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Original Research Article

A Prospective Comparative Study of 50 Cases of Intestinal Anastomosis by Stapler versus Hand Sewn Method

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Abstract

Background: Intestinal anastomosis in General Surgery is a very commonly performed procedure for various indications by various methods and for ancient times. Various evolvements occurred in the field of various aspects of intestinal anastomosis with recent advancement is the use of stapler as a device for GI anastomosis. Because of the use of staplers, technical failure is a rarity, anastomosis is more consistent and can be used at difficult locations.

Method: A total of 50 cases which met the inclusion and exclusion criteria were included in this hospital based prospective comparative study. Than after taking informed and written consent of the patients, they have been operated by either hand-sewn or stapler methods of intestinal anastomosis randomly (25/25 cases). The subjects were allocated into two groups according to the type of anastomosis, hand sewn and stapler. Both the group of patients have been compared for various outcome measures: hospital stay, operation time, post-operative pain, post-op wound discharge, post-op anastomotic leakage, post-op resumption of day-to-day activity.

Result: The patients, operated by stapler method of intestinal anastomosis have required less operation time and less hospital stay with significantly low rate of postoperative pain, wound discharge, anastomotic leakage and early resumption of routine daily activity.

Conclusion: In our present study, we found that stapling technique can significantly reduce the time for anastomotic procedure, less tissue trauma due to less tissue handling, there is early restoration of gastrointestinal function, less post-operative complications including those of anastomotic site and reduced duration of hospital stay which helps ultimately in early return to routine work, importantly staplers can be used at places were hand sewn anastomosis is technically difficult.

Keywords: Intestinal Anastomosis, Stapler method, Hand sewen Anastomosis.

Introduction

is a surgical procedure to establish communication between two formerly distant portions of the intestine. This procedure restores intestinal continuity after removal of a pathologic condition affecting the bowel. Intestinal Anastomosis

dates back to 1000 B.C., the era of Sushruta 'The great Indian Surgeon', he described the use of black ants during the suturing of intestinal anastomosis. [1]

Proper surgical technique and adherence to fundamental principles is imperative to ensure successful outcome after intestinal anastomosis. It has been stated that "the key to a successful anastomosis is the accurate union of two viable bowel ends with complete avoidance of tension". Thus, the most important factors in the creation of a bowel anastomosis are: (1) meticulous technique; (2) good blood supply; and (3) no tension. [2] Adequate exposure and access, gentle handling of the bowel, adequate hemostasis, approximation of well-vascularized bowel, absence of tension at anastomosis, good surgical technique, and avoidance of fecal contamination are tenets of good intestinal anastomosis.

can be performed by means of a hand-sewn technique that uses absorbable or non-absorbable sutures or by means of stapling. The former is the more commonly used option because of the availability and affordability of suture materials and the wide familiarity with the procedure. The increased availability of stapling devices for has provided an alternative option to perform a rapid anastomosis. Stapled anastomotic technique has virtually replaced hand-sewn technique for low colorectal anastomosis, and its use in other areas has also increased. Although stapled anastomosis has not yet been proved superior to hand-sewn anastomosis, it has definitely reduced the operating time and facilitated the ease of doing the procedure and the surgical technical bias.

Stapling has been compared with suturing in various trials since the introduction of stapling devices in the 1970s. Between 1977 and 1986 several case series and small randomized controlled trials (RCTs) showed no significant difference in anastomotic leak rates, morbidity or mortality between sutured and stapled anastomosis throughout the gastrointestinal tract. [2] However, more importantly, there continues to be a controversy regarding whether stapling anastomosis lead to better clinical outcome over hand suturing. [3]

This study has been taken up to know the advantages of staplers anastomosis over conventional hand sewn anastomosis in respect to hospital stay, operation time, post-operative pain, post-op wound discharge, post-op anastomotic leakage, post-op resumption of day-to-day activity.

Materials and Method

A randomised controlled trial was performed at a tertiary care centre in Gujarat, India. The study was conducted after ethical clearance from the institutional review board. We included 50 patients who need intestinal anastomosis. Informed and written consent was obtained from all the participants of the study.

Inclusion Criteria:

- Male or female patients between the ages of 12 and 80 years
- All patients requiring bowel anastomosis for various benign and malignant conditions.
- Subjects who gave written informed consent after reviewing the informed consent document.

Exclusion Criteria:

- Age less than 12 years and above 80 years.
- Patients undergoing radiotherapy.
- Patients of coagulopathy and patients on anti-coagulation.

