance of cecal volvulus in women as seen in the present case.[6]

In a study made by Hasbahceci, et al., it was believed that during embryogenesis, intestinal development occurs in a sequential process, with the final counterclockwise rotation of the cecum is the peritoneal fixation to the retroperitoneal structures. The ones with developmental failure of fixation has the potential for cecal volvulus.[7]

Clinical presentation of cecal volvulus is highly variable. But as seen in the case, they usually present with the cardinal symptoms of obstruction like colicky abdominal pain, nausea, vomiting, and abdominal distention.[4]

Abdominal radiographic findings such as cecal dilatation, single air fluid level in the right lower quadrant and absence of rectal gas can confirm the diagnosis of cecal volvulus in 70% of cases.[4] On the other hand, barium enema has been used as an imaging tool for cecal volvulus confirmation with findings of beak sign, and has a reported accuracy of 88%.[8] However, was not performed in this case due to risk of possible barium extravasation.

While CT scan of the whole abdomen as mentioned in the ASCRS clinical practice guidelines has a positive diagnostic yield of 89%, the authors were able to clinch the diagnosis with the help of the pathognomonic CT findings. The CT findings of whirl sign, ileocecal twist, x-marks-the-spot-sign and split wall sign are >90% sensitive and 100% specific for cecal volvulus.[14] All of the pathognomonic signs were noted in this case.

Cecal volvulus has its associated "textbook" answer for what operation should be performed but these do not take into account the wide variations in disease presentation and patient fitness for surgery. There are surgical options depending on several factors. The optimal approach means doing the definitive surgical intervention on a stable patient, who was adequately resuscitated, and medically optimized, which was done to the patient in the present case.

It is good to know that in an emergent condition, patients with cecal volvulus require immediate

intervention due to patient instability, bowel ischemia or perforation, or complete obstruction. It means that the patient is medically fit for surgery but typically has not had time for full resuscitation and optimization. However, early management for these patients are similar and includes a thorough history and evaluation focused on the degree of current physiologic disturbance and operative risk assessment.[9]

Success rate of colonoscopic reduction is only 30% with potential risk of colonic perforation.[10] Given the unusual nature of the disease, there are no prospective treatment trials to guide management decisions. In the above case, resection is necessary because cecum was thin-walled and grossly distended.

According to the Scandinavian Journal of Surgery, reported success rates for detorsion of cecal volvulus are significantly lower (15-20%), so urgent surgery is more often required.[11]

Resection of the volvulized segment should be rapidly performed followed by lavage and temporary abdominal closure. A second look surgery for patients with questionable bowel viability may be warranted. The critical surgical decision on whether to perform a primary anastomosis, diverting ostomy or combined approach is made based on the surgeon's assessment of the risk of anastomotic leak versus the morbidity of an ostomy.[12] Non-resectional approaches may provide an excellent bail-out option in patients who are extremely high risk.

Data presented in ASCRS (American Society of Colon and Rectal Surgeons) clinical practice guidelines indicate the following: cecal resection is the most consistently effective means of preventing recurrent volvulus.[12] Non-viable bowel is a meaningful predictor of mortality and resection is required.[13]

Conclusion

The management of volvulus involves a series of stepwise decisions that must be performed rapidly. Due to the fact that this condition is relatively uncommon makes it more critical for surgeons to maintain a solidified algorithm tailored to the disease process in order to amplify chances of successful outcome. In this case, the diagnosis of acute cecal volvulus was made from a "whirl sign" on abdominal computed tomography. An exploratory laparotomy confirmed the diagnosis of cecal volvulus and a segmental ileocolic resection with primary anastomosis was carried out. The patient was discharged, improved.

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