

Chapter 12

Sigmoid Volvulus: Current Management

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Abstract

Sigmoid volvulus is an uncommon etiology of acute intestinal obstruction predominantly observed in elderly individuals, characterized clinically by abdominal pain and distension. Diagnosis is typically established through abdominal radiography or computed tomography, which reveals the distinctive features of sigmoid volvulus. Management strategies for sigmoid volvulus are categorized into endoscopic and surgical interventions. Endoscopic management involves endoscopic detorsion, although it is associated with a high rate of recurrence. Surgical management entails either sigmoid resection with anastomosis or Hartmann's procedure, with the choice of procedure contingent upon whether the volvulus is complicated or uncomplicated. This chapter will explore the management of sigmoid volvulus, focusing on the role of endoscopic detorsion and surgical approaches, including sigmoid resection with anastomosis and Hartmann's procedure.

Keywords: Sigmoid Volvulus, Colonic volvulus, Endoscopic detorsion, Sigmoid colectomy, Hartmann's procedure, Intestinal obstruction, and Colostomy.

1. Introduction

Sigmoid volvulus is characterized by the torsion of an elongated, redundant sigmoid colon around its narrow mesentery, resulting in acute intestinal obstruction. This condition predominantly affects younger individuals in regions such as Africa, the Middle East, and Central and South Asia, collectively referred to as the volvulus belt. Conversely, in Western countries, sigmoid volvulus is more commonly observed in older adults, individuals with neuropsychiatric conditions, and residents of nursing homes who have underlying comorbidities and chronic constipation. Clinically, it presents with symptoms of abdominal pain, distension, and constipation, which may progress to ischemia and perforation contingent upon the extent of the colon's twisting [1–3]. Diagnosis is typically achieved through an abdominal X-ray, which reveals a characteristic coffee bean sign, with computed tomography employed when diagnostic uncertainty persists [4]. Management involves initial endoscopic detorsion followed by the insertion of a flatus tube, maintained for up to 48 hours. Definitive treatment entails sigmoid resection with anastomosis or, in cases of bowel contamination where anastomosis is not feasible, a Hartmann's procedure [5, 6].

The World Society of Emergency Surgeons (WSES) guidelines for managing sigmoid volvulus recommend endoscopic decompression as the primary treatment for patients without complications such as perforation. Should endoscopic decompression prove unsuccessful, an urgent sigmoid resection is advised. The surgical approach may involve either a sigmoid resection with anastomosis or a Hartmann's procedure, contingent upon the patient's clinical status and bowel viability. For patients who have successfully undergone endoscopic detorsion, a sigmoid colectomy is recommended to prevent recurrence. Non-resection procedures, such as sigmoidoplasty and sigmoidopexy, are not advised for managing sigmoid volvulus [7]. The American Society of Colon and Rectal Surgeons, in their clinical practice guidelines for colonic volvulus management, also recommends endoscopic evaluation and detorsion for stable patients with sigmoid volvulus, reserving sigmoid resection for those who do not respond to endoscopic therapy. Surgical options include sigmoid resection or Hartmann's procedure, based on the patient's condition [8]. The American Society for Gastrointestinal Endoscopy guidelines on endoscopy's role in managing acute colonic volvulus advocate for endoscopic detorsion in hemodynamically stable patients presenting with sigmoid volvulus, followed by the placement of a flatus tube [9].

In this chapter, we will examine the role of endoscopic therapy in the management of sigmoid volvulus. Additionally, the surgical management of sigmoid volvulus will be evaluated, with particular attention to the roles of sigmoid colectomy and anastomosis, as well as Hartmann's procedure. The efficacy of percutaneous endoscopic colostomy in managing sigmoid volvulus will also be assessed. A comprehensive literature review was conducted using PUBMED, the Cochrane Database of Clinical Reviews, and Google Scholar, focusing

on clinical trials, observational studies, cohort studies, systematic reviews, and meta-analyses published between 1980 and 2026. The search utilized the following keywords: “Sigmoid Volvulus,” “Colonic Volvulus,” “Endoscopic Detorsion,” “Sigmoid colectomy,” “Hartmann’s procedure,” “Intestinal obstruction,” and “Colostomy.” Only articles published in English were included. Additional relevant articles were identified through manual cross-referencing of the literature. Exclusion criteria encompassed case reports, studies with fewer than ten patients, and editorials. The study population consisted of adult male and female patients, with pediatric patients being excluded.

