COMPARISON OF SINGLE LAYER INTERRUPTED INTESTINAL ANASTOMOSIS WITH DOUBLE LAYER INTESTINAL ANASTOMOSIS

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ABSTRACT

Objective: To evaluate the safety and cost affectively of single layer interrupted intestinal anastomosis in comparison with the double layer conventional methods of intestinal anastomosis.

Material and Methods: This was a comparative prospective study, conducted in Saidu group of teaching hospital Swat (NWFP) from Feb 2001 to Dec 2002. Total of 113 patients were included in the study. They were divided into two groups I and II. The data was collected from emergency as well as from OPD patients admitted for elective list. In group I containing 52 patients (36-Males and 16- Females) single layer anastomosis was constructed, while in group II contained 61 patients (43-Males and 18-Females) double layer conventional anastomosis were fashioned. Age of group II ranged from 9 years to 60 years with the mean of 34.5 years. The suture material was vicryl (poly galactin 910) 2/0 on round bodied needle. In group II the outer layer (Lambert suture) was done with silk 2/0 on round body needle. The same antibiotics were used in both groups. The safety of both the technique were analysed in terms of morbidity and mortality.

Results: One patient in group I while 8 patients in group II developed leakage. Five patients in group II re-explored and stomal diversion performed. Two patients in group II died of sepsis and multi organ failure. Mortality in group I was 0% while in group II it was 3.27%.

Conclusion: The study shows that there was low incidence of anastomotic failure and septic complications in group I (single layer) as compared with the double conventional methods of gut anastomosis. Hence the single layer anastomosis is safe and cost effective.

Key words: Anastomosis, Single layer interrupted, Morbidity and Mortality.

INTRODUCTION

The methods of gastro intestinal anastomosis remained controversial till now. Whether to adopt the single layer interrupted methods or the double layer technique, as the major concern about the surgery is anastomotic failure leading to leakage, sepsis morbidity and mortality. The patient general conditions, time of surgery, material used and surgeon experience all have their own importance but the method of anastomosis has its own fundamental place in the success of anastomosis. The controversy regarding single layer vs. double layer anastomosis goes as back as the period of Halsted.[1] The objections against the traditional double layer anastomosis are that it incorporates large amount of ischaemic tissue in the suture line leading to tension and increases the chance of leakage and lumen narrowing.[3] In contrast single layer anastomosis causes least damage to the submucosal vascular plexus and minimally disturb the gut lumen.[5] The single layer anastomosis with extra mucosal sutures incorporates the strongest submucosal layer and allows accurate tissue apposition and layer to layer attachment, leading to better wound healing and minimal lumen narrowing.[1,4]

Our study is aimed to evaluate the safety of single layer gastro intestinal anastomosis.

MATERIAL AND METHODS

Those patients who were fulfilling the inclusion criteria, total of 113 patients were included in the study, 85 were operated in the emergency and 28 patients on the elective list.

The following is the criteria of the patients in whom the Anastomosis were carried out.

- Palpable good volume pulse.
- Systolic Blood pressure more than 90mmhg.
- Heamoglobin more than 8gm/dl.
- Peritoneal cavity free of feaces.

Those patients who were not fulfilling the above criteria were submitted to the stomal diversion.

The patients were randomly divided into two groups I and II. Group I containing 52 patients.

(40 emergency + 12 elective) in whom single layer interrupted serosubmucosal sutures with submucosal back stitch putting knots on the luminal side anastomosis were made, Out of these patients 36 were males and 16 were females. While in group II total of 61 patients (45 emergency + 16 elective) double layer continuous conventional anastomosis were carried out. The suturing material was the polygalactin 910 (vicryl 2/0) in all the patients. The Lambert sutures were made with the silk 2/0. All the patients were operated by the same group of surgeons. The antibiotics used post operatively were the same(Cefotaxime and Metronidazole) continued for 5 days. In elective cases gut preparation was done with Magnesium sulphate 60 gms (2-sachets) in a glass of water started 48 hours before surgery, and continued with the same dose 8-hourly till loose motions were obtained. During this period the patients were only allowed liquids and oral antibiotics (Erythromycin and metronidazole).

The outcome of the two methods in terms of morbidity, mortality and cost effectivity were compared.

