

Original Research Article

A comparative study of single layer versus double layer small bowel anastomosis

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ABSTRACT

Background: There are various gastrointestinal surgeries in which we require small bowel anastomosis. Bowel anastomosis is quite common in different bowel pathology. Bowel anastomosis can be done by hand sewn or y stapler. In hand sewn anastomosis, we can do single layer or double layer anastomosis.

Method: The study was carried out in 50 patients between August 2019 to March 2020. In this study, we have included all the patients who require small bowel end to end anastomosis in either elective surgeries or emergency surgeries. Patients who require proximal stoma formation and other than small bowel anastomosis are excluded. In present study, patients were randomly allocated in two groups: group A (n=25) includes single layer(interrupted) hand sewn bowel anastomosis and group B two layer (Connell and seromuscular) handsewn bowel anastomosis. Author have compared two groups in terms of intraoperative time and postoperative leak.

Results: This shows that there is significantly reduce in intraoperative time in group A patient while there is no significant difference in postoperative complication or postoperative leak between two groups.

Conclusions: There is no significant difference in single layer and double layer technique of bowel anastomosis.

Keywords: Single layer and double layer bowel anastomosis, Intraoperative time, Post operative complications

INTRODUCTION

Bowel anastomosis is a very common procedure in elective as well as emergency surgeries. Bowel anastomosis can be done by hand-sewn techniques or by stapler devices. Because of availability and affordability, hand-sewn bowel anastomosis is the mainstay technique. Bowel anastomosis depends on underlying disease condition, condition of bowel wall inflammation, site of the bowel as well as overall general condition of the patient.¹

Intestinal anastomosis has been performed successfully using a variety of techniques, materials and devices. Among the different methods, the method that has widely used in most situation and in the hand of most surgeons is

the two layer bowel anastomosis. Two layer bowel anastomosis is time consuming to perform. Recently several studies were done on single layer bowel anastomosis.²⁻⁸ Single layer bowel anastomosis requires less time, less costly and less risk of leakage.

Two layer bowel anastomosis has been adopted routinely by the most surgeons. But according to recent studies, it is revealed that As compared to double layer anastomosis, single layer anastomosis is cost effective, less time consuming and no increase in postoperative complications like leak.⁹

The objective of the study is to observe the bowel anastomosis technique with low post operative complication and minimum intraoperative time.

METHODS

This is an observational study. This study was conducted at tertiary care centre, Surat municipal institute of medical education and research, Surat. Sample was collected from August 2019 to March 2020 according to inclusion criteria.

Study population

All the patients of elective or emergency surgery who require bowel anastomosis and fulfilled inclusion criteria were taken as study population.

Inclusion criteria

All the patients with age >18 years who require bowel anastomosis either in emergency or elective surgery were included in the study.

Exclusion criteria

Patients with age less than eighteen (<18) years and patients who require stoma formation were excluded from the study.

All the patients who fulfilled inclusion criteria were prepared for laparotomy.

After proper anaesthesia, adequate painting and draping was done.

All these patients were divided into two groups.

In group A (n=25) patients, bowel anastomosis was done with silk 2-0 (round body) in interrupted manner.

In group B (n=25) patients, bowel anastomosis was done with vicryl 2-0 (round body) inner connell stitches and with silk 2-0 (round body) outer seromuscular interrupted stitches.

Each group was observed for intra operative time, postoperative complication.

Statistical data were analysed using χ^2 test, student's t test, independent sample T test as well as paired sample T test.

RESULTS

Important parameters in our study is intraoperative time and postoperative complication in group A and group B patients.

Number of elective and emergency surgery with bowel anastomosis in group A and group B is described in Table 1.

Table 1: Elective and emergency surgeries in group A and group B.

Variables	Group A	Group B
Elective surgery	5	4
Emergency surgery	20	21

Gender distribution in group A and group B is described in Table 2

Table 2: Male and female in group A and group B.

Variables	Group A	Group B
Male	15	14
Female	10	11

Intraoperative time taken in group A and B is described in Table 3.

Table 3: Intraoperative time in group A and B.

Time	Group A	Group B
<90 minutes	21	5
>90 minutes	4	20

So, Table shows there is overall lower intraoperative time require in group A patients than in group B patients.

Postoperative complications in group A and group B are described in Table 4

Table 4: Postoperative complications in group A and B.

Complications	Group A	Group B
Leak	0	0
Stricture	0	1

So, table shows there is 1 incidence of stricture in group B patients.

So, our study shows that there is decrease intraoperative time in group A patients than group B patients. There is no significant difference in postoperative complications in group A and group B patients. But there are chances of stricture in group B patients.

DISCUSSION

Bowel anastomosis is routinely performed in general surgery. Bowel anastomosis should be leak proof and it should not undergo stricture formation. But in certain condition like high risk patients, it is also important to reduce intraoperative time without compromising bowel anastomosis technique.

In double layer technique, submucosal vascular plexus may be compromised and there may be excessive inversion and inflammation of tissue leading to narrowing of lumen. Single layer anastomosis causes least damage to submucosal vascular plexus, least chances of luminal narrowing, incorporates strongest submucosal layer and accurate tissue apposition.¹⁰

To accomplish a two two-layer anastomosis, more meticulous circumferential clearing of mesentery, appendices epiploica and omentum is required before beginning the anastomosis and in single layer anastomosis, minimal circumferential clearing required. So, time required in single layer anastomosis is less.¹¹ the shorter operative time in single layer anastomosis is very helpful in patients with hemodynamically instability in emergency. This technique is also easily learned, flexible to apply.¹²

A meta-analysis analysing 670 patients revealed that there was no difference in postoperative leakage rate between two techniques.⁹

Ceraldi et al and Burch et al too revealed no significant difference in the rates of anastomotic leaks or abdominal abscess between the two techniques.^{7,11}

In prospective series of 553 single layer interrupted seromucosal anastomosis, the leakage rate was 0.2%.¹³

In some studies it is observed that postoperative return of bowel function was early in single layer anastomosis than in double layer anastomosis.^{14,15} While in some studies it is observed that there is no difference in return of bowel function between two techniques.¹⁶

In our study, it is observed that there is no significant difference in postoperative complication between single layer and double layer bowel anastomosis technique. There may be minimal chances of subclinical stricture formation in double layer bowel anastomosis. However, there is significant less intraoperative time required in single layer bowel anastomosis than double layer bowel anastomosis.

The limitation of this study is that patient with severe peritonitis with severe bowel inflammation, who require stoma formation, cannot be evaluated.

CONCLUSION

In bowel anastomosis, both techniques (single layer and double layer) are equally good and effective in preventing postoperative leak. So according to surgeon's preference both-technique can be used. But single layer bowel anastomosis significantly reduces intraoperative time. So, in emergency surgeries or in hemodynamically unstable patient where we need to reduce intraoperative time, single layer bowel anastomosis technique can be adopted.

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