The patients were randomized into two groups according to the type of anastomosis, hand sewn and stapler. Group A (25 cases) were in hand sewn group and group B (25 cases) in stapler group. For the hand sewn group the suture material and type of anastomosis was done according to the individual surgeon's choice and preference. For the stapler group anastomosis was done using Linear cutting

stapler, Linear anastomosing staplers or Circular anastomosing staplers, based on the need. The various observations made like the time taken for the procedure, hospital stay, postoperative wound discharge, post operative anastomotic leak, post operative pain, patient returning back to work in 15 days are recorded in the charts. The reports were compared between the hand sewn and stapler anastomosis groups and also compared with other studies.

Comparisons between the two groups is done using the Student's t-test, (quantitative data) or chi-squared test (categorical data). For all the tests, $P < 0.05$ is considered statistically significant.

Result and Discussion

A total number of 50 cases of intestinal anastomosis were studied, out of which 25 patients had hand sewn (Group A) and 35 patients had stapler (Group B) anastomosis.

Age Distribution:

In group A (Hand-sewn group) 11 patients in 12-30 years age group,05 patients in 30-50 years age group,09 patients in >50years age group with mean age of the subject is 43.12 years. In group B (Stapler group) 14 patients in 12-30 years age group, 05 patients in 30-50 years age group and 06 patients in >50 years age group with mean age of the subject is 35.88 years.

Sex Distribution:

In Group A (Hand-sewn group) out of 25 patients, there are 19 males and 06 females. While in Group B (Stapler group) out of 25 patients, there are 09 males and 16 females.

Operation Time:

In this study, In group A (Hand-sewn group) total 03 patients have required <3 hours operation time, while 21 patients have required 03-05 hours time, while 01 patient has required >5 hours time with mean operation time required is 3.78 hours. In group B (Stapler group) total 18 patients have required <3 hours time, while 03 patients have required 03-05 hours time, while 04 patients have required >5 hours time with mean operation time required is 2.93 hours.Thus patients operated for intestinal anastomosis by stapler method required relatively less time than those, operated by hand sewn intestinal anastomosis ($p<0.05$).

These results are similar to the study done by HimabinduBangaruet al [4] and similar to the study done by Dameshaet al [5] , George et [6] al and Hollender et al [7].

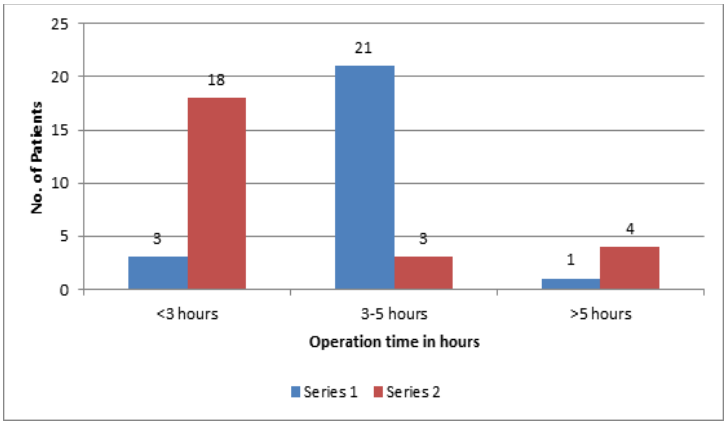

Figure 1: Operation time

Postoperative Significant Pain:

In this study, in group A (Hand-sewn group) 80% patients have developed post-operative significant pain, while in group B (Stapler group) only 40% patients have developed post-operative significant pain. Thus, patients, operated by stapler intestinal anastomosis has developed postoperative significant pain in comparatively less percentage of patients

than those operated by hand-sewn intestinal anastomosis. ($p<0.05$)

Postoperative Wound Discharge:

In this study, In Group A (Hand-sewn group) 36% patients have developed post-operative wound discharge, while in group B 08% patients have developed post-operative wound discharge. Thus, patients, operated by stapler intestinal anastomosis has developed postoperative wound discharge in comparatively less percentage of patients (cases) than those operated by hand-sewn intestinal anastomosis due to infection. ($p<0.05$).

Postoperative Anastomotic Leak:

In this study, in group A (Hand-sewn group) 32% patients have developed anastomotic site leakage, while in group B (Stapler group) only 04% patients have developed anastomotic site leakage which is significant. Thus, patients, operated by stapler intestinal anastomosis has developed postoperative anastomotic leak in comparatively less percentage of patients than those operated by hand-sewn intestinal anastomosis. ($p<0.05$)

