

Sigmoid Volvulus in a 46-Year-Old Man

Mallory Williams, MD
Christopher P. Steffes, MD

The sigmoid colon is the most frequently reported site of intestinal tract volvulation.¹⁻⁴ The symptom triad of constipation, severe abdominal pain, and a distended abdomen is common in patients with sigmoid volvulus. Sigmoid volvulus is responsible for 5% to 7% of all intestinal obstructions¹ and is the third leading cause of large bowel obstruction.⁵ In the United States, sigmoid volvulus is classically described as an illness in elderly persons, persons with psychiatric disorders, or persons residing in nursing homes or mental institutions.⁶ However, some reports suggest that sigmoid volvulus occurs in younger age-groups more frequently than has been reported.⁷⁻¹⁰ This report reviews the case of a 46-year-old previously healthy man with sigmoid volvulus.

CASE PRESENTATION

A 46-year-old African-American man with a history of untreated hypertension presented to the emergency department for evaluation of constipation that had been present for 6 days and severe left lower quadrant abdominal pain that had been present for 6 hours. He was normotensive, nontachycardic, and in moderate acute distress. He had no surgical history or significant medical history. Physical examination revealed a distended abdomen with tympanic percussion tones in the upper quadrants. Rectal examination revealed normal mucosa and guaiac-negative stools. The patient developed nausea 4 hours prior to examination and began to vomit in the emergency department.

Intravenous lines were placed and resuscitation was started with normal saline. Results of a complete blood count, serum electrolyte panel, assessment of amylase and lipase values, liver function studies, and coagulation profile were within normal limits. A nasogastric tube and Foley catheter were placed. Surgical consultation was requested. Abdominal radiography demonstrated a dilated sigmoid colon projecting into the upper quadrants of the abdomen (**Figure**).

After the surgical team examined the patient and reviewed the abdominal radiographs, sigmoidoscopy and rectal tube placement were scheduled for reduction of a sigmoid volvulus. The patient also consented

to laparotomy in the event that nonviable mucosa was encountered on sigmoidoscopy. Sigmoidoscopy demonstrated pink viable mucosa with a contracted segment of colon suggestive of torsion. A rectal tube was left in place for 48 hours, and the patient underwent sigmoid resection 2 days after reduction of the volvulus. The patient's course following surgery was uneventful, and he was discharged 3 days after surgery.

DISCUSSION

Epidemiology

The worldwide incidence of sigmoid volvulus is unknown. In the United States patients with sigmoid volvulus are typically older than age 50 years. These patients are often elderly, have neurologic or psychiatric conditions, or are residents of nursing homes or mental health care facilities. Chronic constipation is a common symptom of sigmoid volvulus in these patients. However, there are reports of younger individuals presenting with a medical history of intermittent abdominal pain as a sign of sigmoid volvulus.⁷⁻¹⁰ Internationally, the pediatric age-group is the second most affected population in areas of roundworm infestation, such as Africa, Southeast Asia, and the South Pacific. In a review by Ballantyne,¹¹ sigmoid volvulus was more common in men (64%) and in African Americans (67%). Women are thought to have a lower incidence because of a wider pelvis. Sigmoid volvulus causes 5% to 7% of all intestinal bowel obstructions, with a mortality rate as high as 20% to 25% depending on the time interval from symptom onset to treatment.⁵

Etiology

In the United States, a long, redundant sigmoid colon—commonly seen in patients with illnesses such as Parkinson's disease, multiple sclerosis, spinal cord injuries, and psychiatric disorders—is the major cause of sigmoid volvulus. Inhibition of colonic motility by

Dr. Williams is chief administrative surgery resident, and Dr. Steffes is an associate professor of surgery; both are at the Department of Surgery, Wayne State University/Detroit Medical Center, Detroit, MI.



