

## ORIGINAL ARTICLE

# CHOICE OF OPERATIVE TECHNIQUE FOR EMERGENCY CASES OF SIGMOID VOLVULUS IN A TERTIARY CARE HOSPITAL OF GUJARAT

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## ABSTRACT

**Introduction:** Sigmoid volvulus is by far the most common type of volvulus, accounting for 75 to 90 % of all volvulus. Most common presenting symptom is abdominal pain and constipation. . It may be initially managed by sigmoidoscopy or rectal tube insertion but where fear of compromised vascular supply of the sigmoid colon is associated, immediate laparotomy after resuscitation must be undertaken to avoid gangrene and septic shock. The primary objective of the study is to demonstrate the most suitable procedure for management of patients with sigmoid volvulus needing emergency surgery.

**Methodology:** All patients presenting with volvulus and needing emergency operative intervention during 1 years duration from January 2010 to December 2011 were included in this study. Total 41 patients were included in the study of which 25 presented with gangrenous sigmoid colon on laparotomy and viable sigmoid colon was present in the remaining 16 cases. Comparison is done with respect to mortality and early morbidity associated with different operative procedures.

**Results:** Highest mortality i.e. 33.3% observed among patients who underwent primary resection and anastomosis without proximal colostomy. Wound infection was more common following all forms of stoma procedure.

**Conclusion:** Hartmann's procedure goes a long way in decreasing mortality due to sigmoid volvulus in the emergency setting.

**Key Words:** Volvulus, Sigmoidoscopy, Detorsion, Hartman's Procedure, Resection and anastomosis

## 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.<sup>1</sup>

Sigmoid volvulus occurs when the last part of the large bowel just before the rectum (the sigmoid shaped sigmoid colon) twists on its self. It is by far the most common type of volvulus, accounting for 75 to 90 % of all volvulus. Sigmoid volvulus accounts for up to 8 % of all cases of intestinal obstruction. It is commoner in the elderly, patients with chronic illnesses, those in long term institutions like nursing homes, and patients with mental illness. It can also be seen in children under the age of ten. Men are more often affected than women.<sup>2</sup> Common to all patients with this condition is

chronic constipation, which leads to a long redundant sigmoid colon with narrowing of the mesentery.

Volvulus of the sigmoid colon is commoner in Africans, Asians, and South Americans. This has been attributed to their consumption of high roughage diet.<sup>2</sup> It is common in India, Eastern Europe and Scandinavia.<sup>3</sup>

Most common presenting symptom is abdominal pain and constipation while vomiting is usually a late symptom. Usually, huge abdominal distension is present and erect abdominal skiagram reveals omega sign which is a distended loop of sigmoid colon filling the entire abdomen with its base in the left iliac region. It may be initially managed by sigmoidoscopy or rectal tube insertion but where fear of compromised vascular supply of the sigmoid colon is associated, immediate laparotomy after resuscitation must be undertaken to avoid gangrene and septic shock. Even following conservative detorsion, elective sigmoidectomy is

advocated due to high rates of recurrence. Various surgical procedures for sigmoid volvulus in the emergency setting are available with conflicting results emanating out of various studies regarding superiority of one procedure over the others.

The primary objective of the study is to demonstrate the most suitable procedure for management of patients with sigmoid volvulus needing emergency surgery. Also, a comparison is done with respect to mortality and early morbidity associated with various operative procedures viz, Hartmann's procedure, primary colonic resection and anastomosis and primary resection and anastomosis with proximal transverse loop colostomy.

**METHODOLOGY**

This study was done at department of Surgery of Surat Municipal Institute of Medical Education and Research (SMIMER), teaching hospital of Surat, city located in the southern Gujarat. All patients presenting with volvulus and needing emergency operative intervention during 1 years duration from January 2010 to December 2011 were included in this study. Patients who presented with sigmoid volvulus where de-rotation was possible with rectal tube placement were excluded from the study. Total 41 patients were included in the study of which 25 presented with gangrenous sigmoid colon on laparotomy and viable sigmoid colon was present in the remaining 16 cases. Surgical decision making regarding choice of surgical procedure depended upon the presence of gangrenous gut, time of presentation following onset of obstructive features, extent of proximal colonic dilatation, co morbidities and surgeon's preference.

Out of 25 patients with gangrenous sigmoid colon, 15 underwent Hartmann's procedure (sigmoidectomy with closure of rectal stump and proximal end colostomy) and 10 patients underwent sigmoidectomy with end to end anastomosis and proximal transverse loop colostomy. All patients underwent proximal gut decompression after sigmoidectomy to decrease abdominal distension and enable better abdominal closure.

Out of 16 patients with viable sigmoid colon, 10 underwent Hartmann's procedure and 6 underwent sigmoidectomy with primary end to end anastomosis of the colon. In all patients who underwent resection

with primary anastomosis without proximal colostomy.

Comparison is done with respect to mortality and early morbidity associated with these operative procedures viz, Hartmann's procedure, primary colonic resection and anastomosis and primary resection and anastomosis with proximal transverse loop colostomy.

Permission was obtained from the Institutional Ethical Committee of the Surat Municipal Institute of Medical Education and Research, Surat before commencing of the study. Confidentiality of the data collected was maintained strictly throughout the study. Data entry and analysis was done using Microsoft Excel.

**RESULTS**

Total 41 patients were included in the study of which 25 presented with gangrenous sigmoid colon on laparotomy and viable sigmoid colon was present in the remaining 16 cases. Out of these patients, 22 (53.65%) were males and 19 (46.34%) were females; 54% patients were over 60 years of age and only 12% patients were under 40 years of age. Average duration of presentation following onset of obstructive symptoms was 4.4 days.

