

COMPARATIVE STUDY OF USAGE OF STAPLER GUT SURGERY VERSUS TRADITIONAL HAND SEWN APPROACH IN TELANGANA POPULATION

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Abstract

Background: Bowel anastomoses are common procedures in both elective and emergency GIT surgeries. The advent of mechanical stapling devices has revolutionized the field of GIT surgery; hence, the pros and cons of Hand Sewn and stapler device technique have to be compared. **Materials and Methods:** Out of 120 who required intestinal anastomosis were studied. These are grouped into two 60-H (hand sewn) and 60-S (stapler device). In H group, intestinal anastomosis was done using the classical double layer technique, while in S group, anastomosis was done using mechanical stapling devices. The comparison of both groups in terms of preoperative and postoperative outcomes **Result:** Duration of surgery, postoperative GIT motility, and hospital stay had significant p values ($p < 0.001$). **Conclusion:** The stapler device has proved to be more efficient than the hand-sewn method because of the early duration of surgery, recovery time to normal function, and least post-surgical complications, but the stapler device is costlier than the hand-sewn method.

INTRODUCTION

The word anastomosis is the Greek words ana (without) and stoma (a mouth), reflecting joining of the cut ends of a tubular hollow viscus (bowel) or a vessel after resection or by pass procedure. Intestinal anastomosis is a surgical procedure done to restore the continuity between two formerly distant or non-contiguous parts of the intestine after rectifying or by passing the underlying pathology.^[1] Lembert described the intestinal anastomosis in the seromuscular suture technique in 1826, which remained a routine technique in the later part of the century. Currently, Matheson of Aberdeen invented a single layer extra mucosal anastomosis, which has gained popularity as the choice amongst the hand-sewn technique,^[2] as it probably causes the least tissue necrosis and lumen narrowing. Later on, in 1908, Hultl found out a mechanical stapling device. Intestinal anastomosis is commonly required to be performed in a variety of benign or malignant conditions and may involve different segments of both the large and small intestine. Common indications include malignancies, strangulated hernias, intussusceptions, and mesenteric ischemia-induced bowel gangrene, traumatic bowel injury radiation enteritis.^[3] The technique for intestinal anastomosis is an emergency, and the elective procedure depends on the site bowel calibre and underlying disease. The newer stapling devices used for intestinal anastomosis can perform the

anastomosis in less time.^[4] Hence, an attempt is made to compare the hand-sewn technique and stapling device techniques to study the merits and deficiencies of both techniques.

MATERIALS AND METHODS

120 adult patients admitted to the surgery department of Mallareddy Institution of Medical Sciences, Susaram, Hyderabad, Telangana-500055 were studied.

Inclusion Criteria

Patients require emergency or elective gastrointestinal surgery with bowel anastomosis for benign or malignant conditions. The patients who gave consent in writing for study were selected.

Exclusion Criteria

Patients age below 12 years, pregnant ladies, patient undergoing radiotherapy. Patients are otherwise medically unfit and not fit for anesthesia and anticoagulant therapies were excluded.

Method: A detailed history and clinical examination of patients were done. Relevant hematological, biochemical, and radiological investigations in patients admitted to the emergency ward, preoperative resuscitation was under taken first once the patient was stabilized. The patient was taken for emergency laparotomy without any further delay. In elective surgeries, bowel preparation was done one day prior to the day of surgery, and antibiotic prophylaxis was used as per the protocols.

Operative procedure: In group hand-sewn (H), conventional hand anastomosis was done using the standard double-layered anastomotic technique comprising an inner layer of continuous mycosa inverting full-thickness absorbable sutures (polyglactin 910 in size 2-0/3-0) with an outer layer of interrupted Lembert's seromuscular sutures using material (silk 2-0/3-0).

In group S – Stapler anastomosis was done using a linear cutter GIA stapler (side to side with functional end to end component) of tissue-appropriate staple height or a circular EEA stapler depending upon the procedure involved.

A comparison was made between the two groups in terms of duration of anastomosis procedure (taken from the first stitch to the cutting of the last stitch in group H and from the orientation of the cut ends to the drawl of the stapler post-firing in group S). Anastomotic integrity or leak rates, return of bowel activity, resumption of oral feeds, and period of hospital stay were recorded and compared in both groups.

The duration of the study was July 2022 to August 2024.

Statistical analysis: Various parameters of both groups were compared with t tests, and significant results were noted. The statistical analysis was carried out in SPSS software. The ratio of male and female was 2:1.

- Age in (in years) 52.06 (\pm 14.4) in hand sewn group, 51.20 (\pm 14.2) in stapler group, t test was 0.32 and $p < 0.74$ (p value is insignificant).
- Duration of surgery (in minutes): 159.36 (\pm 25.6) in the hand sewn group, 127.80 (\pm 20.2) in the stapler group; t test was 7.49 and $p < 0.001$ (p value is highly significant).
- Postoperative GIT motility (in days) 5.56 (\pm 0.5) in the hand-sewn group, 4.22 (\pm 0.4) in the stapler group; the t test was 16.2 and $p < 0.001$ (p value is highly significant).
- Hospital stay in days: 14.8 (\pm 1.5) in hand sewn group, 12.2 (\pm 2.1) in stapler group, t test 7.80 and $p < 0.001$ (p value is highly significant).

