Sigmoid and caecal volvolus: When should we refer patient to gastroenterologist and when do we operate?

By,

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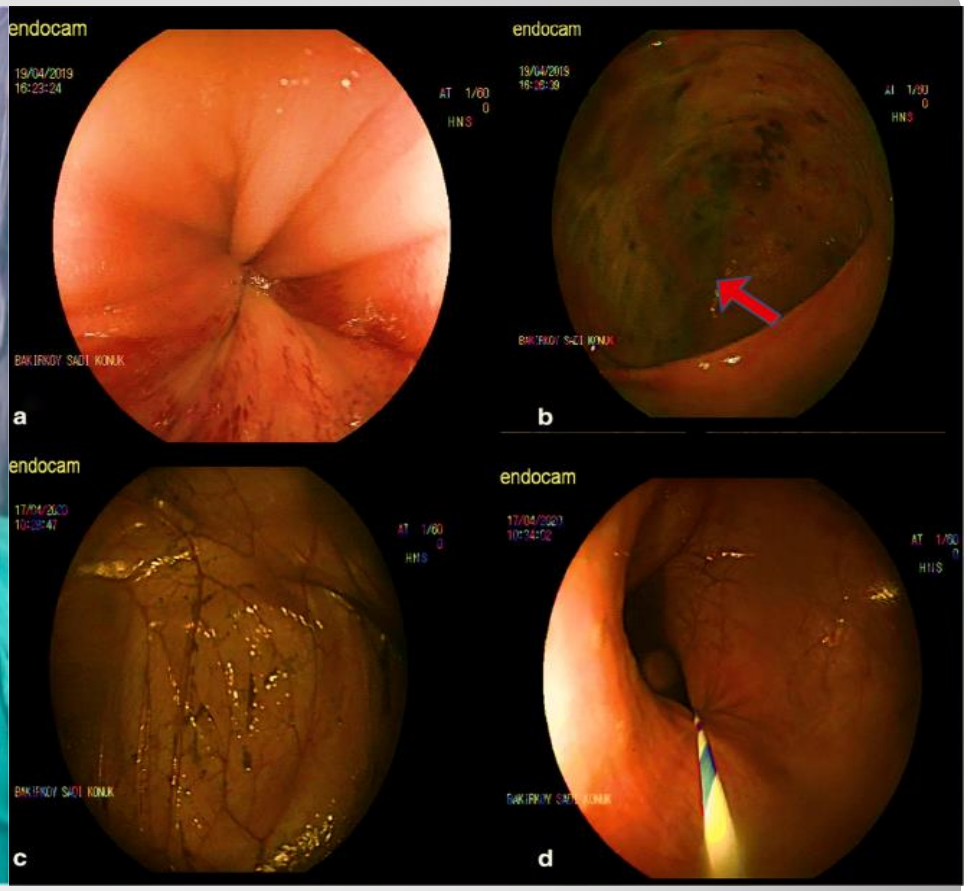
Introduction.

- Volvulus refers to torsion of a segment of the alimentary tract, which often leads to bowel obstruction.
- The most common sites of volvulus are the sigmoid colon and cecum .
- Volvulus of other portions of the alimentary tract, such as the stomach, gallbladder, small bowel, splenic flexure, and transverse colon, are rare.



Sigmoid volvolus

➢ Risk factors :

Although some risk factors have been associated with sigmoid volvulus, the precise pathophysiology underlying sigmoid torsion has not been well established.

❑ Anatomical factors :

- long redundant sigmoid colon with a narrow mesenteric attachment.

❑ Colonic dysmotility :

- Colonic dysmotility may predispose to torsion of the sigmoid colon.

➢ CLINICAL FEATURES :

❑ The majority of patients present with insidious onset of:

- slowly progressive abdominal pain
- abdominal distension.
- Absolute constipation.
- Vomiting usually occurs several days after the onset of pain.

❑ On physical examination:

- The abdomen is distended and tympanic with tenderness to palpation.
- Fever, tachycardia, hypotension, abdominal guarding, rigidity, and rebound tenderness are absent in the early stages of the disease, but if present, are indicative of perforation and/or peritonitis.

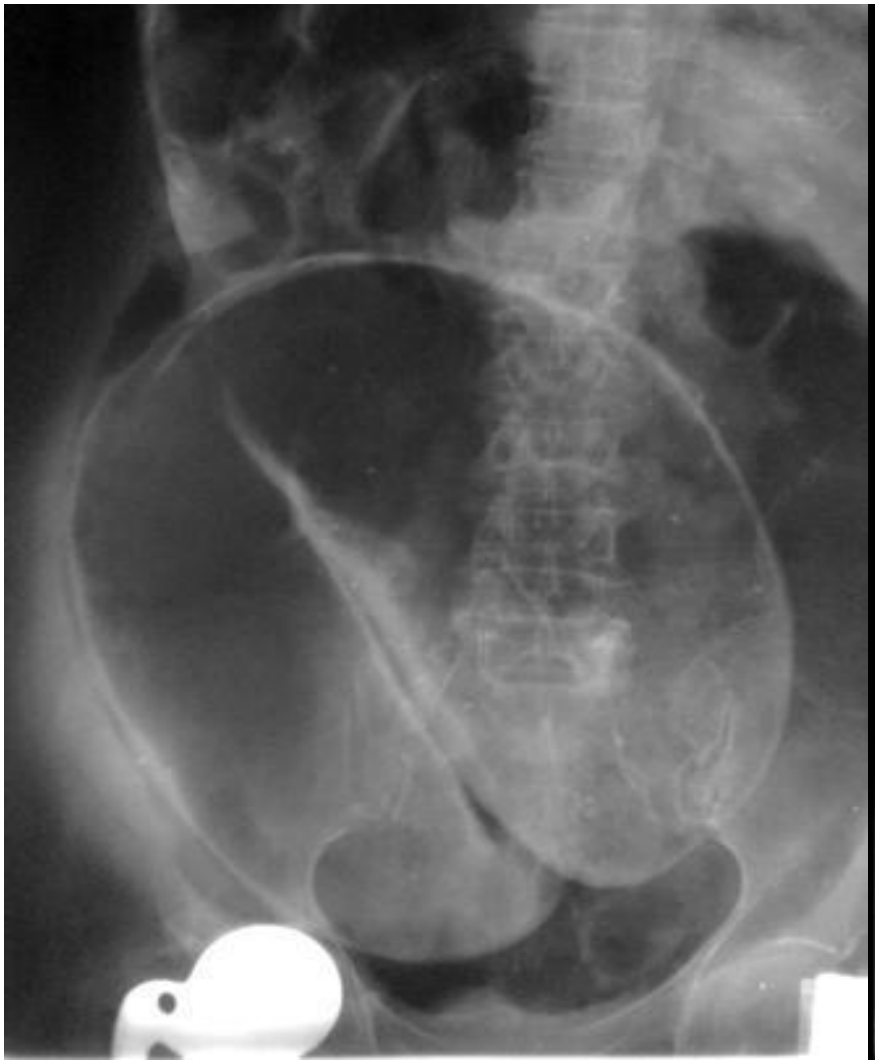
➢ DIAGNOSIS :

