



STAPLED VERSUS HAND SEWN ANASTOMOSIS IN STOMA CLOSURE: A COMPARATIVE STUDY

General Surgery

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ABSTRACT

Background : Intestinal stoma is an opening of the intestinal tract into the abdominal wall. Stoma closure can be performed using either a hand sewn end to end anastomosis or stapled technique. **Aims and Objectives:** The aim of my study is to compare stapled and hand sewn anastomosis in terms of mean operative time and duration of hospital stay. **Materials and Methods:** Total number of 50 patients were included in the study. They were divided into 2 groups: Groups A (Hand sewn anastomosis) and Groups B(Stapled anastomosis) . Each group has 25 patients each. **Results :** Both groups were compared in terms of mean operative time and duration of hospital stay. It was observed that the mean operative time for hand sewn anastomosis was 147.88 minutes as compared to 95.60 minutes for stapled group. The mean hospital stay after procedure was 11.64 days in hand sewn anastomosis as compared to 8.20 days in stapled group. **Conclusion:** The stapled anastomosis is a better technique than hand sewn anastomosis in terms of mean operative time and postoperative hospital stay.

KEYWORDS

Stoma closure, Stapled anastomosis, Hand sewn anastomosis.

INTRODUCTION:

Intestinal Anastomosis dates back to 1000 B.C, the era of Sushruta "The Great Indian Surgeon" he described the use of black ants during the suturing of intestinal anastomosis.¹

Lembert then described his seromuscular suture technique in 1826 which became the mainstay of gastrointestinal anastomosis in the second half of the century. Then Kocker's method, a 2 layer anastomosis became the standard for many years.² Currently the single layer extramucosal anastomosis is popular, as advocated by Matheson of Aberdeen, as it probably causes the least tissue necrosis or luminal narrowing.³

Stoma is a Greek word for mouth or opening. An intestinal stoma is an opening of the intestinal tract into the abdominal wall.

Ileostomies were first described by the German surgeon Baum in 1879 and later by Bohemian surgeon Maydl in 1883.⁴

The maximum number of colorectal surgeries elective as well as emergency can be completed by primary continuity however a large number of patients will require a temporary stoma for a short period of time as a part of staged colorectal surgeries.⁵

Stoma formation is often a part of surgery for small bowel and large bowel pathology. The most common intestinal stomas are ileostomies and colostomies either end or loop stomas. Loop stomas are made when the loop of intestine are brought out on the surface of anterior abdominal wall and opened in order to divert the faeces which is collected in the bag so that faeces do not pass distally in the pathological segment. When the disease is cured, the stoma is closed by suturing or by stapled anastomosis and returned back in the abdominal cavity. On the other hand end stomas are permanent opening of part of intestine on the anterior abdominal wall.

The closure of stoma is traditionally undertaken 6-12 weeks after initial surgery.⁶ Routine closure of the stoma can be performed using either a hand sewn end to end anastomosis or various techniques using staples.⁷

There are different ways in which anastomosis can be created between two segments of a bowel. It may be end to end, side to end or side to side. The submucosal layer of intestine provides the strength of the bowel wall and must be incorporated in the anastomosis to assume

healing.

Anastomotic leakage is very serious and life threatening complication. ⁸ The frequency of anastomosis related complications are comparatively higher in emergency cases than elective cases. The reason seems to be that emergency patients undergo surgery unprepared.

The theory behind a good bowel anastomosis remains consistent whether a sutured or stapled technique is applied: the bowel ends must have

- good blood supply
- under no tension
- anastomosed with meticulous technique.⁹

So many studies concluded that both suturing and stapling have equal safety without much difference in postoperative anastomotic leaks.¹⁰ Anastomotic healing depends upon local as well as systemic factors. Local factors include adequate blood supply, absence of tension, healthy tissue edges, bacterial contamination, distal obstruction, radiation injury, bowel preparation. Systemic factors include patient nutrition, sepsis, hypovolaemia, drugs such as steroids, NSAIDs, etc., uraemia, jaundice.

MATERIALS AND METHODS

Written well informed consent was taken.

All the patients were subjected to detailed history, clinical examination, laboratory investigation and imaging as per the requirement.

Study Design

- Simple prospective study

Setting

- Post Graduate Department of Surgery, GMC Jammu.

Duration Of Study

- One year study from November 2019 - October 2020.

Patients were divided into 2 groups. Group A and Group B. Group A included patients undergoing sutured anastomosis and Group B included patients undergoing stapled anastomosis. In Group A, stoma reversal was done with ETHICON coated VICRYL suture (3-0). In Group B, the reversal of stoma was done using Stapler Technique.

Parameters:

Total number of 50 patients were included in the study. They were divided into 2 groups: Group A and Group B. Each group comprised of 25 patients. In this study, following parameters were taken.

1. Mean Operating Time
2. Duration of Hospital Stay

Operative Technique:

Under all aseptic precautions part was painted with povidone iodine and draped. An elliptical incision is made around the ileostomy site. Flaps were elevated all around and deepened till anterior rectus sheath was reached. Adhesions between the bowel loop and rectus sheath were divided taking care not to injure serosa of the intestine. Mesentery of the small bowel was divided and anastomosis done by either hand sewn or stapled anastomosis.

A. Stoma closure by Stapled Method: For closure of the loop ileostomy, a circumferential dissection was carried out, with a minimal rim of skin included, until the peritoneal cavity was entered, the loop of intestine was brought out through the incision. The antimesenteric borders of the ileum were approximated after mobilizing the spout to perform side to side anastomosis. Stapled anastomosis was performed by GIA staplers.

