



## Surgery

## A PROSPECTIVE COMPARATIVE STUDY BETWEEN STAPLED VERSUS CONVENTIONAL ANASTOMOSIS IN ELECTIVE ILEOSTOMY CLOSURE SURGERY IN J.A. GROUP OF HOSPITALS, GWALIOR (M.P.)

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**ABSTRACT** **BACKGROUND:** Intestinal anastomosis dates back to 1000 B.C., the era of Sushruta “The Great Indian Surgeon” who described the use of black ants during the suturing of intestinal anastomosis. Rapid anastomosis could now be performed after the introduction of newer stapling devices as an alternative option. This study was taken up to know the advantages of staplers anastomosis over conventional hand sewn anastomosis in respect to time taken for procedure and anastomosis, return of bowel movements, resumption of oral feeds, post-operative hospital stay, early or late post-operative complications, if any and return to work and mortality.

**MATERIAL AND METHODS:** A total of 100 cases which met the inclusion and exclusion criteria were included in this hospital based prospective comparative study was conducted for a duration of 12 months. 50 patients were allotted stapled anastomosis group while 50 patients were allotted hand sewn anastomosis group.

**RESULTS:** The duration of surgery for stapled ileostomy closure surgery was lower as compared to hand sewn anastomosis group. It can thus be deduced that for patients requiring multiple anastomosis, stapled anastomosis must be offered which will reduce the operative time significantly. The patients who underwent stapled anastomosis were started oral feeds a bit earlier. The total duration of post operative hospital stay was lower for patients undergoing stapled anastomosis by a day which was not significant. It was found that complications were lower in stapled anastomosis group as compared to the hand sewn group.

**CONCLUSION:** The duration of surgery was comparatively lower for stapled anastomosis as compared to hand sewn anastomosis. The post operative day of return of bowel movements and oral feeding start day were almost same in both the techniques of anastomosis.

**KEYWORDS :** Ileostomy Closure, Suture, Stapler, Anastomosis

### INTRODUCTION

Intestinal anastomosis dates back to 1000 B.C., the era of Sushruta “The Great Indian Surgeon” who described the use of black ants during the suturing of intestinal anastomosis. Currently, the single layer extramucosal anastomosis is popular as it possibly causes least tissue necrosis or luminal narrowing, as was described by Mathewson of Aberdeen. The key to successful anastomosis is accurate anastomosis of two viable ends of the bowel without tension while maintaining good vascularity. Surgical practice has changed drastically after the development of reliable, disposable instruments over the past 30 years. With modern staplers, technical failures are a rarity, anastomosis is more consistent, and can be used at different difficult locations.<sup>1,2</sup>

That being said, if surgical tenets are respected, the odds of creating a safe and reliable anastomosis can be greatly increased. These include tension free anastomosis, meticulous technique, maintaining good tissue vascularity, management of systemic diseases, perioperative optimization of medical comorbidities, perioperative nutritional optimization and avoidance of certain drugs such as steroids and vasopressors. However, the most important factor which governs the choice of anastomotic method depends on individual surgeons expertise and preference.<sup>2</sup>

Rapid anastomosis could now be performed after the introduction of newer stapling devices as an alternative option.

The basic instruments used for stapling are LDS<sup>55</sup> (Ligates and divides to save), TA30<sup>TM</sup> (Thoracoabdominal), TA55<sup>TM</sup>, TA<sup>90</sup>, GIA<sup>TM</sup> (Gastrointestinal anastomosis), and the EEA<sup>TM</sup> (end-to-end) surgical staplers.<sup>3</sup>

Conversely, stapling techniques have been criticized on the grounds of expense, that no improvement in anastomotic recovery has been observed and that there is the possibility of stricture formation. An inflammatory response is invoked following hand suturing and which is initiated from dragging the suture material through the bowel. Currently, inverted anastomosis is the most widely used technique

worldwide.<sup>4</sup>

This study was taken up to know the advantages of staplers anastomosis over conventional hand sewn anastomosis in respect to time taken for procedure and anastomosis, return of bowel movements, resumption of oral feeds, post-operative hospital stay, early or late post-operative complications, if any and return to work and mortality.

### AIMS AND OBJECTIVES

To compare hand suturing with surgical stapling in a prospective observational study in patients undergoing elective ileostomy closure surgeries with parameters viz. duration of surgery, return of bowel movements, oral feeding starting day, hospital stay and early and late postoperative complications.

### MATERIAL AND METHODS

After obtaining approval from ethical committee for our study (prospective, randomized observational study) which was conducted in the Department of General Surgery at Jayarogya Group of Hospitals, Gwalior (M.P.) from January 2019 to December 2019.

A total of 100 cases which met the inclusion and exclusion criteria to be included in this hospital based prospective comparative study was conducted for a duration of 12 months.

### Inclusion Criteria

1. All patients admitted to the surgery wards requiring elective ileostomy closure surgeries.
2. Male or female subjects (between the age of 13 years and above) undergoing elective surgery requiring ileostomy closure.
3. Subjects who gave written informed consent after reviewing the informed consent document.

### Exclusion Criteria

1. Pediatric age group (< 13 years)
2. Gastro-intestinal anastomosis done in emergency setting, biliary-

- enteric anastomosis, anastomosis other than ileostomy closure.
- Patients refusing to join the study or left the hospital before final evaluation.
  - Patients with prior chemo-radiation.
  - Patients unfit for anaesthesia excluded from the study.
  - All pregnant women are excluded from the study.

