

A Comparative Study of Stapler Versus Handsewn Gastrointestinal Anastomosis

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Abstract

Background: In gastro intestinal surgery after resection of bowel loops, anastomosis of the bowel loops is the central part. Stapler technique, commonly used by many of the surgeons is more useful than the hand sewn anastomosis for safety, easy accessibility, duration of procedure, efficiency. This study compares the hand sewn anastomosis with stapler Anastomosis. The purpose of the presentation is to compare the feasibility and outcome of stapler and hand sewn anastomosis in gastro intestinal surgeries.

Material & Method: This study was conducted in the department of surgery of our hospital between the groups of hand sewn and stapler anastomosis gastro intestinal surgeries conducted by open technique in period from January 2021 to September 2021. **Results:** Various parameters like operative time, hospital stay, and post op day of starting oral diet, post op day of appearance of bowel sound, anastomotic leak, time taken to return to work and mortality were compared. **Conclusion:** Results of this study were comparable to many studies done previously which showed there was not much significant difference in post op outcomes after hand sewn or stapled technique of gastrointestinal anastomosis.

Key-words: Anastomosis, stapler, handsewn

Introduction

In gastro intestinal surgery after resection of bowel loops, anastomosis of the bowel loops is the central part. Sero-muscular suture technique is the main stay of the Gastro intestinal surgery which is described by Lambert in 1826.¹ Single layer extra mucosal anastomosis is the more commonly used now a days which is described by Matheson of Aberdeen because it has the capacity to produced least tissue necrosis or luminal narrowing.² The stapler devices recently introduced helps anastomosis of bowel loops with less tissue injury and decreased time duration of Procedure. It also decreases the anastomotic leak complication.³ Stapler technique, commonly used by many of the surgeons is more useful than the hand sewn anastomosis for safety, easy accessibility, duration of procedure, efficiency.⁴ This study compares the hand sewn anastomosis with stapler Anastomosis.

Aim

The purpose of the presentation is to compare the feasibility and outcome of stapler and hand sewn anastomosis in gastro intestinal surgeries in terms of

- Duration of procedure
- Post op hospital stay
- Complications
- Recovery and
- Mortality if any.

Material and Method

This study was conducted in the department of surgery Of Sheth L.G. General hospital between the groups of hand sewn and stapler anastomosis gastro intestinal surgeries conducted by open technique in period from January 2021 to September 2021.

Study Type: Observational and retrospective study

- Control group- hand sewn anastomosis
- Study group-stapler anastomosis

This study included 50 patients; 25 of them underwent hand sewn Anastomosis and 25 of them underwent stapler technique. Hand sewn anastomosis done by single layer or double layer is under control group, but the study group has stapler anastomosis. Which was done by side to side or end to end anastomoses, it depends upon accessibility, the need of surgery, anastomotic site, using which type of stapler instruments. All proforma will be made that include detailed history, physical examination basic investigations and other relevant investigations required. All of them have been diagnosed, treated and followed up in the same hospital. All patients were carefully monitored with the following parameters:

1. Operating time
2. Return of bowel sounds
3. oral feeding starting day
4. Hospital stay
5. Anastamotic complication like leak
6. Return to work and mortality.

The following statistical test was used to compare the results of control group and study group:

- The patients were randomly allotted to control or study group
- Independent samples T-Test to compare mean values Between Methods
- And also used to compare the mean value of the two methods
- Chi-square tests used to compare proportion of the two value. The observation will be analyzed statistically and concluded

Results

This comparative study was carried out from January 2021 to September 2021. A total of 50 cases were included which underwent gastrointestinal anastomosis in GI surgery. Patients were randomized into two groups, 25 in each group as in table 1.

The mean operative time in case of handsewn anastomosis was 191.76 minutes with SD of 51.45 minutes whereas in stapled anastomosis it was 152.08 minutes with SD of 64.51 minutes

Table 1: Operative Time

Operative Time In Minutes	Stapled Anastomosis(Min)	Hand Sewn Anastomosis (Min)
Mean	144.08	191.76
Median	190	190
Range	80-330	110-320
Standard Deviation	46.41831535	51.45085033

Here, t value is 3.69 which shows that there is significant difference in operative time at 99% confidence interval ($p < 0.01$). Thus, stapled anastomosis takes significantly lesser time.

The mean hospital stay in case of stapled anastomosis was 12.72 days with SD of 8.40 days and in handsewn anastomosis it was 14.04 days with SD of 5.87 days.

