

Laparoscopic Approach for Metachronous Cecal and Sigmoid Volvulus

Eran Sadot, MD, Alexander J. Greenstein, MD, MPH, Sharon R. Zisman, MD

ABSTRACT

Background: Metachronous colonic volvulus is a rare event that has never been approached laparoscopically.

Methods: Here we discuss the case of a 63-year-old female with a metachronous sigmoid and cecal volvulus.

Results: The patient underwent 2 separate successful laparoscopic resections.

Discussion and Conclusion: The following is a discussion of the case and the laparoscopic technique, accompanied by a brief review of colonic volvulus. In experienced hands, laparoscopy is a safe approach for acute colonic volvulus.

Key Words: Laparoscopy, Cecal volvulus, Sigmoid volvulus, Colonic volvulus, Metachronous.

INTRODUCTION

The incidence of colonic volvulus is 2.65 of every 100 000 patients annually.¹ It is more uncommon when it occurs as metachronous colonic volvulus involving the cecum and sigmoid colon. Only 4 cases of metachronous cecal and sigmoid colon volvulus have been reported in the literature.²⁻⁵ All those cases were managed by the open approach, except one in which the sigmoid volvulus was managed by elective laparoscopy and the cecal volvulus was managed via the traditional approach. We report, for the first time, successful management of metachronous colonic volvulus treated solely via the laparoscopic approach. Moreover, it is the first report that describes laparoscopic resection for acute cecal volvulus.

CASE REPORT

A 63-year-old female was admitted to The Mount Sinai Medical Center with obstipation and decreased urine output. Ten years prior to her current admission, she was diagnosed with multiple sclerosis, complicated by neurogenic bladder that required a suprapubic catheter, and severe aspiration pneumonia that necessitated percutaneous endoscopic gastrostomy (PEG) placement. Moreover, the patient is bedridden secondary to muscle weakness and treated with a Baclofen pump that was placed subcutaneously in her left lower abdominal wall. Her past surgical history includes laparoscopic cholecystectomy secondary to cholangitis. Four days prior to her admission, she developed obstipation, abdominal distention, and nausea. On physical examination, she was afebrile, hemodynamically stable, her abdomen was distended, tympanic to percussion but without tenderness. Of note, the patient has no abdominal sensation secondary to the multiple sclerosis. Her white blood cell count was $7 \times 10^3/\mu\text{L}$ with 83% neutrophils. Abdominal X-ray showed a markedly distended colon (**Figure 1**). Computed tomography (CT) demonstrated dilated colon with transitional zone and swirling of the mesentery (**Figure 2**). Thus, a working diagnosis of sigmoid volvulus was established. The patient underwent flexible sigmoidoscopy, detorsion of the volvulus, and rectal tube placement. The patient failed to regain normal bowel function, and the decision was made to take the patient to the operating

Department of Surgery, Division of General Surgery, The Mount Sinai Hospital New York, New York, USA (all authors).

Address correspondence to: Eran Sadot, MD, Department of Surgery, The Mount Sinai Medical Center, 5 E. 98th St. Box 1259, 15th floor, New York, NY 10029, USA. Telephone: (212) 241-5499, Fax: (212) 534-2654, E-mail: eransadot@gmail.com

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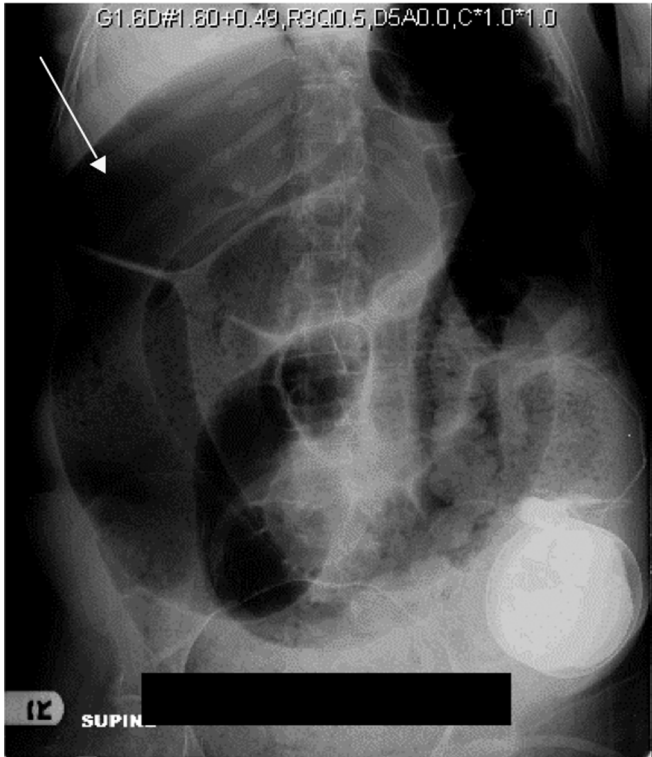


Figure 1. Sigmoid volvulus. Markedly dilated colon loop projecting to the right upper quadrant (arrow).

