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A Comparative Study on Small Bowel Anastomosis Regarding Anastomotic Techniques and Post Operative Outcomes

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ABSTRACT

The joining of two channels, tubes, fibers, or other network components is known as an anastomosis. "Anastomoun" (provide with a mouth) is the Greek word from which the word originated in the late 16th century. An analytical study that was non-randomized, prospective, interventional, and hospital-based was conducted at Burdwan Medical College and Hospital. The study population consisted of patients aged 13-60 who met the eligibility requirements and underwent small bowel anastomosis in an emergency or elective setting during the study period. The research was carried out from January 2018 to June 2019. This study included 50 patients in total. Three techniques were used to construct the anastomosis stapler method (n3 = 10), double layer (n2 = 20), and single layer (n1 = 20). The data that follows has been examined in light of the conclusions reached by these three groups. The same three study groups experienced wound dehiscence. The chi-square test ($p>0.776$) unequivocally demonstrated that there isn't a statistically significant difference. The stapler group did not experience intestinal fistulas, despite the same number of wound dehiscence. However, the difference ($p>0.513$) does not indicate statistical significance. In the double layer group, wound infection is significantly higher ($p>0.002$) than in the single layer group. Between the three distinct research groups, there is no statistically significant difference in the mean hospital stay ($p>0.512$). The earliest discharge was granted to all three groups after five days. The small sample size of this study and the unavailability of staplers in emergency OT make it impossible to draw any clear conclusions. Further investigation is needed for some interference.

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Key Words
Small bowel, anastomotic technique, post-operative outcome

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INTRODUCTION

The joining of two channels, tubes, fibers, or other network components is known as an anastomosis. "Anastomoun" (provide with a mouth) is the Greek word from which the word originated in the late 16th century. In the field of surgery, it is a technique used to create communication between two previously separated sections of the intestine. With this procedure, the intestinal continuity is restored following the removal or bypassing of a pathologic condition that affects the bowel[1]. Compaction anastomotic clips, nithinol-based rings, tissue glue, suture-less biofractile rings, fibrin glue (SAINT), laser welding devices, compression anastomotic ring locking procedure (CARP) and other techniques can all be used to restore intestinal continuity[2]. The surgical experience, material availability and personal preference all influence the technique selected. Regardless of the technique used, the theory for achieving a safe, healthy bowel anastomosis is always the same[3,4]. In this dissertation, we compare and contrast the outcomes of three distinct anastomosis techniques.

In both elective and emergency general surgery, bowel anastomoses are frequently performed. The site of the anastomosis the calibre and quality of the bowel and the underlying disease process all influence the choice of anastomotic technique. Still, surgical experience and personal preference play a significant role in the choice of which anastomosis to perform. Regardless of the technique used the theory for achieving a safe, healthy bowel anastomosis is always the same. Regretfully, though, some anastomoses still leak despite the "perfect patient," a healthy bowel, and careful technique. This leads to significant morbidity and mortality, for example, 22% mortality in patients with a leak vs 7.2% mortality in those without. [5]. Reducing this rate would increase mortality because 4% of all anastomoses made following the removal of a colonic tumor (and a higher percentage of colorectal anastomoses) leak[6].

MATERIALS AND METHODS

An analytical study that was non-randomized, prospective, interventional and hospital-based was conducted at Burdwan Medical College and Hospital. The study population consisted of patients aged 13-60 who met the eligibility requirements and underwent small bowel anastomosis in an emergency or elective setting during the study period. The research was carried out from January 2018 to June 2019. In all, 50 patients were involved in this investigation.

Every manually stitched anastomosis is made in a single or double layer configuration. Using 3-0/2-0 interrupted polyglycolic acid or Polyglactin 910 violet in an extra mucosal manner, single layer anastomosis was performed. In the double-layered technique, interrupted sero-muscular lambert stitches using 3-0 polyglycolic acid or silk were used to create the outer layer, while the inner layer was created using 3-0/2-0 polyglycolic acid in a full thickness continuous fashion. Gia staplers were the staplers used in anastomosis.. Following surgery, patients received post-operative antibiotics, fluid-electrolyte balance, postural care, chest physical therapy and DVT prophylaxis. They were also closely monitored for complications and recovery.