Table 1 shows presence of co morbidities among the patients included in the study.

**Table 1: Co morbid conditions presents in the patients of Sigmoid Volvulus who had undergone emergency surgery (n=41) (multiple answers)**

| Co-morbid conditions      | Number of patients (%) |
|---------------------------|------------------------|
| Hypertension              | 12 (29.26)             |
| Diabetes Mellitus         | 8 (19.51)              |
| Neuropsychiatric disorder | 14 (34.14)             |
| Osteo-arthritis           | 9 (21.95)              |
| COPD/Asthma               | 3 (7.32)               |
| None                      | 4 (9.75)               |

Outcome was analysed in all groups by assessing complications, blood requirement and operating time. Operating times, intra-operative and postoperative blood requirement increased in patients who underwent primary anastomosis with/ without proximal colostomy.

**Table 2: Outcome following Surgery**

| Outcome following surgery | Gangrenous Gut (n=25) |  | Viable Gut (n=16)               |                  |
|---------------------------|-----------------------|--|---------------------------------|------------------|
|                           | Hartman's(n=15)       | Resection anastomosis with proximal Colostomy (n=10) | Resection and anastomosis (n=6) | Hartman's (n=10) |
| Mortality                 | 3                     | 2  | 2                               | 1                |
| Wound infection           | 5                     | 4  | 1                               | 4                |
| Burst abdomen             | 1                     | 1  | 1                               | 1                |
| Colostomy retraction      | 1                     | -  | -                               | 1                |
| Anastomotic leak          | -                     | -  | 2                               | -                |

Highest mortality i.e. 33.3% observed among patients who underwent primary resection and anastomosis without proximal colostomy. Wound infection was more common following all forms of stoma procedure. Incidence of burst abdomen was also highest (16.6%) in patients who did not have a proximal colostomy and underwent primary anastomosis following sigmoidectomy. Anastomotic dehiscence was seen in nearly 33.3% in this group. Two patients who underwent Hartmann's procedure initially needed relaparotomy due to colostomy retraction in the early postoperative period. All patients who underwent primary resection and anastomosis and had anastomotic leak were later converted to Hartmann's procedure but only one of them survived, the rest succumbing to sepsis.

## DISCUSSION

Depending upon patient's condition and choice of surgeon, any of the available treatment options can be selected for patients presenting with sigmoid volvulus. But non-operative de-torsion with sigmoidoscopy or rectal tube insertion followed by early elective sigmoidectomy is preferred in the emergency conditions to prevent recurrence.<sup>4,5</sup>

Surgeon should limit his choice to mesosigmoidoplasty or sigmoidopexy in emergency surgery where gut is viable to avoid the high risk of anastomotic leak associated with resection and anastomosis in the emergency setting.<sup>6</sup> But the recurrence rate is high after this procedures. Sigmoidectomy with or without anastomosis has gained agreement as definitive treatment of sigmoid volvulus by most of the authors.<sup>7,8</sup>

The average days of presentation are 4.4 days after onset of obstructive symptoms in our study. Thus, the chances of patients having advanced disease and increased incidence of ischemic and gangrenous bowel is more. Also, most patients were elderly and with comorbidities thus increasing the risk of complications and morbidity/mortality following surgical intervention.

It has been documented previously by various studies that in the presence of gangrenous gut, Hartmann's procedure is the surgical intervention of choice as primary resection and anastomosis is associated with an unacceptably high mortality.<sup>9</sup> Comparing mortality rate of different procedures in our study, mortality was highest i.e. 33.33% in those undergoing resection and primary anastomosis only followed by 20% in patients undergoing Hartmann's procedure with gangrenous gut, 20% in those undergoing primary anastomosis with a proximal colostomy and least in patients undergoing Hartmann's procedure with viable gut(10%). Also, the increased mortality in the group undergoing resection and anastomosis with proximal colostomy may be explained by the increased operating time and blood requirement intraoperatively and postoperatively in compromised patients with poor

general condition. One of the most important factors involved in success of resection and primary anastomosis is the surgeon's experience.<sup>10</sup>

In our hospital, like most other institutes in India, the same sets of surgeon are deputed for emergency surgery for a period of 24 hours. Also, emergencies are handled mainly by emergency surgeons and residents, the junior most tiers of surgeons in the institute. Thus, surgical skill and experience also becomes an important issue in the success of anastomosis done under less than optimal conditions. Another factor is surgeon fatigue. As evident in the results, 78% of surgeries started beyond midnight. But after a surgical day spanning over 18 hours and often comprising more than six major emergency surgeries, surgeon fatigue also has a major bearing on the quality of the anastomosis. In this study, it was found that there was anastomotic leak in all 2 of the 6 primary anastomosis (without colostomy) done beyond midnight. Thus, keeping this factor of surgeon fatigue in mind, even in cases of viable gut, in most patients operated beyond midnight, Hartmann's procedure was done, limiting mortality to the least.

## CONCLUSION

Sigmoid volvulus is a surgical emergency. If possible, conservative (non-operative) de-torsion with elective sigmoidectomy is the procedure of choice. If emergency surgery is indicated, Hartmann's procedure should be the procedure of choice especially if done beyond midnight by less experienced surgeons towards the end of an operative schedule. Thus, Hartmann's procedure goes a long way in decreasing mortality due to sigmoid volvulus in the emergency setting.

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