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Often a plain film diagnosis

Learning Objectives

1. The learner should be able to formulate a differential diagnosis for large bowel obstruction.
2. The learner should recognize the more reliable diagnostic modalities for cecal and sigmoid volvulus.
3. The learner should be familiar with the available treatment options for cecal and sigmoid volvulus.

Case Scenario

A 63-year-old female presents to a rural hospital with 12 h of severe abdominal distention, obstipation, nausea, vomiting, and progressive abdominal pain. She is tender but not peritoneal on examination. She is afebrile, tachycardic with a normal blood pressure. Abdominal films show both colonic and small bowel distention with multiple air fluid levels. Advanced imaging or endoscopy are not available, so

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the decision is made to proceed with surgical exploration. Operative findings at laparotomy showed a cecal volvulus. She undergoes right hemicolectomy with a primary anastomosis (ileotransverse colostomy).

Epidemiology/Etiology/Pathophysiology

Volvulus is the term used to describe a rotation of the bowel on its own mesenteric attachment (derived from the Latin *volvere*). The incidence of volvulus is greatest in the sigmoid colon, seen at a mean age of 70 years, followed by cecal volvulus which usually occurs at an earlier mean age of 50 years. Volvulus involving the transverse colon or splenic flexure is much less common and will not be discussed here.

Sigmoid volvulus conversely typically occurs as a result of a counterclockwise twist about 15–25 cm from the anal verge (at the rectosigmoid junction). When the sigmoid colon is disproportionately long compared to its mesentery, torsion can occur at 180° or possibly involve a 360° twist where there is a higher risk of strangulation. This occurs in over half of affected individuals. It usually affects the elderly or institutionalized patients and those with psychiatric or neurologic diseases.

Cecal volvulus has two variants, the more common, occurring in 90% of cases, involves a twisting of the cecum or right colon along with the terminal ileum in a (usually) clockwise direction around the axis of its mesentery. In cases of the less common cecal bascule, the cecum folds anteromedial to the ascending colon, causing a flap-valve occlusion at the site of flexion. In order for either of these to occur, there must be a mobile or insufficiently fixed cecum or ascending colon [1].

There is a slight female predominance, and it is most commonly seen in the 6th decade of life. Patients with cecal volvulus tend to be younger than those that present with the more common sigmoid volvulus. Prior abdominal surgery and pregnancy are also considered risk factors [2].

If the volvulus does not decompress, it could rapidly progress to a closed-loop obstruction and strangulation leading to worsening ischemia, necrosis, and ultimately perforation.

Differential Diagnosis

Cecal volvulus, cecal bascule, sigmoid volvulus, small bowel obstruction (adhesive disease, internal hernia, volvulus, and neoplasm), colonic obstruction (diverticular stricture and neoplasm), transverse colon volvulus, and gastric distention.

Diagnosis

An acute presentation characteristic of bowel obstruction—namely with significant generalized abdominal pain and distention sometimes accompanied by nausea, vomiting, and constipation is typical in cecal volvulus. Feculent emesis, again similar to more proximal small bowel obstruction, can be seen in cecal volvulus (yet almost never in sigmoid volvulus).

Chronic relapsing symptoms of distention, pain, and obstipation can also be seen (especially with cecal bascule) but are more common with sigmoid volvulus.

Patients characteristically are seen late in their course. The presence of peritoneal signs and fever indicate possible strangulation. Perforation of the sigmoid is unusual, because the sigmoid colon in older patients is usually thickened.

The diagnosis of sigmoid volvulus can often be made based on a plain abdominal radiograph (Fig. 3.1). The distended large bowel has the appearance of a bent inner tube. Barium enema was used previously for diagnosis and for possible reduction but has fallen out of favor and should be avoided if strangulation is suspected, as it is likely to cause perforation. If strangulation with gangrene is suspected, CT of the abdomen may be helpful, especially if a “whirl sign” is present, though not necessary.



Fig. 3.1 Plain abdominal film with the classic Omega sign of sigmoid volvulus. The sigmoid dilates and twists at the root of the mesentery. © Dale Dangleben, MD

Though radiologic signs may be absent, the diagnosis of cecal volvulus can also be made on plain abdominal films (findings may include a coffee bean sign, a dilated colon segment with air–fluid level in the left upper quadrant) (Fig. 3.2), on barium enema (bird’s beak sign, lack of visualization of the right colon or cecum), CT scan, and sometimes upon surgical exploration. When plain films and clinical examination are inconclusive, CT scan tends to be the most reliable imaging modality, with plain films and contrast studies correctly diagnosing cecal volvulus less than 30–40% of the time (Fig. 3.3).



Fig. 3.2 Marked dilation of the cecum with closed-loop obstruction consistent with a volvulus.
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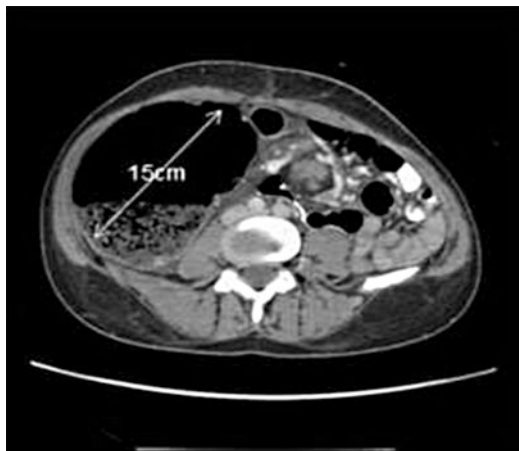


Fig. 3.3 CT scan with 15-cm cecum. © Dale Dangleben, MD

Complications

If the cycle of ischemia is allowed to progress to necrosis and perforation, the morbidity and mortality of this condition is very high, even if successful surgical management is undertaken. Mortality rates have improved however, due to advances in perioperative care and anesthesia.

