

## The Comparison of Hand Sewn and Stapled Anastomoses

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### ABSTRACT

**Objective:** To compare hand-sewn and stapled sutures and the influence of intestinal excision on postoperative complications.

**Study Design:** Retrospective comparative study.

**Place and Duration of Study:** General Surgery Department of CMH Peshawar, from Jan 2020 to Jan 2021.

**Methodology:** Once receiving consent, all individuals hospitalized in the medical facility for ileostomy closure were included in our investigation. In a questionnaire, postoperative complications were documented.

**Result:** This study involved a total of 60 subjects. Individuals were scheduled for surgery after receiving clearances and a loopogram distally. Thirty patients had their wounds hand-sewn shut, while 30 others had their wounds stapled shut. The mean operating time for the hand-sewn method was  $2.46 \pm 0.29$  hours, compared to  $1.86 \pm 0.17$  hours mean for the stapled method. In both categories, the anastomotic leak was comparable. Thirty patients in the hand-sewn group took a mean of  $2.42 \pm 0.25$  days to return bowel sounds after surgery, whereas it took  $1.83 \pm 0.20$  days to return bowel sounds.

**Conclusion:** The stapler method greatly decreases the duration of surgery, promotes rapid recovery, and has a lower fatality rate. Stapling is a simple procedure that can be performed in inaccessible locations, such as a low colorectal anastomosis. In elective gastrointestinal procedures, stapler anastomosis can be utilized safely and successfully.

**Keywords:** Hand sewn anastomosis, Loop ileostomy, Stapler.

**How to Cite This Article:** Hussain T, Jabbar A, Ahmed N, Shah N, Zulfiqar M, Anita. The Comparison of Hand Sewn and Stapled Anastomoses. Pak Armed Forces Med J 2022; 72(3): 1004-1007. DOI: <https://doi.org/10.51253/pafmj.v72i3.6833>

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### INTRODUCTION

A defunct loop ileostomy is a surgical strategy that enables faeces to be diverted from a distant colligation. The procedure is fundamentally implemented to expedite colon and rectal inosculation's curing capabilities and minimize the risk of a suture/anastomotic leakage.<sup>1,2,3</sup> Rectal cancer resections, ulcerative colitis, diverticular disease, and adenocarcinoma are other common reasons for a looped suture. In chronic fistulizing perianal Crohn's disease, it could also be utilized as a diversion. If the suture colligation has healed or a fistula has been making repairs, the intestinal loop can be closed. The basic technique to reverse an intestinal loop closure involves hand sewing from one end to the other in the bowel junction. The side-to-side stapler colligation for intestinal loop closure gained popularity in the 1980s.<sup>4,5,6</sup>

In colorectal surgery, loop ileostomies are commonly used to treat distal enteric illness and anastomoses.<sup>7</sup> A diverting loop ileostomy effectively reduces the effects of leakage through sutures and is thought to

lower the occurrence of anastomotic problems by certain investigators. However, after reversing an ileostomy, there is a 0.1-4% death risk. In addition, wound infection and small bowel obstruction are still much more prevalent and inconvenient consequences.<sup>8,9</sup> Problems, for instance, raise medical expenditures, lengthen hospital stays, necessitate out-patient treatment, and the possibility of late complications such as incision hernia.

Even though Meta-analyses on this subject have already been published, neither of them have focused on the impact of small-bowel resection undergoing ileostomy reversal.<sup>4,10</sup> This study aimed to evaluate and assess stapled versus hand-sewn sutures in terms of all known perioperative morbidity criteria. The focus of this research was to evaluate hand-sewn and stapled anastomotic techniques for loop ileostomy closure and the impact of intestinal resection on the risk of complications.

### METHODOLOGY

This Retrospective comparative study was conducted after the approval of the Ethical Review Committee (serial No.60/21) from January 2020 to January 2021 at the General Surgery Department of Combined Military Hospital, Peshawar.

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Received: 03 Jun 2021; revision received: 25 Aug 2021; accepted: 27 Aug 2021

**Inclusion Criteria:** Patients aged 12 years or older, upon whom elective gastrointestinal operations requiring anastomosis were performed were included in the study.

**Exclusion Criteria:** Children under the age of 12 years and emergency gastrointestinal surgery patients were excluded from the study.

