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A Comparative Prospective Study of Handsewn versus Stapled Anastomosis in Gastrointestinal Surgery

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Abstract

Introduction and objectives: *Though laparotomy has been practiced for many years, the optimal procedure for repair of gut remains controversial. Gut suturing is an important part of gastrointestinal operations and can be achieved by hand suturing or by the newly developed staplers. The choice for suturing between a stapling device and a hand-sewn approach depends on the surgeon's choice and experience of the surgeon. Technical fault of intestinal repair leads to leakage; regarded one of the most common complication in surgical practice & is more serious and life threatening condition. Recent advancement is the use of stapler as a device for gut repair. Because of the use of staplers technical failures is a rarity, suturing is more consistent. It can be used at difficult places.* ***Aims:*** *To assess and compare stapling and hand sewing method of anastomosis, the technique of stapling is better than hand sewing in a prospective study in patients undergoing elective gut surgery.* ***Materials and Methods:*** *The prospective comparative study was carried out in the Medical College for Women and Hospital (MCWH) and different private hospital, in Uttara, Dhaka, January 2019 to December 2023. A total of 100 cases which met the inclusion and exclusion criteria. The study population included patients who underwent elective gut surgeries for various conditions of stomach, small bowel, large bowel and rectum were alternatively placed in stapled and hand sewn group. One group A (n = 50) hand sewing and the other group B (n = 50) undergoing stapling.* ***Outcome factors:*** *anastomotic time, duration of operation, hospital stay.* ***Results:*** *The mean age was 41.82±12.31 and 45.48±11.96 yrs. in the hand-sewn group and stapled group respectively. Both mean and median ages were slightly higher in the stapler group (45.48 vs. 41.82 years; 45.5 vs. 42.5 years), but the differences were not statistically significant (p>0.05). The mean duration of surgery was 133.86±7.71 minutes in the stapled group and 146.50±5.28 minutes in the hand sewn group (P<0.05). Stapled group had significantly shorter anastomotic and operative times than hand sewn Group, with mean anastomotic times of 11.60 vs. 39.98 minutes and operative times of 133.86 vs. 146.50 minutes (p < 0.001). Post-operative complications were higher in the hand-sewn group, with lower rates of fever, infection, dehiscence, and leakage in the stapler group. Complication-free cases were more in the stapler group (80% vs. 42%). The overall difference was statistically significant (p=0.001). The stapler group had a significantly shorter hospital stay than the hand-sewn group (mean 8.94 vs. 11.78 days, p<0.001).* ***Conclusion:*** *With use of staplers there was a significantly decrease in duration of surgery. Stapling technique appears to be safer and accuracy as sutures. It reduced duration of hospital stay which helps ultimately in early return to routine work, importantly staplers can be used at places where hand sewn anastomosis is technically difficult. Stapler anastomosis is a new surgical innovation that can be performed successfully and safely.*

Keywords: *Anastomosis, Anastomotic leakage, stapling device, hand-sewn method, gastrointestinal.*

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Introduction:

