The Professional Medical Journal
www.theprofesional.com

ORIGINAL PROF-2951

ILEOSTOMY STOMA WOUND;
PURSE-STRING CLOSURE

Dr. Muhammad Faisal Bilal Lodhi[1], Dr. Farhan Javed[2], Dr. Sofia Irfan[3]

1. Associate Professor, Surgical Unit-I, Allied Hospital, Punjab Medical College, Faisalabad, Pakistan.
2. Medical Officer Surgical Unit-I, Allied Hospital, Punjab Medical College, Faisalabad, Pakistan.
3. Senior Registrar Surgical Unit-I, Allied Hospital, Punjab Medical College, Faisalabad, Pakistan.

Correspondence Address:
Dr. Muhammad Faisal Bilal Lodhi,
Associate Professor,
Surgical Unit-I, Allied Hospital,
Punjab Medical College,
Faisalabad, Pakistan.
iamfaisallodhi@live.com

Article received on:
28/05/2015
Accepted for publication:
10/06/2015
Received after proof reading:
02/06/2015

ABSTRACT… Objective: The objective of the study was to compare the frequency of infection in stoma site skin wound closure done by purse string suture and linear suturing techniques. **Study Design:** Randomized control trial. **Setting:** Surgical Unit-I, Allied Hospital, Punjab Medical College, Faisalabad. **Duration:** From 1st Jan, 2014 to 31st March, 2015 (15 Months). **Material and Methods:** Total number of sixty patients of both sexes with benign disease were included using non-probability consecutive sampling technique after approval from hospital ethics committee. All patients were admitted through OPD and a written informed consent was taken. They were divided into two groups (30 each). The two techniques of ileostomy stoma wound closure used were linear closure and purse-string closure. Data was analyzed using SPSS v10. Chi-square test was used to compare the outcome (wound infection) in both groups. P-value less than 0.05 was taken as significant. **Results:** Comparison of infection in stoma site skin wound closure done by purse string suture and linear suturing techniques was done which shows presence of infection in 36.67%(n=11) in Linear closure and 10%(n=3) in Purse-string closure group while remaining 63.33% (n=19) and 90%(n=27) respectively case had no infection, p value was calculated as 0.01 which shows a significant difference. **Conclusions:** The frequency of infection in stoma site skin wound closure done by purse-string suturing technique is significantly less than linear suturing technique.

Key words: Stoma site skin wound closure, purse string suture, linear suturing techniques, surgical site infection

Article Citation: Lodhi MFB, Javed F, Irfan S. Ileostomy Stoma Wound; Purse-string closure. Professional Med J 2015;22(6):833-837.

INTRODUCTION

Ileostomy is a commonly performed surgical procedure. In our clinical setting its common benign indications are typhoid perforation[1] and intestinal tuberculosis. It is usually required when the conditions are considered to be unfavorable for a primary anastomosis of gut or when a proximal diversion of gut contents is required to give a distal gut repair or anastomosis time to heal.[2,8] The decision to reverse a stoma depends upon the overall condition of the patient, status of the disease for which the ileostomy was performed in the first place and clinical assessment of the local factors of the site of ileostomy. However in most cases, reversal is carried out 2 to 4 months after initial surgery.[3,4] This delay also allows the stoma to mature. Reversal is usually performed extra-peritoneally without need for a full scale midline exploratory laparotomy.[2,3] Surgical site infection following stoma take down is a common complication, ranging from 0 to 40%.[4,5]

Two different types of skin incisions can be used for the reversal procedure.[2,6] Some surgeons use an elliptical incision around the ileostomy[4], which creates a comparatively larger operative field with better exposure.[4] The wound is primarily closed. The larger operative area increases the risk of infection with unsatisfactory cosmetic results. The second option is a circular incision around the stoma. This gives rise to a round skin wound which is closed by a purse-string suture. This type of closure has double advantage of apposition of skin to close major part of the wound and leaving a small gap in the middle of the wound to allow for drainage of any discharge that may otherwise get collected below the stitch line creating a favorable environment for bacterial growth. This procedure thus combines the advantages of primary and secondary wound closure.[2,4,6] Patients undergoing

reversal by an elliptical incision and linear closure have a greater incidence of wound infection compared to those undergoing a circular incision and purse-string closure, 38.7% and 6.67% respectively.[2]

Limited studies are available to define the effectiveness of purse-string skin closure of ileostomy stoma wound in minimizing the wound related complications, which are common in conventional linear skin closure. This study is designed to compare the wound infection rate between the two techniques.

