IJBPAS, February, Special Issue, 2022, 11(2): 165-170
ISSN: 2277–4998

International Journal of Biology, Pharmacy and Allied Sciences (IJBPAS)
'A Bridge Between Laboratory and Reader'

www.ijbpas.com

SINGLE LAYER VERSUS DOUBLE LAYER INTESTINAL ANASTOMOSIS

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Received 12th July 2021; Revised 14th Aug. 2021; Accepted 27th Oct. 2021; Available online 15th Feb. 2022

https://doi.org/10.31032/IJBPAS/2022/11.2.1022

ABSTRACT

Objective:

To study about the efficacy in terms of post operative outcome of single layer intestinal anastomosis to double layer intestinal anastomosis technique.

Materials and Methods: In the Department of Surgery, Krishna Institute of Medical Science Karad from November 2020 to May 2021 60 patients who underwent resection anastososis were taken for this study.30 patients had single layer intestinal anastomosis and 30 had double layer anastomosis. Total 60 patients were divided into 2 groups.

Results:

Each group consisted of 30 patients. After completion of study results were analysed. In single layer group no anastomotic leak was seen. In double layer group one patient had leak which was not statistically significant

Conclusion:

Single layer intestinal anastomosis is comparatively less time consuming than double layer intestinal anastomosis technique also single layer technique does not have any additional adverse outcomes compared to double layer

INTRODUCTION:

One of the common procedures performed all over world among major abdominal surgeries is intestinal resection and anastomosis. Connecting two loops of intestine so as to restore normal bowel function without leakage of intestinal contents is challenging task for a surgeon. One of the adverse complication following resection anastomosis is anastomotic leak.

Anastomotic leak rate ranges from 1.5% to 2%, depending on what type of anastomosis was performed. Other important factors are emergency or elective procedure, age of patient, nutritional status, other associated systemic comorbidities, vascularity, sepsis, surgical technique **[1]**.

One of the cause for increased mortality and morbidity following resection anastomosis is leaking anastomosis. Leaking anastomosis can increase the length of hospital stay upto 10 times and significantly increases the rate of mortality among patients **[2-4]**. 20 to 30 percentage of all deaths post operatively in patients who underwent an intestinal anastomosis are due to leaking anastomosis **[5]**.

Although the method of choice depends on operating surgeon however in most case when 2 healthy, well vascularised limbs of intestines are anastomosed without tension at anastomosis site one can expect good outcome. However whether to perform single or double layer of intestinal anastomosis is still matter of debate among surgeons. Conventional old method preferred is double layer bowel anastomosis using an outer inverted seromuscular layer and a running transmural inner layer. Some ill effects of two layer anastomosis are mucosal damage and serosal appostition. Hemostasis is achieved by the layer which is on inner side, but there is increased chance of strangulation of mucosa in two layer technique **[6]**. Double layer intestinal anastomosis requires more time compared to single layer and single layer technique has additional advantage of causing less tissue necrosis or luminal narrowing **[8]**.

This study was conducted to determine post operative adverse Outcome like anastomotic leak in one layer and double layer Intestinal anastomosis.

MATERIALS AND METHODS:

Our study is randomized prospective study which was conducted at Krishna Hospital from November 2020 to May 2021. 30 patients each were selected for single and double layer technique Inclusion Criteria:

1. Patient's age> 14yrs,
2. Patients who require bowel RA
3. Patients with both elective and planned RA.

Exclusion criteria:

1. Patients with cardiac conditions, renal failure, DM

2. Patients requiring anastomosis of esophagus, rectum, Biliary tract

Single layer intestinal anastomosis was done with vicryl 3-0 in interrupted manner. For all double layer intestinal anastomosis vicryl 3-0 for inner layer and silk 3-0 for outer layer. Fistula with radiological evidence, or visible bowel content draining from the wound externally, or fecal matter from drain or a visible disruption of the anastomotic site during re-exploration are considered as anastomotic failure.

RESULT

60 patients who underwent resection anastomosis surgery were divided in two groups, 30 each. Patients with age 14 to 60 years were in single layer group While most of them were of 50 to 60 age range. Patients with age 16 to 60 years were in two layer group while most of them were of 41 to 50 age range.

