

A study on various modalities of surgical management of sigmoid volvulus

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ABSTRACT

Background: Worldwide incidence of sigmoid volvulus varies from 6-30%. In India the incidence varies from 11.8% in the west to 1.5 - 9.4 % in north and south India respectively, depending on the dietary constituents. The management of sigmoid volvulus varies depends on the timing of presentation and the condition of the large bowel.

Objective: The aim of the study was to evaluate the effectiveness of the various surgical options in treatment of sigmoid volvulus.

Methods: An analysis of 30 patients treated for sigmoid volvulus over a span of 1 year was done. The findings at exploration were carefully recorded. Following a suitable surgical procedure, the patients were monitored for complications and followed up.

Results: In our study of 30 patients, 23 were male, 7 female. The age group ranged from 20 - 70 years, with maximum patients in age of 60 -70 years. Majority of these patients presented with abdomen distension and abdomen pain followed by constipation and vomiting. Plain Skiagram was diagnostic in 90% patients. Operative procedure undertaken in 23 cases was primary resection and anastomosis whereas 5 cases were gangrenous Sigmoid Volvulus for which Hartmann's procedure was done.

Conclusion: This study showed that for non-gangrenous bowel, primary resection and anastomosis is ideal and for gangrenous bowel, Hartmann's procedure is ideal.

Keywords: Sigmoid volvulus, Hartmann's procedure, primary resection, anastomosis

Introduction

Sigmoid volvulus is the third common cause of large intestinal obstruction after carcinoma and diverticulitis and accounts for about 2 – 4% of all intestinal obstruction. It is most common in Africa, South America, South East Asia and Eastern Europe. [1] Volvulus of the sigmoid colon means twisting of the sigmoid colon on the axis of its own mesentery, causing intestinal obstruction. The twist always happens in anticlockwise direction. [2] The twist gets spontaneously reduced or early detorsion is carried out by non-operative means. Delay in reduction may lead to strangulation or gangrene. The diagnosis of sigmoid volvulus can be made easily, however it is difficult to differentiate gangrenous and non-gangrenous bowel pre operatively. [3] Management of sigmoid volvulus is controversial, non-operative or conservative surgery may be associated with an episode of recurrence. Operative management includes

primary resection and anastomosis, Hartmann's Procedure and subsequent anastomosis, depending on the bowel condition and general condition of the patient. [4]

The study was undertaken to correlate the incidence of sigmoid volvulus in relation to age and sex, to study the clinical presentation of sigmoid volvulus, to evaluate the effectiveness of surgical options of sigmoid volvulus and to study the mortality and morbidity pattern of sigmoid volvulus.

Materials and Methods

An observational case-control study of 30 patients treated for sigmoid volvulus at Rajah Muthiah Medical College Hospital, Chidambaram, over a span of 1 year was done. The patient was subjected to thorough clinical and physical examination and necessary investigations like Abdomen X-ray was

done. After the diagnosis of sigmoid volvulus was made, the patient was taken up for surgery immediately. The findings at exploration were carefully recorded and a suitable surgical procedure was carried out. Post-operatively these patients were treated with intravenous fluids, prophylactic antibiotics and blood transfusion as and when required.

In our study, patients were subjected to following procedures.

- Hartmann’s procedure consists of excision of gangrenous sigmoid, closure of the rectal stump. Proximal part of the colon was brought out as end colostomy and one silk suture was applied for distal stump for future identification.
- Primary resection and anastomosis without proximal defunctioning colostomy was done in selected few patients
- Sigmoidopexy following Derotation
Post operatively the patients were monitored for complications. The patients who had undergone colostomy underwent colostomy closure with colorectal anastomosis after 8 weeks from the first procedure.

Results

This study shows increased incidence of sigmoid volvulus in Males than females especially after 40 years of age. The highest incidence of sigmoid volvulus is reported in age group of 61 – 70 years with 1:3 Female:Male Preponderance.

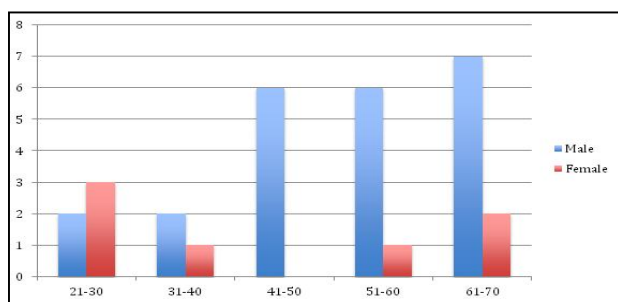


Fig. 1 Age and Sex Distribution

All patients in the study presented with abdominal pain, abdominal distension, Constipation and Vomiting. Guarding (90%) and rigidity (90%) were

