Review Article

Colonic Volvulus: An Update on Management- Narrative review article

Abstract

Colonic volvulus is a rare cause of large bowel obstruction, and it is commonly seen in older patients. The clinical presentation is abdominal pain and abdominal distension which is followed by absolute constipation. The diagnosis is usually obtained by performing abdominal Xray or computerized tomography. Sigmoid volvulus is the most common cause followed by cecal volvulus and transverse colon volvulus. The management of colonic volvulus is divided into endoscopic detorsion and surgical therapy which involves surgical resection. We have conducted this review article to look at the various causes of colonic volvulus and the management of this condition.

Keywords- colonic volvulus, sigmoid volvulus, cecal volvulus, ileo-sigmoid knotting, endoscopic detorsion, sigmoid resection and right hemicolectomy.

Introduction

Colonic volvulus is a condition that is characterized by segmental twisting of a segment of the colon on its narrow and fixed mesentery, leading to a closed loop obstruction caused by a redundant loop of colon. It accounts for 10%-15% of cases of colonic obstruction and the most common site is the sigmoid colon followed by the cecum, transverse colon and splenic flexure. The most common clinical presentation is abdominal distension, constipation and abdominal pain. Sigmoid volvulus is commonly seen in elderly patients with chronic constipation in western countries whereas it is seen in younger patients in Central Asia, South Asia, the middle east and Africa where there is a high fiber diet. Cecal volvulus is seen in younger patients and predominantly female, as is patients with transverse colon and splenic flexure volvulus(1,2).

The diagnosis of colonic volvulus is by performing abdominal radiographs which can demonstrate a loop of dilated intestine like a bent inner tube or omega loop in sigmoid volvulus. If the diagnosis is not confirmed, then a computerized tomography is performed. In cecal volvulus plain abdominal radiographs are usually not diagnostic and the diagnosis is confirmed by computerized tomography. Computerized tomography can detect the degree of colonic distension and direct signs of intestinal ischemia in the twisted loop of intestine. The treatment of colonic volvulus depends on the location with patients with sigmoid volvulus initially being

treated with endoscopic decompression followed by an elective definitive treatment like sigmoid resection and anastomosis. For patients with complicated sigmoid volvulus a Hartmann's procedure may be performed. Cecal volvulus is treated with a right hemicolectomy or a cecostomy and endoscopic detorsion are rarely performed(3–7).

The American Society of Colon and Rectal Surgeons Clinical practical guidelines for the management of colonic volvulus has recommended that for patients with sigmoid volvulus a sigmoidoscopy and detorsion should be performed for stable patients and for unstable patients a laparotomy and sigmoid resection should be performed with either an anastomosis or stoma being performed. Treatments like detorsion followed by sigmoidopexy or mesosigmoidoplasty are not recommended. For patients with cecal volvulus endoscopic detorsion is not recommended with surgical resection like a right hemicolectomy or ileocecal resection being the preferred treatment(8).

The management of colonic volvulus depends on the site of volvulus, and it can be divided into endoscopic therapy and operative treatment. For patients with sigmoid volvulus the treatment can be divided into endoscopic detorsion followed by definitive therapy in the form of sigmoid resection while for patients with cecal volvulus surgical resection is the primary form of therapy. We have conducted this review article to investigate the various treatment options in the management of sigmoid volvulus, ileo-sigmoid knotting, cecal volvulus and transverse and splenic flexure volvulus. We conducted a literature review using PUBMED, Cochrane database of clinical reviews and Google scholar looking for clinical trial, observational studies, cohort studies systemic reviews, and meta-analysis from 1980 to 2024.We used the following keywords, "Sigmoid volvulus", "Cecal volvulus", "Colonic volvulus", "endoscopic detorsion "" sigmoid resection "," right hemicolectomy" and "ileo- sigmoid knotting". 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. Adult male and female patients were included in this study. Pregnant patients and pediatric patients were excluded.

