VARIOUS SURGICAL OPTIONS FOR EMERGENCY MANAGEMENT OF SIGMOID VOLVULUS

Munir Ahmad[1], Shahid Alam[2], Saeed Amer[3], Nadim Khan[4], Liaqat Ali Shah[5], Muzafar Uddin Sadiq[6], Nasir Ahmad[7]

ABSTRACT

Objectives: *The objective of this study was to compare the outcome of various surgical options for the emergency surgical management of sigmoid volvulus.*

Methodology: *This comparative study was conducted in emergency department of postgraduate medical institute Lady Reading Hospital, Peshawar over a period of one year from February 2007 to January 2008. Study comprised of hundred cases to have sigmoid volvulus on clinical and radiological grounds operated in casualty department with various surgical options and outcomes of these procedures were determined postoperatively.*

Results: *Out of 100 cases, 79% were males and 21% females. Majority 51% patients were in the age range of 41-60 years, 36% patients were in age group of 61-80 years. Resection and Hartman's procedure was performed in 52% cases, resection with primary anastomosis with covering colostomy in 18% cases, resection and primary anastomosis in 15% cases, and resection with double barrel colostomy (Paul Mikulicz) in 15% cases. Wound infection/ dehiscence occurred in 21% cases, intra-abdominal abscess in 9% cases, anastomosis leakage in 6% cases. Colostomy complications included bleeding in 7% cases, retraction in 7% patients, prolapse in 4% cases.*

Conclusion: *Resection and Hartmann procedure was performed in majority of patients. Wound infection/dehiscence, intra-abdominal abscess, anastomosis leakage were common postoperative complications with various frequencies.*

Key Words*: Sigmoid-Diseases-Surgery, Colonic-surgery, Intestinal-obstructions-surgery, Treatment-outcome.*

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INTRODUCTION

Sigmoid volvulus is defined as an abnormal twisting of the sigmoid colon around its mesentry, is the most frequent cause of colonic obstruction[1].

Sigmoid volvulus has been recognized since ancient Egyptian times by physicians and surgeons, with methods of treatment evolving over many centuries[2].

[1-7]Department of Surgery, Lady Reading Hospital, Peshawar - Pakistan

Address for Correspondence:
Dr. Munir Ahmad,
Junior Registrar,
Department of Surgery,
Lady Reading Hospital, Peshawar - Pakistan
E-mail: drmahmad29@yahoo.com

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This condition is much more common in the developing world, where sigmoid volvulus accounts for 50% of all bowel obstructions as compared with 5% in the developed world[6].

The causes of sigmoid volvulus include, irregular bowel habits, consumption of high fiber bulky diets which appear to overload the sigmoid colon. The gut elongates and dilates gradually and subsequently undergoes volvulus[3].

Presentation varies in severity and acuteness, with younger patients appearing to develop the more acute form. Abdominal distension is an early and progressive sign which may be associated with hiccough and retching, vomiting occurs late. Constipation is absolute. In the elderly a more chronic form may be seen. A plain radiograph shows massive colonic distension. The classic appearance is of a dilated loop of bowel running diagonally across the abdomen from right to left with two fluid levels seem, one within each loop of bowel[7].

The actual treatment at laparotomy depends on whether the colon is gangrenous or not[9]. Gangrenous colon requires immediate excision. Untwisting under these circumstances is not advised as this can result in irreversible shock. In the presence of gangrene, resection is followed by a colostomy and mucous fistula or Hartman's procedure, depending on the surgeon's experience and preference, as well as whether or not it is possible to bring the distal loop to the skin. This appears the best option, as these patients are often shocked and acidotic [8]. The mortality rate averages 38% in those with gangrene, eight times higher than when the colon is viable. The effect of the choice of operation remains unclear and there is little evidence that it influences survival. It is in fact likely that the presence of the gangrenous bowel was responsible for the high mortality associated with emergency operations, rather than the choice of surgical procedure[9].

Prognosis of sigmoid volvulus depends upon early diagnosis and prompt intervention. For example, expected mortality of sigmoid volvulus is 10% to 15% in early cases while it rises to 52% when the diagnosis is delayed. Mortality above 10% is believed to be the "mortality of delay" [11].