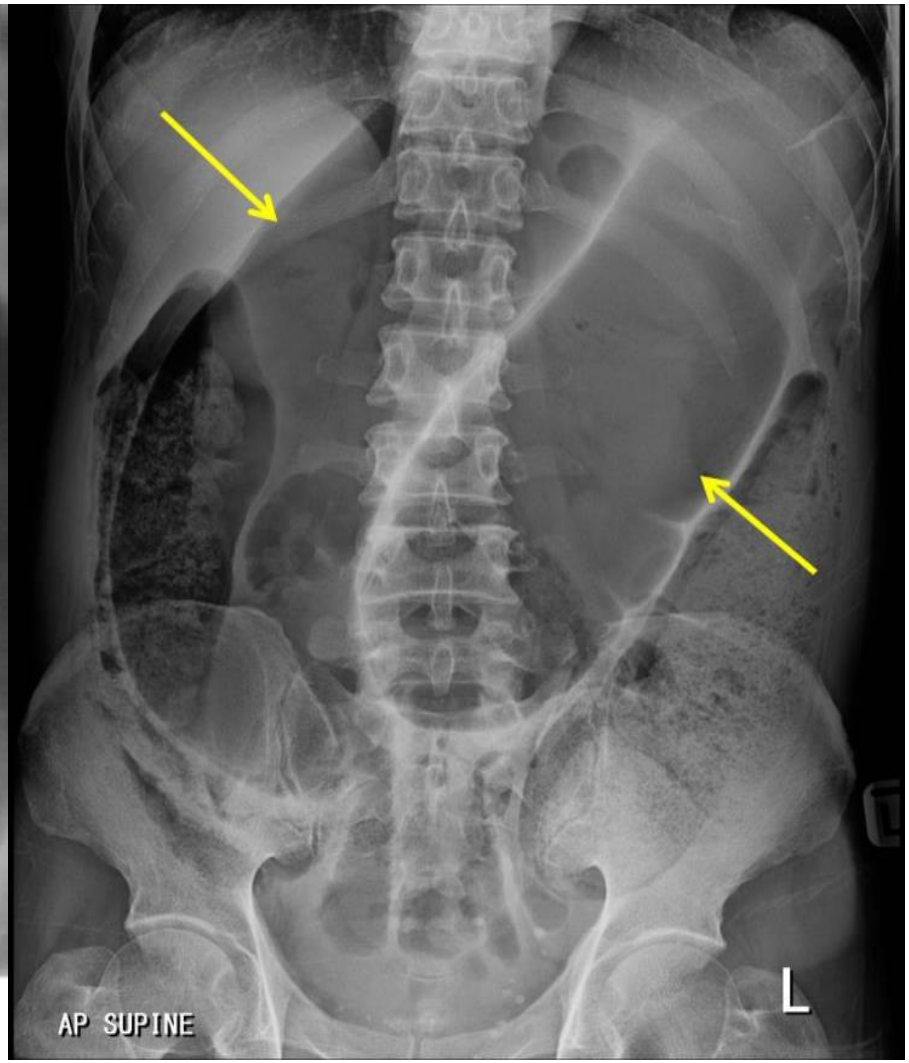
- The diagnosis is often suspected on clinical base and finally established by imaging.
- Patients with typical presentation should be sent first for abdominal x-ray.
- Abdominal Ct is recommended in patients with vague abdominal radiograph or atypical presentation.

(Alavi K.et al, Dis Colon Rectum. 2021)

The American Society of Colon and Rectal Surgeons Clinical Practice Guidelines for the Management of Colonic Volvulus and Acute Colonic Pseudo-Obstruction.

- Abdominal radiographs – Diagnostic findings on abdominal radiography include the presence of a U-shaped, distended sigmoid colon seen as an ahaustral collection of gas (sometimes referred to as a "bent inner tube"),(coffee bean sign) extending from the pelvis to the right upper quadrant as high as the diaphragm.

