



# Sigmoid Volvulus: A Narrative Review and Current Management

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## Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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Review Article

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## ABSTRACT

Sigmoid volvulus is a common cause of acute intestinal obstruction in older patients and the diagnosis is made by clinical examination and imaging. Sigmoid volvulus can be divided into complicated or uncomplicated clinical presentation. Once the diagnosis of sigmoid volvulus is made, the treatment is initially endoscopic decompression followed by flatus tube insertion. This is followed by surgical intervention which is sigmoid colectomy followed by anastomosis. For complicated sigmoid volvulus, the Hartmann's procedure is the most common operation. We have conducted this review article to review the current management of sigmoid volvulus.

**Keywords:** Sigmoid volvulus; endoscopic decompression; sigmoid colectomy; Hartmann's procedure.

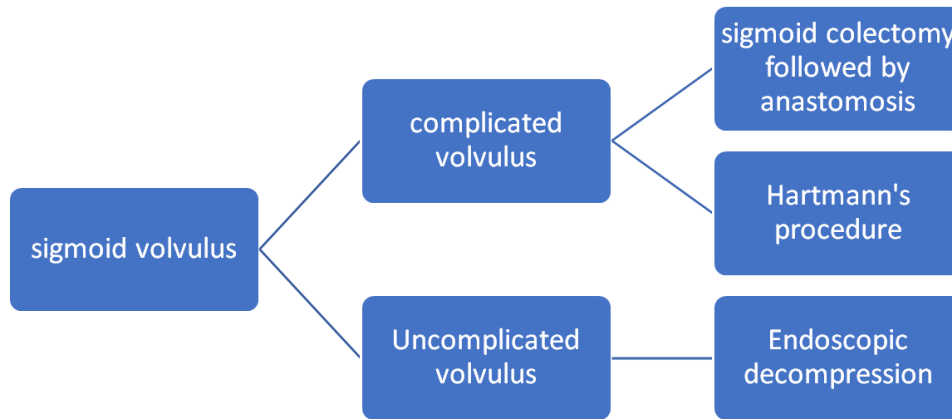
## 1. INTRODUCTION

Sigmoid volvulus is defined as a condition where the sigmoid colon wraps itself around its own

mesentery and causes intestinal obstruction. It accounts for intestinal obstruction in up to 50% of cases in Africa, central Asia, and South America but only 5% to 10% of cases in Europe and

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**Image 1. Flow chart on the classification and management of sigmoid volvulus**

the United States. It is most seen in the 4<sup>th</sup> to 8<sup>th</sup> decade of life and in males rather than females [1,2].

The etiology is multifactorial with chronic constipation, the frequent use of laxatives, high fiber in the diet and previous laparotomy being some of the common causes. The mesosigmoid twist by more than 180 degrees which then leads to torsion and intestinal obstruction. The two mechanisms of torsion are axial mesocolic volvulus and organo-axial volvulus [3].

The management of sigmoid volvulus can be divided into conservative treatment and surgical treatment. The conservative treatment involves sigmoidoscopy and decompression followed by flatus tube insertion. The surgical management can be divided into sigmoid colectomy followed by primary anastomosis or the Hartmann's procedure. The surgical management depends on whether the patient presents with signs of peritonitis, and it is indicated to prevent recurrence after endoscopic decompression [4-8].

As there is no uniform consensus on the management of sigmoid volvulus, we have conducted this review article to investigate the various treatment options. We conducted a literature review using PUBMED, Cochrane database of clinical reviews and Google scholar looking for clinical trial, observational and cohort studies, systemic reviews, and meta-analysis from 1990 to 2022. We used the following keywords, "Sigmoid volvulus", "endoscopic decompression", "Flatus tube", "Sigmoid colectomy", "Hartmann's procedure". All articles were in English language only. Further articles were obtained by manual cross referencing of

the literature. Case reports and studies with less than 10 patients and editorials were excluded. Only adult patients were included, and pediatric and pregnant patients were excluded.