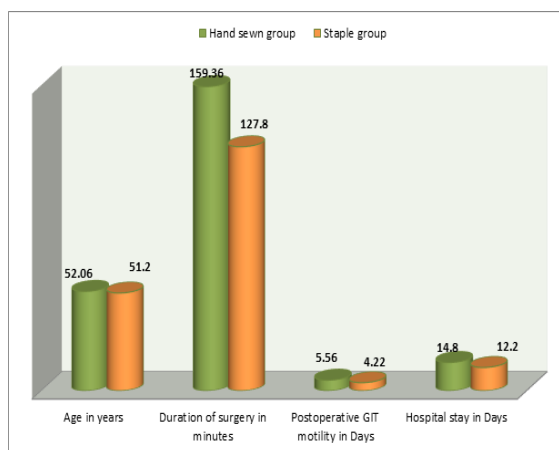


Figure 1: Comparison of parameters in Hand sewn and stapler surgeries

RESULTS

[Table 1] Comparison of parameters in hand sewn and stapler surgical techniques

Table 1: Comparison of parameters in Hand sewn and stapler surgeries.

Parameters	Hand sewn group (60)	Staple group (60)	t test	p value
Age in years	52.06 (\pm 14.4)	51.20 (\pm 14.2)	0.32	$p > 0.74$
Duration of surgery in minutes	159.36 (\pm 25.6)	127.80 (\pm 20.2)	7.49	$P < 0.001$
Postoperative GIT motility in Days	5.56 (\pm 0.5)	4.22 (\pm 0.4)	16.2	$P < 0.001$
Hospital stay in Days	14.8 (\pm 1.5)	12.2 (\pm 2.1)	7.80	$P < 0.001$

DISCUSSION

Present a comparative study of usage of stapler gut surgery versus the traditional hand-sewn approach in the Telangana population. The age (in years) was 52.06 (\pm 14.4) in the H and sewn (H) group and 51.20 (\pm 14.2) in the stapler (S) group; the t test was 0.32 and the p value was insignificant. Duration of surgery (in minutes): 159.36 (\pm 25.6) in the H group, 127.80 (\pm 20.2) in the S group, t test: 7.49, and $p < 0.001$ (p value is highly significant). Postoperative GIT motility (in days): 5.56 (\pm 0.5) in the H group, 4.22 (\pm 0.4) in the S group; t test was 16.2 and $p < 0.001$ (p value is highly significant). Hospital stay (in days): 14.8 (\pm 1.5) in the H group, 12.2 (\pm 2.1) in the S group; t test was 7.80 and $p < 0.001$ (p value is highly significant). These findings are more or less in agreement with previous studies.^[5-7]

Gastro intestinal bowel anastomosis constitutes one of the most commonly performed surgeries

worldwide due to varied pathologies of the small and large intestine, which may be congenital, inflammatory, traumatic, benign, or malignant. Now days there are improved surgical techniques, suture materials, anesthetic care, antibiotic prophylaxis, etc., consequently leading to improved outcomes in anastomosis. With the evolution of mechanical stapling devices and the development of reliable and disposable stapling instruments in recent times, stapler anastomosis is being properly and increasingly used in various surgical spheres. The decision to finalize a technique is dependent upon numerous factors, like the patient's general condition, the health and viability of the cut ends of the gut, the surgeon's preference, familiarity, and expertise in the technique.^[8]

Surgery remains a major first-line treatment in tumors (benign or malignant). The surgical treatment for digestive tumors normally involves partial or total organ removal, surrounding lymph node clearance,

and post-resection digestive tract reconstruction. Anastomosis should fulfill the following criteria: it must be well vascularized, safe, tension-free, and spillage from the operation field should be avoided.^[9] The manual procedure has been used in tract anastomosis for a long time, but stapler suturing has been increasingly used as an anastomotic method in digestive tract surgery in the past few years.^[10] Stapler suturing shortened the operation time compared to conventional hand sewn suturing. Shortening of operation time means reduction of surgical trauma and intra-operative blood loss and also abating local infection and reducing the chance of surgical complications. It is also confirmed that, stapler suturing is superior to manual methods in reducing the incidence of anastomotic leakage for gastric carcinoma and colorectal cancer.^[11]

CONCLUSION

In the present comparative study, the staple device approach was superior to the conventional hand-sewn method in terms of operative time, postoperative functional recovery, and postsurgical complications. These advantages are partially benefited due to the cost factor involved.

Limitation of study: Owing to the tertiary location of the research center, the small number of patients,

and the lack of the latest techniques, we have limited findings and results.

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