Management

Sigmoid Volvulus

Nonoperative reduction with decompression is the initial treatment of choice in patients with sigmoid volvulus and no signs of bowel ischemia. At the bedside, using a rigid sigmoidoscope, the patient is placed in the left Sims position, and the scope is passed to the twist. Minor insufflation is used to enable passage of a long, 50 cm, 32–36 French flexible lubricated tube to the dilated proximal colon for decompression. If the point of torsion is more proximal, a flexible sigmoidoscope may need to be used and maneuvered into the proximal colon after which the rectal tube is passed. The tube usually remains in place for 48–72 h, and elective resection is planned during the same admission.

If there is evidence of strangulation or when nonoperative reduction is unsuccessful, then emergency surgery is required. If gangrenous bowel is identified intraoperatively, the involved area must be resected without untwisting the volvulus to avoid releasing inflammatory mediators. If the bowel is viable, resection is still considered the preferred procedure of choice given the lower recurrence rate compared to nonresection procedures. Reconstruction following resection is more contentious; options include colostomy with mucus fistula, a standard Hartmann procedure (sigmoidectomy with end colostomy and a closed rectal stump) or primary anastomosis. Some surgeons elect to leave the bowel in discontinuity after the hemodynamic derangement, and hypothermia and acidosis are corrected after which anastomosis may be more favorable at a second-look operation. The acceptable decision of constructing a primary anastomosis in unprepared left colon should be selectively individualized; if the patient is frail or critically ill, a Hartmann procedure is a much more prudent operation. The surgeon should realize that a significant number of patients never undergo reversal, a procedure that can also often be a tedious and difficult operation.

Cecal Volvulus

Given the significant risk of bowel ischemia, operative management is usually necessary despite some reports of nonoperative decompression by colonoscopy or

barium enema. Recurrence of cecal volvulus can be seen in approximately 15–25% after treatment with simple detorsion, cecopexy, and cecostomy. On the other hand, surgical resection of the mobile segment of colon with a primary anastomosis virtually eliminates this risk and is the treatment of choice unless the patient is too fragile to undergo colectomy. Cecostomy (either a tube or “matured” to the skin) is also associated with higher rates of morbidity and mortality and is no longer favored as a treatment option when compared to detorsion with cecopexy or resection [3].

While cecopexy is advocated by some particularly in the setting of viable colon, detorsion and fixation is associated with a higher recurrence rate, making resection the treatment of choice (Fig. 3.4). As in sigmoid volvulus, the bowel should not be reduced prior to resection to avoid unleashing a cascade of inflammatory cytokines that could lead to irreversible shock. In the setting of necrotic or perforated bowel, right hemicolectomy is definitively the treatment of choice (Fig. 3.5). In cases of questionable bowel viability, a planned second-look operation may be of value. When end ileostomy creation is necessary, the distal, closed colon end can be brought through the same ostomy opening in the abdominal wall (“double-barrel”) to facilitate simple closure and restoration of bowel continuity using a local approach.

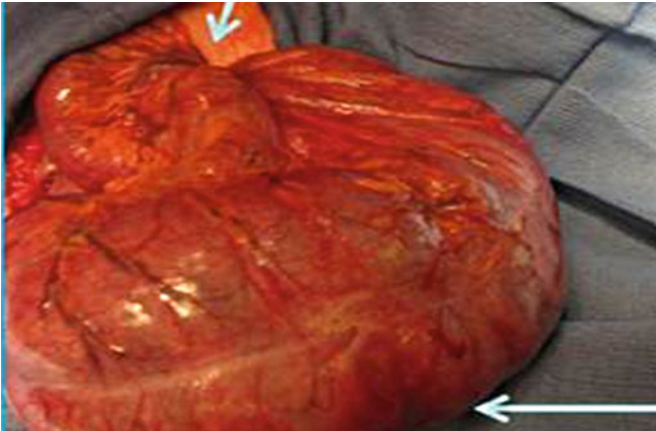


Fig. 3.4 Shows the cecum twisting at the mesentery. © Dale Dangleben, MD

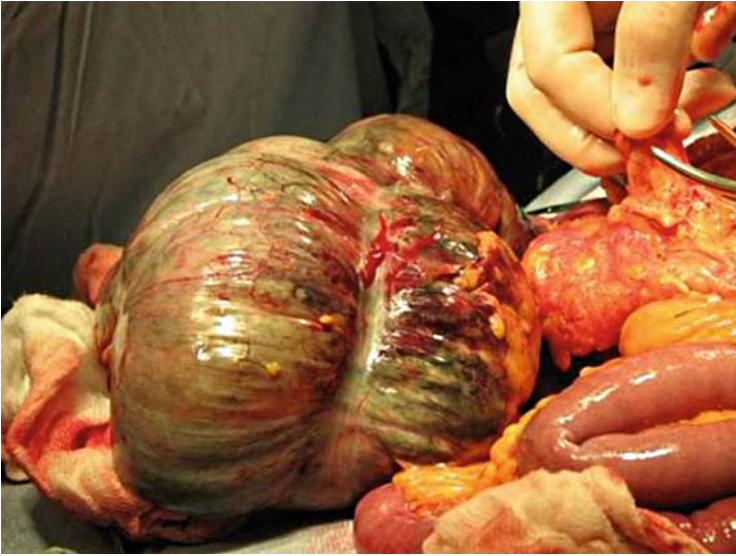


Fig. 3.5 Cecal volvulus with transmural necrosis. © Dale Dangleben, MD

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