Gut lumen is opened prior to a resection or bypass, and the anastomosis is then performed to restore gastrointestinal continuity. Gastrointestinal anastomosis may be end-to-end, end-to-side or side-to-side. It may be created between two segments of bowel or between small bowel and another viscus. Technique of anastomosis is hand- sutured or stapled, and whether it is performed at laparotomy or laparoscopy. Gut anastomosis dates back to 1000B.C. the era of Sushruta "The Great Indian Surgeon" he describes the use of black ants during suturing of intestinal anastomosis[1]. Lembert then described his seromuscular suture technique in 1826 which became the mainstay of gut anastomosis in the second half of the century. In the last 200 years gut suturing is being performed for various surgical problems like intestinal tumors, gut obstruction, perforated hollow viscus and gastric outlet obstruction (GOO). These conditions require gut resection and anastomosis[2] which join two ends of bowel by accurate approximations without tension with good blood supply to both parts[3]. Prospective, randomized trials in colorectal surgery have not showed any differences between both methods of anastomosis regarding rate of leakage, hospital stay length and morbidity[4]. In gut surgery, intestinal resection and maintenance of continuity are the most frequently performed surgical procedures in the elective or emergency setting for benign or malignant conditions. The fate of an anastomosis depends on the site of anastomosis, bowel caliber, and the nature of the underlying disease. The choice of suture material is either a stapling device and a hand-sewing approach depends only on the surgeon's preference[5]. Postoperative complications significantly increase the length of the hospital stay, in turn, increases the morbidity and mortality associated with the process. It is clinical appearance of leakage of gut contents from the wound or from drains or development of peritonitis, enterocutaneous fistula, anastomotic dehiscence proved by reoperation and or radiographic leakage which is demonstrate extravasations of contrast medium from the anastomosis in radiological image. Failure of intestinal anastomosis leads to anastomotic leakage, regarded as one of the most commonly feared complications in surgical practice, and it's more serious and life- threatening conditions, leading to increased morbidity and mortality. Stapled anastomosis are thought to have a lower rate of leakage, both clinically and radiologically[6]. Conversely, some reports argued that overall leak rate is similar with hand sewn anastomosis[7]. In another study evaluating 1125 patients for ileocolic resection and anastomosis demonstrated less anastomotic leaks in stapler group than hand sewn group[8].The worldwide anastomotic leakage rate is 7.5% and it is more in colonic cancer patients[9]. Several risk factors have been extensively analysed from various studies, like obesity, diabetes mellitus, malnutrition, smoking, malignancy, intra-operative complications etc. The development of reliable, disposable stapler over the past 30 years has altered surgical practice dramatically. With modern devices, technical failures are rare, the staple lines are of more consistent quality, and anastomosis in difficult locations is easier to construct[10]. The introduction and wide spread application of stapling devices helped revolutionized the technical aspects of surgery that have allowed minimally invasive procedures to be developed. The evolution of mechanical sutures by means of stapler use has become a real technological advancement, as it has represented the concept of new functions that have resulted in improvements and effective gains of quality or productivity in the handicraft suture process that has been done by surgeons for centuries[11]. Staplers are capable of cutting and stapling at the same time avoiding the need for clamping. Circular staplers have proven to have better access in low pelvic surgery, sparing many patients from the permanent colostomy. The higher cost of stapler is offset by reduction in operating time[12].Then Kocker's method, a 2-layer anastomosis became the standard for many years[13]. Some studies have shown that two techniques are well suited for different kinds of anastomosis, such as gastrojejunostomy, jejeuno-jejunostomy, ileo-transverse anastomosis, Colorectal anastomosis etc. A single layer of interrupted extra mucosal sutures is now favoured by the majority of surgeons. The single-layer extra-mucosal anastomosis advocated by Matheson is now known to have the least tissue necrosis and luminal narrowing[14-16]. The anastomosis time may influence the total length of operative procedure or hospital stay and there are no any different advantages for other parameters in both group[17].The aim of our study is to compare both surgical techniques of suturing. Stapling and hand sewing in a prospective randomized design, regarding duration of gut anastomosis, duration of operation, duration of postoperative hospital stay in both groups and incidence of postoperative complications.

Materials and Methods:

This Prospective Observational study was carried out in the Medical College for women and Hospital and different private Hospital, Uttara, Dhaka, Bangladesh from 1 January 2019 to December 2023 (5 years). Adult male and female patients admitted in General surgery Department at Medical