Figure. Upright abdominal radiograph demonstrating a distended colon with an “omega loop” projecting into the right upper quadrant. The right colon is distended with signs of fecal stasis.

psychotropic medications as well as the possible inherent colonic dysmotility properties of the primary disease lead to sigmoid elongation. This redundant, enlarged bowel causes the approximation of 2 limbs of sigmoid colon and predisposes the limbs to twist around the mesenteric axis. Similarly, the patient with congenitally narrow sigmoid mesentery is predisposed to sigmoid volvulus due to increased mobility of the colon. Hirschsprung’s disease affects the myenteric plexus of the colon and also predisposes the patient to sigmoid volvulus.

Chronic constipation, most often resulting from the low physical activity levels seen in residents of nursing care facilities, is also a cause of sigmoid volvulus secondary to sigmoid enlargement. Another important etiologic factor is the repetitive use of laxatives, cathartic agents, and enemas. The etiology of sigmoid volvulus in younger patients has been thought to be a congenital megasigmoid with additional stimuli, such as purgation, diet, fecal loading, active peristalsis, or pregnancy.⁷

Outside the United States, sigmoid volvulus may be caused by diet or infectious etiologies. Patients in non-industrialized countries often have high-residue diets that may result in overloading and enlargement of the sigmoid colon, prompting rotation around the root of the mesentery. The myenteric plexus of the bowel is

affected by Chagas’ disease, resulting in megacolon and predisposing the patient to sigmoid volvulus. Roundworm infestation is prevalent in more than 1 million persons worldwide and causes sigmoid enlargement secondary to constipation.

Clinical Presentation

Because patients with sigmoid volvulus often present with debilitated physical status resulting from neurologic or psychiatric illness, it may not be possible to obtain a coherent and complete medical history from the patient. A patient history should be obtained from family or caregivers. A history of recent weight loss may signal a coexisting condition. Patients with dehydration from vomiting and/or third-spacing of fluid caused by bowel obstruction may present with hypovolemic shock. Prompt resuscitation with crystalloid should begin immediately. Because of underlying illness, resuscitation may not improve the patient’s mental status. The abdomen should be examined for surgical scars. A gastrostomy tube that is vented without significant improvement of the abdominal distention may signal a distal or complete obstruction. Leukocytosis and guaiac-positive stools may be an indicator of bowel ischemia. A distended and painful abdomen with guaiac-positive stools may indicate a need for laparotomy after resuscitation.

Diagnosis

The diagnosis of sigmoid volvulus is made by physical examination and radiographic studies. Abdominal radiographs demonstrate a markedly distended sigmoid colon with a convex superior margin projecting into the right upper quadrant of the abdomen. This section of sigmoid colon is often devoid of haustral markings (Figure). A “coffee bean” or “omega loop” sign has been described on abdominal radiograph. These terms refer to the 2 large compartments of distended sigmoid colon with central double walls of colon and a single outer wall, which assume the shape of a coffee bean or omega loop. Computed tomography scan has been used to rule out other etiologies of obstruction and colonic ischemia in patients with sigmoid volvulus.

Contrast enema can be used as a diagnostic study as well as a therapeutic radiographic study that can reduce the sigmoid volvulus and provide immediate relief of the patient’s symptoms. On radiography, a “bird’s beak” sign can be demonstrated at the torsion point of the sigmoid. A limited enema using water-soluble contrast material can be performed in patients for whom perforation is suspected. Contrast enema

successfully reduces 5% of cases of sigmoid volvulus.¹² Although the patient experiences dramatic relief of symptoms, contrast enema is not definitive treatment. Recurrence rates of sigmoid volvulus after contrast enema are 80% to 90%, and sigmoid resection is recommended as definitive treatment. Although air enemas have been described in the reduction of intestinal intussusception, no data are available to support their use in sigmoid volvulus.

Sigmoidoscopy with insertion of a rectal tube beyond the obstruction point is a safe and fast method for diagnosis that allows thorough assessment of the bowel mucosa and that has therapeutic value as well. Sigmoidoscopy for reduction of sigmoid volvulus was first described by Bruusgaard.¹³ It can be performed in the operating room by the surgeon. Like contrast enema, sigmoidoscopy with rectal tube placement is an acute management strategy.

