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SINGLE VERSUS DOUBLE LAYER CLOSURE IN ILEOSTOMY REVERSAL : A COMPARATIVE STUDY

General Surgery

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ABSTRACT

Background:
Ileal perforation is one the most frequently encountered acute surgical emergency in Indian subcontinent and always warrants operative intervention with frequent intestinal stoma formation. But the kind of intervention for stoma reversal has remained controversial whether to use either of one or two layers of sutures for anastomosis.

Methods:
Sixty patients with ileostomy were taken for study. These patients were divided into two groups, A & B of 30 each. These patients were taken for ileostomy closure in Single layer (Group A , 30 patients) & Double layer (Group B, 30 patients)

Results:
60 patients of ileostomy were studied, divided equally in two groups, decreased intra operative time was seen in Group A when compared with Group B with no any significant comparative complication in these groups.

Conclusion:
Two layer anastomosis for ileostomy closure offers no definite advantage over Single layer anastomosis in terms of post operative leak and other complications. Single layer ileostomy closure technique is safe, easy to perform and simple to teach.

KEYWORDS

Ileostomy Closure, Anastomosis, Perforation Peritonitis, Stoma Reversal

INTRODUCTION:

Typhoid is a febrile illness caused by faeco-oral transmission of gram negative bacillus, salmonella enteritidis serovar typhi from chronic carrier. It can cause various surgical complications like gastrointestinal haemorrhage, ileal perforation etc. Ileal perforation peritonitis forms bulk load of surgical emergencies. To treat such illness ,it is a challenge to a surgeon as they occur in a younger age group and is associated with high morbidity and mortality. The operative management of ileal perforation includes either an approximation of the perforation margins known as primary repair or by exteriorisation of the involved segment to form stoma/ileostomy. Ideal time to do stoma closure is at least 9-12 weeks after the surgery so that the time interval allows the adhesions to settle down, the patient to recover from previous operation and any swelling within the abdomen and the stoma site to fully resolve.[1] Controversy regarding single versus double layer anastomosis (stoma reversal) goes back to 1887 when Halsted proposed interrupted extra mucosal suturing.[2]

The basic principles of the intestinal suture were established more than 100 years ago by Travers, Lambert and Halsted.[3] Two-layer anastomosis was done by Larry in the 19th century.[4] In two-layer anastomosis a running absorbable suture for a transmural inner layer and interrupted silk sutures for an outer inverted seromuscular layer has been standard for most surgical situations. The single-layer continuous anastomosis is a contemporary innovation first described by Hautefeuille in 1976.[5] The aim of the present study is to evaluate the outcome of single layer versus double layer ileostomy closure in terms of operative and post operative outcome in each group like time taken for surgery, cost factor, wound infection, intra abdominal abscess, stricture of anastomotic site, anastomotic leak, peritonitis, septicemia and death. The study will help to establish the criteria for instituting the management modality and the outcome of these procedures.

METHODS:

This comparative study was conducted over a period of 12 months from August 2016 to July 2017 in the Department of General Surgery, Indira Gandhi Institute Of Medical Sciences, Sheikhpura, Patna. Sixty patients (60) with ileostomy were taken for study. These patients were divided into two groups, A and B, each group was of thirty patients (30). The ileostomy closure was done in single layer in Group A (n =30) & double layer in Group B (n = 30), comparative study was done between both the procedures.

INCLUSION CRITERIA:

All patients admitted via OPD/ Emergency with pre performed ileostomy for perforation peritonitis with post operative period not less than 9 – 12 weeks were included for stoma reversal / ileostomy closure surgery.

EXCLUSION CRITERIA:

Patients with age less than 10 years, HIV seropositive , immunocompromised, systemic complications, poor general condition or with poor state of nutrition were excluded from the study .

In single layer group, ileostomy closure was carried out by interrupted method with seromuscular non absorbable silk 3-0 suture. In double layer, ileostomy closure was carried out by inner layer with continuous absorbable 3-0 polyglactin 910 suture and external layer with interrupted 3-0 silk suture, by hand sewn method. Operative and post operative outcome, wound infection, intra abdominal abscess, stricture of anastomotic site, anastomotic leak, peritonitis, septicemia, time taken for surgery, cost factor and death were evaluated. Statistical analysis was performed by IBM-compatible Statistical Package for the Social Sciences (SPSS) version 20.0. The qualitative data were expressed as number (%), while the continuous quantitative data as mean ± standard deviation (SD) and the data was statistically analyzed, p-value at <0.05 was considered significant and at <0.001 was considered highly significant, while at >0.05 was considered not significant.

