

A Unique Case of Recurrent Metachronous Volvulus of the Gastrointestinal Tract

Dimitrios V. Avgerinos, MD; Omar H. Llaguna, MD; Richard L. Friedman, MD

Colonic volvulus is an uncommon disease that predisposes patients to bowel obstruction in both the adult and pediatric population. The international literature offers few reports of synchronous or metachronous volvulus of 2 organs of the gastrointestinal tract. We describe a unique case of a patient who presented with recurrent metachronous volvulus of the sigmoid colon, cecum, and stomach. The patient underwent multiple operations for bowel obstruction, lysis of adhesions, and colon resection. The interesting intraoperative findings were a very long mesentery and peritoneal attachments of the intraabdominal gastrointestinal organs that made the stomach and colon extremely mobile and thus susceptible to volvulus. Prophylactic pexis of the cecum and the stomach during the first operation, in light of the elongated mesentery, may have prevented the subsequent episodes of volvulus.

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Colonic volvulus is an uncommon disease that accounts for 2% to 4% of all cases of bowel obstruction in the adult population.¹ Even more uncommon is the metachronous volvulus of organs of the gastrointestinal tract. Acute volvulus occurs most commonly in the sigmoid colon, followed in incidence by the right colon and the stomach.² There have been several reports of synchronous or metachronous volvulus of 2 organs of the gastrointestinal tract.³⁻⁵ However, as far as we know, this is the first reported case in the international English literature of recurrent metachronous volvulus of the sigmoid colon, cecum, and stomach.

REPORT OF A CASE

A 64-year-old female patient with a medical history significant for hypertension, scoliosis, and sigmoid volvulus that was treated with colonoscopic reduction 8 years prior presented last year to the emergency department of our hospital with symptoms of diffuse abdominal pain and

obstipation for a few hours. Computed tomography results suggested sigmoid volvulus (**Figure 1**), and due to the recurrent nature of the disease, an exploratory laparotomy with a Hartmann-type sigmoidectomy was performed. After a 3-month symptom-free period after discharge, the patient returned to the hospital with an episode of mesoaxial gastric volvulus. Further investigation revealed no diaphragmatic defect or strangulation of the stomach. Operative intervention was offered, but the gastric volvulus was finally reduced endoscopically after the patient's refusal of surgery. During the next few months, the patient had 3 more admissions to the hospital with a small-bowel obstruction due to adhesions from the previous laparotomy, which was resolved with nasogastric tube decompression and bowel rest. During the third admission for small-bowel obstruction, because of the recurrent episodes of obstruction, the patient consented to another laparotomy for lysis of adhesions. Six months after the second operation, the patient again presented with bowel obstruction, and computed tomography and abdominal images showed right colon and

Author Affiliations: Department of Surgery, Beth Israel Medical Center, Albert Einstein College of Medicine, New York, New York.

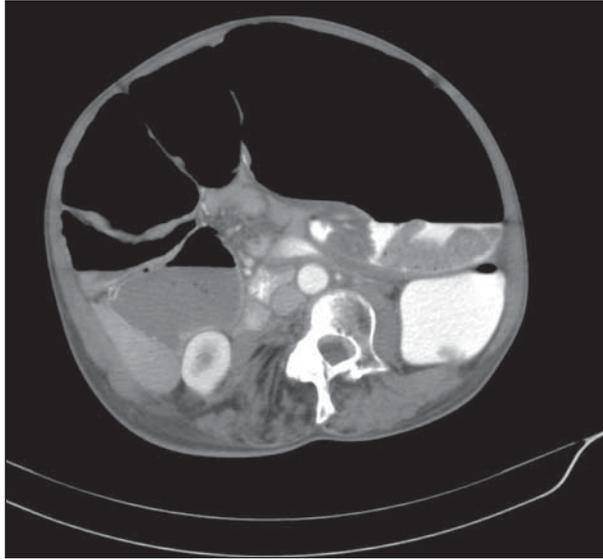


Figure 1. Computed tomography of abdomen with oral contrast showing massive dilatation of the colon owing to sigmoid volvulus.

cecal volvulus with possible ischemic changes (**Figure 2**). A right hemicolectomy was performed at this time with the addition of prophylactic gastropexy to avoid recurrent gastric volvulus in the future. The patient recovered uneventfully and was discharged home after 1 week of hospitalization. The interesting finding during all the operative procedures was that the colon appeared very mobile, with a long mesentery, making the large bowel very redundant. In addition, the retroperitoneal attachments of the stomach appeared very weak, causing the organ to be positionally unstable in the abdominal cavity. However, further workup of the patient and her family did not reveal any rheumatologic or collagen disorder that could justify the elongated mesentery.

COMMENT

Volvulus (from the Latin verb *volvere*, which means “to twist”) of the gastrointestinal tract refers to the axial rotation of an organ around its pedicle; it was first described by ancient Egyptians and Hippocrates, who advocated air insufflations to relieve the obstruction.⁶ The sigmoid is the organ that volvulizes most frequently, with the cecum and the transverse following in frequency.⁷ Gastric volvulus is a rare event, but a true surgical emergency.⁸ Today, volvulus is the third most common cause of colonic obstruction in the United States after cancer and diverticulitis. Its frequency is much higher in Africa, India, Iran, and Russia.⁶ Its cause is multifactorial, with the 2 most important risk factors being the length of the bowel and the length of the mesocolon. A long and narrow mesentery predisposes an individual to volvulus, as it brings the 2 ends of the loop close together so it can twist on itself. Recent studies of the anatomic characteristics of the sigmoid colon have shown that its mesocolon is dolichomesocolic (longer than it is wide) in men and brachymesocolic (wider than it is long) in women. This can possibly explain the increased incidence of sigmoid volvulus in males compared with females, as a nar-