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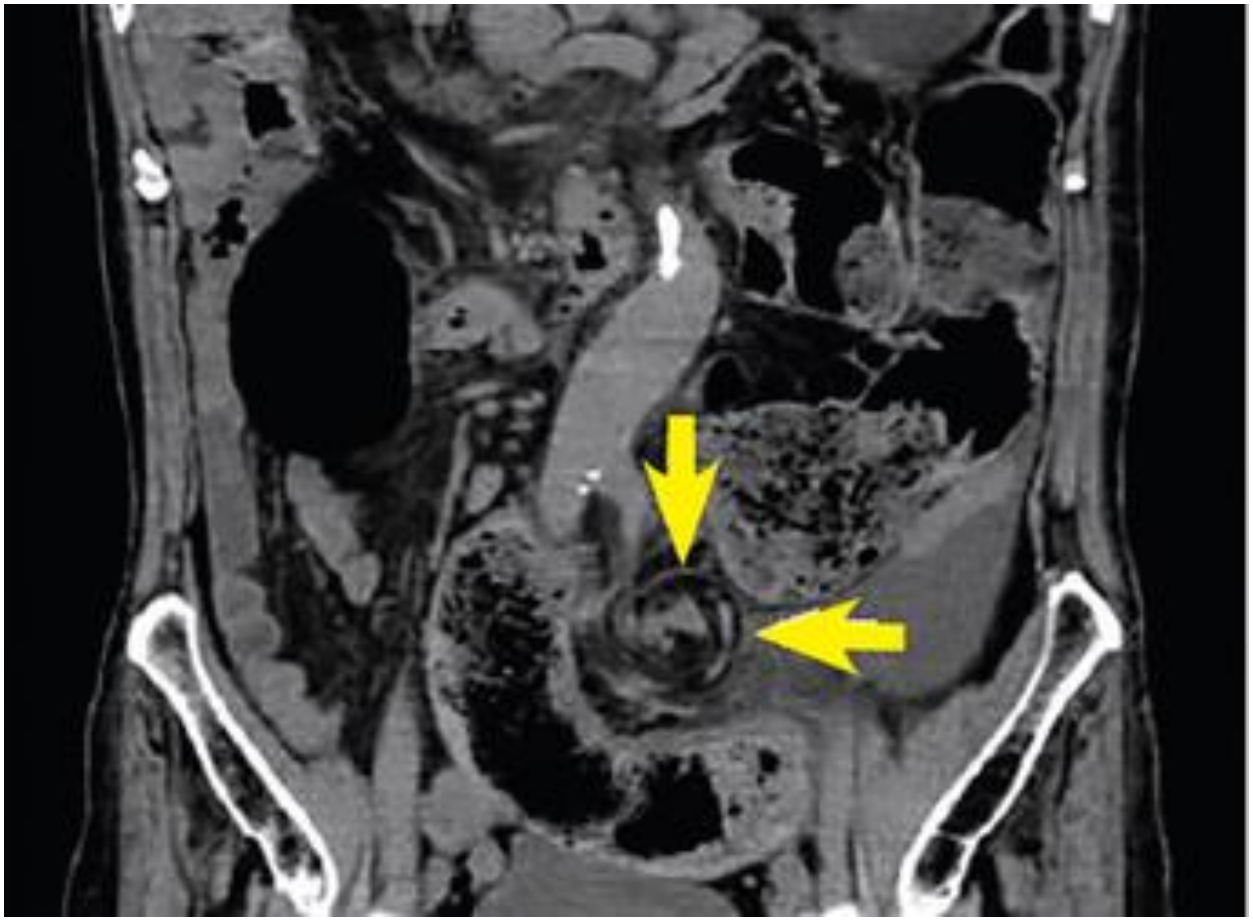
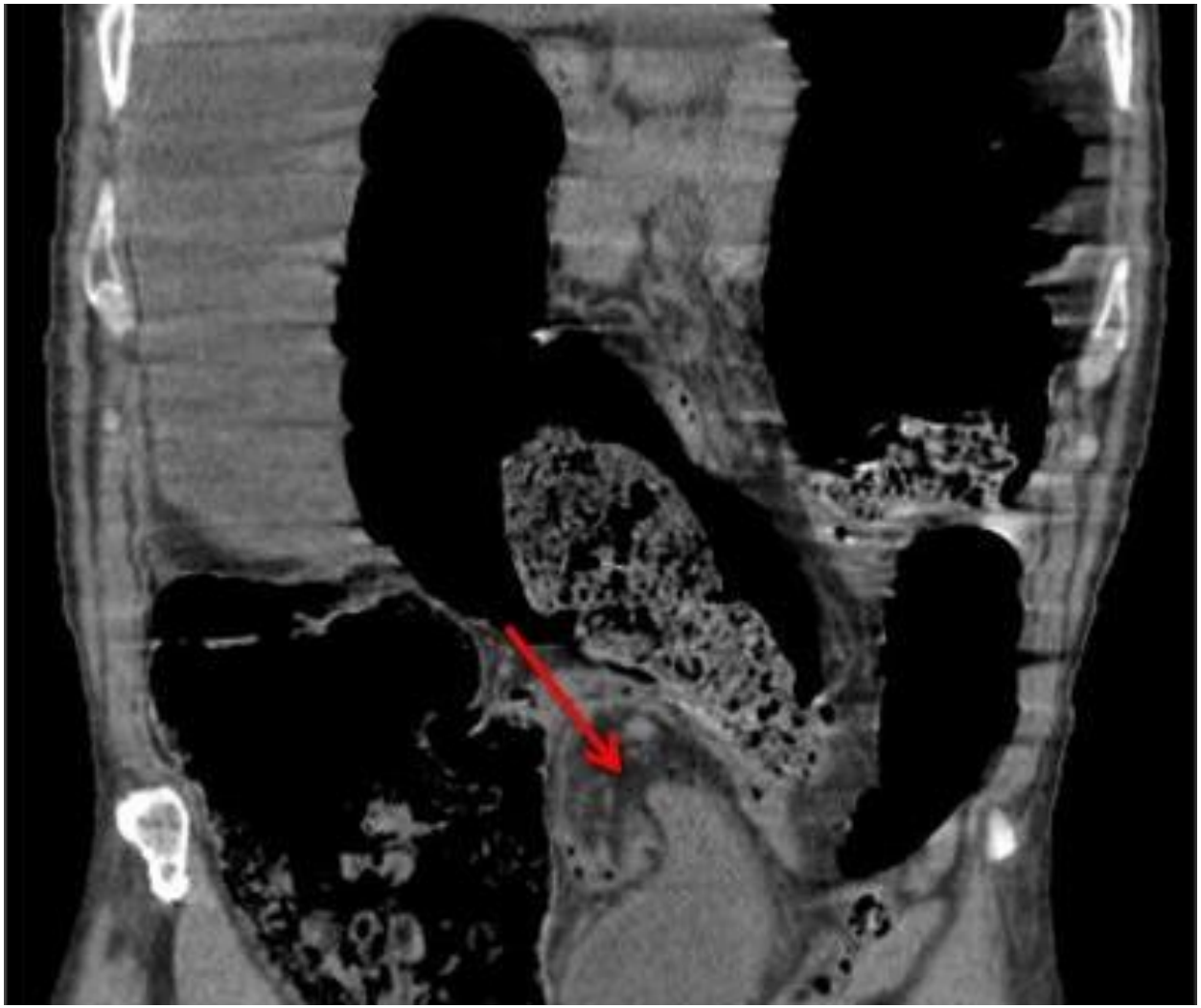
- Abdominal CT scan – Diagnostic findings of sigmoid volvulus include:

- whirl pattern caused by the dilated sigmoid colon around its mesocolon and vessels
- bird-beak appearance of the afferent and efferent colonic segments.
- The presence of pneumatosis intestinalis, portal venous gas, or loss of bowel wall enhancement on CT scan is suggestive of bowel necrosis.



