



A COMPARATIVE STUDY ON SMALL BOWEL ANASTOMOSIS REGARDING ANASTOMOTIC TECHNIQUES AND POST-OPERATIVE OUTCOMES

General Surgery

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ABSTRACT

Background: - Anastomosis is a connection between two channels. In Surgery there are various procedures to establish connection between two formerly distant portions of intestine. This restores intestinal continuity after bypassing the pathological part. This study compares three known techniques of bowel anastomosis.

Methodology: - Patients were randomized. Single layer extra mucosal interrupted sutures were done by 3-0/2-0 Polyglactin. Double layer technique was done by 3-0/2-0 Polyglactin. Staplers used for anastomosis were GIA Staplers. Post op care was given adequately.

Results: - No significant outcome difference were noted amongst the three groups in post-operative recovery, wound dehiscence, hospital stay, intestinal fistula.

Conclusion: - Due to small sample size and non-availability of staplers in emergency OT, any definitive conclusion cannot be made from this study. Further studies are necessary for definitive interference.

KEYWORDS

Bowel, Anastomosis, Single layer, Double layer, Stapler.

INTRODUCTION:

Anastomosis is the connection between two channels, tubes, fibres, or other parts of a network. The word originated in the late 16th century from Greek 'anastomoun' (provide with a mouth). It has been used in the discipline of surgery as a procedure to establish communication between two formerly distant portions of the intestine. This procedure restores the intestinal continuity after bypassing or removal of a pathologic condition affecting the bowel.¹ Intestinal continuity can be restored by hand sewn suturing, stapling devices, tissue glue, sutureless bio fragmentable ring, fibrin Glue (SAINT), laser welding devices, compression anastomotic clips, ring made up of nithinol, compression anastomotic ring locking procedure (CARP) etc.² The technique chosen depends on the individual surgical experience, personal preference and availability of material. The theory behind creating a safe, healthy bowel anastomosis remains constant, irrespective of the technique chosen.^{3,4} In this dissertation, we discuss the results of three different techniques of anastomosis in a comparative manner.

MATERIALS & METHODS:

Institution based, Interventional, Prospective, Non-randomized, analytical study was carried out in Burdwan Medical College and Hospital. Patients of 13-60 years who underwent small bowel anastomosis in emergency and elective setup within the following study period fulfilling the criteria was the study population. Study was conducted between February 2015 to July 2016. Sample size was 72.

All the hand sewn anastomosis constructed in either single layer or Double layer fashion. Single layer anastomosis was done using 3-0/2-0 interrupted polyglycolic acid or Polyglactin 910 violet in extra mucosal fashion. In the double layered technique, inner layer was constructed by 3-0/2-0 polyglycolic acid in full thickness continuous fashion; outer layer was made by interrupted sero-muscular lambert stitches using 3-0 polyglycolic acid or silk. Staplers used in anastomosis were GIA STAPLERS. Patients were managed post-operatively with comparative nutritional support, fluid-electrolyte balance, antibiotics, postural care, chest physiotherapy, DVT prophylaxis and were observed for recovery & complications.

INCLUSION CRITERIA

1. The patients between the ages of 13-60 undergone small intestinal anastomosis in Burdwan Medical College & Hospital during the study period not having any of those exclusion criteria.
2. Patients who gave valid & informed consent for the study.

EXCLUSION CRITERIA

1. Age 12 years or below.
2. Age more than 60.
3. All the esophageal, gastric & biliary-enteric anastomoses.
4. Pancreatico-enteric anastomosis.
5. Colo-rectal anastomosis.
6. Lag period more than 4 days in emergency cases.
7. Patients undergoing palliative surgery or having metastatic disease.
8. On immunosuppressive drugs.
9. Grossly deranged liver function.
10. Coagulopathy or anti-coagulant therapy.

RESULTS:-

Most of the patients of the study are middle aged. As evidenced by Median age of the population = 35 yr and the Mean age = 34.79 yr. Patients less than 12 yr and more than 60 yr had been excluded from the study. Majority of the study population is male (66.67%).

Anastomosis had been constructed by three methods- single layer (n1=26), double layer (n2=26) and by stapler method (n3=20). The following data has been analysed based on the outcome of this three groups.

Wound dehiscence occurred in same three study group. The chi-square test showed clearly that there is no statistically size number in significant difference (p value 0.976)

Although there is same number of wound dehiscence, intestinal fistula was not occurred in stapler group. The difference, however, is not statistically significant (p value 0.673). Despite vigorous management of this two patients in post-operative period, we have lost one patient after 20th post-operative day who had a blunt trauma abdomen causing

jejunal perforation 5 cm from DJ flexure. All other patients were discharged in a stable condition.

Wound infection is significantly higher (p value 0.005) in double layer group and least in case of single layer group.