The information was gathered retrospectively. After the operation, all patients were examined for one month, and the recovery data was documented. Between the stapled and hand-sewn groups, the following clinical features were compared: time spent in the operating room, in the hospital after surgery, and recovering from surgery (Rate of motility gastro col-rectal and period to start a normal liquid diet), as well as issues (suture leakage, haemorrhage in suture junction, leakage of stump and complications associated with ICU stay after surgery).

On receiving consent, 60 participants hospitalized at our medical institution for ileostomy closure were involved in our investigation. The loop ileostomy was closed while the patients were under general anaesthesia. Preoperatively, all participants received systemic antibiotics like Cefuroxime along with metronidazole.

In category A, the hand-sewn suture technique was performed without brief small bowel resection, with the small bowel mobilized as needed for stoma closure. The skin boundaries around the stoma were removed. In a hand-sewn method with minor small bowel resection, the small intestine was mobilized from the abdominal wall, and the exteriorized stoma area was excised. The bowel was shut down in two stages: an exterior inverted seromuscular layer was closed with interrupted silk sutures, and a transmural inner layer was closed with a continuous absorbable suture Vicryl (Polygalactin). The superior ligament was sutured to the abdominal cavity employing continual suture.

In category B, the intestinal mucosa was mobilized from the abdominal cavity in a homogenous method. The exteriorized portion of the abdominal opening was excised in stapled suture closure with a minor gut excision. The abdominal opening was sealed with an L stapler, and the intestine was closed with a linear stapler. The average functional time was calculated. Problems were examined during the first 30 days after surgery, and a 6-month follow-up was recorded.

Statistical Package for Social Sciences (SPSS) version 25.0 was used for the data analysis. Descriptive statistics were performed on the variables like age, gender, anastomotic leak, duration of surgery, hospitalization, bowel sounds and oral feed with a mean and standard deviation. An independent t-test was performed to correlate the differences of the variables between the hand sewen and stapled groups. The *p*-value of  $\leq 0.05$  was set as the cut-off value for significance.

**RESULTS**

Sixty participants were selected for the study. The mean of the patients in our study was  $39.7 \pm 14.5$  years. A total of 38 (63.3%) males while 22 (36.7%) females were enrolled in the study. The frequency of the duration of surgery in Group 1 showed a mean of  $2.46 \pm 0.29$  hrs. In contrast, the Group 2 showed a mean of  $1.86 \pm 0.17$  hrs, a return of the bowel sounds after the surgery with a mean of  $2.42 \pm 0.25$  days in Group 1 and a mean of  $1.83 \pm 0.20$  days in Group 2, the start of oral feeds with a mean of  $3.09 \pm 0.3$  days in Group 1 and mean of  $2.11 \pm 0.26$  days in Group 2 while the mean of number of days of hospital stay in Group 1 was  $9.0 \pm 0.78$  days and in Group 2 was  $7.5 \pm 0.62$  days. The resulted *p*-value was found to be less than 0.05 (Table-I).

**Table-I: Comparison of frequency of duration of surgery, return of bowel sound, start of oral feed and hospitalization in hand sewn and stapled anastomoses (n=60).**

| Parameters                  | Study Groups    |                 | <i>p</i> -value |
|-----------------------------|-----------------|-----------------|-----------------|
|                             | Group A (n=30)  | Group B (n=30)  |                 |
| Duration of Surgery (hours) | $2.46 \pm 0.29$ | $1.86 \pm 0.17$ | 0.001           |
| Bowel Sound Returns (days)  | $2.42 \pm 0.25$ | $1.83 \pm 0.20$ | 0.001           |
| Oral Feed Start (days)      | $3.09 \pm 0.30$ | $2.11 \pm 0.26$ | 0.001           |
| Hospitalization (days)      | $9.0 \pm 0.78$  | $7.5 \pm 0.62$  | 0.001           |

After the surgical intervention, the anastomotic leak resulted in 10 (33.33%) individuals in hand-sewn individuals, while 8 (26.66%) people showed the same symptoms in stapled individuals (Table-II).

