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ORIGINAL RESEARCH PAPER

Surgery

A COMPARATIVE STUDY BETWEEN SINGLE LAYER VERSUS DOUBLE LAYER INTESTINAL ANASTOMOSIS

KEY WORDS: Single layer anastomosis, Double layer anastomosis, Intestinal anastomosis, anastomotic leak,

Dr Sudhansu Sarkar* MS(surgery), Associate Professor, Department Of Surgery, Bankura Sammilani Medical College & Hospital, Bankura, W.B. *Corresponding Author

Dr Sourav Das PGT(Surgery), Department Of Surgery, Bankura Sammilani Medical College & Hospital, Bankura, W.B

ABSTRACT

A comparative study between Single Layer versus Double Layer Intestinal Anastomosis, was undertaken at Department of Surgery, Bankura Sammilani Medical College & Hospital, Bankura from April 2019 – September 2020, which included 74 patients, comprising 2 groups: Group A-Single layer and Group B- Double layer with equal number of patients randomly allotted in each group. More number of patients had anastomotic leak in Group B than Group A, though not statistically significant. Difference of Mean Duration of Anastomosis with both groups is statistically significant.Mean Duration of Hospital Stay with both groups is statistically insignificant. Although more number of patients had anastomotic leaks in Group B than Group A, it was statistically insignificant.

INTRODUCTION

This prospective study compares between single layer and double layer intestinal anastomosis. It is a critical procedure both in elective and emergency surgeries. There is a long history of bowel anastomosis which started in the early 19th century. Since then, the concept of creating a successful anastomosis has been under research. Investigators were interested to design a method that excluded the possibility of leakage following anastomosis. Late in 19th century, Billroth and colleague conducted the first successful manual anastomosis in intestinal surgery. In the early 19th century through the experimental work of Travers[2] and Lembert[3], double-layered intestinal anastomosis was first performed.

The single-layered interrupted anastomosis was first described by Hautefeuille[4] in 1976. In single layer technique, only seromuscular 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.

A recent Cochrane database review compared effectiveness of single layer versus double layer gastrointestinal anastomosis. Different studies say that single layer intestinal anastomosis is better than double layer intestinal anastomosis. And some studies say that there is no significant difference between the two groups of anastomosis. This study is being performed to find out which one is better among single layer interrupted extramucosal intestinal anastomosis and double layer intestinal anastomosis in terms of parameters like efficacy, safety, duration, post operative complications like anastomotic leak and duration of hospital stay in each group.

AIMS & OBJECTIVES

General objective:

The purpose of this study is to compare the utility of single layer extra-mucosal anastomosis over the double layer intestinal anastomosis in emergency as well as elective laparotomy cases.

Specific objective:

To compare the following parameters in respect to single layer versus double layered intestinal anastomosis

1 .To estimate duration required to perform single and double layered intestinal anastomosis
2 .To estimate duration of hospital stay in single and double layer bowel anastomosis
3. To study post operative complication like anastomosis leak in single and double layered intestinal anastomosis

MATERIAL AND METHOD

STUDY DESINGS: Hospital based prospective comparative study.

PLACE OF STUDY: Department of General Surgery, Bankura Sammilani Medical College and Hospital, Bankura, West Bengal.

DURATION OF STUDY: One and half year (April 2019 – September 2020)

STUDY POPULATION: Patient undergoing resection and anastomosis of small bowel and large bowel at their hospital in elective as well as emergency cases.

SAMPLE SIZE: 74 patient of either sex according to the inclusion and exclusion criteria

Case, control required or not: All study subjects are case, control not required.

Methodology.

This comparative study has been done on patient presenting at Department of Surgery, Bankura Sammilani Medical College and Hospital, Bankura, either in emergency or elective undergoing resection anastomosis of bowel from April 2019 – September 2020. The patients selected for this study are those who are requiring resection and anastomosis of small or large bowel. A total of 74 patients was included in the study. Based on detailed history, thorough clinical examinations, radiological examinations, and ultrasound of abdomen, the diagnosis is made. The study have two groups, Group A – Single Layer and Group B- Double Layer. Cases are alternatively allotted single layered anastomosis group and double layered group. Informed written consent was obtained. The procedure and its probable outcome were well explained. Single layer interrupted extra-mucosal anastomosis technique and double layer anastomosis technique is done by 3-0 vicryl.

PATIENT SELECTION

Inclusion criteria:

- Patients giving written informed consent.
- patients undergoing resection and anastomosis of small bowel and large bowel at our hospital (both elective & emergency) for cause like small bowel gangrene, strangulated hernia with Bowel loops content, small and large bowel tumors, intestinal ischemia.
- Age more than 18 years and less than 80 years

Exclusion criteria:

- Patients who are not willing to give written informed consent.
- pregnant women was not included in this study.
- Esophageal, gastric anastomosis.

A proforma were used to collect relevant information (patient data, clinical finding, lab investigations, follow up events etc) from all the selected patients.

STUDYVARIABLE(SPECIFIC PARAMETERS)

- Age, gender, parity, previous operation etc. is determined by detailed history taking and clinical examination.
- Pre operative work up
- Radiological investigations (Abdominal sonography, digital straight x-ray abdomen)
- Pre operative parameters as described above and subjective assessment of first assistant
- Post operative outcome regarding biochemical changes, complication & morbidities.