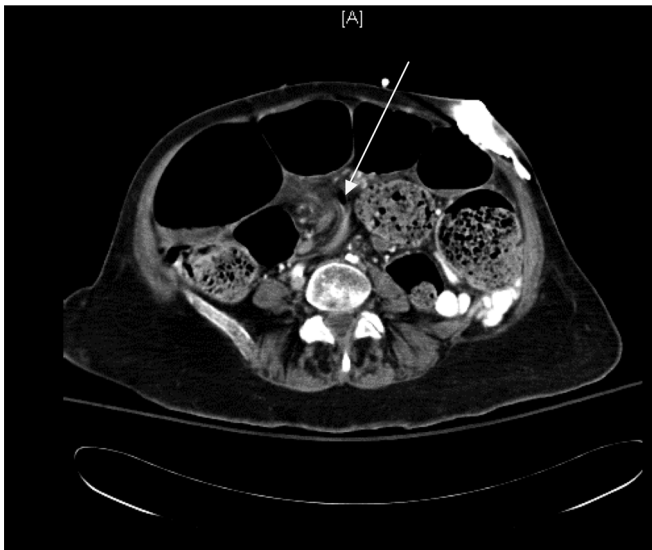


Figure 2. Sigmoid volvulus. Arrow points to the swirling of the sigmoid mesentery, which includes the transitional zone of the obstructed sigmoid colon.

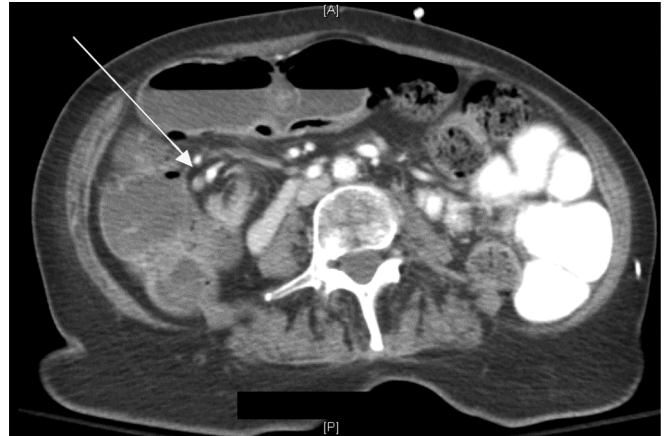


Figure 3. Cecal volvulus. The arrow points to the swirling of mesenteric vessels in the right hemiabdomen.

room (OR). Considering that the patient is bedridden without abdominal sensation and chronically constipated, we performed laparoscopic sigmoidectomy with end colostomy. The findings were markedly dilated colon (including the right colon), very redundant mesentery of the left and sigmoid colon, and counterclockwise sigmoid volvulus. The operative time was 83 minutes. The patient recovered uneventfully and was discharged home on postoperative day 5. Pathology findings of the resected sigmoid colon were consistent with volvulus. A year and a half later, the patient presented with lethargy, high feeding residuals from the PEG, and vomiting. She was afebrile, normotensive but tachycardic with a heart rate of around 130 beats/minute. On physical examination, her abdomen was mildly distended, tympanitic, without tenderness. Her white blood cell count was $28.4 \times 10^3/\mu\text{L}$ with 94% neutrophils. An abdominal X-ray demonstrated nonspecific minimally dilated small bowel loops. CT identified findings suggestive of cecal volvulus: swirling of mesenteric vessels (**Figure 3**), displacement of the cecum to the left upper quadrant (**Figure 4**), dilated proximal colon and small bowel, and collapsed distal colon. At this point, a working diagnosis of cecal volvulus was made. To verify the diagnosis, the patient was taken to the OR for diagnostic laparoscopy. Placement of trocars was limited by the PEG, suprapubic catheter, previous colostomy, and Baclofen pump. Diagnostic laparoscopy verified axial cecal volvulus in a clockwise direction. Detorsion was performed laparoscopically, and the bowel appeared viable. The lengthy mobile mesentery of the ileocecal region enabled easy laparoscopic mobilization, and afterwards we proceeded with ileocolic resection and extracorporeal anastomosis through a 4-cm midline incision that was



Figure 4. Cecal volvulus. Long arrow points to the transitional zone at the ileocecal valve that starts to swirl. Short arrow points to the cecum that is displaced to the left upper quadrant.

continuous with the umbilical port. The operative time was 96 minutes. The patient had her first stoma output on postoperative day 6 and was discharged uneventfully on postoperative day 8.