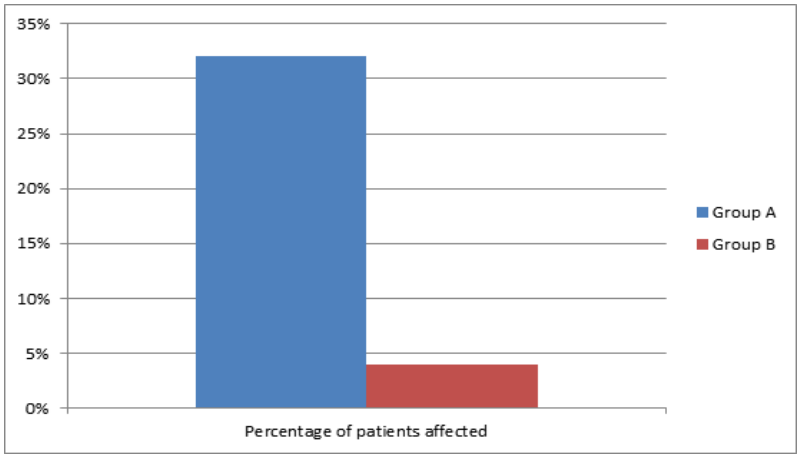

Figure 2: Anastomotic leak

Hassanen et al in their clinical trials of 39 patients found leak in 16.6% in stapler group and 38% in hand sewn favoring stapler anastomosis. [8] As per the 1998 meta-analysis which addressed 13 trials published during 1980 to 1998 showed no difference in leak in colorectal anastomosis and significant reduction in leak in stapled group for ileocolic anastomosis. [9] The high rate of anastomotic leak in OG group in this study is due to absence of adventitious layer. [10]

Hospital Stay:

In this study, In group A (Hand-sewn group) total 9 patients stayed in hospital for 5-15 days, 11 patients stayed for 16-30 days, 05 patients stayed for >30 days with mean hospital stay with mean stay 20.32 days. In group B (Stapler Group) total 14 patients stayed in hospital for 5-15 days, 08 patients stayed for 16-30 days, 03 patients stayed for >30 days with mean stay 19.52 days.

The hospital stay in both group of patients was more due to the patients were from peripheral and remote areas where no supportive medical facilities were available. Patients in both groups were been discharged only after there was no need for medical management.

Patients Returning Back to Work In 15 Days:

In this Study, in group A (Hand-sewn group) 16% patients have returned to work within 15 days of operation, while in group B (Stapler group) 64% patients have

returned to work within 15 days of operation. Thus, patients, operated by stapler intestinal anastomosis have returned to their work within 15 days of operation in significantly more percentage than those operated by hand-sewn intestinal anastomosis. ($p<0.05$)

Conclusion

In comparison to hand-sewn intestinal anastomosis, Intestinal anastomosis by stapler is superior in less operation time, shortened hospital-stay, less post-operative wound discharge, pain and less post-operative anastomotic-site complications. After stapler anastomosis, the patients can easily and early resume their work.

Thus, Intestinal anastomosis by stapler method is more effective, efficient, less time consuming, more patient friendly than open hand-sewn intestinal anastomosis.

References

1. Singh RK, Vyas MK. Surgical procedures in Sushruta Samhita. Int J Res Ayurveda Pharm. 2011;2(5):1444-50.
2. Bowel anastomosis: The theory, the practice and the evidence base, Frances Goulder.
3. Intestinal Anastomosis Neil j. Mortensen, MD, FRCS, and Shazad Ashraf, DPhil, FRCS.
4. Himabindu et al: Comparative Study between Staplers and Conventional (Hand-Sewn) Anastomosis in Gastrointestinal Surgery. Indian J Surg. 2012 Dec; 74 (6): 462–467.
5. Damesha N, Lubana PS, Jain DK, Mathur R. A comparative study of sutured and stapled anastomosis in gastrointestinal operations. Internet J Surg. 2008;15(2).
6. George WD, West of Scotland and Highland anastomosis study group Suturing or stapling in gastrointestinal surgery: a prospective randomized study. Br J Surg. 1991; 78:337–341.
7. Hollender LF, Blanchot P, Meyer C, da Silva e Costa JM. Mechanical suturing apparatus in gastrointestinal surgery. Zentralbl Chir. 1981;106(2):74–83.
8. Hassanen A, Darwish A, Bieh HA. Stapled versus hand-sewn anastomosis of the large bowel due to abdominal trauma: a prospective comparative study. Egyptian Journal of Surgery. 2008 Oct;27(4):208-212.
9. Kracht M, Hay JM, Fagniez PL, Fingerhut A. Ileocolonic anastomosis after right hemicolectomy for carcinoma: stapled or handsewn? A prospective, multicenter, randomized trial. Int J Colorectal Dis. 1993; 8: 29-33
10. Chakdoufi S., Mamoune E. M., Brahim E. M., & Anas G. A. Postoperative (Pressure) Alopecia on Head Rest Fixation Pointes Area, Following Intracranial Removal of Meningioma. A Rare but Disturbing Complication to Consider. Journal of Medical Research and Health Sciences, 2023; 6(3): 2480–2083.