

Outcome of Stapler and Hand Sewn Anastomosis In Elective Gastrointestinal Surgeries: A Prospective Comparative Study

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ABSTRACT:

BACKGROUND: Intestinal anastomosis can be performed by a hand sewn technique using absorbable and/or non absorbablesutures , mechanical stapling devices or biological glues. The choice of anastomotic technique may be influenced by the diameter of the bowel ends, edema, accessibility and site of anastomosis, contamination, available time and equipment and underlying pathology.

MATERIALS AND METHODS: The study included 50 patients in the age group of 18-80 years who were randomly allocated into two groups. 25 underwent hand sewn and 25 underwent stapler anastomosis.

RESULTS:The mean operating time for hand sewn was 178.28 minutes and for stapler was 124.16 minutes (p-value-0.0019). The mean time taken for return of bowel sounds (P value 0.843), mean time for resumption of oral feeds was (p value- 0.2663), mean duration of post-operative hospital stay(p value 0.44)was insignificant for hand sewn and stapler group. 2 leaks, one from each group was seen.

CONCLUSION: Stapling technique significantly reduces the time for anastomotic procedure so may be advantageous in patients whose general condition is poor. There is no difference in the time of appearance of bowel sounds , resumption of oral feeds and in total post-operative hospital stay .**KEYWORDS:** Anastomosis- Hand sewn- Stapler- GI surgeries

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I. INTRODUCTION:

Intestinal anastomosis can be performed by a hand sewn technique using absorbable and/or non absorbablesutures , mechanical stapling devices or biological glues . Sutured anastomosis (hand sewn technique) is the commonly used option because of the availability and affordability of suture materials and familiarity with the procedure¹.The evolution of mechanical sutures by stapler devices is a technological advancement which helps anastomosis of bowel loops with less tissue injury and decreased time duration of procedure. It also decreases the anastomotic leak complication².With modern devices, technical failures are rare, the staple lines are of more consistent quality, and anastomosis in difficult locations are easier to perform. The effect of minimizing the operative trauma has certainly been the main attribute in the use of staplers^{3,4}.The choice of anastomotic technique may be influenced by the diameter of the bowel ends, edema, accessibility and site of anastomosis, contamination, available time and equipment and underlying pathology^{5,6,7}.Two of the most significant complications related to intestinal anastomosis remain dehiscence and leakage².

II. AIMS AND OBJECTIVES:

The aim of this study is to compare the effectiveness of staplers vs hand sewn anastomosis in elective gastro-intestinal surgeries in respect to (a)Time taken for the procedure(b)Postoperative hospital stay(c)Post operative leak (d)Mortality.

III. MATERIALS AND METHODS:

The study was conducted on 50 consecutive patients undergoing gastrointestinal resection and anastomosis for various elective procedures over a period of one year who were allocated randomly into two groups according to the type of anastomosis , hand sewn and stapler. Group A in hand sewn and group B in stapler group.

Data entry and analysis was done using GraphPad InStat 3, a software program developed by GraphPad Software.Descriptive study like mean and standard deviation were used.Inferential statistics were used to analyze the statistical difference amongst the groups like ,Independent samples T –test to compare mean

values between methods and Chi-square test to compare proportion of the two values. The observation was analyzed statistically and concluded. (P value <0.05 – significant).

IV. RESULTS AND OBSERVATION:

A total number of 50 cases of resection and anastomosis studied , out of which 25 patients had hand sewn and 25 patients had stapler anastomosis.

Types of anastomosis done were gastrojejunostomy, ileoileal ,ileocolic, colorectal and oesophao gastric anastomosis.

Age in years	Group A Number of patients (HAND SEWN)	Group B Number of patients (STAPLED)
18-20	0	0
21-30	2 (8%)	2 (8%)
31-40	5(20%)	6(24%)
41-50	10(40%)	6(24%)
51-60	4(16%)	8(32%)
61-70	4(16%)	2(8%)
71-80	0	1(4%)

Table:1 Age distribution

1. OPERATING TIME:

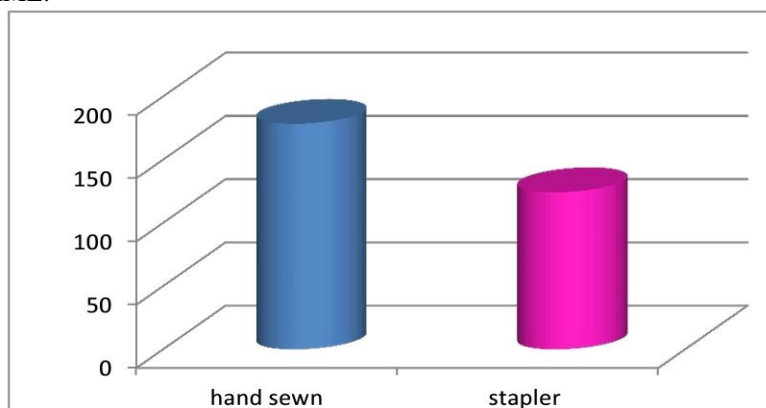


CHART 1: Total mean operating time

The mean operating time taken for Group A was 178.28 minutes and for group B was 124.16 minutes. There was a significant difference with a p value of 0.0019.

