



Outcomes Assessment between Hand Sewn and Stapled Intestinal Anastomosis

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Authors' contributions

This work was carried out in collaboration among all authors. Author ZAY designed the study, performed the statistical analysis, wrote the protocol and wrote the first draft of the manuscript. Authors KD and JA managed the analyses of the study. Authors GHR, MZ and SHD managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

Objective: This study was conducted at the Department of Surgery of Liaquat University of Medical & Health Sciences, Jamshoro, Sindh, Pakistan for comparing the effectiveness of both methods: hand sewn and stapled intestinal anastomosis and to find a better comparatively to be more efficient.

Methods: A total of 70 patients were encompassed who underwent intestinal anastomoses from proximal jejunum to 2/3rd of proximal distal rectum. All patients were assigned to two different groups A and B each encompassing of 35 cases. In group A, the single layer continuous and in group B single layer patients intervallic serosubmucosal anastomosis was made by implementing the stitches approximately 6 mm at a distance integrating around 5.5 mm of the gut in its stretched direction axis evading individual mucosa. The patients were observed post operatively for anastomotic fiasco such as leakage.

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Results: Fourteen (14) out of 35 (2.5%) patients in group A developed anastomotic leakage . In group B, the interrupted serosubmucosal anastomoses were made in 26 patients in emergency and remaining were operated schedule wise. Five (7%) patients exhibited anastomotic leakage in group B. In group A, the continuous leakage in serousubmucosal anastomosis was 2.5% while in group B interrupted serousubmucosal anastomosis was 7%.

Conclusion: It has observed in past studies that single layer interrupted stitches leakage is higher as compared to continuous. It is clear that anastomotic failure in group A is greater than group B but it not considerably substantial and hence both are remarkably efficient.

Keywords: Hand sewn; Stapled Intestinal Anastomosis.

1. INTRODUCTION

The abdominal trauma, intestinal obstructions, bowel disorders especially peritonitis from a perforated bowel are most serious surgical challenges occurring across the globe. These issues must be treated typically using surgical operations and therefore it is usually essential to link two sections of bowel collectively [1]. The precise estimations of this bowel using a virtuous supply of blood to both of the structures without any stiffness are being perceptibly basic in combined form. The fundamental principles of intestinal anastomosis were recognized over 100 years before and have since undertaken slight modifications. An uncertain intestinal anastomosis is an intolerable iatrogenic threat [2]. The inappropriate anastomosis or cessation of suture line might result into leakage, hemorrhage, diverticular formation, stenosis and eventually fecal fistula with critical septic complications which can lead to death. The occurrence of leakage of intraperitoneal anastomotic differs in the literatures within the ranges of 0.5% to 30% but is commonly between 2% to 5% [3]. The systematic process of anastomosis healing is dependent mostly upon the techniques of anastomosis. Several methods have been utilized to perform anastomosis. These methods have been classified into 2 classes, stapled or hand sewn anastomosis. Hand sewn procedures comprise the interruption of several double layers or single layer methods [4] The advancement of stapling apparatuses has added innovative tendencies in intestinal surgeries. The comparison of hand sewn with stapled anastomosis seemed to be zero differences between each other. The hand suturing methods were obviously revealed to exhibit an extensive learning curve as compared to stapling methods [5]. The characteristic of intestinal suturing method which has continuously still controversial is the usage of either two layers or one suture layer for anastomosis. The magnitudes of intestinal

surgery were emerged with the latest development of stapling apparatuses for intestinal anastomosis. This method is verified to be a perfect way for apposition of tissues at the site of anastomosis as it provokes a negligible inflammation in the tissues and provides an instant strength throughout the weakest healing phases [6]. Up to now, the lot of clinical trials, systematic reviews and meta-analyses have been made on the evaluations of stapled and hand sewn methods for anastomosis of the intestines. The outcomes of multiple researches have exposed various benefits of stapler technique with respect to rates of anastomosis leakage which was 22% in as in hand sewn patients and was 2.8% in stapler techniques [7]. The less rate of infection of about 4.3% stapler and 5.9 % for hand sewn techniques as well as low time of operational procedure with the average differences of 8 minutes in stapler method's favor. Additionally, it has been shown in a meta-analysis that stapled anastomosis was linked significantly with less anastomotic leakages than that of hand sewn with the values of 0.015% for stapled and 6.6% for hand sewn method [8]. In most of the under developed countries such as Pakistan, the researches which have evaluated the hand sewn and stapler techniques are deficient especially in province Sindh. Thus, this study was conducted for comparing the effectiveness of both methods and to find a better way comparatively that would be more satisfactory and decrease the occurrence of anastomosis leakages.

2. MATERIALS AND METHODS

This comparative and prospective study was conducted at the Department of Surgery of Liaquat University of Medical & Health Sciences, Jamshoro, Sindh, Pakistan. The approval of the research was taken from the ethical committee of the institution. From Sep 2019 to Jan 2020, a total of 70 patients were encompassed who underwent intestinal anastomoses from proximal

jejunum to 2/3rd of proximal distal rectum. The patients of more than 15 years age from both sexes (males and females) were included who were undergoing emergency or elective surgical operation. The consultant surgeon and some residents with a minimum of 5 years' experience performed the complete surgical procedures.