CT has been shown to confirm diagnosis of sigmoid volvulus with near 100 percent sensitivity and >90 percent specificity.

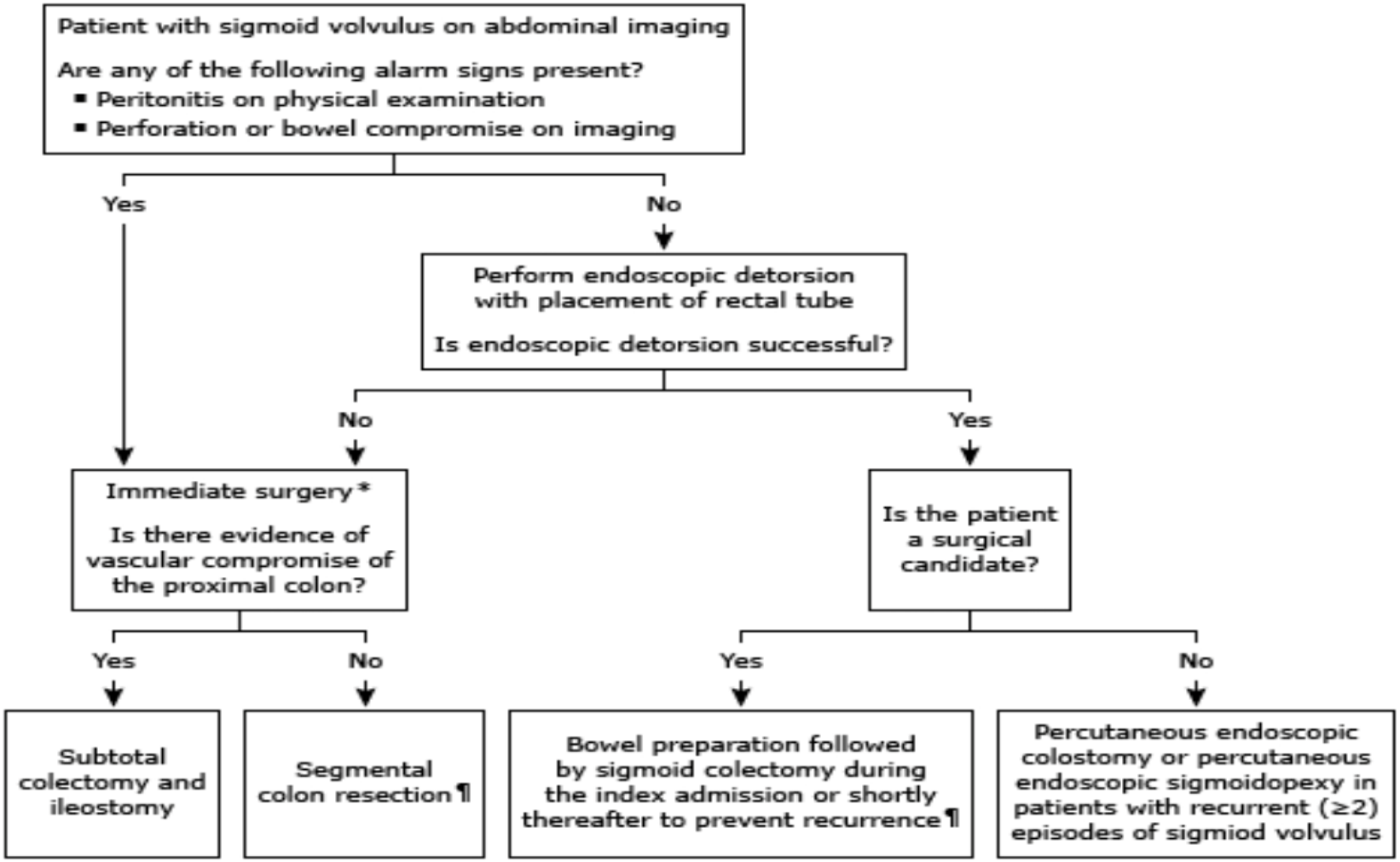
Computed tomography coronal view showed the whirl sign, representing twisted bowel and mesentery (arrows).



Sigmoid volvulus. Coronal non-contrast CT showing a bird beak sign just distal to the obstruction in a patient with sigmoid volvulus.

➢ MANAGEMENT

- Management of patients with sigmoid volvulus depends on the presence of alarm signs (perforation or peritonitis) (algorithm 1).
- Our recommendations are largely consistent with the guidelines by the American Society for Gastrointestinal Endoscopy on the role of endoscopy in the management of colonic volvulus (2020) and those by the American Society of Colon and Rectal Surgeons (2021) .



Approach of volvolus management

- *Patients with alarm signs —* Immediate surgical management is required in patients with perforation or peritonitis.

  - Patients with perforation or peritonitis generally should not have their volvulus detorsed to avoid reperfusion injury.
  - The extent of resection depends on the status of the colon proximal to the volvulus (e.g., if there is vascular compromise of the proximal colon, a subtotal colectomy rather than a segmental resection should be performed).

- Reconstruction options include no reconstruction (Hartmann's procedure), colorectal anastomosis with proximal diversion, and colorectal anastomosis without proximal diversion.
- The choice must be individualized based on the patient's clinical parameters.
- Hartmann's procedure is preferred in the presence of hemodynamic instability, coagulopathy, acidosis, or hypothermia.

❑ Patients without alarm signs — In patients who do not have perforation or peritonitis, should be sent for flexible sigmoidoscopy in an attempt to detorse the twisted segment, and if successful, *surgical resection during the index admission or shortly thereafter*.