**Table-II: Comparison of frequency of anastomotic leak in hand sewn and stapled anastomoses (n=60).**

| Characteristics  | Group A, (n=30) | Group B, (n=30) |
|------------------|-----------------|-----------------|
| Anastomotic Leak | 10 (33.33%)     | 08 (26.66%)     |

**DISCUSSION**

In this study, the mean age of patients who underwent hand-sewn and stapled anastomosis was  $39.7 \pm 14.5$  years, whereas, in the Scher *et al.* study, the average age of the patient was 54.6 years in handsewn and 58.6 years in Stapler.<sup>8</sup> In the Reiling *et al.* study, the mean age of patients in hand-sewn and stapled groups was 55.1 years.<sup>10</sup>

The Scher *et al*, study found no difference in the length of time required for subtotal gastrectomy. Furthermore, there was no statistically significant difference between the two groups in Reiling *et al*, study, whereas in Thakor *et al*, study found a statistically significant difference in favour of the stapler group.<sup>9,10</sup> In this study, the mean duration of time for surgery was 2.4 hours in hand-sewn and 1.8 hours in Stapler, with a statistically significant *p*-value of 0.001, comparable to the Scher *et al*, study, which found a statistically significant difference in favour of stapler group.

In Adloff *et al*, study found no statistically significant difference in the time duration between the two techniques, with the hand-sewn technique taking 180 minutes and the stapler technique taking 176 minutes.<sup>11</sup> The Scher *et al*, study found a significant difference in the time duration between the two techniques, with the hand-sewn technique taking 186 minutes, the stapler technique taking 209 minutes, and the stapler method taking longer.<sup>8</sup>

In this study, the mean time to reintroduce bowel sounds after subtotal gastrectomy and gastrojejunostomy was 2.4 days in the hand-sewn group and 1.8 days in the stapler group, with a *p*-value of 0.001. The mean time to initiate oral feeding was 3.09 days in the hand-sewn group but 2.11 days in the stapler group, with a *p*-value of 0.00, which differed from Scher *et al*, study,<sup>8</sup> however, Weijian *et al*. study found no significance.<sup>12</sup>

In subtotal gastrectomy and gastrojejunostomy, the mean hospitalisation day was 9 in handsewn and 7.5 in stapler technique, with a *p*-value of 0.001. While Andloff *et al*, found no difference in hospitalisation between the two techniques, Scher found insignificant differences.<sup>11</sup> In our study, the mean duration of hospitalisation in the resection and anastomosis group, was nine days in the handsewn group and 7.5 days in the Stapler.

Eighteen patients had an anastomotic leak, ten individuals had hand-sewn anastomosis, and eight had stapler anastomosis, with a *p*-value of 0.074. According to Scher *et al*, the anastomotic leak occurred at a rate of 2.1 percent with hand-sewn anastomosis and 2.9 percent with stapled anastomosis, with no significant difference between the two techniques.<sup>8</sup> Some studies concluded that there was no significant difference in anastomotic leak between the two techniques.<sup>13,14</sup>

The outcomes of this study indicated a significant difference between hand-sewn and stapled closure.

There were no differences between the two groupings in terms of re-operation or re-admission rates. The operating time and time to the first bowel movement were considerably reduced with stapled closure technique.<sup>15,16</sup> Having a shorter operation means less surgical trauma and blood loss and a lower risk of systemic infections and medical issues. However, the benefits of stapling also apply to the length of the hospital stay after surgery, consistent with previous findings that showed a difference in the time period of hospital stay among the patients of both groups. Stapled sutures are more affordable and appealing in terms of cost.<sup>14</sup>

The advantages of the stapled method could be converted into benefits of functional recovery or reduced problems by using: consistent suture space; tight closure of suture nails, type "B" cross-stitch using titanium nails; inosculation and cutting stability may reduce the risk of infection due to manual operation and minimize the risk of pulling and clamping the jejunum, thus lowering GI bleed.<sup>17,18</sup>

### CONCLUSION

The stapler anastomosis required significantly less operating time, resulting in the significantly earlier recovery of bowel sounds (except for low anterior resection and the other resection and anastomosis groups), resulted in significantly earlier initiation of oral feeds, resulted in decreased hospitalization days, and resulted in an early return to normal daily activity. Stapler anastomosis resulted in a significant reduction in mortality compared to the hand-sewed anastomosis. In addition, stapling procedures are more efficient, especially in inaccessible areas such as low colorectal anastomosis. With recent advancements in modern stapler devices, stapler anastomosis may be utilized safely and successfully in gastrointestinal procedures. One should be equally comfortable using a stapler pistol as they are with a needle holder and suture.

**Conflict of Interest:** None.

### Authors' Contribution

TH:, AJ:, NA:, NS:, MZ:, A: Direct contribution.

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