48 years and 45 years was mean age in one layer group And two layer group respectively . Single layer group Had 17 male and 13 female patients. Two layer group Consisted of 19 male and 11 female patients. Common indication for surgery in most patients was ischaemia of bowel due to trauma, infection or carcinoma. Bowel obstruction, strangulated hernia, volvulus were mainly the causes of ischaemia in both the groups. First group consisted of patients who had Single layer bowel RA while second group Included patients undergoing two layer RA. Our study included planned as well as emergency Cases and surgical outcome was determined by presence Or absence of anastomotic leakage in post operative period. The leak was diagnosed by radiological investigations Or by presence of fecal matter in drain or by oozing of Fecal matter through suture line Table - Distribution of different age group in the study Age(years) Single Layer (%) Double Layer (%)

11-20 2 1

21-30 5 4

31-40 4 5

41-50 9 12

51-60 10 8

Mean age 48 45

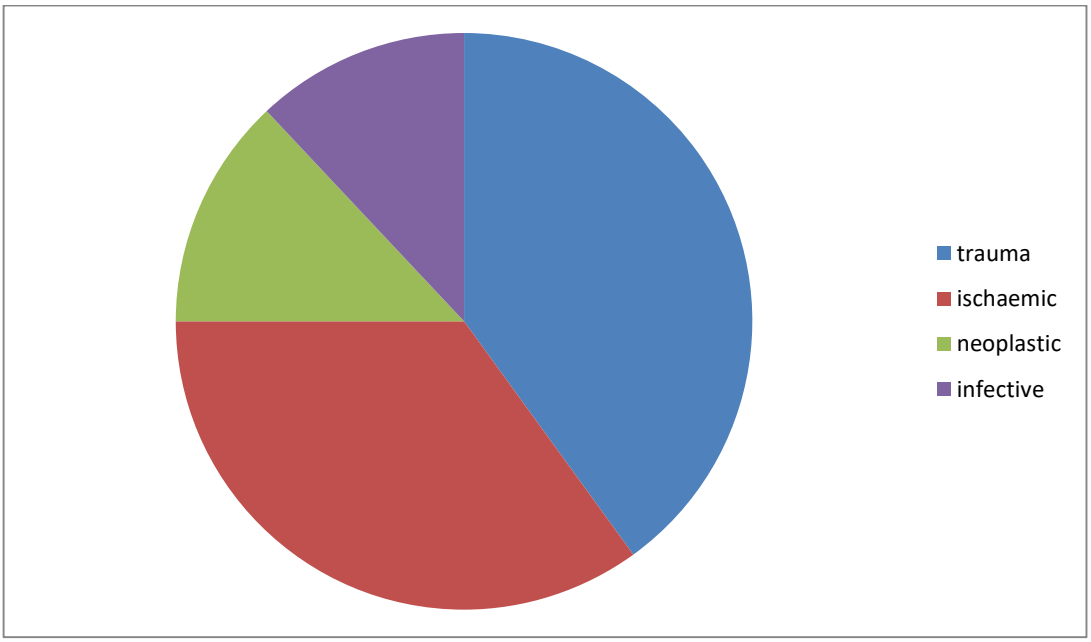

Figure 1: Indications for surgery (Single layer)
Trauma-40%, Ischaemic-35%, Neoplastic-13%, Infective-12%