RESULT:

During the 12 months period of study , ileal perforations were most commonly observed in third and fourth decade of life which lead to stoma formation. Ileostomy closure were done more commonly in males with Male : Female ratio 6.5 : 1 with mean age for ileostomy closure in both procdure was 36.11 years with range from 15-70 years (Table: 1 and Table: 2). The mean operative time for ileostomy closure starting from the first to last stitch in single layer Group A was 15.3 minute ranging from 8-22 minute while in double layer Group B was 24.2 minute ranging from 16-36 minute (Table : 3). The average duration of hospital stay of the patients in Group A was 12.8 days and in Group B was 11.7 days. In Group A, wound infection was most common complication , 5 (16.67%) followed by abdominal collection 3 (10.00%), wound dehiscence and systemic complication 2 (6.67%) each. In Group B wound infection was most common complication, 7

(23.33%) followed by wound dehiscence 3 (10.00%), abdominal collection and systemic complication 2 (6.67%) each and intestinal obstruction in 1 (3.33%). Anastomotic leak occured in 2 (6.67%) patients in each group of our study requiring re operation (Figure : 1).

Age group (in years)	No. of cases in Group A	% age
10-20	3	13.33%
21-30	7	26.67%
31-40	10	30.00%
41-50	4	16.67%
51-60	4	13.33%
61-70	2	0%
TOTAL	30	100%
RANGE	15-70	
MEAN± SD	37.07±13.12	

TABLE 1: AGE DISTRIBUTION IN GROUP A

Age group (in years)	No. of cases in Group B	% age
10-20	**4**	**13.33%**
21-30	**8**	**26.67%**
31-40	**9**	**30.00%**
41-50	**5**	**16.67%**
51-60	**4**	**13.33%**
61-70	**0**	**0**
TOTAL	**30**	**100%**
RANGE	**15-60**	
MEAN±SD	**35.16±11.95**	

TABLE 2 : AGE DISTRIBUTION IN GROUP B

Operative time in minute	GROUP A		GROUP B	
	No. of cases	**%age**	**No. of cases**	**%age**
5-10	2	6.67	0	0
11-15	16	53.33	0	0
16-20	8	26.67	7	23.33
21-25	4	13.33	13	43.33
26-30	0	0	6	20
31-35	0	0	3	10
36-40	0	0	1	3.33
TOTAL	30	100	30	100
RANGE	8-22		16-36	
MEAN± SD	15.30±3.63		24.20±5.24	
't' and p value are 7.64 and < 0.0001 i.e. highly significant.				

TABLE 3 : OPERATIVE TIME IN BOTH THE GROUPS IN MINUTES

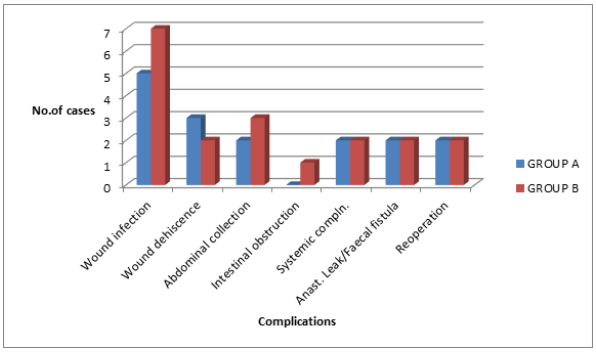

FIGURE 1 : COMPICATIONS IN THE STUDY GROUP .

DISCUSSION:

Anastomotic failure had always been a cause of concern in patients undergoing surgery with gastrointestinal anastomosis, as it adversely affects the surgical outcome. Healing process is dependent on general factors as age, state of nutrition and co existence of disease like renal failure, jaundice, malignancy, as well as local factors like vascularity, sepsis and suture technique.[7] The present study evaluated the outcome of single layer versus double layer ileostomy closure in terms of operative and post operative outcome in each group. In our study, single layer ileostomy closure (50%) and double layer ileostomy closure (50%) were the surgical procedures performed in 60 patients with pre performed ileostomy, the average duration of ileostomy before closure was 101.75 days (3.39 month).The mean operative time for ileostomy closure from starting of first stitch to last stitch of anastomosis in single layer Group A was 15.3 minute ranging from 8-22 minute while in double layer Group B was 24.2 minute ranging from 16-36 minute which was slight lower as compaired to study done by Burch et al[9] , 20.8 minute for single layer and 30.7 minute in double layer. And 26 minute in single layer and 43 minute for double layer studied by Ordorica et al.[10] The average duration of hospital stay of the patients in Group A was 12.8 days and in Group B was 11.7 days which was in comparison to 10.4 days in both group by Ordorica et al[10] and 11.4 days in single layer and 18.6 in double layer by Maurya et al.[11]

Numbers of anastomotic techniques are available but because all compromise healing, none can be considered perfect. The optimal method of intestinal anastomosis would promote primary healing by achieving accurate alignment of the divided bowel. cause minimal disruption of local vasculature. incorporate the minimum amount of foreign material. not implant malignant cells at the anastomosis. not enhance the risk of metachronous cancers.[8]

In our study complication occurring after stoma reversal were noted in both groups. In Group A, wound infection was most common complication, 5 (16.67%) followed by abdominal collection 3 (10.00%), wound dehiscence and systemic complication 2 (6.67%) each. In Group B, wound infection was most common complication ,7 (23.33%) followed by wound dehiscence 3 (10.00%), abdominal collection and systemic complication 2 (6.67%) each and intestinal obstruction in 1 (3.33%). Anastomotic leak occured in 2 (6.67%) patients in each group of our study requiring re operation.

