



ORIGINAL RESEARCH PAPER

General Surgery

COMPARATIVE STUDY OF SINGLE LAYER INTESTINAL ANASTOMOSIS AND DOUBLE LAYER INTESTINAL ANASTOMOSIS

KEY WORDS:

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ABSTRACT

Background: Gastrointestinal anastomosis is one of the most common procedures being performed in oesophagogastric, hepatobiliary, bariatric, small bowel and colorectal surgery. There are still conflicting views regarding suitability of single layer and double layer anastomotic technique. **Methods:** This comparative study was conducted at Patna Medical College and Hospital, Patna in which 48 patients were repaired with single layer anastomosis and 48 were repaired with double layer intestinal anastomosis. Single layer intestinal anastomosis was carried using extramucosal technique with 2-0 vicryl suture (round body). Double layer anastomosis was carried out using interrupted 2-0 vicryl suture for both inner (continuous) and outer (Interrupted) layer. End to end colocolic, end to side ileocolic, end to end ileoileal, side to side ileoileal, end to end jejunoleal and end to end jejunojejunal anastomosis were performed. Each group was compared for anastomotic leak, time required to construct the anastomosis and length of hospital stay. **Results:** The mean time taken for anastomosis (15±2 minutes in single layer anastomosis versus 32±5 minutes in double layer) and the length of hospital stay was same in both the groups. There was 1 anastomosis leak in single layer anastomosis group and 3 in double layer group. **Conclusion:** It can be concluded that single layered extramucosal continuous intestinal anastomosis is equally safe and perhaps more cost effective than the conventional double layered method and may represent the optimal choice for routine surgical practice.

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. Surgery stands major modality of treatment in such cases in diagnosis, treatment and even palliation in few situations. Bowel anastomoses after resection of bowel may be either end to end anastomoses and side to side or side to end anastomoses depending on surgery and the operating surgeon. Different techniques of intestinal anastomosis are single, double layered closure, staples, glue, laser welding¹. 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^{2,3}. 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 plexus⁴. 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^{5,6}. This comparative study is done 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.

MATERIALS AND METHODS:

The study was done on patients presenting to Patna Medical College and Hospital, Patna either in emergency or elective undergoing resection anastomosis of bowel from January 2018 to December 2018. 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 2-0 Vicryl round body and double layer continuous technique with 2-0 vicryl taking through all layers and seromuscular layer with 2-0 vicryl.

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 begins with placement of first stitch on the bowel and ended when the last stitch was cut. All single layer anastomosis was done with 2-0 Vicryl round body which had a suture material of 90 cm length. For double layer, 2-0 vicryl was used taking through all layers. All cases were followed up to discharge and subsequently for a follow up period of 6 weeks. A total of 96 cases with were selected for the study and were allocated alternatively to each of the comparative study group.

RESULTS:

A total of 96 participants were randomized. 48 patients were allocated to single layered extramucosal continuous anastomosis and 48 patients to double layered anastomosis. The patients in each group were well matched for age, sex and diagnosis.

Total 58 resection anastomosis and 38 stoma closure were performed. Out of the 48 anastomoses performed using the single layered method, the most common was ileostomy closure followed by ileo-ileal anastomosis. The double layered anastomosis was most commonly performed for ileo-ileal anastomosis followed by ileostomy closure.

The mean time taken for anastomosis 15±2 minutes in single layer anastomosis versus 32±5 minutes in double layer.

In this study the patient who had developed anastomotic leak on the 8th post-operative day responded well to conservative

management and recovered while rest patients were asymptomatic.

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 48 cases altogether 96 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 Khan RAA series⁷, the 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 layer⁸. In our study the mean duration required to construct a single layer anastomosis was 15 minutes and 32 minutes for double layered anastomosis.

The complication rate in our present series was 1 (2%) patient in single layer and 3 (6.25%) 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:

Considering the different parameters associated with these two surgical procedures, it may be concluded that the single layer extra mucosal technique is equally safe and efficacious as classical double layer technique. Thus, the findings of study affirms that single layer anastomosis can be trusted to be performed in the patients particularly economically poor one.

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