2. Discussion

2.1. Endoscopic decompression of sigmoid volvulus

Sigmoidoscopy is utilized in patients with sigmoid volvulus to confirm the diagnosis, characterized by the classical presentation of a spiral-like twist of the lumen approximately 20 cm from the anal verge, with an inability to advance the endoscope beyond this point. Endoscopic detorsion involves the insertion of the endoscope and the rotation of its tip to the opposite side, employing minimal air insufflation. The success rate of endoscopic decompression ranges from 48% to 100%, with a morbidity rate between 0% and 26.4% [10]. Atamanalp conducted endoscopic decompression on 748 patients with sigmoid volvulus, achieving a success rate of 83.2%, a mortality rate of 0.5%, a morbidity rate of 1.9%, and a recurrence rate of 5.5% [11]. Da Rocha et al. performed endoscopic decompression on debilitated patients with sigmoid volvulus, with 52 patients undergoing the procedure and achieving a success rate of 86.4%; however, the recurrence rate was 81% after three months [12]. Tan et al. conducted a retrospective study on the management of sigmoid volvulus, including 71 patients, of whom 64 underwent endoscopic detorsion. This treatment was successful in 74.6% of the cases [13].

Negm et al. conducted a randomized controlled trial to compare endoscopic decompression and surgical resection in the management of elderly high-risk patients with sigmoid volvulus. The study involved 18 patients, divided equally into two groups: one undergoing endoscopic decompression and the other undergoing surgical resection. The findings indicated that endoscopic decompression resulted in a shorter hospital stay and procedure time, although no significant differences were observed in morbidity and mortality rates [14]. Yalcin et al. evaluated the outcomes of endoscopic therapy for sigmoid volvulus, including 18 patients in their study. They reported a recurrence rate of 66.7%, with elective surgery performed in 33.3% of cases (Oter, 2022). Moro-Valdezate et al. investigated the treatment outcomes for sigmoid volvulus, involving 92 patients, with 43 undergoing endoscopic detorsion and 49 undergoing sigmoid resection. Endoscopic detorsion demonstrated a success rate of 87.8% and a recurrence rate of 47.2% [15]. Queneherve et al. assessed the efficacy of endoscopic detorsion as a first-line therapy for sigmoid volvulus in a study of 42 patients, reporting a success rate of 96% but a recurrence rate of 54% [16].

A systematic review and meta-analysis conducted by Sabatini et al. examined the safety and efficacy of endoscopic detorsion in the management of colonic volvulus. This study incorporated a total of 19 studies, revealing a success rate of 80%, a recurrence rate of 33.9%, and a mortality rate of 22.6%. The findings indicate that endoscopic detorsion serves as an effective first-line therapy for the initial management of uncomplicated sigmoid volvulus [17]. To prevent recurrence, a flatus tube is typically placed following endoscopic detorsion and maintained for 36 to 48 hours. However, this procedure is often associated with pain and discomfort, which frequently results in the tube’s dislodgement and removal [18, 19].

Table 1: Success Rate and Recurrence Rate of Endoscopic Detorsion in the Management of Sigmoid Volvulus

Study	Study Type	Year	N=numbers	Success rate (%)	Recurrence rate (%)
Moro-Valdezate et al	Observational study	2021	92	87.8%	47.2%
Sabatini et al	Systematic-Review & Meta-analysis	2026	3285	80% (95% CI:75-83%)	33.9% (95% CI:19.5-52.1%)

Table 1 showing the success rate and recurrence rate for endoscopic detorsion in the management of sigmoid volvulus.

2.2. Surgical Management of Sigmoid Volvulus

The surgical management of sigmoid volvulus is contingent upon the clinical presentation. Patients who are stable and have successfully undergone endoscopic detorsion are typically offered an elective sigmoid resection with anastomosis. In contrast, for patients in whom endoscopic detorsion has failed, presenting with acute intestinal obstruction and an ischemic or gangrenous sigmoid colon, a Hartmann’s procedure is indicated. If the sigmoid colon remains viable, a sigmoid resection with anastomosis may be attempted [20]. The role of definitive surgery in managing sigmoid volvulus was evaluated in a retrospective study by Hardy et al. In this study, 25 patients underwent surgical intervention, with 13 receiving the Hartmann’s procedure and 11 undergoing sigmoid resection with anastomosis. Postoperative morbidity was comparable between the groups, with one mortality reported in the Hartmann’s procedure group [21]. Additionally, a multicenter observational study on the surgical management of sigmoid volvulus was conducted by Lee et al. In this study, 74 patients underwent sigmoid resection, with 35 cases performed as emergency procedures and 29 as elective procedures. Sigmoid resection with anastomosis was performed in 46 patients, while the Hartmann’s procedure was conducted in 23 patients. Emergency surgery was associated with a higher complication rate compared to elective surgery (40% vs. 15.4%) [22].

