



PRIMARY RESECTION AND SINGLE LAYER INTERRUPTED EXTRAMUCOSAL (SEROSUBMUCOSAL) ANASTOMOSIS FOR THE MANAGEMENT OF SIGMOID VOLVULUS

Surgery

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ABSTRACT

Volvulus is a major health problem in parts of Africa, Iran, India, Pakistan, Turkey and South America.¹ In 90% of volvulus cases sigmoid colon² is involved causing acute intestinal obstruction. Since the risk of recurrence is high up to 40% after non operative detorsion of sigmoid, an elective sigmoid colectomy and anastomosis should be performed after adequate bowel preparation. The goal of this study was to compare between single layer interrupted extramucosal (serosubmucosal) anastomosis and double layer anastomosis.

Materials and methods: Total 38 patients of sigmoid volvulus were enrolled for this prospective study from august 2018 to January 2020. These cases were managed by primary resection and anastomosis. Single layer extramucosal repair was done in 17(44.7%) patients and double layer repair done in rest 21(55.2%) patients. These two methods of repair were compared by analyzing time taken by surgeon, postoperative complications and uneventful recovery of patients.

Conclusion: After resection of sigmoid volvulus, single layer extramucosal repair have advantage over conventional double layer repair.

KEYWORDS

Volvulus, anastomosis, serosubmucosal, extramucosal

INTRODUCTION

A revolution occurs in surgical practice in nineteenth centuries due to advances in anesthesia, antisepsis and blood transfusion.⁵ As a result human body and organs were exposed to the art of surgery with increasingly dramatic outcomes. Volvulus (figure-1) occurs when an air-filled segment of the colon twists about its mesentery. In 90% of volvulus cases sigmoid colon is involved, but it may be seen in caecum or transverse colon.² Ballantyne in a collected series of 546 cases of volvulus found that in 60.9% cases the involved part was sigmoid colon, and caecum and transverse colon was involved in 34.5% and 3.6% cases respectively.⁴ A volvulus may reduce spontaneously but more commonly it leads to bowel obstruction, which may progress to strangulation of the involved segment causing gangrene and perforation. Volvulus is a major health problem in parts of Africa, Iran, India, Pakistan, Turkey and South America.¹

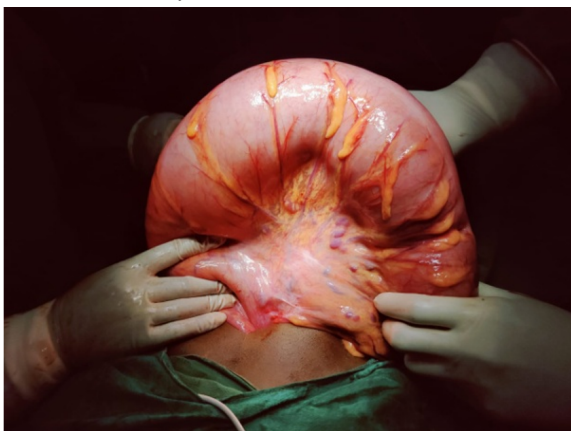


Figure-1 Sigmoid volvulus (without sign of gangrene)

The treatment of sigmoid volvulus has evolved from attempts to untwisting the involved bowel loop non-operatively, as advocated by Hippocrates to definitive surgical therapy. If patient's vitals are stable and there is no obvious sign of gangrene or intestinal perforation, initial management is resuscitation followed by detorsion. Since the risk of recurrence is high up to 40% after non operative detorsion of sigmoid, an elective sigmoid colectomy and anastomosis should be performed after adequate bowel preparation. The sin-qua-non of any

intestinal anastomosis is the viable bowel ends must be held in opposition without tension for sufficient length of time. The conventional two layer anastomosis has been the established norm. Healing takes place on serosal aspect and all coat apposition doesn't contribute to this. Two layer anastomosis may be associated with necrosis between sutures by strangulation. Louis P. Gambee et al reported that colonic anastomosis should be done by single layer anastomosis. On the basis of their clinical experience they concluded following points:² (1) single layer anastomosis was easier to perform under relatively adverse condition, (2) minimal disturbance of blood supply, (3) lack of encroachment on bowel wall, (4) less chances of obstruction, (5) easier in joining the bowel ends of unequal diameter, (6) occurrence of minimal anastomotic complication. Goligher J.C. in a review of technique of anastomosis has concluded that single layer technique is slightly superior than the double layer.⁶ **Aims and objectives:** Considering the above facts present study was done to compare the mortality and morbidity associated with single layer extramucosal and double layer anastomosis and to identify the benefits of single layer interrupted extramucosal anastomosis.

MATERIAL AND METHODS

Data of total 38 patients were analyzed for this prospective study from Department of General Surgery in Rajendra Institute of Medical Sciences, Ranchi from august 2018 to January 2020.