- An additional advantage of sigmoidoscopy is that it allows for an assessment of the viability of the colon.
- Endoscopic reduction of the volvulus converts an emergency surgery into a semi urgent surgery, performed 24 to 72 hours after endoscopic reduction of the volvulus, such that bowel preparation (cleanout) can be accomplished and underlying fluid and electrolyte imbalances can be corrected.

Outcomes —

- Endoscopic decompression has an associated mortality of 6.4 percent.
- Endoscopic reduction of a sigmoid volvulus has been reported to be successful in 75to 95 percent of cases.

(Atamanalp SS. Tech Coloproctol 2013)

Treatment of sigmoid volvulus: a single-center experience of 952 patients over 46.5 years.

- A wide range of recurrence rates have been reported ranging from 20 to 84 percent after initial successful endoscopic decompression .
- In a study of 73 patients, detorsion was unsuccessful in 21 and was associated with previous abdominal surgery and a cecum diameter over 10 cm.

(***Johansson N, et al. Colorectal Dis 2018)***

Risk of recurrence of sigmoid volvulus: a single-centre cohort study.

Failure of endoscopic detorsion —

Patients with unsuccessful endoscopic detorsion should be referred for urgent surgical management.

Definitive management after endoscopic detorsion —

Surgical resection should be performed during the index admission or shortly thereafter due to the high risk of recurrence and high mortality rates in patients with recurrent sigmoid volvulus

(Althans AR, et al.. Colorectal Dis 2019).

Surgical resection –

- ✓ Surgical management of a sigmoid volvulus after endoscopic detorsion usually entails sigmoid colectomy with primary colorectal anastomosis; stoma creation in this nonemergency setting is not usually required but may be considered on a case-by-case basis depending on the operative findings and unique circumstances of the patients .

- ✓ Mortality after planned surgery following successful decompression is lower as compared with emergency surgery (3.3 percent versus 13 percent).

(Halabi WJ et al. Ann Surg 2014)

Colonic volvulus in the United States: trends, outcomes, and predictors of mortality.

Non-resectional surgery –

including operative detorsion alone, detorsion with intraperitoneal or extra peritoneal fixation (sigmoidopexy), and tailoring of the sigmoid mesentery to broaden its base and prevent torsion (mesosigmoidopexy) are generally inferior to sigmoid resection in preventing recurrent volvulus. Thus, these procedures cannot be recommended.

(Alavi K.et al, Dis Colon Rectum. 2021)

Limited role for other non-operative methods —

- The use of advanced endoscopic techniques such as percutaneous endoscopic colostomy and percutaneous endoscopic sigmoidopexy are reserved for selected patients who are non-surgical candidates that have had repeated (two or more) bouts of volvulus . However, both techniques are associated with a high incidence of complications .

(Imakita T et al, Gastrointest Endosc 2019)

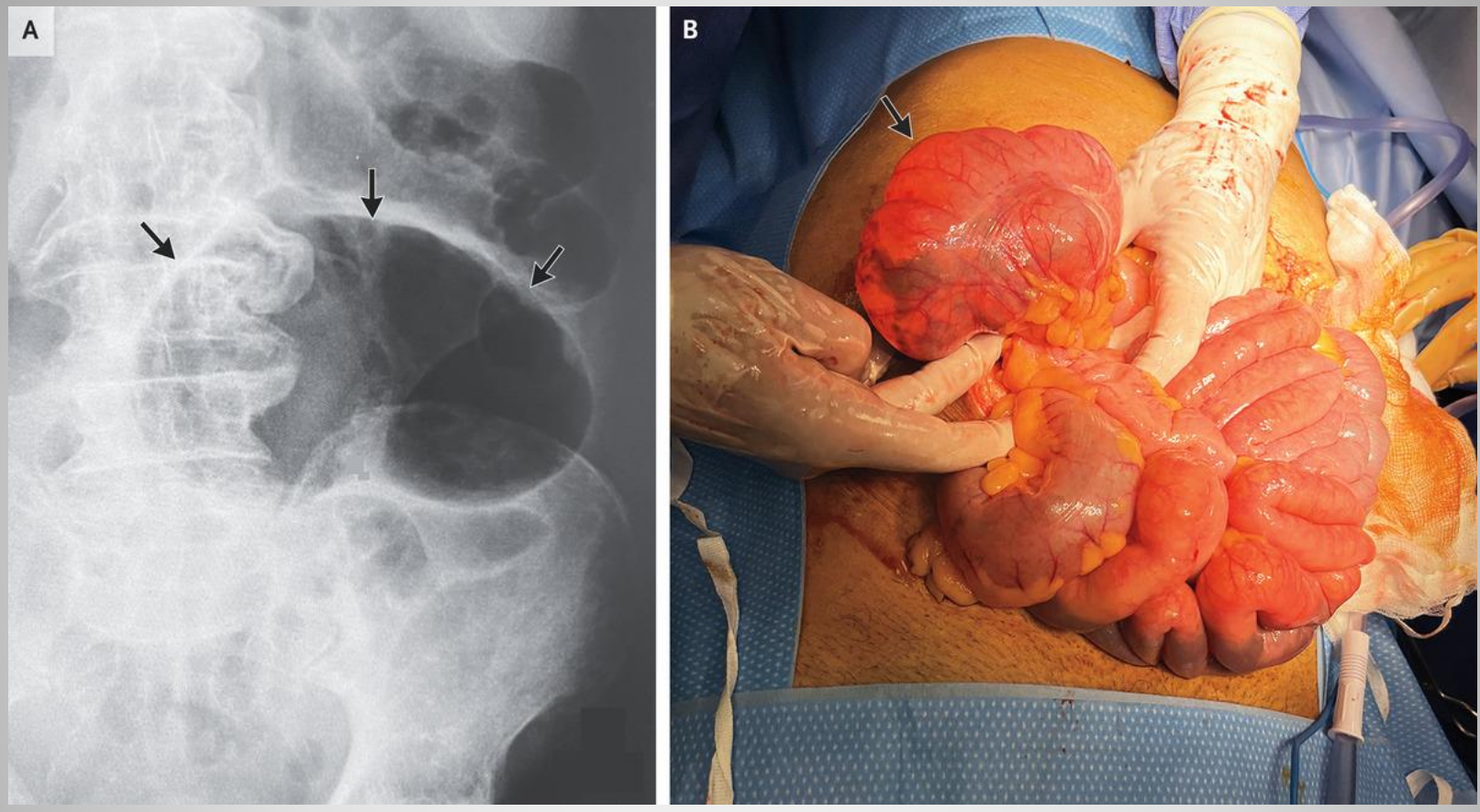
Colonoscopy-assisted percutaneous sigmoidopexy: a novel, simple, safe, and efficient treatment for inoperable sigmoid volvulus