College for women and Hospital and different private Hospital according to their selection criteria.Inclusion criteria were Age: 20 to 70years, BMI: 16-26, Undergoing elective surgery for any benign or malignant condition of the gastro-intestinal tract that includes gut resection anastomosis and Patients with obstructed or strangulated hernia requiring surgery. Exclusion criteria were Patient not fit for surgery, Patients with High risk disease like DM, HTN, MI, BA, and (ASA) III or IV, Patients in severe sepsis with hemodynamic instability, Pregnancy and Patient with esophageal pathology -N = 50 (for each group), Total 100 cases were needed as sample, Total 100 patients were taken according to selection criteria, Group-A: Patients were undergone hand-sewn anastomosis by suture material (n=50) and Group-B: Patients were treated by stapling anastomosis (n=50). A total of 100 cases were selected according to selection criteria from the patients attending the General surgery Department 'at Medical College for women and Hospital and different private Hospital'. A predesigned proforma which included: age, gender, operative findings, method of anastomosis, anastomotic time, operating time, postoperative anastomotic leak and duration of hospital stay was made for all patients. All patients were admitted as elective cases from the OPD. Preoperative preparation included was done with Lactulose/Duralax/polyethylene glycol the night before surgery. In emergency cases, bowel preparation was not done.Before operation antibiotics were administered 30 minutes prior to surgery in both groups. After taking informed consent, the patients were divided into two groups. Selected patients were allocated into two groups by consecutive sampling. Group-A patients were treated by handsewn anastomosis and group-B: patients underwent anastomosis by staple. (Linear stapler, circular stapler). All cases of anastomosis were done by a senior surgeon as per standard procedures in both hand sewn and stapler group. The affected segment of bowel was divided between two clamps, resected then the bowel ends were approximated. In hand sewn group, the intestinal anastomosis done in two layers. Or single layer (Extramucosal) with 3/0 polyglactin (vicryl), every bite of the suture was put about 5mm apart and at 5mm depth and averted excessive tension on the suture line. Stapler anastomosis was done by linear cutter GIATM which place two double rows of titanium staples then cut and divide tissue between the two double rows simultaneously. In this technique, the two arms of the stapling device are placed through open bowel ends or through an enterotomy at antimesenteric border if the bowel ends are stapled then stapler is fired to produce lumen between both segments. The enterotomy or the bowel ends was closed by another stapler or by hand suturing. Circular stapler of various sizes was used for anastomosis. All patients were evaluated by history, physical examination and investigation, having a similar protocol. The patient investigations are complete blood count, blood sugar, blood urea, serum creatinine, urine routine, serum albumin, prothrombin time, and USG of the whole abdomen; X-ray abdomen in erect posture in A/P view; Contrast CT scan of the whole abdomen, upper gastrointestinal endoscopy, colonoscopy. Before operation, each patient of two groups were evaluated and compared for age and stage of the disease. A thorough clinical examination and radiological investigations were performed. Anastomosis time (in minute) in hand sewn group: The time start with the placement of first suture and ended when excess suture from last stitch was cut. While in stapler group anastomosis time start with firing and ends by removing stapler. Duration of operation (in minute): Time start from skin incision ends by the skin closure. All the patients were observed in general surgical ward until discharge to home and during this period, they were kept nothing per oral and on I/V fluids. Immediately after the operation, a nasogastric tube and an intra-abdominal drain tube were placed and anal stretching was done whenever it was required. Daily patient follow-up is ensured, and wound conditions are assessed clinically in terms of collection in drain, type of content in drain, bowel sound auscultation and palpation of abdomen, local wound infection, discharge and presence of wound dehiscence. Nasogastric tube was removed on 3rd-4th POD and subsequently they were switch over to sips orally then on liquids and followed soft diet with a span of 3-5 days, drains was removed on 5th – 7th POD. Patients were discharged to home after they stayed stable for few days and skin stitches were removed on 7th-10th POD. All patients were observed till their complete postoperative hospital stay and followed up for a period of one month. Anastomotic integrity was assessed by the presence or absence anastomotic leak. Other postoperative complications were also noted and tackled accordingly.Data collection: All the patients were enrolled by consecutive sampling. Thereafter, they were scrutinized according to eligibility criteria. They were explained regarding the study and the surgery. Informed consent was taken from every patient. The clinical history of the patients, physical examination findings and relevant investigations, post-operative complications, e.g. fever, abdominal pain and distension, wound dehiscence, drain tube collection, were recorded for analysis. The time of arrival in the postoperative ward was defined as zero hour postoperatively. All patients in both groups were in follow-up daily post-operatively. All patients were asked about the time required to return to normal activities. Statistical analysis of data: Collected data were compiled, checked and edited first. Then all the relevant collected data were compiled on master chart first and statistical analysis was performed.

Results:

A total of 100 patients were selected from OPD according to selection criteria. Selected patients were allocated into two groups by consecutive sampling: Group-A (patients who had undergone anastomosis by hand-sewn method). And Group-B (patients who had undergone anastomosis by stapling device, e.g., linear stapler, circular stapler) The purpose of the study is to assess and compare the clinical outcome of the patient in any elective gastrointestinal surgery using a stapler device vs. the hand-sewn method of anastomoses.

Table I: Comparison of age between two groups

Age (in years)	Group A (Hand-Sewn anastomosis) (N=50)	Group B (Stapler anastomosis) (N=50)	p-value
	n(%)	n(%)	
≤20	1 (2.0)	0 (0.0)	
21-30	12 (24.0)	6 (12..0)	$^{c}0.598^{ns}$
31-40	11 (22.0)	12 (24.0)	
41-50	13 (26.0)	16 (32.0)	
51-60	8 (16.0)	10 (20.0)	
>60	5 (10.0)	6 (12.0)	
Mean±SD	41.82±12.31	45.48±11.96	$^{t}0.135^{ns}$
Median (IQR)	42.50 (30.0-51.2)	45.50 (36.7-54.2)	

Data presented as frequency and percentage over the columns and Mean±SD over the rows.