significantly prominent in patients with gangrenous sigmoid volvulus. Plain Skiagram showed features of sigmoid volvulus in 27(90%) patients and features of intestinal obstruction (Multiple Air Fluid levels) in the remaining 3 (10%). In this study, all 30 cases presented with acute symptoms and were taken up for surgery after clinical assessment and pre-operative resuscitation. 10(33%) of these patients had Gangrenous Bowel whereas 20(66%) non-gangrenous ischemic bowel was present. In this study, 23 patients underwent Primary Resection and Anastomosis whereas 5 patients underwent Hartmann’s Procedure with subsequent anastomosis and 2 patients underwent Sigmoidopexy. Of the complications, wound infection was present in 5 cases (16%). Out of 30 cases, 0 deaths were reported.

Table 1: Sign and symptoms

Signs and Symptoms	N	%
Abdominal Distension	30	100
Abdominal Pain	30	100
Constipation	30	100
Vomiting	30	100
Guarding	27	90
Rigidity	27	90

Table 2: Operative Procedures

Operative Procedure	N	%
Primary resection and anastomosis	23	77
Sigmoidopexy	2	6
Hartmann’s procedure and subsequent anastomosis	5	17

Table 3: Complications of Surgery

Post – operative Period	N	%
Wound Infection	5	16.6%
Lower Respiratory Tract Infection	1	3.3%
Stomal edema	1	3.3%
Pre renal uraemia	1	3.3%

Discussion

The commonest cause of large bowel obstruction

in India, Africa and Eastern Europe is Sigmoid Volvulus, whereas in Western Europe and America it is due to neoplastic lesions.^[5] In Western Europe, USA, Scandinavian Countries, the incidence of Sigmoid Volvulus is 6%. Ballantyne in 2001 reported 7.5-30% incidence of Sigmoid Volvulus.^[6] In India the incidence varies from 11.8% in the west to 1.5 –9.4 % in north and south India respectively. This varying incidence in various parts of the world is attributed to the difference in the dietary habits and bowel habits of the population. Incidence is higher in countries with diet containing coarse vegetable fibers rich in roughage are consumed in large quantities when compared to countries where low roughage non-vegetarian diet is consumed^[7,8] There is overall preponderance of males over females in the ratio of 1.5: 1 to 9:1. In our study there was increased male to female ratio of 3:1. In females it is said to be due to large and roomy pelvis and the lax abdominal wall, which allows spontaneous detorsion of the partially twisted sigmoid loop. A qualitative study in Gondar region, Northwest Ethiopia revealed the low incidence of Sigmoid Volvulus in women attributed to their regularity of bowel habit. This regularity is found to be protective from overloading of the Sigmoid colon and its consequences. In our study, the incidence of sigmoid volvulus is around 1.1% with 3:1 male: female preponderance. In relation to age, two gross patterns have been observed. In countries with high incidence of Sigmoid Volvulus, most patients are found to be in the age group of 60-70 years. In the west the patients are usually 60-70 years. In the east, patients are found from 40-50 years. This overall age difference is due to difference in ecological factors responsible for causing Sigmoid Volvulus. In our study, there is increased incidence of sigmoid volvulus in Males than females especially after 40 years of age with higher incidence in the age group of 61-70 years. (Fig. 1) In American and European series an underlying psychiatric illness or association with mental disorder (25-7.5% cases) has been reported. Such association has not been found in

my study. This difference may be due to age related cardiovascular or neurological lesions.^[7] The association of these disorders causing Sigmoid Volvulus is still controversial. However psychiatric drugs are known to produce altered bowel habits making the patient susceptible to Sigmoid Volvulus.

The symptoms of Sigmoid Volvulus include abdomen distension (65-100%), abdomen pain (75-100%), Vomiting (12.6%), Chronic Constipation (25-100%).^[5] In our study abdomen distension (100%), abdomen pain (100%), constipation 0%, vomiting (100%), guarding and rigidity (90%). It is found that patients have usually had symptoms for more than 48 hours before seeking medical attention. This delay is due to travel from long distances, practice of indigenous treatment and illiteracy and lack of awareness. In the western world delay in treatment is due to patients of mental health institutions, or those with an underlying neurological deficit with a communication gap between the clinician and the patient.^[9]

The findings on physical examination in these cases include varying degrees of abdominal distension, absence of bowel sounds, tympanic note on percussion uncommonly visible intestinal peristalsis and dehydration. The real problem is to differentiate between gangrenous and non-gangrenous bowel. The various features of gangrenous bowel include shock, abdomen guarding and rigidity. Abdominal sounds and bleeding per rectum are usually absent in majority of gangrenous Sigmoid Volvulus cases.^[10] Upright skiagram of the abdomen usually delineates a distended prominent, sigmoid loop in majority of cases. In our study 27 out of 30 cases showed features of Sigmoid Volvulus. The rest 3 cases showed features of intestinal obstruction.

