Original Research Article

A use of staplers during gut surgery and its comparative hand sewn technique: A Prospective Study

Vibhuti Bhushan[1], Abhay Kumar[2*], Deepak Pankaj[3]

[1]Additional Professor, Department of General Surgery, IGIMS, Patna, Bihar, India
[2]Senior Resident, Department of General Surgery, IGIMS, Patna, Bihar, India
[3]Assistant Professor, Department of General Surgery, IGIMS, Patna, Bihar, India

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Abstract

Background: Anastomosis in GI surgery is a relatively common procedure; numerous ways of intestinal anastomosis have been used since the time of Sushruta; a recent breakthrough is the use of a stapler as a device for GI anastomosis. Intestinal obstruction, peritonitis from a ruptured gut, abdominal trauma, gastrointestinal cancer, and other bowel illnesses are all prevalent surgical problems that must be treated operatively around the globe. As a result, joining two portions of bowel is frequently required. This anastomosis can be done manually or with the assistance of staplers. **Method:** After receiving written informed consent, patients who walked for gastrointestinal anastomosis in between 30th September 2020 to 30th August 2021were involved in the research. Pre-operatively, all of the patients were thoroughly investigated and were assigned at random to one of two sets: stapler group or hand stitched group. Both the sets had complications, which were noticed and dealt with. **Result:** The study included 60 individuals who underwent 60 gastrointestinal anastomosis procedures. The larger population was between the ages of 30 and 50. The hand sewn group had a 13.3% anastomotic leak rate, whereas the stapler group had a 3.3 percent rate. A few individuals experienced further issues like a burst abdomen, electrolyte imbalance, pulmonary complications, cardio-vascular difficulties, wound contamination, and so on. **Conclusion:** In gastrointestinal surgery, the hand-sewn approach has been the primary incisional technique for modifying anastomosis. In this research, we discovered that using the stapling approach can greatly shorten the time it takes to do an anastomotic surgery, as well as cause less tissue stress due to less tissue handling. The incidence of post-operative problems, such as anastomotic leak and wound infection, did not differ significantly between the hand sewn and stapled procedures. As a result, both the hand sewn and stapled anastomosis techniques are safe to use.

Keywords: anastomosis, leak, resection, stapled, hand-sewn, peritonitis

Introduction

Intestinal anastomosis has been documented since 1000 B.C., when Sushruta "The Great Indian Surgeon" reported the suturing of intestinal anastomosis with black ants [1]. Even in today's surgical practise, the most feared consequence of any bowel anastomosis is anastomotic leak. An exact joining of two viable bowel ends with perfect avoidance of tension is the intent of a successful anastomosis. Intestinal obstruction, peritonitis from a ruptured gut, abdominal trauma, gastric outlet hindrance, gastrointestinal cancer, and other bowel illnesses are all common surgical issues around the globe. These issues must be addressed surgically, which commonly necessitates the joining of two sections of bowel. The bulk of surgeons prefer hand suturing using improved suture materials, although the routine of stapling has arisen as an alternate form of anastomosis. Technical collapses are rare with current devices, staple lines are of higher quality, and anastomosis in challenging spots is easier to establish. The ability to reduce surgical trauma has undoubtedly been the most salient factor in the adoption of staplers [2]. The growing utilization of stapling devices has assisted in the technical advancements of surgery. Refinements in surgical techniques, anaesthetic care, diagnostic accuracy, and antibiotic prophylaxis have all contributed to better results, but the growing confidence of surgeons in their capability to achieve intestinal wound restoring owes much to the recognition of the critical prerequisites for anastomotic security [3].

*Correspondence
Dr. Abhay Kumar
Senior Resident, Department of General Surgery, IGIMS, Patna, Bihar, India.
E-mail: drabhaykumar55@gmail.com

Several retrospective studies have provided contradictory results. Large bowel surgeries and the handling of stapling devices that are circular have been the concern of the few prospective randomised trials that have compared surgical stapling with manual suturing approaches. There wasn't seen any discernible variation in the measure of anastomotic leakage between stapled and hand-sewn anastomosis in colorectal incision, according to a meta-analysis. In comparison to colorectal anastomosis sewed by hand, the stapled category had a greater prevalence of stricture and intraoperative difficulties. Improved mechanical stapling has increased in versatility in the recent past, to the point where many surgeons are considering it. Despite the abundance of anecdotal data suggesting that manual suturing and surgical stapling are generally similar in terms of well-being, there has been little scientific activity to thoroughly investigate the comparative features of each approach [4-9]. We compare hand suturing to surgical stapling in individuals receiving elective intestinal incision in this research.