The 30 mg magnesium sulphate was administered orally in a glass of water to the patients who required preoperative gut preparation for two hours and prepared them till loose motions occurred [9]. Then, same dose was given every 8 hours and one day prior to surgery. The klean enema was administered in case of large bowel elective surgery. In emergency peritonitis cases, the anastomosis and segmental resection was carried out because of large or small bowel perforations. Meanwhile, it was considered feasible only by operational surgeon when good volume pulse and more than 8 gm hemoglobin as well as free of faeces peritoneal cavity was confirmed.

The patients who did not achieve the above-mentioned standards were deferred to enterostomy. Same material of sutures including antibiotics cefuroxime 750 mg, 2/0 vicryl (polyglyactin) along with 8 hourly metronidazole 500 mg and gentamycin 80 mg were managed up to 5th day postoperatively [10]. All patients were assigned to two different groups A and B each encompassing of 35 cases. In A group, the single layer continuous and in "B" group single layer patients intervallic serosubmucosal anastomosis was made by implementing the stitches approximately 6 mm at a distance integrating around 5.5 mm of the gut in its stretched direction axis evading individually mucosa. The patients were observed postoperatively for anastomotic fiasco such as leakage. The patients were diagnosed clinically for failure of anastomosis by apparent discharge of faecals or unabsorbable materials from the wounds. They were also observed after oral management of medications and radiographic fistula demonstration as well as observable suture line's disruption through another exploration.

3. RESULTS

Out of 70 patients, 51 (72.85%) were males and 19 (27.14%) were females. Out of these, 22 (31.42%) were operated schedulewise while 48 (68.57%) were operated in emergency (Table1).

Of the 35 patients belonging to group A, the continuous serosubmucosal anastomoses were made during emergency and in the remaining patients, it was done schedulewise. A total of (2.5%) out of 35 patients developed anastomotic leakage. In group B, the interrupted serosubmucosal anastomoses were made in 26 patients in emergency and remaining were operated schedule wise. Total 5 (7%) patients exhibited anastomotic leakage in this group. In current study, the anastomotic failure was reported generally in 8 patients specifically. In group A it was 11.4% and in group B it was 14.28%. Only 2 patients reported with sub-clinical leakage and were detected with the help of contrast enema so administered conventionally. Among these, the 1st was verified on second exploration and another was identified with faecal expulsion from wounds. 01 patient of group A and 02 of group B were deceased (Table 2).

4. DISCUSSION

Anastomotic leakage is one of the dreadful complications of gastrointestinal anastomosis which influences the surgical consequence harmfully. Abnormal vigorous symptoms are tremendously usual after anastomotic bowel resections. Although the anastomotic method is the most significant determinant of results but its healing procedure is persuaded by a lot of factors including plentiful supply of blood, proper alignment, appropriate apposition and less tensions have made favorable impacts [11]. While malnutrition, perianastomotic sepsis, corticosteroids, distal obstruction, hypotension, haematoma formation, hypoxia, uraemia and jaundice have adversative consequence on healings.

In many previous researches, it has been demonstrated that technique of border coaptation effects the mechanism of epithelial repairment [12]. It is also suggested that precise apposition is perfect for early healing of epithelial wounds and similar implements on intestinal anastomosis. The intensity of intestinal anastomosis is comparatively low in the initial days after surgical procedure undoubtedly as a consequence of limited enzymatic degradation of supportive matrix of metalloproteinic family. Thus, the intestinal anastomosis has slight intrinsic resistance to distension. Moreover, the longitudinal interruption is frail therefore till deposition of collagen is recognized, the extrinsic care is vital within the lag phase for maintaining the continuity of tissues [13].

Table 1. Descriptive statistics regarding age and gender (n = 70)

Variables	Statistics
Age (mean)	35.34 ± 23.44 years
Gender	Male
	Female

Table 2. Statistical analysis of results

Variables	Study groups		p-value
	Group A	Group B	
Anastomosis leak	2.5%	07.0%	0.002
Anastomosis failure	11.4%	14.28%	0.087
Death	2.5%	04.0%	0.056

Many investigators have well demonstrated the protection of single layer gut anastomosis by their researches. Few are of the opinions that single layer anastomosis consequences in slight ischemic modifications, more comprehensive ends' vascularization, more distension resistance and slight collagen reabsorptions [14]. It has been proved previously that by using radioactive microspheres which are strong for anastomosis vascularization are maintained after continuous method. It has observed in rats previously that there are no microangiographic and histological variances between interrupted and continuous single layer anastomosis [15].

5. CONCLUSION

It has observed in past studies that single layer interrupted stitches leakage is higher as compared to continuous. However overall anastomotic failure was very low. In group A, the continuous leakage in serousubmucosal anastomosis was 2.5% while in group B interrupted serousubmucosal anastomosis was 7%. It is clear that anastomotic failure in group A is less than group B but it is not considerably substantial. The rate of failures in interrupted anastomoses is more as compared to last studies of literatures that is extraordinary.

CONSENT

It's not applicable.

ETHICAL APPROVAL

The approval of the research was taken from the ethical committee of the institution.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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