➢ PROGNOSIS —

- The mortality related to sigmoid volvulus is highest in patients who have developed gangrene and ranges from 11 to 60 percent in case series
- In contrast, the mortality is less than 10 percent in patients who have not developed gangrene .

- Recurrent sigmoid volvulus, after an initial episode that is not treated with surgery, occurs in up to 84 percent of patients.
- Recurrence rates increase with subsequent episodes .
- Mortality rates appear to be higher in patients presenting with recurrent sigmoid volvulus with rates up to 21 percent reported in one study .

(***Johansson N, et al. Colorectal Dis 2018***).

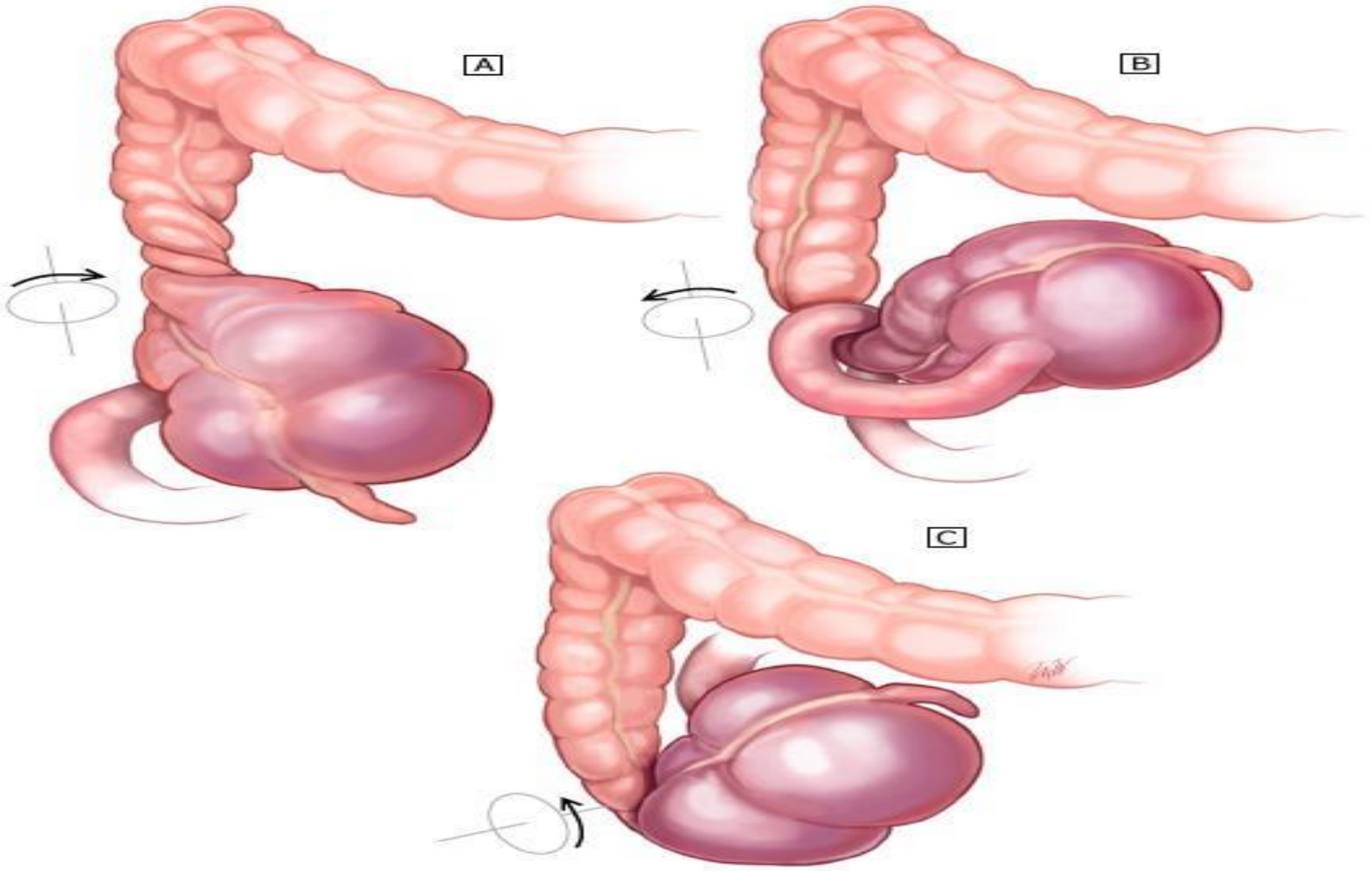


Cecal Volvolus

➢ PATHOPHYSIOLOGY

There are three types of cecal volvulus:

- Type 1 – An axial cecal volvulus develops from clockwise axial torsion or twisting of the cecum along its long axis; the volvulized cecum remains in the right lower quadrant.
- Type II – A loop cecal volvulus develops from a torsion or twisting of the cecum and a portion of the terminal ileum, resulting in the cecum being relocated to an ectopic location (typically left upper quadrant) in an inverted orientation. Most, but not all, type II cecal volvuli have a counterclockwise twist .
- Type III – Cecal bascule involves the upward folding of the cecum rather than an axial twisting.



A) Type I: Axial cecal volvulus.
B) Type II: Loop cecal volvulus.
C) Type III: Cecal bascule
Black arrow denotes direction of rotation

- Torsion-type cecal volvuli (type I and II) are more common, accounting for approximately 80 percent of all cecal volvuli . Cecal bascules (type III) account for the remaining 20 percent.
- All three types of cecal volvuli require a mobile cecum and ascending colon, which could be congenital or acquired.