Discussion

Sigmoid volvulus

Sigmoid volvulus accounts for 2% to 5% of acute colonic obstruction in western countries and 20% to 50% of patients in Africa, central Europe and central Asia. The etiology is multifactorial, and it is due to the redundancy of the sigmoid colon with a mesentery that is wider than long and

narrowing of the base of the mesentery. Other factors include advancing age and constipation in elderly patients, and intake of high fiber diet in younger patients especially in countries in Africa(9).Among the factors that can lead to sigmoid volvulus include increased bowel motility, excessive body motion and overeating following a period of starvation(10–12).

The clinical presentation of sigmoid volvulus is abdominal pain, abdominal distension and constipation, with or without signs of peritonitis. An abdominal Xray may reveal a massively dilated colon, but in cases where the diagnosis is in doubt a computerized tomography or Barium enema may be performed(13,14).The World Society Of Emergency Surgeons(WSES) in their consensus guidelines on the management of sigmoid volvulus has recommended that uncomplicated sigmoid volvulus patients should undergo an emergency sigmoidoscopy and detorsion, followed by the insertion of a flatus tube. Once the patient's clinical condition has improved, a definitive sigmoid resection should be performed to prevent recurrence. For unstable patients with suspected sigmoid ischemia emergency surgical resections should be performed with a Hartmann's procedure being the most common operation that is performed(15).

Endoscopic treatment with a sigmoidoscopy is both diagnostic to establish the diagnosis of sigmoid volvulus and therapeutic in that detorsion of the volvulus can be done. Once endoscopic detorsion is done a flatus tube should be inserted to prevent early recurrence(16–18).Endoscopic detorsion is associated with minimal morbidity and mortality with a success rate of 80% to 90% but it has a high recurrence rate of up to 40%. Hence a definitive surgical therapy should be offered to the patient after successful endoscopic detorsion to ensure better survival and quality of life(19–22).

The surgical management for sigmoid volvulus can be divided into sigmoid resection followed by anastomosis, which is performed for patients with uncomplicated sigmoid volvulus. For complicated sigmoid volvulus the Hartmann's procedure is the most common operation that is performed. If there is extensive ischemia of the sigmoid colon than a subtotal colectomy may be performed(23–27). The patients who underwent sigmoid resection for complicated sigmoid volvulus were associated with a higher morbidity and mortality than those who underwent elective sigmoid resection(28).A retrospective study by Ifversen et al comparing the mortality and recurrence of patients who underwent endoscopic therapy versus surgical therapy concluded that patients who underwent surgical resection had the best survival rate and lowest recurrence rate(29).

Sigmoid colectomy with primary anastomosis was compared with Hartmann's procedure in the management of sigmoid volvulus, in several retrospective studies and there was no difference with regards to the post operative complications and mortality. The Hartmann's procedure was associated with a shorter stay in the hospital(30,31).A systemic review and meta-analysis was conducted by Awedew et al comparing primary resection with anastomosis versus the Hartmann's procedure in complicated sigmoid volvulus.11 studies with 724 patients were included in the study and the mortality from primary anastomosis was 15% and Hartmann's

procedure was 19%.This study concluded that there was no difference with regards to morbidity and mortality form the choice of resection and primary anastomosis or the Hartmann's procedure in the management of complicated sigmoid volvulus(32).

Percutaneous endoscopic colostomy is another procedure that can be performed in patients who have undergone endoscopic decompression but are not fit to undergo surgery and a systemic review by Jackson et al did highlight the advantage of this procedure in unfit patients, but further studies will be needed to evaluate its efficacy(33). Tube sigmoidostomy is another alternative to sigmoidopexy in the management of sigmoid volvulus in patients who are not fit for surgery, but further studies are required to assess its efficacy(34,35).