1. Study design- prospective study
2. 38 patients enrolled
3. Inclusion criteria
 - Both male and female patients were included
 - Patients of age 30 to 60 years
 - Patients with pain abdomen, abdominal distension, sign of obstruction or perforation with X-ray abdomen showing feature of sigmoid volvulus
4. Exclusion criteria
 - Traumatic perforation of colon
 - Chronic large bowel obstruction due to malignancy
5. Investigation done
 - Routine surgical investigation
 - X-ray abdomen erect view
 - USG abdomen and pelvis
6. Management- resuscitation followed by primary repair and anastomosis (single layer extramucosal or double layer)

RESULTS AND DISCUSSION

During the study period conducted from august 2018 to January 2020,

187 cases of intestinal obstruction were admitted from emergency department. Out of these 187 cases, 38 (20%) cases were of sigmoid volvulus. Out of 38 patients, distension and constipation were main symptom in 32 (84.21%) and 30 (78.94%) cases respectively, while pain abdomen present in only 18 (47.36%) cases.

Different types of anastomosis: Out of 38 patients operated for sigmoid volvulus, single layer extramucosal anastomosis done in 17 cases and double layer anastomosis done in 21 patients (table-1).

Table-1 Different types of anastomosis

Type of anastomosis	male	female	total
Single layer extramucosal anastomosis	12	5	17
Double layer anastomosis	15	6	21
total	27	11	38

Time taken by surgeon in performing different type of anastomosis: Hamilton J.E. in 1967 investigated 186 anastomosis with two layer and single layer anastomosis and concluded that time required in double layer anastomosis is more than single layer anastomosis.⁷ In our study mean time required for performing double layer anastomosis was found to be 36 minute while single layer extramucosal took 22 minute (table-2).

Table-2 Time taken by surgeon in performing different type of anastomosis

Types of anastomosis	No of patients	Mean time (minute)
Single layer extramucosal anastomosis	17	22
Double layer anastomosis	21	36

Uneventful recovery and complication: Recovery was comparatively uneventful without any complications in patients with single layer extramucosal anastomosis. Uneventful recovery occurs in 12(70%) patients with single layer extramucosal repair as compared to only 8 (38%) patients with double layer repair (table-3).

Table-3 Uneventful recovery and complication

	Single layer extramucosal	double layer
Uneventful recovery	12 (70%)	8 (38%)
Complication	5 (30%)	13 (62%)
Total	17	21

Operative morbidity status of single layer extramucosal Vs double layer repair: older patients have higher incidence of postoperative complications like wound infection, anastomotic leak, electrolyte imbalance and burst abdomen due higher incidence of malnutrition and vitamin deficiency. Buchin R. and Van Geetruydan .C. concluded that single layer anastomosis was associated with lower incidence of anastomotic and postoperative intestinal dysfunction in comparison with double layer repair. Car I.J. Heifetz in their comparative study of 50 patients with double layer anastomosis and 50 patients with single layer anastomosis conclude that flatus and stool passage occurred one day earlier in single layer anastomosis. Matheson N.A. and Irving A.D. et al in their study of single layer anastomosis after rectosigmoid resection in 52 consecutive patient's total incidence of suture line leakage was 6 percent.⁶ In our study postoperative morbidity was significantly less in patients in which repair was done with single layer extramucosal repair (table-4) (chart-1).

Table-4 Postoperative complications

Type of anastomosis	wound infection	Anastomotic leak	electrolyte imbalance	burst abdomen	mean length of hospital stay
Single layer extramucosal	5 (13.1%)	2 (5.3%)	7 (18.4%)	2 (5.3%)	13day
Double layer	9 (23.7%)	4 (10.5%)	11(28.9%)	6 (15.7%)	17 day

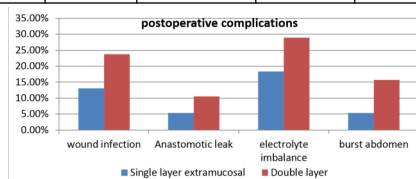


Chart-1 Postoperative complications

CONCLUSION

According to my prospective study on sigmoid volvulus following conclusion were drawn

1. Sigmoid volvulus is one of the commonest causes of large intestinal obstruction.
2. Study show male predominance (2.4:1)
3. Presenting clinical features are pain abdomen, abdominal distension, absolute constipation and rectal ballooning on DRE.
4. Clinical feature suggestive of gangrenous changes are poor general condition of patient, tachycardia, hypotension with absent bowel sound.
5. Double layer anastomosis produces mucosal inversion and serosal apposition. There are chances of strangulation of mucosa due to damage of submucosal vascular plexus. It also leads to luminal narrowing.
6. Advantage of single layer interrupted extramucosal anastomosis: faster and easier to perform, minimal vascular compromise, strongest layer (submucosa) of gut involved in anastomosis, least chances of tissue necrosis and luminal narrowing, accurate layer to layer approximation and earlier vascularization, simple and more cost effective as compared to conventional double layer anastomosis, less morbidity and mortality.

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