A retrospective study conducted by Ifversen et al. examined the surgical management of sigmoid volvulus. The study included 61 patients, with 32 undergoing sigmoid resection and 29 undergoing endoscopic detorsion. The findings indicated that patients who underwent surgical resection experienced reduced morbidity and recurrence rates compared to those who underwent endoscopic detorsion [23]. Shahmoradi et al. assessed the outcomes of sigmoid resection and anastomosis versus Hartmann’s procedure in the surgical management of sigmoid volvulus. This study included 102 patients, of whom 46 underwent sigmoid resection and anastomosis, while 56 underwent Hartmann’s procedure. The results revealed no significant differences in morbidity and mortality between the two procedures; however, Hartmann’s procedure was associated with a shorter hospital stay [24]. Bruzzi et al. investigated the role of elective sigmoid resection following endoscopic detorsion in

managing sigmoid volvulus. In this study, 33 patients underwent sigmoid resection and anastomosis following endoscopic detorsion, with a morbidity rate of 6% and no reported mortalities [25].

Awedew et al. conducted a systematic review and meta-analysis to compare sigmoid resection and anastomosis with Hartmann's procedure in the treatment of gangrenous sigmoid volvulus. This study incorporated 11 studies encompassing 724 patients. The mortality rate was found to be 15% following sigmoid resection and anastomosis, compared to 19% for Hartmann's procedure. No significant differences in morbidity were observed between the two procedures. The findings indicate that both sigmoid resection and anastomosis and Hartmann's procedure are effective surgical interventions for managing sigmoid volvulus (A et al., 2023). Similarly, Jiang et al. performed a systematic review and meta-analysis to evaluate the recurrence rate and mortality associated with surgical resection versus non-resection surgery for sigmoid volvulus. This analysis included 28 studies with a total of 1497 patients, of whom 837 underwent surgical resection and 660 underwent non-surgical resection. The results demonstrated that surgical resection was linked to a reduced recurrence rate, albeit with a slightly higher mortality rate compared to non-surgical resection [26].

Ndong et al. conducted a systematic review and meta-analysis to evaluate the safety and efficacy of laparoscopic surgery in the treatment of sigmoid volvulus. The analysis included 22 studies encompassing 29,874 patients diagnosed with sigmoid volvulus, among whom 2,089 underwent laparoscopic surgery. For cases of uncomplicated sigmoid volvulus, laparoscopic sigmoid resection and anastomosis were performed. The findings indicated that laparoscopic sigmoid resection with anastomosis was associated with a reduction in postoperative complications compared to open resection. However, further research is necessary to fully ascertain the efficacy of laparoscopic surgery in the surgical management of sigmoid volvulus [27].

Table 2: Mortality rate between sigmoid resection with anastomosis and Hartmann's procedure for the surgical management of sigmoid volvulus

Study	Study Type	Year	N=numbers	Mortality Rate-Sigmoid resection & anastomosis (%)	Mortality Rate-Hartmann's procedure (%)
Kazem-Shahmoradi et al	Retrospective study	2012	102	0%	1.8%
A.F.Awadew et al	Systematic Review & Meta-analysis	2023	724	15% (95% CI:11-19%)	19% (95% CI:65-73%)

Table 2 showing the mortality rate between sigmoid resection with anastomosis and Hartmann's procedure for the surgical management of sigmoid volvulus.

2.3. Percutaneous Endoscopic Colostomy for Sigmoid Volvulus

Percutaneous endoscopic colostomy is an endoscopic intervention employed for elderly and frail patients with sigmoid volvulus who are unsuitable candidates for definitive surgical resection. This procedure utilizes a multichannel colonoscopy and involves the insertion of a tube externally, performed under sedation [28]. Jackson et al. conducted a systematic review examining the role of percutaneous endoscopic colostomy in managing sigmoid volvulus. The review included 14 studies and found that percutaneous endoscopic colostomy was associated with a high recurrence rate and mortality. The most prevalent complication was infection at the puncture site [29]. Another systematic review by Frank et al. investigated the use of percutaneous endoscopic colostomy in the management of sigmoid volvulus, incorporating 10 studies with 56 patients. This review reported a morbidity rate of 21% and a mortality risk of 5%. Notably, more than half of the patients required the insertion of two tubes. This study supports the use of percutaneous endoscopic colostomy in frail and elderly patients with sigmoid volvulus [30]. Barazza et al. prospectively evaluated the role of percutaneous endoscopic colostomy in managing sigmoid volvulus, including 33 patients in their study. Symptomatic relief was observed in 26 patients, with morbidity occurring in 10 patients and mortality in 1 patient [31].

3. Conclusion

Sigmoid volvulus represents a significant but rare etiology of acute intestinal obstruction frequently encountered by general surgeons. Given its prevalence among elderly patients, timely diagnosis is crucial. In stable patients, endoscopic intervention, specifically colonoscopy and detorsion, should be pursued. The installation of a flatus tube is recommended for up to 48 hours. Once patient stability is achieved, definitive treatment through sigmoid resection and anastomosis is advised. In cases where endoscopic therapy fails or ischemia of the sigmoid colon is present, a Hartmann's procedure is warranted. Surgical intervention via sigmoid resection is regarded as the definitive therapeutic approach for sigmoid volvulus.

Article Information

Conflict of interest: There is no conflict of interest.

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