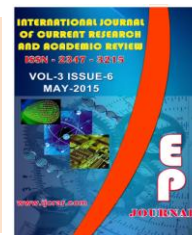




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A study on complications of single and double layered bowel anastomosis in a tertiary care hospital

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KEYWORDS

Single layer,
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A B S T R A C T

This prospective comparative study was conducted at Victoria hospital and Bowring & Lady Curzon hospitals attached to BMC & RI, Bangalore. The study had two groups, group A (single layer) and group B (double layer) and cases were allotted to either groups alternatively requiring single layer anastomosis and double layer anastomosis for various clinical conditions of small and large bowel after fulfilling inclusion and exclusion criteria. Single layer continuous extra-mucosal anastomotic technique was done using 3-0 PDS and double layer continuous technique with 3-0 vicryl & 3-0 mersilk. Duration was noted and all cases were followed up to discharge and subsequently for 2 weeks any complications like leak. 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 and resection of ileum and ileo ileal anastomosis was performed in maximum number of patients i.e. 19 (36%) 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. Overall complication in the form of anastomotic leak was noted in 3 patients (6%). 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 septicaemia and the other two recovered. No dogmatic evidence was found that double layered anastomosis is superior to single layered closure of bowel anastomosis..

Introduction

The intestinal anastomosis is a surgical procedure to establish communication between two formerly distant portions of the intestine. The procedure restores intestinal continuity after removal of a pathological condition affecting the bowel. Intestinal

anastomosis is one of the most commonly performed surgical procedures, especially in emergency setting and is also commonly performed in elective setting when the resection are carried out for benign or malignant lesions of the gastrointestinal tract

anastomotic leakage and dehiscence with high morbidity and mortality, 22% hospital mortality in patient with leak as compared with 7.1% without leak¹.

The anastomotic complications are also associated with increased hospital stay rose from 25.4 days for patient without anastomotic leakage to 45.7days for those with leakage respectively².

Various complications following bowel anastomoses are anastomotic leak resulting into peritonitis, abscess, fistula, necrosis, stricture. Various factors contribute to these complications like suturing technique, suture material, presence of concurrent sepsis, vascular compromise and so on. Leakage from the bowel anastomoses in the gastrointestinal tract is major complication and accounts for about 1.3 to 7.7%, that is often associated with increased morbidity and mortality and prolonged stay^{3,4}

In double layered closure where mucosa and seromuscular layers are sutured separately though haemostatic there is more chance of strangulation of mucosa due because of damage of submucosal vascular plexus⁵.

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^{6,7}.

This comparative study endeavours to compare outcome of single layer versus double layer intestinal anastomosis in small and large bowel in terms of duration required to perform intestinal anastomosis, post operative complications like anastomotic leak, Duration of hospital stay in each group.

Methodology

The comparative study was done on patients presenting to Victoria, Bowring and Lady Curzon hospital attached to BMC & RI, either in emergency or elective undergoing resection anastomosis of bowel from November 2011 to May 2013.

The patients selected for this study are those who were admitted with various clinical conditions requiring resection and anastomosis of small and large bowel. Based on detailed history, thorough clinical examinations, radiological examinations and ultrasound of abdomen, the diagnosis was made. These patients were subjected to the required pre operative investigations; after bowel preparation, ensuring fitness elective surgery was done. Cases were allotted to either group alternatively, requiring single layer anastomosis and double layer anastomosis for various clinical conditions of small and large bowel. Intestinal anastomosis was carried out in single layer continuous extramucosal technique with 3-0 PDS and double layer continuous technique with 3-0 vicryl taking through all layers and seromucosular layer with 3-0 mersilk.

Each case was analyzed with respect to duration required to perform intestinal anastomosis, post operative complications like anastomotic leak and the duration of hospital stay The duration of anastomosis begin with placement of first stitch on the bowel and ended when the last stitch was cut . All single layer anastomosis was done with PDS 3-0 pack which had a suture material of 90 cm length. For double layer, 3-0 vicryl was used taking through all layers and seromucosular layer with 3-0 mersilk pack which had suture material measuring 90 cm. Cost effectiveness is not studied here in our study. All cases were followed up to discharge and subsequently for a follow up period of 2 weeks. A minimum of 50 cases

with the following inclusions and exclusion criteria were selected for the study and were allocated alternatively to each of the comparative study group.

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

Results and Discussion

In our study, In Group A (single layer) there were 17 (68%) males and 08 (32%) females. In group B (Double layer) there were 15 (60%) males and 10 (40%) females.