	GROUP A	GROUP B
ESOPHAGOGASTRIC ANASTOMOSIS	237.5	222
GASTROJEJUNOSTOMY	210.77	140
ILEAL GROUP	115	83.57
COLORECTAL ANASTOMOSIS	182.857	115.714

TABLE 2 : Subgroup analysis of Mean Operating Time

2.POSTOPERATIVE HOSPITAL STAY:

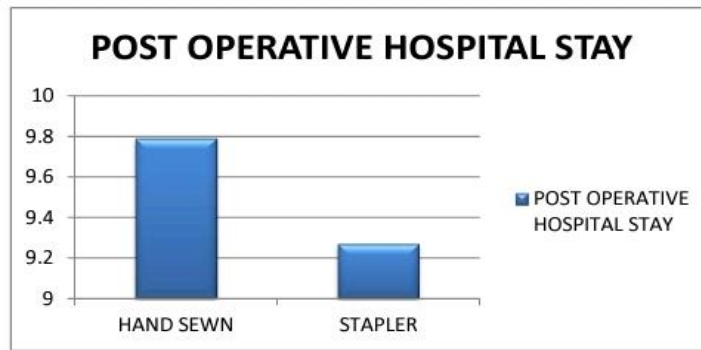


CHART 2:Post-Operative Hospital Stay.

Mean duration of post-operative hospital stay was almost same in both the groups , 9.79 days for hand sewn and 9.27 for stapler group, with a p value of 0.44 which is insignificant.

POST OPERATIVE COMPLICATIONS :

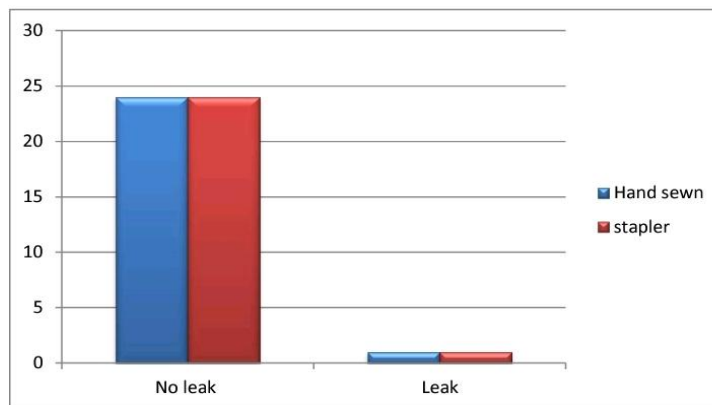


CHART 3: Correlation of technique used with anastomotic leak

ANASTOMOTIC LEAK	GROUP A			GROUP B		
	Yes	No	Total	Yes	No	Total
Number	1	24	25	1	24	25
Percentage	4%	96%	100%	4%	96%	100%

TABLE 3:Post-operative Leak

Complications of anastomotic leak were found in 2 cases of oesophago gastric anastomosis group , 1 in each hand sewn and stapler group, both on post operative day four. There were no complications of anastomotic bleeding in both groups

3.DEATH:

GROUP	DEATH		P VALUE
	YES	NO	
Group A	1 (4%)	24 (96%)	0.2874
Group B	2 (8%)	23 (92%)	

TABLE 4: Comparison of death in group A and group B.

There were two deaths in oesophago gastric anastomosis groups, 1 from both groups. One in peri ampullary carcinoma group of stapler anastomosis group who died due to pulmonary complications.

V. DISCUSSION:

This randomized controlled trial compared the outcome of hand sewn anastomosis with stapled anastomosis in 50 patients. The results were analyzed and compared with other studies published in literature.

The results are same for both hand sewn and stapler anastomosis regarding postoperative hospital stay ,post operative leak and mortality. Regarding the total operating time , it is shorter in stapler group of gastrojejunostomy, ileocolic,colorectal and oesophago gastric anastomosis subgroups as compared to hand sewn technique^{8,9,10}

Several recent studies show that the mean operating time taken by stapled technique is shorter as compared to the time taken by hand sewn technique; which is also shown by the present study favouring stapled to hand sewn techniques.^{11,12,13}

VI. CONCLUSION:

It is concluded by this study that both hand sewn and stapler anastomosis can be performed safely with no difference in total post-operative hospital stay, post operative leak and mortality; with the only advantage of shortened operating time for stapler technique as compared to the hand sewn technique.

Due to the significant reduction in time taken for stapler anastomosis, it can be advantageous in patients with a poor general condition.

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