The management of volvulus of sigmoid colon remains controversial [12]. The conservative methods include detorsion by enema, endoscopic decompression or minilaparotomy with colopexy. Depending upon the general status of the patient, viability of the gut and the surgeon experience, various operative procedures are available for management of sigmoid volvulus includes:

(1) Resection with primary anastomosis.

(2) Resection and primary anastomosis with transverse colostomy.

(3) Resection with double barrel colostomy (Paul Mikulicz).

(4) Resection and Hartman's procedure[3].

The rationale of this study was to standardize a surgical procedure best suited for the emergency surgical management of sigmoid volvulus according to the facilities available in our emergency setup.

METHODOLOGY

This comparative study was conducted in emergency department of Lady Reading Hospital, Peshawar over a period of one year from February 2007 to January 2008. All adult patients greater than 14 years of both sexes who presented to emergency department with large gut obstruction and suspected to have sigmoid volvulus on clinical and radiological evidence were included and patients having other causes of intestinal obstruction e.g. tuberculosis, obstructed inguinal hernia, volvulus of small intestine, carcinoma of colon and rectum, postoperative adhesions, etc. and with co-morbid conditions with sigmoid volvulus were excluded.Simple selection technique was non- probality purposive sampling method that all cases were admitted to the casualty after fulfilling the inclusion and exclusion criteria and provided printed Performa.

Informed consent for operation as well as about stoma was taken from the patients or relatives. Detailed clinical and per-rectal examination was done and detailed history of past and present illness was taken from the patients or relatives. Routine investigations for example x-ray abdomen, blood urea, serum creatinine, serum electrolytes, Hb, HCT, were performed and special investigation i.e. X-ray abdomen (erect) was done for the confirmation of sigmoid volvulus. The diagnosis was based on history, clinical examination and radiological findings. All the patients were resuscitated before surgical intervention by administration of intravenous fluids, antibiotics, nasogastric decompression and catheterization. After pre-operative management all the patients underwent emergency laparotomy. At emergency laparotomy, type of surgery for example resection and primary anastomosis with transverse colostomy, resection with primary anastomosis, resection with double barrel colostomy (Paul Mikulicz), resection and Hartman's procedure, etc. was decided on the general physical condition of patients and condition of the sigmoid volvulus. Due to non-availability of sigmoidoscope/colonoscope in surgical emergency department, we operated our patients after initial resuscitation and correcting fluid and electrolyte imbalance.

The outcomes of the procedures were measured in term of postoperative complications e.g. wound dehiscence, anastomotic leakage, colostomy complications, bleeding prolapse, retraction.

All this information, operative findings and postoperative complications etc. were recorded.

All the qualitative variables like demographic features, type of operative method, postoperative complications like wound dehiscence, anastomotic leakage, colostomy, prolapse, retraction, were analyzed for descriptive statistics. For quantitative variables for example age, means, $\pm$ standard deviation was calculated. For sex-wise distribution male to female ratio was calculated.

The results were expressed/presented

through frequency tables, graphs and charts. All the data was analysed by using computer program SPSS version 12. Due to the nature of the study design (comparative) chi square test was applied.

RESULTS

A total of 100 patients with suspected sigmoid volvulus were included in this study. There were 79 (79%) males and 21 (21%) females, with a male to female ratio of 3.76: 1 (Figure 1).

The age of patients ranged between 25-95 years. In this study the mean age was 59.93 while the standard deviation was ± 14.65 (Table 1).

Per-operative findings showed that sigmoid colon was grossly distended and redundant sigmoid colon was observed in majority 96 (96%) patients, whereas gangrenous patches were present in 4 (4%) patients (Table 2).