Methodology

This 12-month study took place at the Department of General Surgery at IGIMS, Patna, India, with prior approval from the institutes ethical committee. The study invited adult male and female volunteers (ages 18 to 70) who were undergoing elective surgery that required a gastric, small, or large bowel anastomosis. Patients having emergency setting anastomosis, pregnant women, patients with carcinomas, coagulopathies or on anticoagulant therapy, anaemic (Haemoglobin less than 8 g/dl), and hypoalbuminemic patients were all disbarred from this study. Patients were assigned to one among the two categories: stapler or hand stitched. Each case of intestinal anastomosis was randomly designated to one among the two groups: manually stitched or stapled. Each and every patient were given thorough explanations of the procedures and their outcomes. All

standard blood tests were completed. Haemoglobin, Total Count, Differential Count, blood urea, Serum creatinine, Liver Function Tests, RBS, blood grouping, Urine routine and microscopic examination, Chest X-ray, ECG, and USG are some of the tests available.

Table 1: Surgery and indications

Surgery	Indication	Hand-sewn	Stapler
Retrocolic gastrojejunostomy and jejunojejunostomy, truncal vagotomy	Gastric outlet hindrance due to chronic duodenal ulcer	30	30
Antecolic gastrojejunostomy following gastric resection (distal gastrectomy) (Billroth II) and jejunojejunostomy	stomach carcinoma antrum and/or pyloric area (they're all with early gastric cancer with no variation in staging)	30	30
End-to-end colorectal following a low anterior abscission, anastomosis	Carcinoma rectum (tumor > 5 cm above the anal periphery)	30	30
	(no variance in staging in all volunteers)		

Result

From 30 September 2020 to 30th August 2021, an anticipated study was carried out at IGIMS, Patna, to balance the upshot of hand stitched versus stapled anastomosis in patients going through GI proceedings in the Department of General Surgery. Out of 60 cases of abscission and anastomosis evaluated in this scrutiny, 30 patients had hand stitched anastomosis and 30 patients had stapler anastomosis. A two-layer hand-sewn anastomosis was formed using 3-0 vicryl and 3-0 silk. Liner cutting and a liner stapler were taken in use to form a stapler anastomosis. With 30 patients each, there were primarily two sets: hand stitched and stapled. One incidence of gastrojejunostomy in the manually stitched group had anastomotic leak. The stapled anastomosis batch had no leaks. In five cases, wound contamination was discovered. 4 cases were hand-sewn, and 1 case was stapled. There wasn't any post-operative mortality in any of the groups.

Oesophagogastric group, Gastrojejunostomy group, Jejunojejunostomy group, and Ileocolic group were the four groups identified in our investigation.

a) The Oesophagogastrostomy group was made up of two patients, one in each of the groups (hand stitched and stapled). In both situations, there were no problems.
b) There are 14 victims in the gastrojejunostomy group, including 7 in the hand stitched and 7 in stapler anastomosis groups. In the hand stitched group, there was an occurrence of anastomotic leak, but none in the stapled group. In the hand stitched group, it had two occurrences of an infection in a wound and one incidence of wound infection in the stapled category. In neither lot, there came any mortality.
c) The Jejunojejunostomy group is made up of two patients, one in individual groups (hand stitched and stapled). There weren't any difficulties.
d) There were 22 victims in the Ileocolic group, with 11 in the groups individually. In the two groups, there wasn't any leak. It had two manifestations of wound being contagious in the hand sewed group and not at all in the stapled group. In both the groups, there wasn't any mortality.

The typical time to resume oral feedings after a gastrojejunostomy was 4.1 days in the stapler group and 4.25 days in the hand-sewn group in the gastrojejunostomy group. The standard time to resume oral feeds after gastric resection was 4.95 days in the stapler group and 4.9 days in the hand-sewn group. In the antecedent resection group, the standard time to resume oral feeds noted was 3.8 days, although in the stapler group, it came to be 3.8 days.

