

INTESTINAL ANASTOMOSIS; COMPARATIVE EVALUATION FOR SAFETY, COST EFFECTIVENESS, MORBIDITY AND COMPLICATION OF SINGLE VERSUS DOUBLE LAYER

DR. RANA ASRAR AHMAD KHAN

FCPS, Surgery,
Surgical Unit 1, Allied Hospital
Faisalabad.

Dr. Mohammad Dilawaiz

FCPS, Surgery
Surgical Unit 1, Allied Hospital
Faisalabad.

DR. FAKHAR HAMEED

FCPS, Surgery,
Surgical Unit 1, Allied Hospital
Faisalabad.

Dr. Ch. Mohammad Akram

FRCS, Surgery,
Iqbal Ward, Surgical Unit 4
DHQ Hospital, Faisalabad.

DR. BASHIR AHMED

FCPS, Surgery,
Surgical Unit 1, Allied Hospital
Faisalabad.

Article Citation:

Khan RAA, Hameed F, Ahmed B, Dilawaiz M, Akram M. Intestinal anastomosis; Comparative evaluation for safety, cost effectiveness, morbidity and complication of single versus double layer. Professional Med J Jun 2010;17(2):232-234.

ABSTRACT... Objective: To evaluate the safety and cost effectiveness of single layer interrupted intestinal anastomosis in comparison with the double layer conventional method of intestinal anastomosis. **Study Design :** Prospective comparative study. **Period & Setting:** Surgical unit 4 DHQ hospital Faisalabad operated by single team during 12 months starting from Feb. 2007 to Jan. 2008. **Materials and Methods:** The cases were assigned to the two techniques, each being applied on alternate patient, single layer extra mucosal interrupted anastomosis and double layer anastomosis. In group 1 we used black silk 3/0 and in double layer we used vicryl 3/0 for inner continuous layer and black silk 3/0 for outer continuous layer. Comparison between two techniques was done on the bases of procedure time, cost effectiveness, morbidity in terms of rate of leakage/. **Results:** Average time for the construction of the single layer anastomosis was 20 minutes and in double layer was 35 minutes, the difference in average time is statistically significant ($p < .001$) while average duration of stay was 168 hrs and 216 hrs in group 1 and 2 respectively ($p < .001$). Leakage rate was double (12%) in group 2 while 6% in group 1. Moreover structure material consumption was more in two layered technique and longer stay added to that lead to more hospital expenses on two layered technique. **Conclusion:** Anastomosis using a single layer interrupted extra mucosal technique was faster to perform, cost effective, less likely to leak and as strong as a 2-layer anastomosis.

Key words: Gut Anastomosis, extramucosal, anastomotic leak

INTRODUCTION

When a segment on the gastrointestinal tract is resected for benign or malignant indications and gastrointestinal continuity needs to be restored, an intestinal anastomosis becomes necessary. Intestinal anastomosis can be performed in a variety of ways. Anastomosis may be done with the help of stapling devices, by using double layered suturing technique or by a single layer technique. Stapling devices are expensive and not available in emergency situation in our set up.

The traditional double layered anastomosis incorporates large amount of ischemic tissue in the suture line leading

Article received on: 18/05/2009
Accepted for Publication: 08/12/2009
Received after proof reading: 12/04/2010
Correspondence Address:
Dr. Rana Asrar Ahmad Khan
FCPS, Surgery
Surgical Unit-1, Allied Hospital , Faisalabad.
dr.rana.asrar66@yahoo.com

to increased tension at suture line and increased chances of the luminal narrowing. Single layered anastomosis may be done through continuous suturing^{1,2} or by using extra mucosal interrupted suturing technique. Although, continuous absorbable single layer technique has been claimed to be superior to other techniques^{3,4} but data is scarce. Similarly, single layer interrupted extra musocal technique is also argued to be superior for being constructed in shorter time and at lower cost but similar in term of safety to two layer technique⁵, however, no randomized trials have addressed the question of whether interrupted sutures or the single layered technique is superior to double layered technique. There was paucity of literature on this topic in our country and also internationally. So, we conducted a study for making a comparison between single layer interrupted extra mucosal and double layer continuous techniques on the bases of rapidity to perform, cost effectiveness and chances of anastomotic failure.

MATERIALS AND METHODS

Total of 30 cases (17 males, 13 females, average age 30 years) undergoing the gut anastomosis for any surgical condition operated in Surgical unit 4 DHQ hospital Faisalabad operated by single team during 12 months starting from Feb. 2007 to Jan. 2008 were included in the study. Cases were randomized into two groups on alterne basis. Group 1 included 15 cases (11 cases of small bowel, 3 cases of large bowel and one case of ileocolic anastomosis after right hemicolectomy) and technique used was single layer extra mucosal interrupted anastomosis by using black silk 3/0. In the group 2 the technique used was double layer; inner layer continuous with vicryl 3/0 and outer layer interrupted with black silk 3/0. This group included 10 cases of small bowel, 5 were large bowel. Out of 30 cases 21 were small bowel, 8 were large bowel and a single case of ileocolic anastomosis. 12 cases of small bowel anastomosis were done in emergency and 9 on elective list. Ileocolic anastomosis was done in emergency where as all cases of large bowel anastomoses were done on elective list. Post operatively average duration of ileus in small bowel anastomosis was three days while in ileocolic and large bowel was 5 days. Proforma were used to collect per op data and patients

were followed up in the ward for development of the complication and time for recovery. Collected data was used to make a comparison between the two techniques to determine rapidity to perform, feasibility to teach, cost effectiveness and chances of anastomotic failure.

