



PROSPECTIVE STUDY OF EXTRAMUCOSAL SINGLE LAYER INTERRUPTED SUTURE VERSUS CONVENTIONAL TWO LAYER REPAIR OF INTESTINAL ANASTOMOSIS

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ABSTRACT

Objective: To compare the stricture formation after anastomosis. To study the retain of bowel function. Post-operative anastomosis leakage. To compare duration required to perform single and double layered intestinal anastomosis. To compare cost effective of suture material used in single and double layered intestinal anastomosis.

Methods: The patients selected for this study are those who were admit with various clinical conditions requiring resection and anastomosis of small or large bowel. A total of 50 patients were included in the study. The patients were alternatively allotted single-layered intestinal anastomosis group and double layered group.

Results: The mean age in group A was 41.4 years and in group B was 41.72 years. Ileal stricture was diagnosed in maximum number of patients i.e. 17 (34%) cases. In group A mean duration to perform anastomosis was 19.04 minutes to perform a single layer anastomosis and 28.8 in Group B. The mean difference between two groups was 9.76 minutes, and P value was <0.001 highly significant. In group A leak was observed in 1 (4%) and in Group B in 2 (8%) patients. The p value was not significant. One patient in Group B died due to septicemia and the other two recovered.

Conclusion: Single layer extra mucosal interrupted intestinal anastomosis can be constructed in significantly shorter duration. No dogmatic evidence was found that double layered anastomosis is superior to single layered closure of bowel anastomosis.

KEYWORDS : Single layer; double layer; duration; anastomotic leak

INTRODUCTION

Gastrointestinal anastomosis has been excited interest in our day to day surgical practice and aim of anastomosis is to make a sound alignment of bowel through which the contents will pass in as early as possible.

Patients undergoing resection anastomoses for various causes like bowel obstruction, incarcerated hernias, benign and malignant tumors of small and large bowel is not so uncommon.

Bowel anastomosis after resection of bowel may be either end to end anastomosis or side to side or side to end anastomosis depending on surgery and the operating surgeon. Different techniques of intestinal anastomosis are single, double layered closure, staples, glue, laser welding.^[1]

In double layered closure where mucosa and sero-muscular layers are sutured separately though there is more chance of strangulation of mucosa because of damage of submucosal vascular plexus^[4].

In single layer technique, only sero-muscular layer of gut wall is approximated. This technique incorporates the strongest layer (submucosa) of gut and causes minimal damage to the submucosal vascular plexus, anatomy is maintained and hence less chances of necrosis and superior to double layered closure^[5,6].

OBJECTIVES OF THE STUDY

AIM:

To study of extra mucosal single layer interrupted suture versus conventional two layer repair of intestinal anastomosis

OBJECTIVES

- To compare the stricture formation in bowel in single layer and double layer technique.
- To study the retain of bowel function.
- Post-operative anastomosis leakage.
- To compare duration required to perform single and double layered intestinal anastomosis.
- To compare cost effective of suture material used in single and double layered intestinal anastomosis.

MATERIALS AND METHODS

This study was conducted from March 2017 - May 2019 on all the

patients, who were admitted and operated in Department of surgery, S.N. Medical College, Agra.

METHODS

The patients selected for this study were those who were admitted with various clinical conditions requiring resection and anastomosis of small or large bowel. A total of 50 patients were included in the study. All the patients were above the age of 18 years and less than 60 years. Based on detailed history, thorough clinical examinations, radiological examinations and ultrasound of abdomen, the diagnosis was made. Those requiring anastomosis involving the esophagus, stomach & duodenum were excluded. The patients were alternatively allotted single-layered intestinal anastomosis group and double layered group. Informed written consent was obtained and the procedure and its probable outcome were well explained to patients.

Inclusion criteria:

- Patients undergoing resection and anastomoses of small bowel and large bowel at our hospital for causes like intestinal obstructions due to bowel ischemia, strangulated hernia, traumatic bowel injury, bowel tumors etc.
- Age more than 18 years and less 60 years.

Exclusion criteria:

- Esophageal, gastric and duodenal anastomosis.
- Age less than 18 years and more than 60 years.

RESULTS

Table-1: AGE DISTRIBUTION

Age Groups (Years)	Group A (Single Layer) n (%)	Group B (Double Layer) n(%)
20-30	5 (20%)	5 (20%)
31-40	8 (32%)	6 (24%)
41-50	6 (24%)	9 (36%)
51-60	6 (24%)	5 (20%)
TOTAL	25 (100%)	25 (100%)
MEAN AGE	41.4	41.32

In our study we had two groups, Group A (single layer) and Group B (Double layer). Maximum number of patients in group A (single layer) were in the age group of 31-40 years i.e. 08 (32%) and in group B (double layer) maximum number of patients were in the age group of 41-50 years i.e. 09 (36%). The mean age in group A (single layer) was

41.4 years and in group B (double layer) was 41.32 years.