There is no statistically significant difference (p value 0.718) in Mean hospital stay among three different study groups. Earliest discharge given in 5 days in all the three groups.

Longest stay in case of a Intestinal fistula was 30 days.

TABLE 1: Age Distribution (n=72)

		No of cases	Percentage (%)
Age group(yr)	13-20	15	20.83
	21-40	33	45.83
	41-60	24	33.34
Sex	Male	48	66.67
	Female	24	33.33
Method of anastomosis	Single layer	26	36.11
	Double layer	26	36.11
	Stapler	20	27.78

Table 2: Wound dehiscence in different method of anastomosis

Method of anastomosis	Wound Dehiscence		Total
	Yes (%)	No (%)	
Single	1(3.8)	25(96.2)	26
Double	1(3.8)	25(96.2)	26
Stapler	1(5.0)	19(95.0)	20
Total	3(4.2)	69(95.8)	72

Anastomosis & Wound dehiscence Cross tabulation

Table 3: Intestinal fistula in different method of Anastomosis

Method of anastomosis	Intestinal Fistula		Total
	Y(%)	N(%)	
Single	1(3.8)	25(96.2)	26
Double	1(3.8)	25(96.2)	26
Stapler	0(0)	20(100)	20
Total	2(2.8)	70(97.2)	72

Table 4: Wound infection in different method of anastomosis

Method of anastomosis	Wound infection	Percentage
Single	5	19.23
Double	12	46.15
Stapler	6	30

Table 5: Hospital stay in different method of anastomosis

Method of anastomosis	No	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Min	Max
					Lower Bound	Upper Bound		
Single	26	7.38	2.815	.552	6.25	8.52	5	20
Double	26	7.96	4.652	.912	6.08	9.84	5	30
Stapler	20	7.15	2.519	.563	5.97	8.33	5	17
Total	72	7.53	3.496	.412	6.71	8.35	5	30

DISCUSSION

As discussed previously, method of anastomosis has been evolved throughout the centuries in search of the better outcome. But the principles remained the same irrespective of the method used- 1) good blood supply at the ends, 2) meticulous techniques, 3) no tension between the loops, 4) no distal obstruction, 5) mere absence of peritonitis or fecal contamination⁵. The literature fails to demonstrate superiority of stapled over hand-sewn techniques in colorectal anastomosis, regardless of the level of anastomosis, although a high stricture rate was noted with the former technique⁶. The use of staplers for intraperitoneal anastomosis has been questioned. The decision over which technique to use must be judged on the basis of previous experience, clinical circumstances, and available resources. Another systematic review showed that both techniques (stapler vs Hand-sewn) are effective, and the choice may be based on personal preference. All the prospective and randomized trials have shown variable outcome. No significance intergroup difference was found in regard to time for construction of anastomosis or occurrence of complications⁷.

CONCLUSION

In this study, no significant outcome difference was observed among the three groups in terms of post-operative recovery, wound dehiscence, intestinal fistula, hospital stay etc. Although, passage of flatus was significantly earlier in the stapler group than in the single and double layer anastomosis group. Wound infection was also significantly higher in case of double layer anastomosis. This might be due to selection bias and non-randomization which could not be eliminated in this study. Apart from this, due to a small sample size and non-availability of staplers in our emergency OT, any definitive conclusion cannot be made. Larger sample size and better randomization of the data is necessary for definitive inference on this controversy.

The decision on which technique to be used, must be judged on the basis of previous experience, clinical circumstances, and available resources.

REFERENCES

1. Kate V. Intestinal Anastomosis. <http://emedicine.medscape.com/article/1892319>
2. McKenzie S, Evers BM. Small intestine. Sabiston textbook of Surgery, 19th Ed. 2012; volume II, ch 50: 1227-1278
3. Scher KS, Scott-Conner C, Jones CW, Leach M. A comparison of stapled and sutured anastomoses in colonic operations. Surg Gynecol Obstet. 1982; 155:489-493
4. Didolkar MS, Reed WP, Elias EG, Schnaper LA, Brown SD, Chaudhary SM. A prospective randomized study of sutured versus stapled bowel anastomoses in patients with cancer. Cancer 1986; 57:456-460
5. Hastings JC, van Winkle W, Barker E: Effects of suture materials on healing of wounds of stomach and colon. Surg Gynecol Obstet 1975; 140:701
6. Lustosa SA, Matos D, Atallah AN, Castro AA. Stapled versus handsewn methods for colorectal anastomosis surgery. Cochrane Database Syst Rev. 2001;CD003144.
7. Cajozzo M, Compagno G, DiTora P, Spallitta SI, Bazan P. Advantages and disadvantages of mechanical vs. manual anastomosis in colorectal surgery. A prospective study. Acta Chir Scand. 1990; 156:167-169