B. Stoma closure by Hand sewn Method: After mobilization of the spout of the stoma, the anastomosis was performed by double layer anastomosis with the help of vicryl 3-0. Inner layer had full thickness interrupted sutures whereas outer layer was interrupted (using vicryl 3-0) and extramucosal.



Fig.1 Diagram showing proximal and distal loops of small intestine



Fig.2 Diagram showing hand sewn stoma closure



Fig.3 Diagram showing application of stapler.

OBSERVATIONS AND RESULTS

Table no.1 Total Operating Time

	Type of anastomosis	N	Mean Operating time	Std. Deviation	P value
TOTAL OPERATING	HAND SEWN ANASTOMOSIS	25	147.88	9.985	P value<

TIME	STAPLED ANASTOMOSIS	25	95.60	9.390	0.001
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The mean operating time for hand sewn anastomosis in our study was 147.88 minutes as compared to 95.60 minutes for stapled group (p value<0.001).

Table no.2 Hospital Stay

	Type of anastomosis	N	Mean	Std. Deviation	P Value
HOSPITAL STAY	HAND SEWN ANASTOMOSIS	25	11.64	4.672	0.003
	STAPLED ANASTOMOSIS	25	8.20	2.887	

The mean hospital stay after procedure was 11.64 days in hand sewn anastomosis as compared to 8.20 days in stapled group (p value=0.003)

DISCUSSION:

Intestinal tumour, intestinal obstruction and peritonitis from abdominal trauma or from perforated bowel are common surgical problems that may be treated by resection and anastomosis which join two parts of bowel together by accurate approximations without tension and with a good blood supply to both parts.¹¹

The most commonly used anastomotic methods are hand sewn anastomosis and stapled anastomosis. The present study was conducted in the Department of General Surgery, Government Medical College and Hospital Jammu. The objectives of the study was to compare the hand sewn and stapled anastomotic techniques with various parameters. Fifty patients were included in the study. Twenty five patients underwent hand sewn anastomosis and twenty five patients underwent stapled anastomosis of stoma closure. The parameters that were compared in the 2 groups comprised of

- a) Total operating time
- b) Duration of hospital stay

Didolkar et al¹² conducted a study in 1986 comparing sutured versus stapled bowel anastomosis. Eighty eight patients were included, forty five were in hand sewn and forty three in stapled group. The anastomosis took an average of nineteen minutes for sutured and nine minutes for stapled technique. The conclusion was made that stapled anastomosis was as safe as sutured one in patient with advanced stage cancer. It saved time in anastomosis, but no advantage for post operative return of bowel function and hospital stay.

In the present study, the mean age of the patients was 39.04 years in hand sewn group and 35.9 years in the stapler group. Out of 50 patients of stoma closure in our study the number of males were 32 and out of 32 males 17(53.1%) undergo hand sewn anastomosis and 15(46.9%) had stapled anastomosis. Similarly, out of 18 females 8(44.4%) undergo hand sewn anastomosis and 10(55.6%) undergo stapler anastomosis.

The Mean Operating Time for Hand Sewn anastomosis in our study is 147.88 minutes as compared to 95.60 minutes for Stapled group (p value<0.001) which is statistically significant. This result is harmonious to mean operating time in the study conducted by Damesha et al in 2008 where he concluded that Mean operating time was 145 minutes in hand sewn group and 125 minutes in the stapler group. Shelygyn YA et al¹³ (2010) suggested in his study that mean operating time of stoma closure was 92+ 11 minutes for hand sewn group and 68+ 7 for stapled anastomosis. In another study conducted by Belbase N.P et al¹⁴ (2017), the mean operating time was 147.12+ 20 minutes in hand sewn and 132.52+ 15 minutes in stapled group.

In our study, the mean hospital stay after procedure was 11.64 days in hand sewn anastomosis as compared to 8.20 days in stapled group (p value=0.003) which is statistically significant. Dinc B et al¹⁵ (2014) evaluated retrospectively the data of 68 patients and found that mean operating time and duration of hospital stay were shorter in the stapled group. Postoperative complications e.g. anastomotic leak were also lower in stapled group. Shorter operating time, lower anastomotic leak rate in stapled group make this method preferable.

Gong J et al¹⁶ (2013) identified 14 studies including 5084 patients. Meta analysis showed that stapled closure was associated with shorter hospital stay and operating time where as no significant difference was

noted between two techniques in terms of anastomotic leakage, wound infection.

CONCLUSION

The present study was a simple prospective comparative study conducted in Government Medical College Jammu from November 2019-October 2020. It included 50 patients that underwent stoma closure by two different methods viz. hand sewn anastomosis and stapled anastomosis.

There were 2 groups in the study : Group A including hand sewn anastomosis comprising of 25 patients and Group B including stapled anastomosis having 25 patients. Both the groups were compared for the following parameters a) Mean operating time. b) duration of hospital stay. From the observations and results, following conclusions were drawn from our study:

- a) The mean operating time for stoma closure by stapled anastomosis is significantly lesser than the operating time for hand sewn anastomosis.
- b) The duration of post operative hospital stay is shorter significantly in case of stapled anastomosis when compared to hand sewn anastomosis.

Hence it is concluded that stapled anastomosis is better than hand sewn anastomosis in terms of mean operative time and postoperative hospital stay.

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