Different types of operative procedures were performed in all these patients presenting

Figure 1: Male to Female Ratio = 3.2: 1

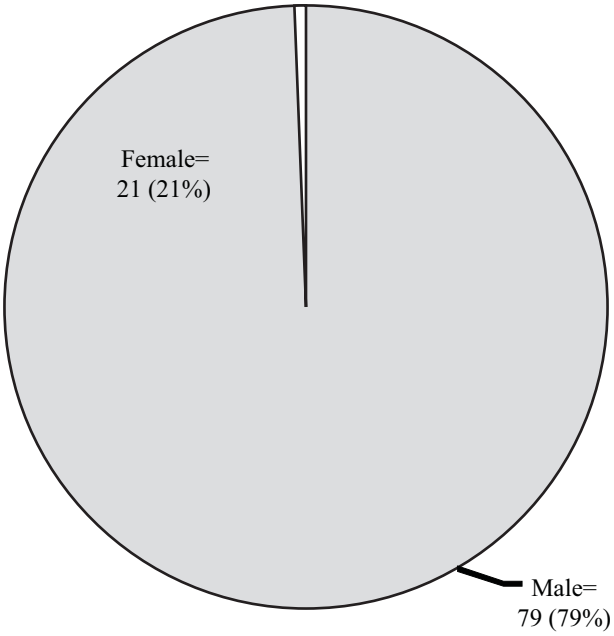

Table 1: Age-wise distribution of patients (n=100)

Age Range	No. of Patients	Percentage
21-40 years	09	09%
41-60 years	51	51%
61-80 years	36	36%
Above 80 years	4	4%

Minimum age = 25 years, Maximum age = 95 years,
Mean age was 59.95 ±14.65 years

Table 2: Per-Operative Findings in Patients (N=100)

Finding	No. of Patients	Percentage
Grossly distended and redundant sigmoid colon	96	96%
Gangrenous patches	04	04%
Total	100	100%

Table 3: Types of Operative Procedures Done (n=100)

Procedure Done	No. of Patients	Percentage
Resection and Hartman's procedure	52	52%
Resection with primary anastomosis with covering colostomy	18	18%
Resection and primary anastomosis	15	15%
Resection with double barrel colostomy (Paul Mikulicz)	15	15%
Total	100	100%

Table 4: Postoperative Complications in Various Procedures (n=100)

Complication	Resection/primary anastomosis (n=15)	Hartman's procedure (n=52)	Resection E to E anastomosis with colostomy (n=18)	Resection and double barrel colostomy (n=15)	P-value
Wound infection/ dehiscence	4 (26.66%)	8(15.38%)	5 (27.77%)	4 (26.66%)	.559
Intra-abdominal abscess	2 (13.33%)	3(5.76%)	3 (16.66%)	1 (6.66%)	.437
Anastomosis leakage	5 (33.33%)	-	1 (5.55%)	-	.000
Colostomy complications:					
Bleeding	-	1 (1.92%)	5(27.77%)	1 (6.66%)	-
retraction	-	3 (5.76%)	3(16.66%)	1 (6.66%)	
Prolapse	-	2 (3.84%)	2(11.11%)	-	
Stenosis	-	2 (3.84%)	-	-	

with sigmoid volvulus as shown in Table 3.

Different post-operative complications among various procedures and colostomy as shown in Table 4.

Anastomosis leakage occurred in 5/15 (33.33%) cases of resection and primary anastomosis on 3rd and on 4th postoperative day in 1/18 (5.55%) case of resection with primary anastomosis with colostomy. Both cases were re-explored and colostomy was performed.

DISCUSSION

Sigmoid volvulus is a common cause of large gut obstruction in developing countries. According to few local studies it is also a very serious condition in Pakistan[3,5,13,14], and its frequency is more among Pathans of North West Pakistan[3].

In this study male to female ratio was 3.76:1, which is comparable to one reported by Turan M[1], Heis HA et al[16], and Agaoglu N, et al[18]. This ratio is lesser as compared to other studies as

Taj MH et al[5], Bhuiyan MM and colleagues [19] reported a ratio of 9:1 and Zarin M et al[3] reported a ratio of 6:1, while Mohtasimbillah[14] reported a ratio of 10:1. The low ratio rate in our study may be probably due to the small sample size and a short study period. The other reason could be that in this province (by tradition) females are restricted to seek medical treatment from male doctors. It is also documented that the low incidence rate in females is due to the fact that females have a wider pelvis and a lax abdominal wall.