P-value reached through:

c = Chi-square test for categorical variables

t=independent t-testfor normally distributed continuous variables

Ns = non-significant

The age distribution between the two groups was comparable. Both mean and median ages were slightly higher in the stapler group (45.48 vs. 41.82 years; 45.5 vs. 42.5 years), but the differences were not statistically significant (p>0.05).

Table **II**:Comparison of gender between two groups

Gender	Group A (Hand-Sewn anastomosis) (N=50)	Group B (Stapler anastomosis) (N=50)	p-value
	n(%)	n(%)	
Male	33 (66.0)	33 (66.0)	$^{c}1.000^{ns}$
Female	17 (34.0)	17 (34.0)	

Data presented as frequency and percentage over the columns. P-value reached through:

c = Chi-square test for categorical variables

ns = non-significant

Both groups had identical gender distributions, with 66% male and 34% female in each. The difference was not statistically significant.

Table III: Comparison of operative procedures between two groups

Operative procedures	Group A (Hand-Sewn anastomosis) (N=50)	Group B (Stapler anastomosis) (N=50)	p-value
	n(%)	n(%)	
Gastrojejunostomy	8 (16.0)	10 (20.0)	
Jejunojejunostomy	12 (34.0)	14 (28.0)	$^{c}0.081^{ns}$
Ileo-ileal anastomosis	4 (8.0)	0 (0.0)	
Ileocolic anastomosis	16 (32.0)	10 (20.0)	
Colorectal anastomosis	5 (10.0)	13 (26.0)	
Gut restoration	5 (10.0)	3 (6.0)	

Data presented as frequency and percentage over the columns. P-value reached through:

c = Chi-square test for categorical variables

ns = non-significant

Operative procedures varied between groups. Group A had more jejunojejunostomy and ileocolic anastomoses, while Group B had more colorectal and Jejunojejunostomy, gastrojejunostomy and ileocolic rates were similar. The overall difference was not statistically significant.

Table IV: Comparison of anastomotic and operative time between two groups

Variables	Group A (Hand-Sewn anastomosis) (N=50)	Group B (Stapler anastomosis) (N=50)	p-value
Anastomotic time (Minute)			
Mean±SD	39.98±2.81	11.60±1.93	^{u}**<0.001**^{s}
Median (IQR)	40.0 (37.75-42.00)	12.0 (10.0-13.0)	
Operative time (Minute)			
Mean±SD	146.50±5.28	133.86±7.71	^{u}**<0.001**^{s}
Median (IQR)	146.0 (142.0-150.0)	135.0 (130.0-140.0)	

Data presented as Mean±SD and Median over the rows. P-value reached through:

u = Mann Whitney U-test for non-normally distributed continuous variables

s = statically significant in p <0.05

Group B had significantly shorter anastomotic and operative times than Group A, with mean anastomotic times of 11.60 vs. 39.98 minutes and operative times of 133.86 vs. 146.50 minutes (p < 0.001).

Table V: Comparison of post-operative complications between two groups

Postoperative complications	Group A (Hand-Sewn anastomosis) (N=50)	Group B (Stapler anastomosis) (N=50)	p-value
	n (%)	n (%)	
Fever	9 (18.0)	0 (0.0)	
Wound infection	9 (18.0)	6 (12.0)	
Wound dehiscence	5 (10.0)	2 (4.0)	^{c}**0.001**^{s}
Anastomotic leakage	6 (12.0)	2 (4.0)	
Nil	21 (42.0)	40 (80.0)	

Data presented as frequency and percentage over the columns. P-value reached through:

c = Chi-square test for categorical variables

s = statically significant if p <0.05

Post-operative complications were higher in the hand-sewn group, with lower rates of fever, infection, dehiscence, and leakage in the stapler group. Complication-free cases were more in the stapler group (80% vs. 42%). The overall difference was statistically significant (p=0.001).

Table **VII**: Comparison of hospital stays between two groups

Hospital stay (days)	Group A (Hand-Sewn anastomosis) (N=50)	Group B (Stapler anastomosis) (N=50)	p-value
Mean±SD	11.78±1.44	8.94±1.45	^{u}**<0.001**^{s}
Median (IQR)	12.0 (11.0-13.0)	9.0 (7.75-10.00)	

Data presented as Mean±SD and Median over the rows. P-value reached through:

u = Mann Whitney U-test for non-normally distributed continuous variables

s = statically significant in p <0.05

The stapler group had a significantly shorter hospital stay than the hand-sewn group (mean 8.94 vs. 11.78 days, p<0.001).