ETHICAL CLEARENCE-_This study has been conducted after getting due permission from Institutional ethical Committee and approval of The West Bengal University of Health Sciences.

RESULT AND ANALYSIS

In Group-A, the mean Age (mean± s.d.) of patients was 53.9730± 8.4803. In Group-B, the mean Age (mean± s.d.) of patients was 51.9459± 8.3098. Difference of mean Age with both Group is not statistically significant (p=0.3025).

In Group-A, 17(45.9%) patients were female and 20(54.1%) patients were Male. In Group-B, 16(43.2%) patients were female and 21(56.8%) patients were Male..In Group-A, 28(75.7%) patients had E to E Anastomosis type, 2(5.4%) patients had E to S Anastomosis type and 7(18.9%) patients had S to S Anastomosis type. In Group-B, 29(78.4%) patients had E to E Anastomosis type, 2(5.4%) patients had E to S Anastomosis type and 6(16.2%) patients had S to S Anastomosis type.

In Group-A, the mean anastomosis duration in minute (mean± s.d.) was 18.8919± 1.7124. In Group-B, the mean anastomosis duration in minute (mean± s.d.) was 29.1081± 2.2084. Difference of mean anastomosis with both Group is statistically significant (p<0.0001).In Group-A, 2(5.4%) patients had anastomotic leak. In Group-B, 5(13.5%) patients had anastomotic leak.Association of anastomotic leak vs group is not statistically significant (p=0.2333). In Group-A, the mean Hospital stay (mean± s.d.) of patients was 8.7027± 2.0530.In Group-B, the mean Hospital stay (mean± s.d.) of patients was 9.2162± 3.2243. Difference of mean Hospital stay with both Group is not statistically significant (p=0.4165).

DISCUSSION

Our study shows that in Group A, the mean Age of patients was 53.9730± 8.4803 In Group B, the mean Age of patients was 51.9459± 8.3098. Age distribution in both the groups is comparable. In Group A,17(45.9%) patients were Female and 20(54.1%) patients were Male. In Group B, 16(43.2%) patients were Female and 21(56.8%) patients were Male. Association of Sex vs. group is not statistically significant. Law W et al [8](2014) found that Age and sex difference was not significant.

We found that association of Diagnosis vs. group is not statistically significant (p=0.7121). Association of Procedure vs. group is not statistically significant (p=0.4361). In Group A, 28(75.7%) patients had E to E, 2(5.4%) patients had E to S and 7(18.9%) patients had S to S. In Group B, 29(78.4%) patients had E to E, 2(5.4%) patients had E to S and 6(16.2%) patients had S to S Association of Anastomotic type vs. group is not statistically significant (p=0.7626).

In this study in Group A, the mean Duration of anastomosis of patients was 18.8919± 1.7124. Group B, the mean Duration of anastomosis of patients was 29.1081± 2.2084. Difference of mean duration of anastomosis with both Group is statistically significant (p<0.0001).

In Shikata S et al [9](2012) found that the mean time taken for anastomosis in single layer versus in Double layer was statistically significant. {P-value <0.001}. Khan RAA et al The difference in average time (mean duration of anastomosis) is statistically significant as p value <.001.

Pathak A et al [10] (2012) found that the percentage of complications(Anastomotic leak) was more in double layer as compared to single layer but it was not statistically significant.

The complication rate in this study, In Group A, 2(5.4%) patients had anastomotic leak. In Group B, 5(13.5%) patients had Anastomotic leak. More patient in Group B had anastomotic leak then the Group A. Association of anastomotic leak vs. group is not statistically significant (p=0.2333).

In Sajid MS et al [11] (2018) found that among the 50 patient, no leakage was found in single layer group while 1 patient had leakage in double layer group which was statistically insignificant.khan RAA et al 1 (6%) patient had anatomotic leak in single layer and 2 (12%) of patient had anastomotic leak in double layer which is statistically insignificant. Burch JM et al [12] (2014) found that, there was no statistical difference between the two groups in anastomotic leak.

Bhargava GS et al [13](2011) found that there was no significant difference between the two groups in terms of anastomotic leak.Garude K et al [14](2003) found that the difference of anastomotic leakage rates between the two methods was not significant (p-0.05)

In our study shows that in Group A, the mean Duration of the Hospital stays of patients was 8.7027± 2.0530. Group B, the mean Duration of the Hospital stays of patients was 9.2162± 3.2243. Difference of mean Duration of the Hospital stays with both Group is statistically insignificant (p=0.4165).In Close K et al [15] (2000) found that Mean length of stay was more for Double Layer than Single Layer; though not statistically significant.Saboo R et al [16] (2012) found that mean length of stay was more for Double layer than Single layer which was significant.

Despite this study and previous other studies, it is still unclear which method is better in terms of safety and efficacy. Further studies are needed.

CONCLUSION

1. Single layer has lesser number of anastomotic leaks than double layer, but not statistically significant.
2. Single layer takes lesser time as compared to Double Layer which is statistically significant.
3. Difference of Mean Duration of Hospital Stay with both groups is statistically insignificant (p= 0.4165).

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