DISCUSSION

Colonic volvulus is relatively rare in the United States; it is responsible for about 5% of cases of large bowel obstruction. Sigmoid volvulus accounts for two-thirds of all cases of colonic volvulus, whereas cecal volvulus accounts for about one-fourth of them. Although information about the true incidence is scant, a report from Olmsted County, Minnesota, noted that the overall incidence of colonic volvulus is 2.65 of every 100 000 patients annually, while sigmoid volvulus accounts for 1.47 of every 100 000 patients annually, and cecal volvulus accounts for 1.08 of every 100 000 patients annually.¹ A metachronous colonic volvulus is even more infrequent. Only 4 cases of metachronous cecal and sigmoid colon volvulus have been reported in the literature.²⁻⁵ Two were managed with nonresectional surgery and 2 with surgical resection.

In the United States, the factors that predispose to sigmoid volvulus in adults are largely acquired.¹ The main risk factors are chronic constipation, laxatives, being elderly, and institutionalized persons.⁶ Other risk factors are pregnancy, Parkinson's disease,⁶ high fiber diet,^{7,8} Chagas' disease,⁹ and previous abdominal surgery.¹⁰ For cecal volvulus, a mobile ileocecal region is a prerequisite. Cadaver studies at Northwestern University Medical School demonstrated that the cecum fails to fuse to the retroperitoneum in nearly 25% of the population.¹¹ Despite this

high rate of inadequate fixation, cecal volvulus accounts for only 1% of large bowel obstructions. This observation suggests that other factors must be present for volvulus to occur. Various risk factors have been reported in the literature. Among them are a high fiber diet,¹² early postoperative period,¹³ previous abdominal operations,¹⁴ diarrhea,¹⁵ pregnancy, and pelvic tumors.¹⁶

Volvulus of the colon is the leading cause of strangulated large bowel obstruction, with a 33% to 80% mortality rate in cases involving intestinal ischemia. Because mortality rates are significantly lower in patients without ischemic change (0% to 7%), early diagnosis and treatment are of primary concern.^{1,6,17} The management of sigmoid volvulus includes endoscopic detorsion followed by elective resection if there is no suspicion of bowel ischemia.^{1,18-22} An urgent laparotomy is indicated if the suspicion of bowel ischemia is high (eg, high fever, leukocytosis, peritoneal signs, free abdominal air, acidosis, and sepsis).^{6,23} The intraoperative findings dictate the different surgical alternatives (eg, colopexy, primary anastomosis, colostomy).²⁴ Of note, the finding of a mobile cecum rarely results in cecal volvulus, and intestinal obstruction caused by cecal volvulus occurs in only about 1% of cases.^{25,26} As for cecal volvulus, endoscopic decompression is rarely successful (5%). Thus, treatment usually requires laparotomy.^{1,19,27} The different surgical options depend on the clinical status of the patient and include resection with primary anastomosis, diverting stoma, cecopexy, and cecostomy.²⁸

The role of laparoscopy in colonic volvulus is not yet defined. However, 3 factors make laparoscopy an attractive approach for colonic volvulus as opposed to the traditional surgical armamentarium. First, the patients are generally elderly with comorbidities and as a group would potentially benefit from a minimally invasive approach. Secondly, the long colonic mesentery lends itself to a relatively easy laparoscopic mobilization of the redundant colonic loop. Furthermore, the shortened base of the colonic mesentery facilitates a stapled primary anastomosis. Thirdly, laparoscopy is initially a diagnostic modality that can rapidly determine bowel viability. Other advantages of laparoscopy are reduced postoperative pain, early mobilization, reduced wound infections, rapid return of gastrointestinal function, short length of hospital stay, and lower rate of incisional hernias. At present, reports of its use remain scant. Few case reports and case series report management of sigmoid volvulus with endoscopic decompression followed by elective laparoscopic resection.²⁹⁻³¹ Cartwright-Terry et al³² reported a series of 9 cases of sigmoid volvulus managed by colonoscopic

decompression followed by same admission laparoscopic anterior resection. Their conclusion was that laparoscopy is a good option for sigmoid volvulus: surgical complications are minimal and recovery is quick. Only 5 case reports describe laparoscopy for the management of cecal volvulus, all being laparoscopic cecopexy.³³⁻³⁷

In the case reported here, the patient had several risk factors for colonic volvulus: being institutionalized, neuropsychiatric disorder, chronic constipation, laxatives, being elderly, and previous abdominal surgery. We decided to utilize the laparoscopic approach mainly because of its diagnostic capabilities, to promptly establish a diagnosis of volvulus and determine bowel viability. The laparoscopic approach to acute cecal volvulus is corroborated by similar scenarios in which laparoscopy was safely utilized in patients with acute abdomen and limited abdominal domain.³⁸ Despite the fact that the bowel appeared viable, we proceeded with resection to lower the likelihood of recurrent volvulus in this patient at very high risk for recurrent volvulus.

CONCLUSION

Surgeons taking care of patients with previous surgery for colonic volvulus should have a high index of suspicion for metachronous volvulus if bowel obstruction recurs, particularly if the patient has risk factors for colonic volvulus. Thus, early intervention is facilitated and strangulation is avoided. In addition, we suggest that in experienced hands, laparoscopy is a safe approach for acute colonic volvulus.

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