This study included a total of fifty anastomosis at different levels of small intestine and large intestine. The maximum number of anastomosis in group A (single Layer) were performed at entero colic level in 12 (48%) patients, next at entero enteric site in 11 (44%) patients and least at colo colic site in 2 (8%) patients. In group B (double layer),out of 25 anastomosis maximum number of anastomosis were performed at entero enteric level in 13 (52%) patients, next common site for anastomosis was at entero colic site in 9 (36%) patients and followed by colo colic site in 3 (12%) patients.

In this comparative study, In group A(single layer) the minimum time required to perform anastomosis was between 10 to 15 minutes in 1 (4%) patient and maximum time was between 21 to 25 minutes in 2 (8)% patients, followed by 22(88%) patients between 16-20 minutes and no anastomosis took more than 25 minutes.

In group B (double layer) the minimum time required to perform anastomosis was between 21 to 25 minutes in 1 (4%) patients

and maximum time was between 31 to 35 minutes in 5 (20%) patients and no anastomosis required beyond 35 minutes. Maximum were done in between 26 to 30 minutes 19(76%). P value was <0.001 HS.

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)

In this study two patients who had developed 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 septicaemia 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 is not significant.

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

- 1) There is no significant difference in anastomotic leak between two groups.
- 2) There is no significant difference in duration of hospital stay in single vs double layered bowel anastomosis.

Table.1 Sex distribution

Gender	Group A (Single Layer) n (%)	Group B (Double Layer) n (%)
Male	17 (68%)	15 (60%)
Female	08 (32%)	10 (40%)

Table.2 Anastomotic site

Anastomotic site	Group A (Single Layer) n (%)	Group B (Double Layer) n (%)
Entero enteric	11 (44)	13 (52)
Entero colic	12 (48)	9 (36)
Colo Colic	2 (8)	3 (12)
Total	25 (100)	25 (100)

Table.3 Complication- anastomotic leak

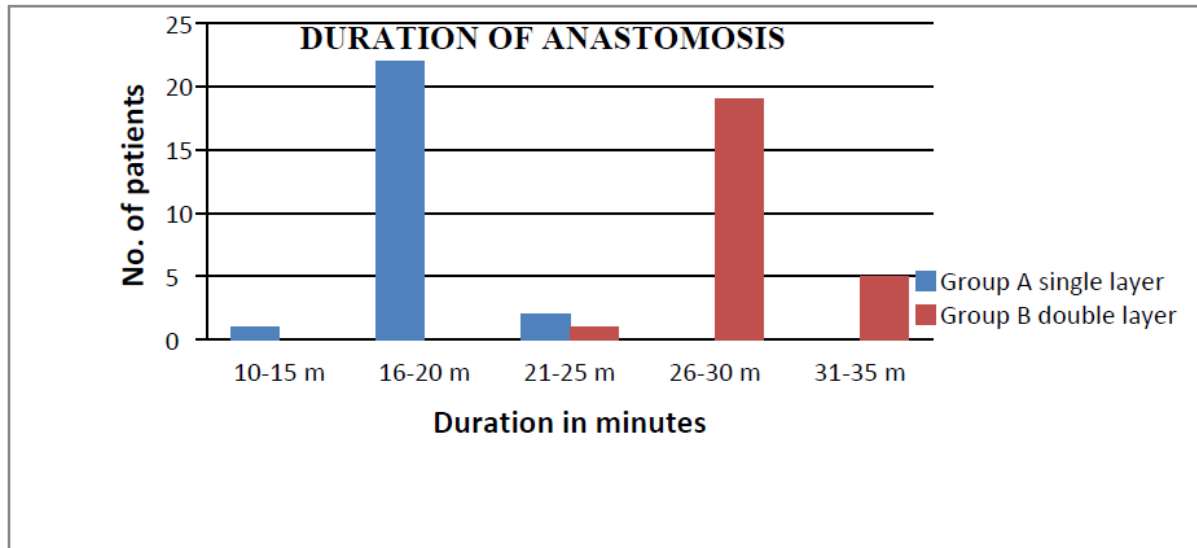
COMPLICATION	Group A (Single Layer) n (%)	Group B (Double Layer) n (%)
ANASTOMOTIC LEAK	1 (2)	2 (4)

Table.4 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)

Comparison of percentage of anastomotic leak in Khan RAA series with present series8



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