#### Method Of Collection Of Data:

- Clinical study was conducted through questionnaires and clinical examination.
- All 100 patients were classified accordingly into 2 groups with 50 in each of them. The first group consisted of the hand-sewn anastomosis group which included 4 layered hand sewn anastomosis. The second group was the stapled anastomosis group.

#### RESULTS

The present prospective study was performed on 100 patients admitted in the Department of General Surgery, J.A. Group of Hospitals, Gwalior (M.P.) on patients undergoing elective ileostomy closure surgery from January 2019 to December 2019. Based on the data collected, following observations were made –

**Table 1: Allocation Of Subjects Enrolled In The Study Based On The Type Of Anastomosis**

S. No.	Type of anastomosis	Number of patients
1	Hand sewn double layered	50
2	Stapled	50

In the study, 50 % of the patients underwent stapled anastomosis and 50% of the patients underwent hand sewn double layered anastomosis.

**Table 2 : Duration Of Surgery For Ileostomy Closure In The Hand Sewn And Stapled Anastomosis**

Time (in minutes)	Stapled	Hand sewn
<30	4	0
30-45	37	4
45-60	9	26
60-75	0	16
>75	0	4

In our study, it was found that the mean operative time for a stapled anastomosis is 38.1 minutes while mean operative time for a hand sewn double layered anastomosis is 55.5 minutes.

**Table 3 : Starting Day Of Oral Feeds For Patients Undergoing Elective Ileostomy Closure Surgery By Stapled And Hand Sewn Anastomosis**

POD	Stapled	Hand sewn
3	16	5
4	25	33
5	8	12
<b>TOTAL</b>	<b>49*</b>	<b>50</b>

In the study, the mean post operative day for starting oral feeds after ileostomy closure surgery by stapled anastomosis is 3.62 day while for hand sewn double layered anastomosis is 4.14 day.

\*1 patient from the stapled anastomosis group could not be started orally due to anastomotic leak and underwent ileostomy formation.

The p-value for mean Post operative feeding start day is 0.21753 which is insignificant.

**Table 4 : Post Operative Stay Of The Patient Undergoing Ileostomy Closure Surgery By Stapled And Hand Sewn Double Layered Anastomosis**

POD	Stapled	Hand sewn
4	8	1
5	15	7
6	13	10
7	12	18
8	1	10
9	0	2
>10	0	2

Out of the 100 patients who underwent ileostomy closure surgery, mean hospital stay for patients who underwent stapled anastomosis

was 5.8 days while for patients who underwent hand sewn anastomosis, the mean post operative stay was 6.92 days.

The p-value of the mean duration of hospital stay is 0.0681 which is insignificant

**Table 5 : The Complications After Elective Ileostomy Closure Surgery By Stapled And Hand Sewn Anastomosis**

S. No.	Complications	Stapled	Hand sewn	p-value
1	Bleeding	0	1	0.3125
2	Surgical site infection	4	7	0.33706
3	Fever	1	1	1
4	Anastomotic leak	1	0	0.3125

In the study, it was found that the most common complication following an elective ileostomy closure surgery is surgical site infection which was noted in 7 [14%] patients who underwent hand sewn anastomosis and in 4 [8%] patients with stapled anastomosis.

Anastomotic leak was noted in only 1 [2%] patient who underwent stapled anastomosis while bleeding was noted as a complication in 1 [2%] patient who underwent hand sewn anastomosis.

#### DISCUSSION

The fundamental aim of gastrointestinal anastomosis whether performed by hand sewn or stapled technique is a good approximation of the tissues without tension and preserving its blood supply. For a proper and perfect anastomosis, the factors to be considered are intraoperative duration, restoration of normal GI function, effective hemostasis, reduction of tissue damage and prevention of post-operative mortality and morbidity.

The mean operative time for stapled anastomosis was 38.1 minutes and for conventional hand sewn anastomosis, it was 55.5 minutes in our study. **Honeyalsinh et al<sup>5</sup>** also observed the same with the mean operative time for stapled anastomosis was 30 minutes and for conventional hand sewn anastomosis, it was 45 minutes. **Hull et al<sup>6</sup>** found the stapled anastomosis to be quicker as the mean operative time in stapled anastomosis was 55 minutes while it was 67 minutes for hand sewn anastomotic group. **Lord et al<sup>7</sup>** found the mean duration time for stapled anastomosis to be 71.5 minutes and 88.5 minutes for hand sewn anastomosis.

In our study, it was found that anastomotic leak occurred in 2% of the patients undergoing stapled anastomosis. **Madani et al<sup>8</sup>** observed that anastomotic leaks occurred in 2.08% patients undergoing stapled anastomosis and in 2.93% patients undergoing conventional hand sewn anastomosis.

In our study, it was found that the post operative stay for stapled anastomosis was lower as compared to the conventional hand sewn group being 5.8 days for stapled group and 6.92 days for conventional hand sewn group. **Hull et al<sup>6</sup>** found that the mean duration of hospital stay after ileostomy closure surgery was 3 days after stapled anastomosis as compared to 2.5 days in the hand sewn group. **Lord et al<sup>7</sup>** also observed the average length of stay to be shorter in stapled anastomosis at 4.3 days while it was 9.7 days for hand sewn anastomosis.

#### CONCLUSION

Majority of the patients undergoing ileostomy closure were males with the predominant age group 13- 25 years. The duration of surgery was comparatively lower for stapled anastomosis as compared to hand sewn anastomosis. The post operative day of return of bowel movements and oral feeding start day were almost same in both the techniques of anastomosis. The duration of hospital stay for patients undergoing stapled anastomosis was a bit shorter. The complication rates of both the anastomotic techniques were comparable to the standard literature.

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