Table-2: TYPE OF ANASTOMOSIS

Type of anastomosis	Group A (Single Layer) n (%)	Group B (Double Layer) n (%)
End to end	25 (100)	25 (100)
Side to side	-	-
End to side	-	-
Total	25 (100)	25 (100)

The study included three different types of anastomosis all together in both groups depending up on the position of the viscera. In both the groups end to end type of anastomosis was done in all of the cases, i.e. in group A (single layer) 25 (100%) patients and in group B (double layer) 25 (100%) patients. No side to side type of anastomosis or end to side anastomosis was performed in either of groups.

Table-3: COMPARISON OF MEAN DURATION OF ANASTOMOSIS BETWEEN TWO GROUPS

Groups	Range	Mean±SD	Mean difference	t* value	P value
	(Duration in minutes)				
Group A (Single Layer)	14 - 22	19.04±1.60	10.16	19.6	0.000
Group B (Double Layer)	25 - 35	28.8±2.02			

*Unpaired t test

Mean difference of duration between the two groups was found to be 10.16 and p value is 0.000 which is < 0.005 and is highly significant.

Table-4: COMPLICATION-ANASTOMOSTIC LEAK

COMPLICATION	Group A (Single Layer) n(%)	Group B(Double Layer) n(%)
ANASTOMOTIC LEAK	1 (2)	2 (4)

p = 0.5, not significant (chi-square test)

In our comparative study, overall complication in the form of anastomotic leak was noted in 3(6%) patients. Anastomotic was observed in group A (single layer) in 1 (4%) patient and occurred in group B (double layer) in 2(4%) patients. The p value was 0.5 (chi-square test).

Table-5: FINAL OUTCOME

Out come	Group A (Single Layer) n(%)	Group B(Double Layer) n(%)
DEATH	0 (0)	1 (4)
RECOVERED	1 (4)	1 (4)
ASYMPTOMATIC	24 (96)	23 (92)

p = 0.14 ns (fisher's exact test)

In this study two patients who had develop anastomotic leak in group B (double layer), among them 1(4%) patient responded well to conservative management and recovered. One more patient (4%) who had anastomotic leak in group B (double layer) died due to septicemia and rest 23 patients (92%) were asymptomatic. In group A (single layer) one patient (4%) developed anastomotic leak and recovered with conservative management. p value if found out to be 0.14 and was not significant.

Table -6: COMPARISON OF MEAN DURATION OF HOSPITAL STAY

Groups	Range	Mean±SD	Mean difference	t* value	P value
	(Duration in days)				
Group A (Single Layer)	5-14	7.32±1.72	0.6	1.002	0.322
Group B (Double Layer)	5 - 15	7.92±2.44			

*Unpaired t test

In our comparative study the mean duration of hospital stay in Group A was 7.32 days and in Group B it is 7.92 days. Mean difference being 0.6. Unpaired t test and p value shows that the comparison was insignificant.

DISCUSSION

The present study assessed the efficacy and safety of single layered

anastomosis in comparison with double layer anastomosis after intestinal resection and anastomosis. The study included two groups' single layer and double layer, each group had 25 cases altogether 50 cases. Cases were allotted to either group alternatively, requiring single layer anastomosis and double layer anastomosis for various clinical conditions of small and large bowel. Anastomosis was done at different levels of intestine and depending up on the position of the viscera. The efficacy of both groups were compared in terms of duration required to perform single and double layered intestinal anastomosis, study post-operative complications like anastomotic leak in single and double layered intestinal anastomosis, the outcome associated with single and double layered anastomosis and the duration of hospital stay in either of them.

In present series mean age in group A (single layer) was 41.4 years and in group B (double layer) was 41.32 years. In Gangat series mean age in group A (single layer) was 37.5 years and in group B (double layer) was 40.2 years.

In Khan RAA series, the arithmetical mean duration required to perform an anastomosis procedure was 20 minutes for single layer and 35 minutes for double layer. In Burch ET series duration required to perform a single layer anastomosis was 20.8 minutes and 30.7 minutes for double layer. In our study the mean duration required to construct a single layer anastomosis was 19.04 minutes and 28.80 minutes for double layered anastomosis. The difference in average time is statistically significant as p value is < 0.001 HS in present series.

Therefore in our series the time required to perform anastomosis is well within the average time.

The complication rate in our present series was 1 (4%) patient in single layer and 2 (8%) in double layered anastomosis. In Khan RAA series one (6%) patient had anastomotic leak in single layer and 2 (12%) of patients had anastomotic leak in double layer. Finally complication rates put all together double layer had more complication in terms of anastomotic leak in both series.

CONCLUSION

This prospective comparative study included fifty cases of various clinical conditions of small and large bowel requiring resection and anastomosis. The study had two groups, single layer and double layer comprising 25 cases in each group. Each group was evaluated and compared with respect to duration required, anastomotic leak in single and double layered intestinal anastomosis, outcome associated and the duration of hospital stay in single vs double layered bowel anastomosis.

Based on the results obtained in the present study following conclusions can be drawn:

- Duration required to perform a single layer intestinal anastomosis is significantly lesser when compared to double layer.
- There is no significant difference in anastomotic leak between two groups.
- There is no significant difference in duration of hospital stay in single vs double layered bowel anastomosis.

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