RESULTS

Total of 113 patients were included in the Study. The patients were randomly divided into two groups I and II. Group I, containing 52 patient (36 Males and 16 Females) out of them 40 patient operated in Emergency while

12 operated on the elective list. The ages ranged from 7 years to 63 years with mean of 35 years. In all patients belonging to group I single layer interrupted sero-submucosal sutures with submucosal back stitch putting knots on the luminal side were made. Group II containing total 61 patients (43 Males and 18 Females) 45 patients operated in Emergency while 16 patients were operated on the elective list. The ages ranged from 9 years to 60 years with mean of 34.5 years. All the patients of group II were submitted to double layer continuous conventional method of anastomosis.

The postoperative complications were noted and recorded.

Wound infection was found in 2 patients (1.34%) in group I, while 5 patient (3.0%) developed wound infection. Both the cases of the group 1 were operated in Emergency, while 3 out of the 5 patient of group II were operated in emergency.

Wound dehiscence and burst abdomen was observed in 0% cases in group I while in group II, 3 patients (1.3%) developed burst abdomen.

Over all anastomotic leakage was noted in 10 patients (8.8%). Two patient (3.8%) in group I developed leakage, responded well to conservative management. While 8 patients (13.11%) in group II developed leakage. Five of these patients developing feacal fistulae managed conservatively, while 3 patients were re-explored and stomal diversion were carried out. Two patient belonging to group II died. One due to sepsis and multi-organ failure, while another died because of Myocardial infarction on the 10th postoperative day.

Over all mortality rate was 1.7%. The mortality in group I was 0%, while in group II it was 3.27%. (Table 1)

DISCUSSION

Anastomotic failure leading to leakage is a major cause of morbidity and mortality following gastro-intestinal anastomosis. The controversy regarding single layer vs. double layer anastomosis goes as back as the period of Halsted.[1] Suture technique in the anastomosis is the single most important determinant of outcome. Healing process in mainly dependent on general factors such as age, nutritional status, jaundice, kidney failure, as well as local factors such as tension, sepsis and suture technique.[2] The objections against the traditional double layer anastomosis are that it incorporates large amount of ischaemic tissue in the suture line leading to tension and increases the chance of leakage and lumen narrowing.[3] In contrast in single layer anastomosis causes least damage to the submucosal vascular plexus and minimally disturb the gut lumen[5] the safety of single layer anastomosis is now well considered in esophageal as well as in the colorectal surgery.[1,2,6] Large bowel can safely be anastomosed by single layer continuous technique using polypropylene taking minute bites.[7] The risk of leakage is similar in both the technique, while the single layer requires less time.[6,7] The single layer anastomosis with extra mucosal sutures incorporates the strongest submucosal layer and allows

Group	No.	M	Mean Ages	Wound	Leakage	Mortality
Group–I	52	36 16	35 Years	5.7%	3.8%	0
Group–II	61	43 18	34.5 Years	8.1%	13.11%	3.27%

TABLE – 1

accurate tissue apposition and layer to layer attachment, leading to better wound healing and minimal lumen narrowing.[1,4]

Our study is mainly focused on the safety of single layer anastomosis. In our study the wound infection was observed in 3 patients (5.7%) in group I and 5 patients (8.1%) in group II showing significant difference in both groups. The overall wound infection rate described in the literature is 2-11%,[7,11] so our study is comparable with other studies.

The anastomotic failure rate in group I was 2 patients in 52 patients (3.8%), which is comparable with the other studies, which shows the leakage tare 1.3%-7.7%.[1,8] Our leakage rate in double layer technique was 4.88%, which is more than the rate described in literature (up to 1.5%).[7,9,10]

The mortality in our study in group I is 0%, while in group II it is 4.88%, which correlates well with that described in literature 2-5%.[12]

Though general factors play an important role in the healing process in intestinal anastomosis and ultimate outcome, yet the surgeon, suturing material and most important is the suturing technique. If the other variables are kept controlled than in the suturing technique the single layer interrupted method of intestinal anastomosis with mucosal backstitch, with acceptable morbidity and mortality may be considered as safe method of anastomosis.[1,6,9,12]

CONCLUSION

Single layer interrupted intestinal anastomosis in simple and more cost effective as compared with double layer traditional method of anastomosis.

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