RESULTS

Average time for the construction of the single layer anastomosis 20 min and in double layer was 35 min per operatively. The difference in average time is statistically significant as p value <.001. Moreover, suture material consumption was more in two layered technique. Average duration of stay was 168 hrs and 216 hrs in group 1 and 2 respectively, the difference in average stay is also statistically significant as p<.001. Anastomotic failure was noted in 1 patient of group 1 and 2 patient of group 2. So leakage rate was double (12%) in group 2 while 6 % in group 1 and longer stay added to that lead to more hospital expenses on two layered technique. Average time consumed in single layer was 20 min and in double layer was 35 min.

DISCUSSION

Following resections of the parts of the gut for any benign or malignant condition, anastomosis is necessary to restore the continuity of the gut. This anastomosis can be performed between the esophagus and stomach (esophago gastric), small bowel to small bowel (enteroenteric), small bowel and colon (enterocolic), colon and colon to colon (colocolic), colon and rectum (colorectal), colon and anus (coloanal) and small bowel and the anus (ileaonal). Intestinal anastomosis can be preformed in a variety of ways. The type of anastomosis depends on personal experience but irrespective of technique used, principle that ensure the successful out come include good vascular supply to segments beings approximated, no distal obstruction and tension free repair. The basic principles of intestinal sutures were established more than hundred years ago by Travers Lambert and Halsted and have since gone little modification. In recent years, there has been large shift towards the use of stapling device. The hand suturing was shown to display a larger learning curve than stapling.

Use of either one or two layer of suture for anastomosis has remained controversial. The two layered technique of anastomosis has remained standard for most surgical situations for many years. Some recent report has advocated Continuous and interrupted sutures can be used in performing an intestinal anastomosis. Double layered anastomosis typically consists of an inner layer of continuous or interrupted absorbable sutures and an outer layer of interrupted absorbable or non absorbable sutures. Single layered anatomists consists of one layer of interrupted or continuous absorbable sutures. The single layer continuous anastomosis was contemporary innovation first describe by Haute Feuille in 1976. Extra mucosal single layer interrupted intestinal anastomosis is claimed to be the safest technique both for the small and large bowel, with minimal possible complications⁶. Moreover, it can be constructed in shorter time at lower cost. The objections against the traditional anastomosis are that it incorproates large amount of ischemic tissue in the suture line leading to tension and increase the chances of leakage and luminal narrowing⁷, leakage rate in our study for the single layer extra mucosal technique was 6% while it was 4% in K Nadeem⁸ and 2% in Samiullah⁹.

CONCLUSION

Anastomosis using a single layer interrupted extra mucosal technique is faster to perform, cost effective, less likely to leak and as strong as a 2 layer anastomosis.

Copyright© 08 Dec, 2009

REFERENCES

1. Olah A., T. Belagyi, G. Neuberger, L. Hegedus. 1999. **Single layer continuous absorbable sutures for gastrointestinal anastomosis.** Magy Seb. 1999;52:63-6.
2. Zoedler, T., H. Becker, HD roher. **Continuous single layer anastomosis as the standard procedure in the gastrointestinal tract.** Chirug. 1995;66:50-3.
3. Sarin, S. RG Lightwood. **Continuous single layer gastrointestinal anastomosis; a prospective audit.** Br. J. Surg. 1989;76:493-5.
4. Burch, J.M., R.J. Franciose, E.E. Moore, W.L. Biffi, Offner P.J. **Single layer continuous versus two layer interrupted intestinal anastomosis a prospective randomized trial.** Ann. Surg 200;231-832-837.
5. Mirza, SM. K. Khalid F. Hanif. **Single layer interrupted serosubmucosal intestinal anastomosis.** An equally safe alternative J. Coll Physicans Surg. Pak. 2002;12:58-7.
6. Javaid Iqbal Malik, Aftab Ahmed, Zafar Ali Chowdry, Imtiaz Rasool. **Extramucosal single layer interrupted intestinal anastomosis a better alternative.** Ann King Edward Med Coll Apr. June 2004; 10(2):18-20. Jinnah Hospital, Lahore.
7. Carty, NJ Keating J Campel, J. Karanjia N. **Prospective audit of an extramucosal technique for intestinal anastomosis.** Br. J. Surg. 1991;78:1439.
8. Khan, N. Ataur Rehman, Muzaffarud Din Sadiq. **Single layer interrupted serosubmucosal (extra mucosal) intestinal anastomosis.** J. Med. Sci. 2006;14:10-3.
9. Samiullah, Israr M Zada N. **Comparison of single layer interrupted intestinal anastomosis with double layer intestinal anastomosis.** J. Postgrad Med. Inst. 2003;17: 263-6.