➢ Clinical presentation

- The clinical presentation is highly variable, ranging from insidious, intermittent episodes of abdominal pain to an acute abdominal catastrophe .
- The findings on physical examination are also variable. Patients who have bowel ischemia or perforation could have fever or hypotension, while others may have normal vital signs.

➢ DIAGNOSIS —

- Cecal volvulus should be suspected in patients who present with obstructive symptoms such as abdominal pain, nausea, and vomiting and a physical examination that reveals a distended and tympanitic abdomen.

- Abdominopelvic computed tomography (CT) is diagnostic of cecal volvulus in 90 percent of patients.

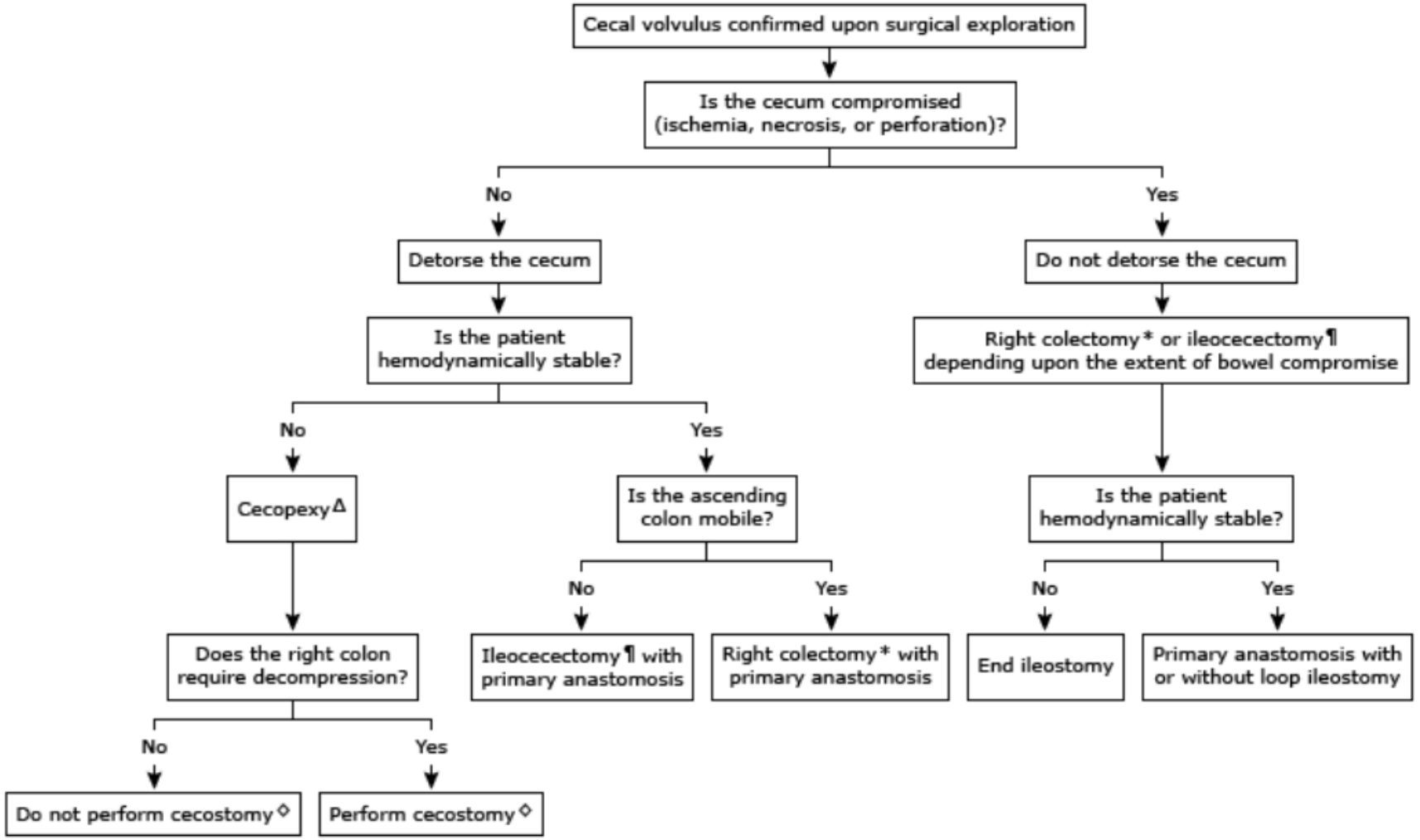
- The remaining 10 percent of cecal volvuli are diagnosed at the time of surgical exploration.

(Lee SY, Bhaduri M. Cecal volvulus. CMAJ 2013).

➢ MANAGEMENT

- The management for patients with a cecal volvulus is primarily surgical .
- Non operative reduction of cecal volvulus (e.g., by colonoscopy or barium enema) is rarely successful (<5 percent) and could cause perforation; it therefore should not be attempted.

- In addition, colonic necrosis may be missed in 20 to 25 percent of patients who undergo non operative reduction, and such patients may develop colonic perforation.
- Surgical approaches to cecal volvulus vary depending upon intraoperative findings and patient stability (algorithm 2).