Various studies show comparison of single layer and double layer in terms of leak. Irvin et al[12] showed leak in 5/29 patients in single layer and 5/31 in double layer. 6/40 leak in single layer and 13/52 in double layer has been shown by Everett et al,[13] Golinger et al,[14] Maurya et al,[11] Ordorica et al and Burch et al showed leak in single layer ileostomy closure 31/69, 4/60, 2/42, 2/59 respectively and 17/66, 20/112, 3/44, 1/66 respectively in double layer ileostomy closure. The point against double layer of ileostomy closure is that it ignores the basic principle of accurately opposing the clean cut edges and large amount of ischemic tissue within the suture line which may increase the incidence of leak and excessive inversion may lead to narrowing of lumen.[9] In contrast, single layer technique, employing extra mucosal sutures allows for accurate opposition, incorporate the strongest layer (submucosa) of gut, causes minimal damage to submucosal vascular plexus and least disturbance to lumen.[15,16] Although various endpoints can be used to assess efficacy and safety of intestinal anastomosis, risk of leak after operation occupies the greatest attention among surgeons.

Because there is no difference in the main outcome between the two techniques in terms of complications in our study, choices in clinical practice should be made after taking into account the results of other outcomes such as mortality, duration of anastomosis procedure, duration of TPN, length of hospital stay, risk of wound infection and cost of sutures. Arithmetical means of these endpoints suggests that the single layer method offers almost the same or better results than the two layer method. To conclude, two layer anastomosis for ileostomy closure offers no defi nite advantage over single layer anastomosis in terms of postoperative leak and other complications. Single layer ileostomy closure technique is safe, easy to perform and simple to teach. Considering duration of the anastomosis procedure and medical expenses, single layer intestinal anastomosis may prove the choice of procedure for most of the surgeons.

REFERENCES:

1. Gooszen AW, Geelkerken RH, Hermans J, Lagaay LB and Gooszwn HB; Quality of life with a temporary stoma: Ileostomy vs. colostomy. Dis Colon Rectum 2000; 43(5):650-655.
2. Khan N, Rahman A and Sadiq MD. Single layer interrupted serosubmucosal (extra mucosal) intestinal anastomosis J Med Sci 2006; 14(1):10-13.
3. Brooks DC and Zinner MJ. Surgery of Small and Large Bowel. In Maingot's Abdominal Operations, Volume 2. 10th edition. Edited by: Zinner MJ. Stamford: Appelton & Lange; 1997; 1309-1310.
4. Cohen Z and Sullivan B. Intestinal anastomosis. In: Wilmore DW, ACS Surgery, Principles and Practice. New York, WebMD.2002;803-805.
5. AhChong AK, Chiu KM, Law IC, Chu MK and Yip AW. Singlelayer continuous anastomosis in gastrointestinal surgery: A prospective audit. Aust NZ J Surg 1996; 66: 34-36.
6. Sarin S and Lightwood RG. Continuous single-layer gastrointestinal tract anastomosis: a prospective audit. Br J Surg1989; 76:493- 495.
7. Orr NWN., A single layer intestinal anastomosis, Br J Surg 1969; 56:771-774.
8. Hamilton JE. Reappraisal of open intestinal anastomosis. Ann Surg 1967; 165:917-923.

9. Burch JM, Franciose RJ, Moore EE, Biffi WL and Offner PJ. Single layer continuous versus two layer interrupted intestinal anastomosis: A prospective randomizedtrial. Ann Surg 2000; 231: 832-837.
10. Ordorica-Flores RM, Bracho-Blanchet E, Nieto-Zermeno J, Reyes- Retana R, Tovilla-Mercado JM and Leon-Villanueva V. Intestinal anastomosis in children: A comparative study between two different techniques. J Pediatr Surg 1998; 33:1757-1759.
11. Maurya SD, Gupta HC, Tewari A, Khan SS and Sharma BD: Double layer versus single layer intestinal anastomosis: A clinical trial. Int Surg 1984; 69:339-340.
12. Irvin TT, Goligher JC and Johnston D. A randomized prospective clinical trial of single-layer and two-layer inverting intestinal anastomoses. Br J Surg 1973; 60:457-460.
13. Everett WG. A comparison of one layer and two layer techniques for colorectal anastomosis. Br J Surg 1975; 62:135-140.
14. Goligher JC, Lee PW, Simpkins KC and Lintott DJ. A controlled comparison one- and two-layer techniques of suture for high and low colorectal anastomoses. Br J Surg 1977, 64:609-614.
15. Subban A, Anis N and Bal och AM., One layer interrupted intestinal anastomosis JCPSP 2001; 6 (2); 9-10.
16. Leslie A and Steele RI. The interrupted serosubmucosal anastomosis-still the gold standard.Colorectal Dis 2003; (4): 362-366.