The mean age in our study was 59.93 years which is comparable to that reported by Heis HA et al[16] and Manzoor A and Muhammad A[20]. While in an Indian study the mean age was 49 years[11] which is a little higher than the aforementioned studies.

Intestinal obstruction is a clinical diagnosis based on symptoms of vomiting, abdominal distension, constipation, and radiological findings of dilated bowel[21].

Sigmoid volvulus classically presents in the seventh or eighth decade, therefore, diagnosis of sigmoid volvulus in an adolescent may be delayed or missed. This life-threatening diagnosis should be considered in young patients presenting with abdominal pain, nausea, vomiting, and constipation[22].

Different routine investigations were performed in all cases of sigmoid volvulus. Serum electrolytes, was normal in 99% cases. Special investigations were done to confirm the clinical diagnosis of sigmoid volvulus, e.g. x-ray abdomen (erect) showed positive sigmoid volvulus in 80% cases, distended large gut in 17% cases, coffee bean sign in 1% case, and it was inconclusive in 1% case. Similar findings are also reported by others authors[3,517,25].

Per-operative findings in patients with sigmoid colon showed that sigmoid colon was grossly distended and redundant in majority of 96% cases while gangrenous patches were present in 4% of cases. As there are few studies done in our country on sigmoid volvulus, so there are no results matching these findings.

The management of sigmoid volvulus remains controversial. In a study conducted by Akcan A et al [23] reported a total of 136 patients with noncomplicated sigmoid volvulus who had undergone emergency surgery within the last 15 years were evaluated retrospectively. Sigmoid resection plus Hartmann colostomy was performed in 45 patients, and sigmoid resection plus primary anastomosis was performed in 91 patients. While in our study of 100 patients with sigmoid volvulus, in majority of patients that is 52% resection plus Hartmann's procedure was performed, resection with primary anastomosis with covering colostomy was performed in 18% cases, resection and primary anastomosis was performed in 15% cases, and resection with double barrel colostomy (Paul Mikulicz) procedure was performed in 15% cases. Performing these various procedures in all our patients with different frequencies was due to two reasons (1) first our aim was to identify the outcome of these procedures in patients with sigmoid volvulus and (2) in some cases, condition of the patient and nature of the sigmoid volvulus was the reason to decide the type of operation at the laparotomy. Same procedures have been reported in a large study of 827 patients who's records were reviewed retrospectively. They concluded that in surgical treatment, resection and primary anastomosis is the first choice, and it can be performed with acceptable mortality and morbidity rates if the patients is stable and a tension-free anastomosis is possible[24]. While in contrast to these findings our results showed that resection plus Harmann's procedure was the best option for emergency treatment of sigmoid volvulus in majority of our cases with less postoperative complications with better outcome. Most of our patients were reffered from periphery where they were treated conservatively in periphery due to lake of facility.After diagnosing on peroperative we deside the procedure as most of them presented late. They were old and malnuitrioned and hemodynamically unstable. We avoid prolong duration of surgery as these patients can not tolerate prolong General Aneasthesia.

We are living in bomb blast zone area and due to heavy emergency our sterilization is poor and infection, burst abdomen are common.

Although resection and primary anastomosis is a single stage first choice procedure but our patients can not tolerate resection and primary anastomosis due general condition of the patients and peroperative findings.

The result of different postoperative complications in patients with sigmoid volvulus in our study were; intra-abdominal abscess, wound infection/dehiscence, anastomosis leakage with different frequencies in different procedures. These results are similar to those reported in different studies [3,14,26]. Colostomy related complications like prolapse, retraction, bleeding and stenosis were also occurred in few cases in our study. In our study we use the various operative procedures for the management of sigmoid volvulus, our results showed that resection plus Harmann's procedure was the best option for emergency surgical treatment of sigmoid volvulus with less postoperative complications and better outcome.

CONCLUSIONS

Males were affected more than females. Resection plus Harmann's procedure found to be best option for emergency surgical treatment of sigmoid volvulus with less postoperative complications and better outcome.

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CONTRIBUTORS

MA conceived the idea & planned the study. SA, SA, NK, LAS & NA did the data collection & analyzed the study. MUS supervised the study. All the authors contributed significantly to the research that resulted in the submitted manuscript.