Discussion:

The anastomosis reflecting the join of a tubular viscus after a resection or bypass procedure. Prior to the nineteenth century, intestinal surgery was limited to exteriorisation by means of a stoma, or closure of simple lacerations. Halsted favoured a one-layer extramucosal closure, and this was subsequently advocated by Matheson as it was felt to cause the least tissue necrosis or luminal narrowing. This technique has now become widely accepted, although it is essential that this is not confused with a seromuscular suture technique. The extramucosal suture must include the submucosa because this has a high collagen content and is the most stable suture layer in all sections of the gut. There is any risk of intestinal spillage during anastomosis, when bowel is unprepared or obstructed for example, atraumatic intestinal clamps should be used across the lumen of the bowel. Clamps should not impinge on the mesentery or the

vasculature of the bowel for fear of damage to the vessels resulting in ischaemic changes. Ideally, the bowel edges should be pink and bleeding prior to anastomosis. The gold standard for a good blood supply for any anastomosis is the presence of arterial bleeding from the marginal vessel immediately adjacent to the cut end of the bowel and the absence of venous congestion. Excessive bleeding from the bowel wall may need over sewing if natural haemostasis is indequate. Now a days, there is a wide range of mechanical devices with linear, side-to-side and end-to-end stapling devices that can be used both in the open surgery setting and laparoscopically. Most of these devices are disposable and relatively expensive, but their cost is offset by the saving of operative time and the potential increase in the range of surgery possible. In the gastrointestinal tract, stapling devices tend to apply two rows of staples, offset in relation to each other, to produce a sound anastomosis. Many of them also simultaneously divide the bowel or tissue that has been stapled while other devices merely insert the staples and the bowel has to be divided separately. For all stapling devices, it is crucial for the surgeon to understand the principles behind the device and to know intimately the mechanism and function of the instrument. Stapled anastomosis is an integral part of major abdominal operation[18]. Still, the interest in the results from comparisons between hand sewing and stapling has been progressively growing. In this study, it was compared the outcome of hand sewn anastomosis with stapled anastomosis in 100 patients who presented in the Medical College for women and hospital and different private Hospital, Uttara, Dhaka. The results were analyzed and compared with other studies published in literature. In present study, both mean and median ages were slightly higher in the stapler group (45.48 vs. 41.82 years; 45.5 vs. 42.5 years), but the differences were not statistically significant ($p>0.05$). Male are predominant in both groups and equal distribution both groups (male: female ratio 1.9:1). Liu et al.[19] in his study titled "Comparison of hand sewn stapled anastomosis in surgeries of gastrointestinal tumors based on clinical practice of China" among 499 patients found the mean age of patients 57.50±10.05 years in hand sewn group and 59.05±10.18 years in stapled group. In accordance this study Abdel Aziz et al.[20] reported the mean age of stapled group was 47.39±11.76 and hand-sewn group 44.04±10.48 years. Male 39.1% and female 60.9% in stapled group and male 40.7% and female 59.3% in hand-sewn group. Banurekha et al.5 reported the mean age of patient who had hand-sewn anastomosis was 51 years and those who underwent stapler anastomosis was 49 years. Bhandary et al.[21] reported their study majority of patients in both groups were between 40 to 80 years. The mean age in the hand sewn group was 54.63 years and in the stapler group it was 56.63 years. Of the 70 cases 40 patients were males and 30 patients were females. In the present study, Operative procedures varied between groups. Group A (Hand sewn) had more jejunojejunostomy and ileocolic anastomoses, while Group B(Stapled) had more colorectal and Jejunojejunostomy, gastrojejunostomy and ileocolic rates were similar. The overall difference was not statistically significant. In the current study, Group B (Stapled) had significantly shorter anastomotic times than Group A (Hand sewn), with mean anastomotic times of 11.60 vs. 39.98 minutes ($p < 0.001$). These findings were comparable with the findings of Hassanen et al.[22] (hand sewn anastomosis was 30±6.3 minutes and stapled anastomosis was 15±12 minutes with a mean difference of 15 minutes in the prospective study). Similar studies done recently in India that shown a significant reduction in the anastomotic times in the stapled group9. and also to Hori et al. study conducted in Japan which demonstrated that the anastomosis time is less in stapler group (14 minutes) than in hand sewn group (25 minutes) 22 .The mean duration of surgery was Group B (Stapled) had significantly shorter operative times than Group A (Hand sewn), with operative times of 133.86 vs. 146.50 minutes ($p < 0.001$). Damesha et al.[23] in his comparative study of 50 patients who underwent resection and anastomosis in gastrointestinal operations also found the mean operating time to be longer in hand sewn group (145 minutes in the hand sewn group and 125 minutes in stapled group). Maatooq and Merdan[25] reported decreasing anastomosis time, the total operative time decreases in stapled group. There was a reduction in the operating time for the stapler group (136.5±16.86 minutes) as compared with the hand-sewn group (176.25±32.07) minutes ($P<0.001$) which is statistically significant. Hussain et al.[26] in his comparative study of 60 patients who underwent resection and anastomosis in gastrointestinal operations also found the mean operating time to be longer in hand-sewn group (147.6 min in the hand sewn group and 111.6 minutes in the stapled group). In present study showed Post-operative complications were higher in the hand-sewn group, with lower rates of fever, infection, dehiscence, and leakage in the stapler group. Complication-free cases were more in the stapler group (80% vs. 42%). The overall difference was statistically significant ($p=0.001$).

