



A COMPARATIVE STUDY OF SINGLE LAYER VERSUS DOUBLE LAYER INTESTINAL ANASTOMOSIS

General Surgery

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ABSTRACT

Background: Intestinal perforation requiring resection and anastomosis of the gastrointestinal tract (GIT) is a common surgical problem. This retrospective study was done to assess the efficacy and safety of single-layer versus double-layer intestinal anastomosis. **Method:** The study was carried out in 60 patients between February 2024 and December 2024. It included patients who required small bowel end-to-end anastomosis in either elective or emergency surgery. Patients who required proximal stoma formation and anastomosis other than small bowel were excluded. Patients were allocated into two groups: Group A (n=30), single-layer interrupted hand-sewn bowel anastomosis, and Group B (n=30), two-layer (Connell and seromuscular) hand-sewn bowel anastomosis. The two groups were compared in terms of intraoperative time and postoperative leak. **Results:** There was a reduction in intraoperative time in Group A patients, while there was no significant difference in postoperative complications or postoperative leak between the two groups. **Conclusions:** There is no significant difference between single-layer and double-layer techniques of intestinal anastomosis.

KEYWORDS

Single-layer And Double-layer Intestinal Anastomosis, Intraoperative Time, Postoperative Complications.

INTRODUCTION

Intestinal perforations due to infectious diseases, trauma, malignancy, etc., requiring resection-anastomosis of the gastrointestinal tract (GIT) or formation and closure of a temporary intestinal stoma are prevalent procedures in India. Currently, expert management of intestinal perforation is based on a detailed knowledge of epithelialization, protein synthesis, the biology of wound contraction, the surrounding milieu of the healing wound, ground substance, and the factors which affect healing [1,2]. The reported rate of failure of gastrointestinal anastomosis (GIA) ranges from 1.5% to 2.2%, depending on what type of anastomosis was performed, whether the operation was elective or an emergency procedure, general factors such as age, nutritional status and comorbid conditions, and local factors like vascularity, sepsis and suture technique. A leaking anastomosis dramatically increases the morbidity and mortality associated with the operation; it can increase the length of hospital stay, total cost of treatment and mortality [3].

METHODS

This is an observational study. This study was conducted at Government Medical College, Surat. Sample was collected from February 2024 to December 2024 according to inclusion criteria.

Study population

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

Inclusion criteria

All the patients with age >20 years who require bowel anastomosis either in emergency or elective surgery were included in the study. Exclusion criteria: Patients with age less than twenty (<20) 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=30) patients, bowel anastomosis was done with silk 2-0 (round body) in interrupted manner.

In Group B (n=30) 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 intraoperative time and 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 are 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	10	8
Emergency surgery	20	22

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	10	9
Female	20	21

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

Table 3: Intraoperative time in Group A and Group B.

Time	Group A	Group B
<90 minutes	21	8
>90 minutes	9	22

So, Table 3 shows there is overall lower intraoperative time required 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 Group B.

Complications	Group A	Group B
Leak	0	0
Stricture	0	2

So, table shows there is 2 incidence of stricture in Group B patients.

So, our study shows that there is decrease in 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 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 [4].

To accomplish a 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 is required. So, time required in single-layer anastomosis is less [5]. The shorter operative time in single-layer anastomosis is very helpful in patients with hemodynamic instability in emergency. This technique is also easily learned and flexible to apply [6].

Ceraldi et al. and Burch et al. revealed no significant difference in the rates of anastomotic leaks or abdominal abscess between the two techniques [7].

In a prospective series of 553 single-layer interrupted seromucosal anastomoses, the leakage rate was 0.2% [8].

In some studies it is observed that postoperative, return of bowel function was early in single-layer anastomosis than in double-layer anastomosis [9,10]. While in some studies it is observed that there is no difference in return of bowel function between the two techniques [11]. In this 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 significantly less intraoperative time required in single-layer bowel anastomosis than double-layer bowel anastomosis.

CONCLUSION

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

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