Table 2: Post Op Hospital Stay

Post Op Hospital Stay In Days	Stapled Anastomosis	Handsewn Anastomosis
Mean	12.72	14.04
Median	12	12
Range	7 To 46	7 To 30
Standard Deviation	8.399007878	5.877074102

Here, the t value is 0.64 which shows that there is no significant difference in post op hospital stay at 99 % confidence interval ($p < 0.01$) and whatever the difference is there occurs by chance. Thus there is no significance difference in post op hospital stay between handsewn anastomosis and stapled anastomosis.

The mean post op day of starting oral diet after stapled anastomosis was 5.16 days with SD of 1.05 days whereas for hand sewn anastomosis it was 5.6 days with SD of 1.26 days.

Table 3: Post Op Day of Starting Oral Diet

Start Of Oral Diet (Days)	Stapled Anastomosis	Handsewn Anastomosis
Mean	5.166666667	5.6
Median	5	5
Range	4 To 9	4 To 8
Standard Deviation	1.049499536	1.258305739

Here, the t value is 0.63 which shows that there is no significant difference in post op day of starting oral diet at 99 % confidence interval ($p < 0.01$) and whatever the difference is there occurs by chance. Thus there is no significant difference in post op day of starting oral diet after hand sewn or stapled anastomosis.

There were 3 patients in stapled anastomosis which anastomotic leak occurred and 3 in handsewn anastomosis

Table 4: Anastomotic Leak

Anastomotic Leak	Handsewn Anastomosis	Stapled Anastomosis	Total
Present	3	3	6
Absent	22	22	44
Total	25	25	50

Here, Chi square test with Yates correction was applied which lead to Chi square value of 0.19 which shows there is no significant difference in occurrence of anastomotic leak in stapled and hand sewn anastomosis at 99 % confidence interval ($p < 0.01$) and whatever difference which may occur would be by chance. Thus, there is no advantage of using stapled anastomosis over hand sewn to prevent occurrence of anastomotic leak.

The mean time taken to return to work in case of stapled anastomosis was 2.21 months with SD of 1.06 months while in case of hand sewn anastomosis it was 2.46 months with SD of 0.92 months

Table 5: Return to Work

Return To Work (Months)	Stapled Anastomosis (Months)	Handsewn Anastomosis (Months)
Mean	2.208333333	2.458333333
Median	2	2
Range	0.5 To 4	1.5 To 5
Standard Deviation	1.062366786	0.919790461

The t value was 0.99 which showed that there was no significant difference in time taken to return to work between hand sewn and stapled anastomosis at 99 % confidence interval ($p < 0.01$) and whatever the

difference occurred was due to chance. Thus there was no significant difference in time taken to return to work after hand sewn or stapled anastomosis.

There was one mortality each in patients operated by hand sewn and stapled anastomosis.

Table 6: Mortality

Mortality	Handsewn Anastomosis	Stapled Anastomosis	Total
Present	1	1	2
Absent	24	24	48
Total	25	25	50

The Chi square test with Yates correction was applied to test the significance in difference mortality rates in patients operated by hand sewn and stapled anastomosis. The Chi square value was 0.52 which shows that there is no significant difference in mortality rates at 99 % confidence interval ($p < 0.01$) and whatever difference which may occur would be by chance.

There was no occurrence of other complications like stricture, stenosis or bleeding. There was one readmission for anastomotic leak in hand sewn anastomosis which succumbed.

Discussion

This comparative study was carried out on 50 patients who were operated for various causes and had undergone bowel anastomosis in Sheth L.G. General hospital.

There was significant difference in mean operative time for stapled anastomosis which was significantly lesser than hand sewn anastomosis which is similar to the result obtained in Dameshaet al, George et al and Hollender et al.⁵

In our study, there was no significant difference in occurrence of anastomotic leak in case if stapled and hand sewn anastomosis, similar to that found in a study from the West of Scotland and Highland Anastomosis Study Group as well as in study done by Afsar Ali Bhatti et al⁶, whereas Hassanen et al⁷ in their clinical trials of 39 patients found leak in 16.6% in stapler group and 38% in hand sewn favoring stapler anastomosis.

There was no significant difference in mortality of patients in case of hand sewn and stapled anastomosis similar to both the studies of West of Scotland and Highland groups⁸ and the metaanalysis of 1998.

There was also no significant difference in time taken to return to work after handsewn and stapled anastomosis.

One patient of handsewn anastomosis in our study required readmission for fecal fistula following anastomotic leak which later succumbed while rest of the anastomotic leaks were managed conservatively.

Conclusion

This comparative study conducted in a group of 50 patients between hand sewn and stapled anastomosis shows that, there was a significant difference in the operative time with stapled anastomosis taking much lesser time compared to handsewn anastomosis. There was no significant statistical difference in post op hospital stay, starting of oral diet, return to work, anastomotic leak or other complications and mortality. One patient required readmission for fecal fistula, managed conservatively which eventually resulted in mortality.

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