Demetriades et al.[27] evaluated 207 patients who underwent hand-sewn or stapled anastomosis in penetrating colon injuries mentioned the incidence of anastomotic leak as 6.3% in the stapled group and 7.8% in the hand-sewn group. The authors concluded that there were no differences in anastomotic leak between patients who underwent anastomosis for condition of small bowel or large bowel. According to Mohammed et al. study compared the hand-sewn and stapler as regard the postoperative leakage in emergent cases and there is no significant difference between the two groups. Other post-operative complications were higher in the hand-sewn group, with lower rates of fever, infection and dehiscence in the stapler group. Complication-free cases were more in the stapler group (80% vs. 42%). The overall difference was statistically significant ($p=0.001$). Choy et al.[10] in a randomized control trial among 1125 patients on "stapled versus hand sewn methods for ileocolic anastomosis" mentioned (9.2% to 16%) patients in the hand sewn group and (9.3% to 12%) in the stapler group had surgical site infection. Ismael et al.[28] reported regarding postoperative general complications. The number of complications in Stapled group was 3

complications (5.8%) compared to 11 complications (21.1%) in HS group, with overall morbidity regarding general complications was (13.5%). No statistical significant difference in general complication was noted between two groups. In accordance this study Mamun et al.[29] demonstrated postoperative complications of fever in Stapled group-2(8%) and hand sewn 06(24%), wound infection in stapled group was 03(12%) and hand sewn 04(16%), Ileus/intestinal obstruction in stapled group was 01(4%) and hand sewn 02(8%), anastomotic failure in stapled group 1(4%) and hand sewn 02(8%).The stapler group had a significantly shorter hospital stay than the hand-sewn group (mean 8.94 vs. 11.78 days, $p<0.001$). which is similar to previous studies Purkayastha et al reported mean postoperative stay in hand sewn group was 17.5 days and in stapled group, it was 12.9 days, with a statistically significant. Mamun et al.[29] reported mean post operative hospital stay stapled group was 6.44(±1.35) days and 7.00(±1.32) days in Hand sewn group ($p<0.01$) that was statistically not significant. In our present study, in comparing the outcome of hand-sewn suturing and stapler technique in gastrointestinal surgery we found the following: In stapler anastomosis there is decreased operative time, early discharge from the hospital and decreased postoperative complications in comparison to hand sewn technique. We recommend the use of Stapling devices are an alternative when speed is required or access is a major factor.

Conclusion:

Several decades manual anastomosis has been the standard surgical procedure and other techniques such as staplers have been introduced later in the 20th century improved the field of surgery. In certain situations, stapling devices are used to fashion the anastomosis but as they are expensive, most surgeons reserve them for specific indications, such as oesophageal, rectal and gastric pouch procedures. Several studies have shown them not to be cost effective in routine small bowel surgery, although many surgeons still use them for ease of use and to save time. In our current study, systemic review of the literature and meta-analysis permit conclusion. We found that stapling shows long term benefit of colorectal patients in restoring the normal continuity avoiding permanent stoma. Stapling device appears to be safer and superior to the hand sewn technique when operative time, length of hospital stay and postoperative complications are taken into account. So, stapler anastomosis is a new surgical innovation that can be performed safely and successfully.

Conflict of Interest: None.

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