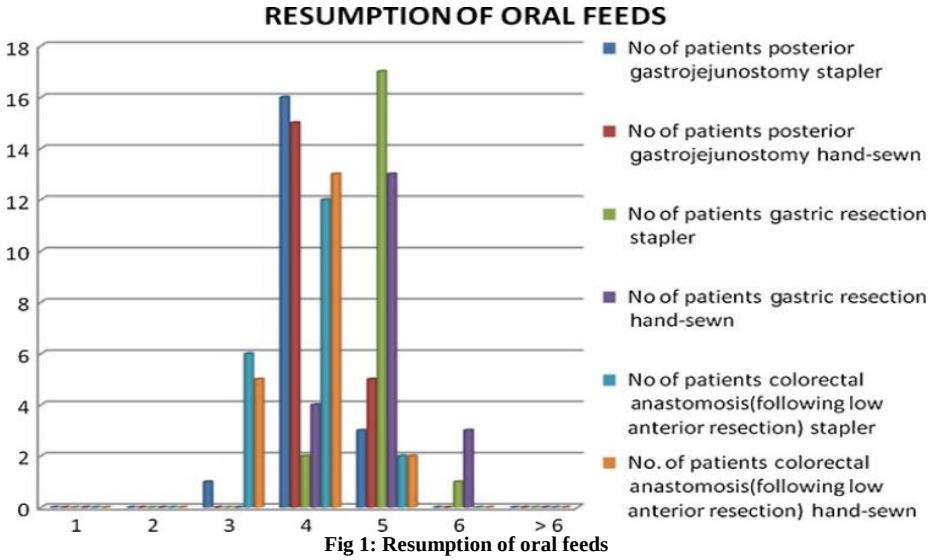

Fig 1: Resumption of oral feeds

Discussion

In this survey of 60 patients, the reactions of hand stitched and stapled anastomosis were compared who approached to the Department of General Surgery at IGIMS, Patna. The findings were examined and contrasted to those of other studies in the compositions. When both of the categories were compared, one instance of anastomosis leakage was spotted in the hand stitched category of GJ, however statistically it was not of significance. There happened to be five incidences of contamination of the wound, including four in the hand-stitched groups and a single in stapled groups. There weren't any deaths reported when it comes to mortality. There weren't any further issues to deal with. In this investigation, hand-sewn anastomosis had one

case in the gastrojejunostomy group of anastomotic leak, which wasn't relevant. It had been handled with caution. In the two, hand stitched plus stapler anastomosis groups, there weren't any leaks. In the hand sewn set, there came two incidences of wound contamination and one case in the gastrojejunostomy group. In studies conducted by Lustosa et al., Docherty et al., and Nasirkhan et al., the usage of sutures or staples to form a colorectal anastomosis didn't significantly had impact on the anastomotic leak rate [10, 11, 12]. In the hand stitched category, two incidences of contagious wound in the ileocolic group existed. In 1998, MacRae & McLeod published a thorough examination and meta-analysis of 17 trials comparing hand sewing versus stapling in ileocolic, colocolonic, as well as colorectal anastomosis [13, 14]. They concluded that, whereas stapled patients had more intraoperative technical issues, there wasn't any indication of distinctions between other characteristics, and they regarded both methods to be uniformly effective.

Conclusion

In this research, we discovered that working on the stapling approach can greatly shorten the time it takes to do an anastomotic incision, as well as cause less tissue stress because of less tissue handling. In gastrointestinal incision, the hand-sewn approach has happened to be the primary method of surgery in modifying anastomosis. No apparent difference could be set up in the affair of post-operative impediment, such as wound contamination and anastomotic leak, between the hands stitched and stapled procedures, according to this study. As a consequence, both hand stitched and stapled anastomosis techniques are safe to come into use. The chosen technique is determined by the surgeon plus the availability of the facility. As a out-turn of reduction in operating time staplers may be beneficial in those whose overall condition is poor and who would not tolerate anaesthesia for an extended period of time.

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