Inclusion creteria:

- During the study period, Burdwan Medical College and Hospital performed small intestinal anastomosis on patients between the ages of 13 and 60 who did not meet any of the exclusion criteria
- Patients who provided the study with legitimate and informed consent

Exclusion criteria:

- 12 years of age or younger
- older than sixty years
- Each and every biliary-enteric, gastric and esophageal anastomose
- Entero-pancreatic anastomosis
- The anastomosis of the colon
- In emergency situations, lag times exceed four days
- Individuals with metastatic illness or those receiving palliative surgery
- Using immunosuppressive medications
- Severely abnormal liver function
- Anticoagulant medication or coagulopathy

RESULTS

The majority of the study's patients are middle-aged. as demonstrated by the population's mean age of 32.51 years and median age of 35 years. Individuals with ages under 12 and over 60 were not allowed to participate in the study. Males make up the majority of the study population (80.0%). Three techniques were used to construct the anastomosis stapler method (n 3 = 10), double layer (n 2 = 20) and single layer (n 1 = 20). The data that follows has been examined in light of the conclusions reached by these three groups. Dehiscence of the wound happened in the same three study groups. The chi-square test ($p>0.776$) unequivocally demonstrated that there is't a statistically significant difference.

The stapler group did not experience intestinal fistulas, despite the same number of wound dehiscence. However, the difference ($p>0.513$) does not indicate statistical significance. A patient who suffered a blunt abdominal trauma resulting in a jejunal perforation 5 cm from DJ flexure passed away

Table 1: Age distribution (n = 50)

Age group(year)	No of cases	Percentage (%)
13-20	8	16.0
21-40	29	58.0
41-60	13	26.0
Sex		
Male	40	80.0
Female	10	20.0
Method of anastomosis		
Single layer	20	40.0
Double layer	20	40.0
Stapler	10	20.0

Table 2: Wound dehiscence in different method of anastomosis

	Wound dehiscence		
Method of anastomosis	Yes (%)	No (%)	Total
Single	1 (5.0)	19 (95.0)	20
Double	1 (5.0)	19 (95.0)	20
Stapler	1 (10.0)	9 (90.0)	10
Total	3 (6.0)	47 (94.0)	50

Table 3: Intestinal Fistula in different method of anastomosis

	Intestinal fistula		
Method of anastomosis	Yes (%)	No (%)	Total
Single	1 (5.0)	19 (95.0)	20
Double	1 (5.0)	19 (95.0)	20
Stapler	0	10 (100)	10
Total	2 (4.0)	48 (96.0)	50
Method of anastomosis			
Wound infection			
Percentage			
Single	4	20.0	
Double	10	50.0	
Stapler	6	30.0	

on the 20th post-operative day, despite our best efforts to manage the two patients during the recovery period. Every other patient was released in a stable state. In the double layer group, wound infection is significantly higher ($p>0.002$) than in the single layer group.

Between the three distinct research groups, there is no statistically significant difference in the mean hospital stay ($p>0.512$). The earliest discharge was granted to all three groups after five days. Thirty days was the longest stay possible for an intestinal fistula.

DISCUSSIONS

As was previously said, the process of anastomosis has changed over the ages in an effort to get better results. But regardless of the strategy used, the principles remained the same 1) sufficient blood flow at both ends, 2) cautious techniques, 3) no tension in the loops, 4) distal blockage absent and 5) the straightforward absence of peritonitis or fecal contamination[7]. Regardless of the degree of anastomosis, the research is unable to show that stapled procedures are preferable to hand-sewn techniques in colorectal anastomosis, despite the former's high stricture rate[8]. It has been questioned whether staplers are necessary for intraperitoneal anastomosis. The choice of approach needs to be evaluated in light of prior experience, clinical conditions and available resources. The decision between the two methods (hand-sewn vs. stapled) may come down to personal preference, as evidenced by another systematic study. The results of every prospective and randomized experiment have been inconsistent. The time required to form the anastomosis and the frequency of issues did not differ significantly between the groups[9].

CONCLUSIONS

There was no appreciable variation observed in the three study group's wound dehiscence, intestinal fistula, hospital stay, or post-operative healing. However, compared to the single and double layer anastomosis groups the stapler group experienced flatus passage significantly sooner. Furthermore, a noteworthy rise in wound infection was observed in cases of double layer anastomosis. This could be due to non-randomization and selection bias, which were not able to be prevented in this study. Aside from this, the small sample size and lack of staplers at our emergency OT prevent it from drawing any firm conclusions. Conclusive analysis of this dispute requires larger sample size and better data randomization. The choice of approach needs to be evaluated in light of prior experience, the clinical situation, and the resources that are accessible.

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