Treatment

The 3 goals of the therapy for the patient with sigmoid volvulus are (1) resuscitation of the patient, (2) acute reduction of the volvulus and relief of the colonic obstruction, and (3) prevention of recurrence of the volvulus. It is essential that patients be fluid resuscitated on presentation to the hospital. Electrolyte abnormalities and fluid deficits may be present. The patient's ability to survive invasive procedures, including surgery, may depend on appropriate resuscitation. Fluid resuscitation may be accomplished with lactated Ringer's solution or normal saline. Premorbid heart conditions may require invasive monitoring of filling pressures. A Foley catheter, at the very least, should be placed to monitor urine output.

Acute reduction of the volvulus by either detorsion or resection is the second goal of therapy. The management approach is contingent on the hemodynamic stability of the patient and the presence or absence of necrotic bowel. Patients with viable mucosa may undergo delayed resection after sigmoidoscopy or contrast studies with rectal tube placement beyond the torsion point. It is important that this rectal tube be secured in place. Patients who have necrotic colon mucosa should undergo detorsion and immediate resection.

Prevention of recurrence of the volvulus involves surgical resection. Patients who are hemodynamically stable with viable bowel are candidates for laparoscopic resection. After bowel preparation, resection of the sigmoid without diversion is the procedure of choice. For patients with compromised bowel or hemodynamic instability, we recommend laparotomy.

Arnold and Nance¹⁴ reported a 15% mortality rate

for patients who undergo resection after the first episode of sigmoid volvulus and a 9% mortality rate for those who undergo resection after recurrence of sigmoid volvulus; the data demonstrated higher mortality rates for patients older than age 70 years. If these older patients are hemodynamically stable with viable bowel, some surgeons advocate acute management by detorsion without surgery for a first episode of sigmoid volvulus. Patients younger than age 70 years who are hemodynamically stable with viable bowel should undergo detorsion with resection. These data are rather old, however, and we propose that the patient's overall physiologic and functional status should be evaluated before recommending surgery. We also expect that, with appropriate perioperative care, some octogenarian patients with sigmoid volvulus will have a good outcome after resection. Clinicians should recognize that some patients and their families will refuse operative management because of the overall prognosis and will instead opt for palliative decompression or analgesia.

Grossmann et al⁵ reported on 228 patients with sigmoid volvulus. The average age of this cohort was 70 years, and higher mortality was associated with emergency surgery and the presence of necrotic bowel. The mortality rate in this series was 6% for elective operations versus 24% for emergency surgeries. Kuzu et al¹⁵ reviewed 106 patients with sigmoid volvulus and showed a 6.6% overall mortality that increased to 11% when necrotic bowel was present. Bhatnagar et al¹⁶ demonstrated that when necrotic bowel is present, it often extends beyond the area of constriction into the rectum and descending colon. This finding predisposes to failure of the anastomoses constructed during primary repair operations.

Percutaneous endoscopic sigmoidopexy has been described as a treatment for sigmoid volvulus but is not the standard of care.¹⁷ Mesosigmoidoplasty has been advocated as a successful operative option for nongangrenous sigmoid volvulus but is not first-line therapy.¹⁸ Martinez et al¹⁹ demonstrated that endoscopic reduction of sigmoid volvulus can be performed with high efficacy, but recurrence rates are high. Although all of these authors have reported small series of creative management strategies for sigmoid volvulus, the definitive therapy remains sigmoid resection.

CONCLUSION

Sigmoid volvulus is a surgical emergency that commonly occurs in patients older than age 50 years but can occur in younger age-groups. An accurate patient history and physical examination followed by prompt resuscitation is essential. Detorsion of the bowel and

assessment of the bowel mucosa must be performed. A rectal tube is placed to maintain the reduction in the preoperative evaluation and stabilization period. A sigmoid colectomy is then performed. Findings of ischemic colonic mucosa mandate immediate operative intervention. **HP**

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