Table 1: This table shows the mortality between sigmoid resection and anastomosis against the Hartmann's procedure in the surgical management of sigmoid volvulus

Study	Study type	Year	N=numbers	Mortality from resection & anastomosis (%)	Mortality from the Hartmann's procedure (%)
Coban et al	Retrospective study	2008	47	8%	8%
Shahmoradi et al	Retrospective study	2020	102	0%	1.8%
Awedew et al	Systemic review & meta-analysis	2023	724	15%	19%

Ileo-sigmoid knotting

This condition is characterized by the wrapping of the ileum and sigmoid colon around one another and its underlying mesentery. It is a rare but severe form of intestinal obstruction and is seen in middle aged patients in central, south Asia and Africa. It is seen in a hypermobile bowel with an elongated mesentery and narrow base. The consumption of a high bulk diet with an empty small bowel are predisposing factors to this condition(36,37).Ileo- sigmoid knotting can

be classified into class 1 where the ileum revolves around the sigmoid colon, class 2 where the sigmoid colon revolves around the ileum ,class 3 the ileocecal junction revolves around the sigmoid colon and the undetermined type where the cause of obstruction cannot be determined. The diagnosis of ileo-sigmoid knotting is usually confirmed by performing a computerized tomography (CT) or magnetic resonance imaging (MRI)(38,39).

The management of ileo-sigmoid knotting is by fluid resuscitation and failure to pass the sigmoidoscope beyond the sigmoid colon should alert one to the possibility of this condition. Surgery is the primary form of treatment of this condition, with untwisting of the knot and assessing the viability of the bowel. Bowel resection and anastomosis can be performed if the bowel is viable, and this can involve small bowel resection and a sigmoid colectomy with anastomosis. If there is bowel perforation with contamination of the peritoneal cavity, then a resection with a stoma may be performed with a Hartmann's procedure being the preferred operation(40–43).non-resection surgical procedures like sigmoidoplasty, sigmoidopexy and cecopexy are rarely performed due to their high recurrence rate. The mortality rate from uncomplicated ileo-sigmoid knotting is 8% -10% but for complicated cases the mortality approaches 60% to 80%(44–47).

Cecal Volvulus

Cecal Volvulus is the second most cause of colonic volvulus accounting for 10% to 40% of cases. It can be divided into 2 subgroups, the first is a loop axial ileocolic volvulus and the second is a cecal bascule. Predisposing factors for cecal bascule include constipation, previous abdominal surgery, prolonged immobility and high fiber intake(48).The clinical presentation is right sided abdominal pain and abdominal distension which may progress to generalized abdominal pain. The diagnosis can be confirmed by performing a computerized tomography which may demonstrate the "coffee bean", "bird beak" and "whirl sign"(49).The treatment of cecal volvulus is by surgical means and can be divided into resection and non-resection surgery depending on the viability of the cecum. Right hemicolectomy and ileocecal resection are the most common resection surgeries with cecopexy and cecostomy being the common non - resection procedures. Colonoscopy decompression is not usually performed due to the high failure rate and difficulty(50,51).

Cecal bascule is a rare form of cecal volvulus that accounts for 5%-10% of cases, and it is characterized by distended cecum fold anteriorly on the ascending colon without any torsion. Adhesion, abdominal surgeries and mobile cecum have been implicated in the etiology of cecal bascule and the clinical presentation is right sided abdominal pain and abdominal distension. The diagnosis is confirmed by computerized tomography. The treatment of cecal bascule is by performing a right hemicolectomy or cecopexy(52–54).

Transverse colon and splenic flexure colon volvulus

These are rare causes of volvulus and are seen in less than 5% of cases of colonic volvulus. The clinical presentation is abdominal pain and abdominal distension which may be followed by generalized abdominal pain. The diagnosis is confirmed by computerized tomography and the treatment is surgical resection as detorsion is usually not performed. The decision to perform an anastomosis or stoma formation will depend on the viability of the colon segment that is involved(55–59).

Conclusion

Colonic volvulus is one of the causes of large bowel obstruction that is seen in older patients and due to the delay in diagnosis, this condition often presents as an acute emergency. Sigmoid volvulus is the most common presentation of colonic volvulus with endoscopic detorsion being the first line therapy and surgical resection being done to prevent recurrence. The choice of performing an anastomosis or a stoma will depend on the clinical condition of the patient. Cecal volvulus is the second most common cause of colonic volvulus, and it is always treated with surgical resection with the right hemicolectomy being the most common operation. The treatment of colonic volvulus is important due to the high mortality if there is a delay in diagnosis and treatment.

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Option 1:

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc.) and text-to-image generators have been used during the writing or editing of this manuscript.

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