Figure 2. Abdominal image showing right colon and cecal volvulus.

rower mesocolic root with a greater vertical length of the mesentery makes the colon susceptible to volvulus.⁹ Other etiologic factors that have been implicated in volvulus are a diet high in fiber, chronic constipation, adhesions from prior laparotomy, systemic and local neurologic disease, pregnancy, toxins, megacolon, and various metabolic diseases.^{6,10}

The clinical presentation of volvulus may vary, but signs and symptoms of intestinal obstruction are almost always present, with abdominal pain, distention, and obstipation being the most prominent. The twist in the mesentery may be clockwise or counterclockwise, and the degree of rotation about the axis can range from 180 to 360 degrees, causing closed-loop obstruction.⁶ Instability of the vital signs is an ominous sign, indicating gangrene of the twisted part of the gastrointestinal tract, with danger of perforation. The thick wall of the sigmoid makes its perforation uncommon, whereas the thin wall of the cecum makes it a strong possibility, especially if the ileocecal valve is competent.

If volvulus is suspected, prompt treatment is required, since any delay can significantly increase morbidity and mortality. Relief of the obstruction and prevention of recurrent attacks is the mainstay of treatment. Endoscopic and/or surgical means of therapy have been advocated. In gastric volvulus, nonoperative therapy may be successful in selected patients, but because of the high recurrence rates (25%-60%), most authors recommend expeditious surgical treatment with gastric decompression, reduction of the volvulus, and fixation of the stomach.⁸ In the case of sigmoid volvulus, when the colon is viable, colonoscopy with endoscopic decompression is the treatment modality of choice. However, any evidence of gangrene should lead to emergency lapa-

rotomy and resection of the bowel segment that appears necrotic. Recurrence rates after endoscopic reduction of sigmoid volvulus remains high (40%-70%), leading most surgeons to advocate sigmoid resection or endoscopic sigmoidopexy in patients not medically fit for surgery, following endoscopic decompression.⁶

The presentation of a patient with synchronous or metachronous volvulus of 2 organs is an extremely rare event. However, the case of our patient with recurrent episodes of metachronous volvulus of the sigmoid, cecum, and stomach is unique in the English-language world literature. It originated from the uncommonly long and weak mesentery of our patient. Owing to the repeated episodes of obstruction in this patient, segmental resection of the ischemic bowel was inevitable. Nevertheless, every effort was made to preserve as much intestine as possible. It is possible that prophylactic pexis of the cecum and the stomach during the first operation, in light of the elongated mesentery, may have prevented the subsequent episodes of volvulus, though there is no literature to support that opinion. Bhatnagar et al⁹ studied the sigmoid mesocolon in 70 human subjects and concluded that when the total length of the mesentery increases, the dimensions of its root decrease, something that may contribute to the etiology of sigmoid volvulus. It is obvious that more studies are needed, both to investigate the exact incidence of elongated mesentery and mobile gastrointestinal organs among humans and to further address the necessity for prophylactic pexis of the viscera that are susceptible to volvulize, such as the sigmoid and cecum, during laparotomy for colon, gastric, or small-bowel volvulus.

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Correspondence: Dimitrios V. Avgerinos, MD, Department of Surgery, Beth Israel Medical Center, 1st Avenue at 16th Street, 16 Baird Hall, New York, NY 10003 (davgerin@chpnet.org).

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REFERENCES

1. Ballantyne GH, Brandner MD, Beart RW Jr, Ilstrup DM. Volvulus of the colon: incidence and mortality. *Ann Surg.* 1985;202(1):83-92.
2. Ören D, Atamanalp SS, Aydinli B, et al. An algorithm for the management of sigmoid colon volvulus and the safety of primary resection: experience with 827 cases. *Dis Colon Rectum.* 2007;50(4):489-497.
3. Sharp JF, Tudor RW. Coexisting organo-axial gastric volvulus and volvulus of the sigmoid colon. *J R Soc Med.* 1986;79(4):240-241.
4. Flynn P, Chapuis P, Pheils MT. Organo-axial volvulus of stomach and volvulus of the sigmoid colon. *Med J Aust.* 1980;2(3):152-153.
5. Scarpa FJ, Boltax RS, Dineen JP. Sequential giant sigmoid and gastric volvulus. *Am J Proctol Gastroenterol Colon Rectal Surg.* 1978;29(5):40-43.
6. Lal SK, Morgenstern R, Vinjirayer EP, Matin A. Sigmoid volvulus an update. *Gastrointest Endosc Clin N Am.* 2006;16(1):175-187.
7. Drelichman ER, Nelson H. Colonic volvulus. In: Cameron JL, ed. *Current Surgical Therapy.* 8th ed. Philadelphia, PA: Elsevier Mosby; 2001:179-183.
8. Sevcik WE, Steiner IP. Acute gastric volvulus: case report and review of the literature. *CJEM.* 1999;1(3):200-203.
9. Bhatnagar BN, Sharma CL, Gupta SN, Mathur MM, Reddy DC. Study on the anatomical dimensions of the human sigmoid colon. *Clin Anat.* 2004;17(3):236-243.
10. Alshawi JS. Recurrent sigmoid volvulus in pregnancy: report of a case and review of the literature. *Dis Colon Rectum.* 2005;48(9):1811-1813.

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