A 68-year-old man presented to the emergency department with abdominal pain. His pain had been present for one day. His last bowel movement was three days ago and he had passed no flatus in 24 hours. He had a history of chronic constipation, diabetes mellitus, hypertension, and bipolar disorder. He had undergone an appendectomy and cholecystectomy several years ago. On physical exam, the patient had a temperature of 100.2°F. His abdomen was distended, tympanitic, and tender to palpation in all quadrants. Rectal exam was negative for stool, blood, or palpable mass. WBC count was 11,000 per cubic millimeter and lactate level was normal. Abdominal x-ray demonstrated a distended and ahastral sigmoid colon with a maximal diameter of 14 cm suggestive of a sigmoid volvulus (Figure 1). Urgent flexible sigmoidoscopy was performed in the emergency department. A spiral area of colonic mucosa was visualized 20 cm from the anal verge. The scope was advanced with gentle pressure and a sudden expulsion of gas and straightening of the colon was achieved consistent with volvulus detorsion. The sigmoid mucosa appeared viable with no evidence of necrosis. A rectal tube was placed, and a sigmoidectomy was performed on the fifth hospital day. The patient had an uneventful hospital course and was discharged on the tenth hospital day.

**COLONIC VOLVULUS—INTRODUCTION AND EPIDEMIOLOGY**

Colonic volvulus (Latin, volvere, to roll or turn) is the axial twisting of the colon on its vascular pedicle. The result is partial or complete obstruction of the bowel lumen with a variable degree of perfusion impairment. The sigmoid colon and cecum are the most frequent sites of colonic volvulus, accounting for about 75% and 22% of all cases (1). Rare sites of colonic volvulus include the transverse colon (2%) and the splenic flexure (<1%). A rare variant of sigmoid volvulus is an ileosigmoid knot, which occurs when the ileum encircles the sigmoid colon leading to a sigmoid torsion and potential strangulation (2). Although the term cecal volvulus is ingrained in the literature, true volvulus of the cecum rarely occurs. The condition is more accurately referred to as cecocolic volvulus consisting of an axial rotation of the terminal ileum, cecum, and ascending colon with concomitant twisting of the associated mesentery. A less common but
related process is the cephalad folding of the cecum anteriorly over a fixed ascending colon leading to the so-called cecal bascule (Figure 2).

In the United States and other Western countries, colonic volvulus causes 1%–4% of all cases of intestinal obstruction, and 10%–15% of cases of colonic obstruction (3). In Eastern Europe and parts of Africa and Asia, volvulus is responsible for 20% to 50% of all cases of intestinal obstruction (4). Why colonic volvulus is more commonly seen in certain regions of the world is not well understood.

**RISK FACTORS**

Anatomic features predisposing to sigmoid volvulus include a redundant sigmoid colon with a narrow mesenteric attachment (Figure 3). Sigmoid volvulus is most often seen in the 6th to 8th decades of life, classically in debilitated and institutionalized patients who suffer from chronic constipation (3). Cecal volvulus patients tend to be younger than those with sigmoid volvulus and often have a history of prior abdominal surgery. A history of chronic constipation and laxative use is also a frequent finding (5). Cecal volvulus is somewhat more common in women, whereas sigmoid volvulus occurs with equal frequency in both sexes. Pregnant women account for 12% of all cases of cecal volvulus, and it is the most common cause of bowel obstruction in pregnancy (6). Nearly one third of patients with cecal volvulus have a concomitant partially obstructing lesion located more distally in the colon. Volvulus of the transverse colon is extremely rare and tends to be associated with other abnormalities such as congenital bands, distal obstructing lesions, and pregnancy.
CLINICAL MANIFESTATIONS
The majority of patients with colonic volvulus present with abdominal pain, nausea, vomiting, obstipation, and a diffusely distended abdomen. The pain is usually constant with a superimposed colicky component. Cecal bascule manifests clinically with intermittent bouts of abdominal pain due to isolated cecal obstruction with subsequent spontaneous relief as the cecum unfolds back into normal position. Manifestations of colonic volvulus may not be as apparent in elderly patients or in those with neurologic disease (7). Fever, peritonitis, sepsis, and/or leukocytosis should raise the suspicion of intestinal gangrene.

DIAGNOSIS
The diagnosis of colonic volvulus can be made with abdominal radiographs alone in as many as 85% of cases. Sigmoid volvulus classically appears as a markedly distended ahastral sigmoid loop (i.e., “bent inner-tube” appearance), the apex of which is often directed toward the patient’s right shoulder (8) (Figure 1). In equivocal cases of sigmoid volvulus, a water soluble contrast enema may be helpful by demonstrating a point of torsion (i.e., a spiral pattern or “birds beak sign”) (Figure 4).

Classic radiologic features of cecal volvulus include a massively dilated cecum located in the epigastrium or left upper quadrant (Figure 5), a coffee-bean appearance of the distended cecum (“coffee-bean sign”) (Figure 6), and a single long air-fluid level on upright films (1) (Figure 7). A CT scan may demonstrate a whirl pattern, secondary to dilation of the colon around its mesentery (9).

MANAGEMENT
The initial management of patients with colonic volvulus includes restoration of intravascular volume, correction of electrolyte abnormalities, nasogastric suction, analgesia, and consideration of broad spectrum intravenous antibiotics. Urgent endoscopic decompression should be performed for sigmoid volvulus without evidence of (continued on page 46)
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intestinal gangrene. Two large series reported successful proctoscopic decompression of sigmoid volvulus in 83% and 93% of patients (10,11). In addition to restoring colonic perfusion, sigmoidoscopy also provides an assessment of colonic mucosal viability. Complete colonoscopy should be avoided in the emergent setting secondary to the risk of perforation of the distended and unprepped bowel (12). If endoscopic detorsion of the volvulus cannot be accomplished, urgent laparotomy with sigmoid resection is required. Endoscopic reduction of a sigmoid volvulus is associated with a recurrence rate of 25% to 50%, which can occur hours to weeks after detorsion (13). Placement of a soft rectal tube after detorsion can reduce the potential for early recurrence (14). Subsequent recurrence is prevented via elective sigmoid resection with either primary colorectal anastomosis, or in medically compromised patients, end colostomy. Recurrence with this approach is around 3% to 6% (14). Case reports of percutaneous endoscopic sigmoidopexy to prevent recurrence in poor surgical candidates have shown positive results (15). Colonoscopy prior to elective sigmoid resection is important to exclude an associated neoplasm.

Colonoscopy has been utilized in case reports to successfully reduce a cecal volvulus; however, there is substantial risk of perforating the thin and often ischemic cecum (12). Hence, the mainstay of cecal volvulus treatment is operative. Management options include cecopexy, cecostomy, and colonic resection. Right colectomy with primary ileo-transverse anastomosis effectively prevents recurrence and is the procedure of choice for most surgeons (1).

The overall mortality rate for patients with colonic volvulus is about 8% to 14% (1). The major predictor of death is the presence of gangrenous bowel (3). After diagnosing a colonic volvulus, the primary goals of treatment are to urgently prevent the development of bowel ischemia, and to prevent volvulus recurrence by ultimately correcting the underlying anatomic abnormality. ■

References


Figure 7. Single long air-fluid level in a cecal volvulus (Sleisenger and Fordtran’s Gastrointestinal and Liver Disease: Pathophysiology, Diagnosis, Management. Feldman M, Friedman LS, Brandt LJ Editors. Publisher: Saunders; 8th edition, July 21, 2006. Figure 116-16, page 2669