Most surgeons, in patients with signs of non-gangrenous bowel follow non-operative methods of reduction of volvulus and when diagnosis is uncertain a laparotomy is performed. At laparotomy various alternatives are available. If the bowel is viable mere derotation and decompression can be done. To this procedure,

sigmoidopexy can be done to prevent recurrence or primary resection and anastomosis, with or without proximal diversion loop colostomy; or to exteriorize the sigmoid loop with delayed resection and anastomosis.^[11] In our study, 23 patients (77%) underwent Primary resection and anastomosis whereas 2 patients (6%) underwent sigmoidopexy and 5 patients (17%) underwent Hartmann's procedure and subsequent anastomosis was done.

In the presence of gangrene the choice is between primary resection and anastomosis with or without, proximal colostomy, Paul Mikiulicz exteriorization or Hartmann's procedure^[12-15] Majority of surgeon favors Hartmann's procedure. For the management of non-gangrenous Sigmoid Volvulus a variety of non-operative techniques have been described to derotate and decompress the sigmoid loop. These include saline enema, Barium enema, proctoscopy, sigmoidoscopy, rectal tube and recently colonoscopy^[16,17]

The non-operative initial reduction of Sigmoid Volvulus is only a temporary procedure and is often followed by recurrence. Therefore after initial successful detorsion, an elective resection of the redundant sigmoid loop should be done. The incidence of recurrence following these procedures varies from 33-100%^[18] The disadvantages of non-operative procedures are high recurrence of Sigmoid Volvulus requiring elective resection of Sigmoid Volvulus and chances of missing underlying gangrenous sigmoid colon. Flexible colonoscopy has been recently used as a non-operative method.^[19] This technique was not used in this study.

Operative management of non-gangrenous bowel:

- These procedures do not involve resection of the bowel. These include detorsion, detorsion with sigmoidopexy, and detorsion followed by extra peritonealisation.
- Those procedures that involve resection of a bowel namely Hartmann's procedure and resection and anastomosis (with or without proximal diverting colostomy).

Non-operative procedures recommended by Carter

and Hinshaw claimed that primary resection and anastomosis in emergency conditions was associated with high incidence of anastomotic leak with its added mortality and Morbidity. Since the incidence of recurrence was high following these non-resection procedures after simple detorsion, it is advised that an elective resection and anastomosis of sigmoid loop should be carried out during the same admission. Mortality rate following laparotomy and detorsion alone varies from 0 – 50%^[22] In this study Hartmann's procedure was done in patients with viable bowel with poor general condition and associated comorbidities. After Hartmann's procedure, probably due to dense adhesions between bowel and rectal stump, colostomy closure can be difficult. It was recommended that Hartmann's procedure be reserved for cases with extensive gangrene where distal stump cannot be brought out with ease. In our study, 5 Hartmann's procedures were done in cases with extensive gangrene.

Operative management of gangrenous bowel:

In cases with gangrenous bowel, laparotomy was indicated^[20-24] Various surgical options available are:^[25-27]

- Paul Mikiulicz exteriorization and delayed resection and anastomosis
- Hartmann's procedure consists of excision of gangrenous sigmoid, closure of the rectal stump. Proximal part of the colon was brought out as end colostomy and one silk suture was applied for distal stump for future identification.
- Primary resection and anastomosis with or without proximal defunctioning colostomy was done in selected few patients.

In the presence of gangrene, Paul Mikiulicz exteriorization was favored provided the distal segment of the sigmoid colon can be exteriorized without tension. This procedure had limitations when gangrene involves rectum or rectum may undergo necrosis due to traction followed by thrombosis^[17]

In our study primary resection and

anastomosis was done in cases for all non-gangrenous bowel. It was established that with availability of better antibiotics, such a procedure was safe. Complications following surgery on Sigmoid Volvulus were wound infection, upper and lower respiratory tract infection^[21] In our study of 30 patients, 23 were male and 7 were female. A male to female ratio of 3:1 was seen. The age group of patients ranged from 20-70 years with the maximum number of patients in the age group of 60 – 70 yrs. Majority of patients had symptoms of abdominal distension and abdominal pain followed by constipation and vomiting. Plain skiagram of the abdomen was diagnosis of 95% of the patients. The operative procedures undertaken in 23 cases of Sigmoid Volvulus were primary resection and anastomosis and 5 were gangrenous for which Hartmann's procedure was done. This study shows that for non-gangrenous bowel, primary resection and anastomosis is ideal and Hartmann's procedure is best choice for gangrenous bowel.

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