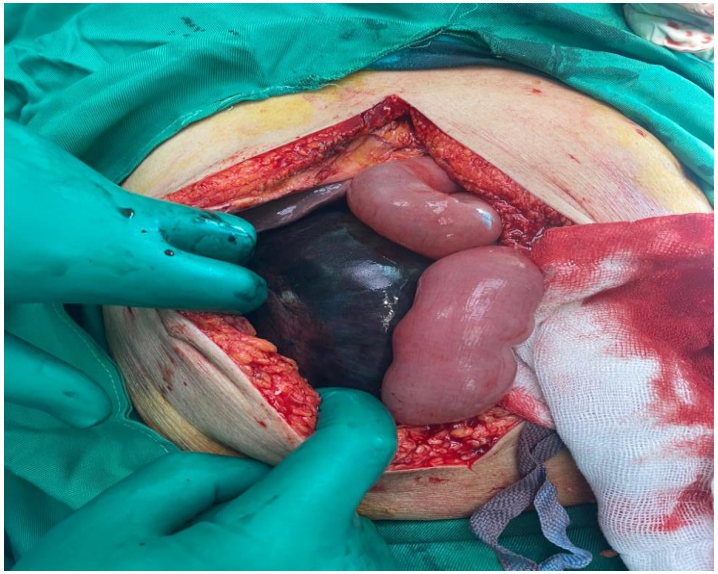
Approach to cecal volvolus

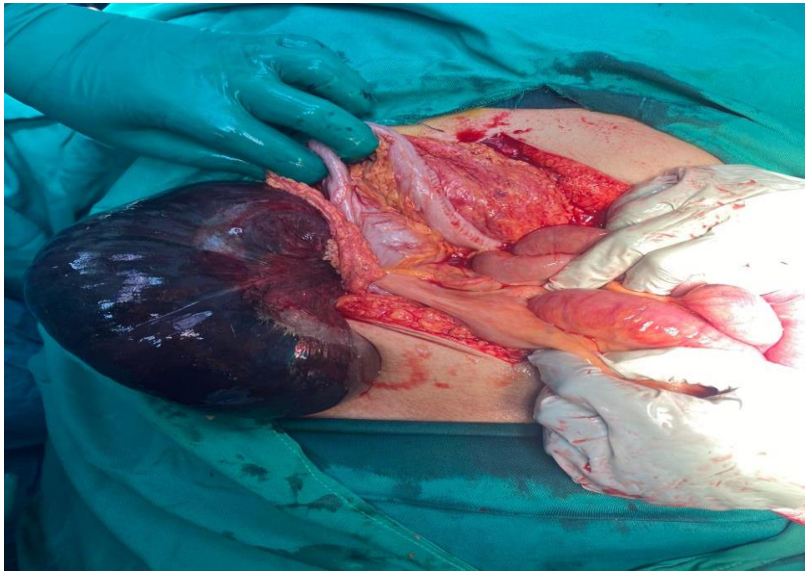
Patients without bowel compromise —

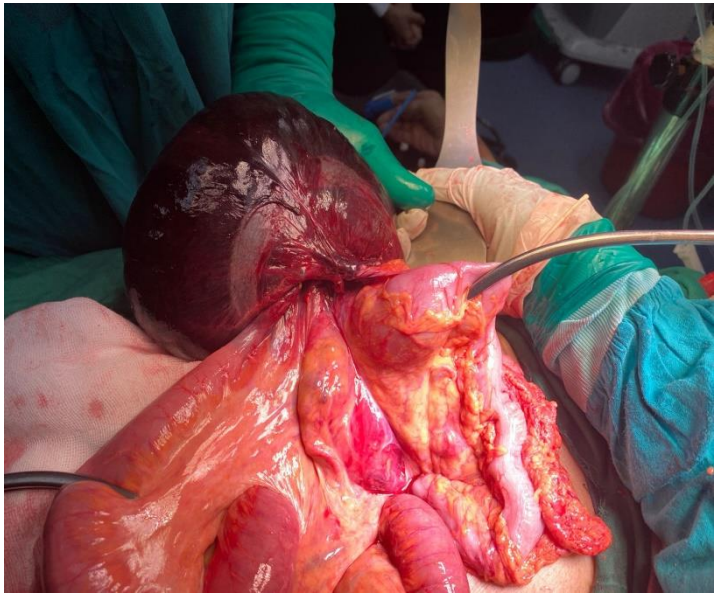
- At the time of surgery, patients without bowel compromise should first have the volvulus detorsed.
- In hemodynamically stable patients, detorsion is typically followed by an ileocecal resection or a right colectomy.
- In unstable patients, a cecopexy (suturing the cecum to the abdominal side wall) with or without a cecostomy tube placement can be performed.

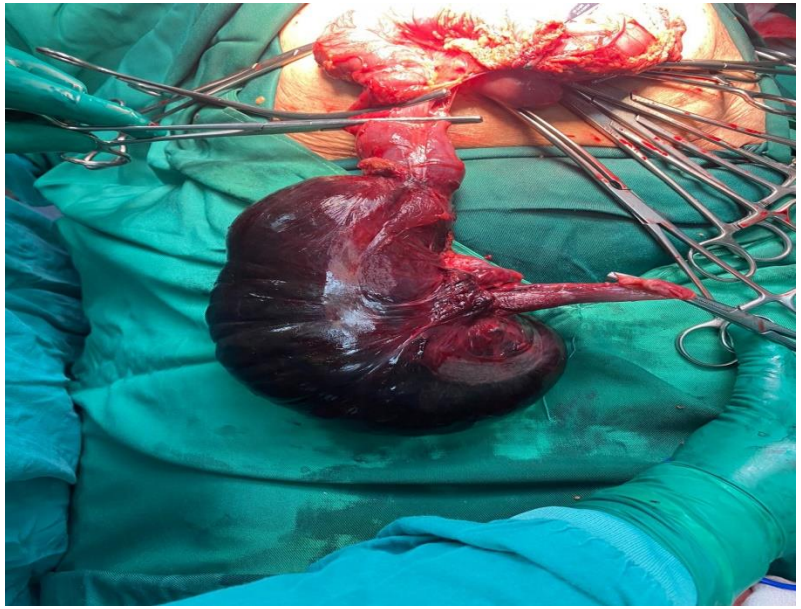
Patients with bowel compromise —

- At the time of surgery, patients who are found to have bowel compromise (ischemia, necrosis, or perforation) should not have their volvulus detorsed, to avoid reperfusion injury.
- Instead, they should undergo resection of the compromised bowel in its volvulized position followed by an ileocolic anastomosis if the patient is hemodynamically stable or an end ileostomy if the patient is not stable.









Open versus laparoscopic surgery —

- Any of the procedures mentioned above may be performed using an open or laparoscopic approach.
- The choice is determined by surgeon preference; the open approach is preferred by most surgeons in the setting of greatly distended bowel.
- In addition, the mobile right colon generally makes it easy to deliver the bowel through a small laparotomy incision.

Thank you