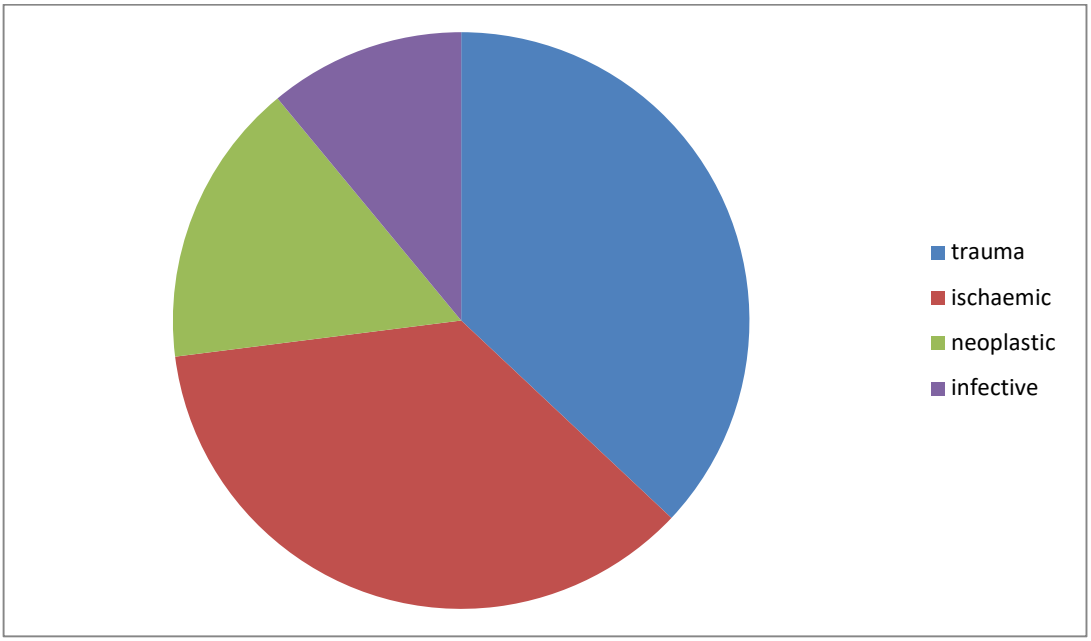

Figure 2: Indications for surgery (Double layer)
Trauma-37%, Ischaemic-36%, Neoplastic-16%, Infective-11%

POST OP PERIOD	SINGLE LAYER	DOUBLE LAYER
UNEVENTFUL	30	30
LEAKAGE	0	1

DISCUSSION

Forty percent cases were planned cases while sixty percent cases were emergency in single layer group. In double layer group fifty four percent were emergency And forty six percent were elective cases.

Emergency cases were predominant in a study done by Samiullah *et al*. **[9]**.

In the double layer intestinal anastomosis group 1 pateint had leakage, the patient had undergone ileoileal anastomosis following intestinal perforation. A similar study comparing single layer versus double layer intestinal anastomosis conducted by Samiullah *et al*. included 52 patients in single layer group and 61 patients double layer group, 2 patients (3.8%) in single layer while in double layer intestinal anastomosis 8 patients had leak. Wayand W *et al*. concluded in a study comparing the two techniques that single layer anastomosis was better for small and large bowel anastomosis **[10]**. Burch *et al*. compared single layer (n= 59) and double layer (n= 66). There was 3 % leaking seen in single layer while in double layer 1.5% had leak, which was statistically insignificant **[11]**.

Similar study done by S. T. Irwin *et al*. including a total of 466 single layer gastrointestinal anastomosis, 6 (1.3%) anastomotic leakage occurred concluding it to be simple and safe procedure **[12]**. In a study by N J Carty *et al*. there was leak observed only in 2.2 percent of single layer interrupted intestinal anastomosis out of 500 concluding it to be a safe procedure.

The objections against the traditional double layer anastomosis may be due to large amount of rendering tissue ischaemia in the suture line **[2]**. In addition itleads to tension on the suture lines and increases the chance of leakage and luminal narrowing. In contrast single layer anastomosis causes less damage to submucosal vascular plexus and minimally disturb the gut lumen as it involves the strongest submucosal layer and allows accurate tissue approximation and layer to layer attachment, leading to better wound healing and early bowel activity.

CONCLUSION

Single layer interrupted intestinal anastomosis is less time consuming and relatively simple technique to carry out. Decreased incidence of post operative anastomotic leakage than traditional double layer intestinal anastomosis and it can be safely carried out in our surgical practice.

ACKNOWLEDGEMENT

I am thankful to rupali salunkhe for secretariat help,Krishna Institute of Medical Sciences Deemed to be University Karad

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