## 2. DIAGNOSIS AND IMAGING OF SIGMOID VOLVULUS

The symptoms of sigmoid volvulus depend on the age of the patient, with the predominant symptoms being abdominal pain, vomiting and abdominal distension. In older patients' constipation is a common symptom. Abdominal x-ray is usually diagnostic with a coffee bean appearance showing a massive distended sigmoid colon and it is diagnostic in 50% to 75% of cases. Computerized tomography and barium enema can also be used to diagnose this condition [9].

The Coffee bean sign on abdominal x ray shows the apposition of the medial walls of the dilated loops of bowel forming the cleft of the bean and the lateral wall forming the outer wall of the bean which is seen in sigmoid volvulus. The assessment of the patient with sigmoid volvulus by using an abdominal x-ray is also good at predicting the clinical outcome. Computerized tomography is useful to exclude ischemic or necrosis of the segment of sigmoid colon and is to rule out complications like perforation [10-12].

Among the factors that lead to sigmoid volvulus is the dolichosigmoid which is an elongated sigmoid colon with a narrow-based mesentery. Other factors include excessive bowel motion and prolonged starvation followed by excessive eating. Other factors include presence of comorbidities, the duration of the disease and presence of shock [13-15].

Diagnosis of sigmoid volvulus can also be made with sigmoidoscopy with the classical finding of a spiral sphincter like twist of the lumen which is about 20 to 30cm from the anal verge. It has a high diagnostic value but quantitative data in the literature is lacking [16].

At attempt was made to classify sigmoid volvulus by atamanalap, who divided patients with sigmoid colitis into 5 categories, Class C1, patients with no risk factors, C2, patients with no shock or gangrene, but with age above 60 years and associated diseases.C3, those with shock, C4, those with sigmoid gangrene and C5, patients with both shock and sigmoid gangrene. Class 3, 4 and 5 is further subdivided to subclass a and b [17,18].

### 3. TREATMENT OF SIGMOID VOLVULUS

#### A. Endoscopic Decompression

This can be performed using a rigid sigmoidoscope, flexible sigmoidoscopy or colonoscopy. The scope is slowly advanced with minimal insufflation, and it detorts the colon once the torsion has been passed, following which there will be release of fluid and gas. A rectal tube is usually place after the procedure to prevent recurrence [19,20].

Although associated with a high recurrence rate, endoscopic decompression is still a good first line therapy for the management of sigmoid volvulus as it helps to optimize and prepare the patients for elective surgery. Sigmoidoscopic decompression is safe in the initial management of uncomplicated sigmoid volvulus [21-26].

Several factors have been associated with influencing the outcomes of endoscopic decompression that include the absence of abdominal tenderness on examination, history of chronic use of laxatives, previous abdominal surgery, and use of opioids [27,28].

Percutaneous endoscopic colostomy is also an alternative endoscopic treatment for patients who are frail and not fit for surgery [29]. Systemic reviews by frank et al and Jackson et al concluded that two percutaneous endoscopic colostomy tubes must be inserted to avoid recurrence and the tubes should be left indefinitely. The draw back from this systemic review was that it was retrospective in nature and that future randomized trials may be needed to evaluate this [30,31].

#### B. Surgical Management

The World Society of Emergency Surgeons consensus guidelines on sigmoid colon management recommended urgent sigmoid resection for cases of failed endoscopic decompression, and the choice of either sigmoid resection followed by a colorectal anastomosis or a Hartmann's procedure will depend on the viability of the colon and the clinical status of the patient [32].

The American Society of Colon and Rectal Surgeons guidelines on the management of sigmoid volvulus also concluded that sigmoid resection showed be offered for patients who underwent endoscopic decompression to prevent recurrence. Surgical resection will include sigmoid resection with either bowel anastomosis or stoma formation [33].

Sigmoid resection is indicated to prevent recurrence of sigmoid volvulus, and it is safe and should be considered for all cases. Surgery should be done as early as possible to prevent recurrence of symptoms [34-36].

The retrospective study by Tan K et al on the management of sigmoid volvulus concluded that sigmoid colectomy followed by anastomosis should be offered as an elective procedure to prevent recurrence as the mortality from emergency surgery was 17.6% in this study [37].

The current trend in the surgical management of sigmoid volvulus has been sigmoid resection followed by primary anastomosis. This will depend on whether there is presence of gangrene of the sigmoid colon, as absence of gangrene is associated with lower complication rates [38-40].

An observational retrospective study by lee et al on the surgical management of sigmoid volvulus concluded that in emergency cases, the Hartmann's procedure was the most common surgical procedure and for elective cases, sigmoid resection followed by colorectal anastomosis is the most common operation. The post complication rates, and morbidity rates were higher in the emergency cases [41].

When deciding on the surgical treatment for sigmoid volvulus, the choice of surgery will depend on the patient's general condition and the viability of the sigmoid colon. The retrospective study by Traore et al showed that a

**Table 1. Table of the studies showing the various treatment results of sigmoid volvulus**

Study	Year	N=numbers	Endoscopic detorsion	Sigmoid colectomy and anastomosis	Hartmann's procedure	Study type
Agoglu et al.	2005	32	7	9	16	Retrospective study
Larkin et al.	2009	27	19	4	4	Retrospective study
Tan K.K et al.	2010	71	53	11	7	Retrospective study
Mulugula et al.	2018	131	29	78	24	Retrospective study
Lee et al.	2018	74	5	46	23	Retrospective study
Tarore et al.	1996-2010	417	101	149	167	Retrospective study

sigmoid colectomy followed by anastomosis was associated with a higher mortality than with a Hartmann's procedure [42].

Surgical treatment for sigmoid volvulus should also be offered as early as possible to prevent recurrence and these studies showed that surgical management was associated with better survival and outcomes regardless of patient characteristics [43-45].

For patients who present with complication from sigmoid volvulus like bowel perforation or intestinal obstruction than emergency surgery should be the treatment of choice with the Hartmann's procedure being the preferred operation of choice. The factors that affect the operative mortality were the patient's condition, state of the disease and timing of surgery [46-48].

A retrospective study by shahmoradi et al comparing the outcomes between primary anastomosis and the Hartmann's procedure in the surgical treatment of sigmoid volvulus concluded that there was no difference in the post operative complications and mortality rates [49].

For patients with concomitant megacolon and megarectum that present at the time of surgery, a subtotal colectomy should be performed as a primary procedure to reduce the risk of recurrence [50].

Other surgical procedures have been attempted like mesosigmoidoplasty, where the sigmoid colon mesentery is fixed, but it is indicated in uncomplicated sigmoid volvulus, and it is not practiced as it is associated with a high

recurrence rate and most case series are of low patient volume [51].

There is a role for laparoscopy in the management of sigmoid volvulus, but it is still in its infancy and most series have very low patient numbers. This method has the potential to improve patient outcomes and decrease hospital stay [52].

#### 4. CONCLUSION

Sigmoid volvulus is diagnosed clinically, and confirmation is done by abdominal x-ray or computerized tomography. Uncomplicated sigmoid volvulus is treated initially with endoscopic decompression followed by an insertion of a flatus tube. Elective surgery should be planned to prevent recurrence and the choice of surgery is a sigmoid colectomy followed by anastomosis.

In complicated sigmoid volvulus the surgery of choice is either the Hartmann's procedure or sigmoid colectomy with bowel anastomosis, but due to contamination of signs of shock, formation of a stoma is usually done. Early diagnosis of sigmoid colitis is important as these cases can be scheduled for elective sigmoid resection, and this can prevent future attacks and limit the risk of complication.

#### CONSENT AND ETHICAL APPROVAL

It is not applicable.

#### COMPETING INTERESTS

Authors have declared that no competing interests exist.

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