MATERIAL AND METHODS

It is a randomized controlled study conducted in Surgical Unit-I, Allied Hospital, Punjab Medical College, Faisalabad. Duration of study was fifteen Months (January 01, 2014 to March 31, 2015). Formal approval of this study was obtained from hospital ethics committee. All patients (n=60) were admitted through OPD. Non-probability consecutive sampling technique was used. Both male and female patients, with age between 12 to 60 years, having ileostomy for benign disease of intestine were included. Written informed consent was obtained from all the patient. Participants of the study were randomly divided into two groups by using computer generated random number table to minimize bias.

The two techniques used to close ileostomy stoma wound were:

1. **Linear closure:** An elliptical incision was used for the closure of Ileostomy. Muscles of abdominal wall were closed by continuous non-absorbable stitches. Skin was approximated using interrupted non-absorbable suture resulting in a linear scar. Figure 1.

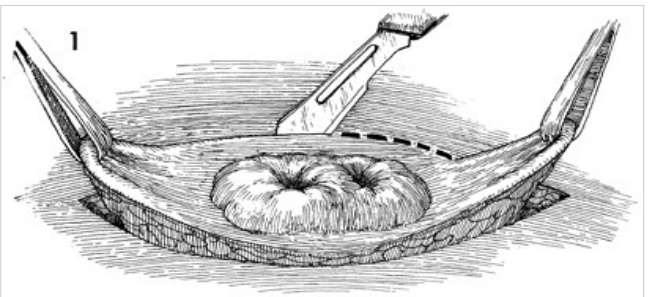


Figure-1

2. **Purse-string closure:** A circular incision was used for the reversal of Ileostomy. Muscles of abdominal wall were closed by continuous non-absorbable stitches. Skin wound was closed using single continuous subcuticular stitch with non-absorbable suture material (Proline No 1) resulting in a rounded wound leaving approximately 0.5cm skin defect in the middle. Figure 2 (A,B)

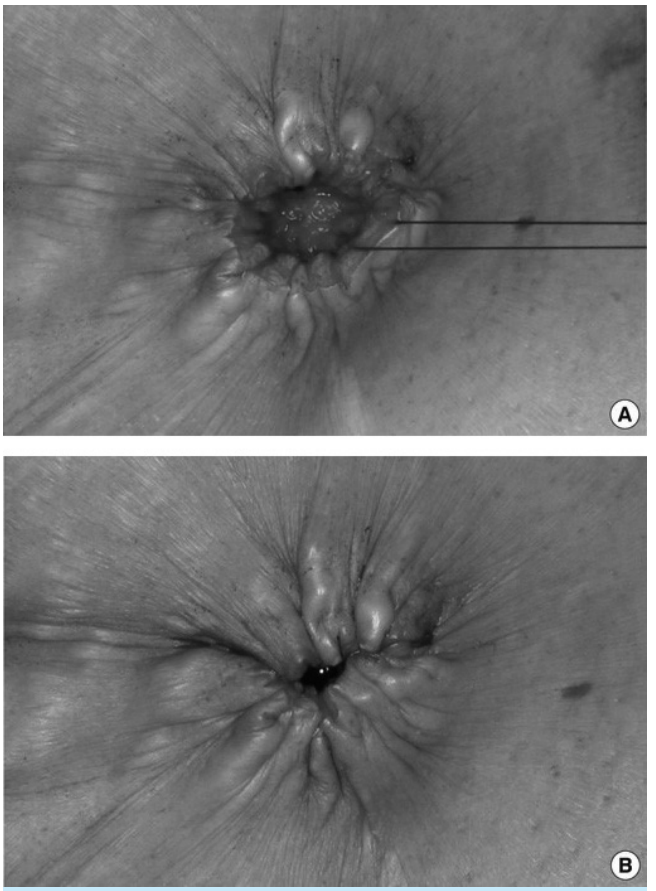


Figure-2

The two groups were compared for the presence of post-operative surgical site infection. Presence of wound infection was assessed by looking for erythema or cellulitis around the wound, purulent discharge from the wound or systemic indications of infection like fever or tachycardia. These assessments were made on 5th post-op day while the patient was still admitted. All patients were called to outpatient department for follow-up visit on the 14th post-op day.

Data was analyzed using SPSS v10. Descriptive

statistics like mean and standard deviation were calculated for all quantitative variables like age and time since last surgery; and frequency and percentages were calculated for all qualitative variables like gender, wound infection at 5th post-operative day. Chi-square test was used to compare the outcome (wound infection) in both groups. P-value less than 0.05 was taken as significant.

RESULTS

A total of 60 cases (30 in each group) were enrolled. Age distribution of the patients was done and the results are shown in Table No. I.

Age (in years)	Purse-string closure (n=30)		Linear closure (n=30)	
	No. of patients	%	No. of patients	%
12-30	8	26.67	11	36.67
31-60	22	73.33	19	63.33
Total	**30**	**100**	**30**	**100**
mean±sd	**40.37±11.71**		**39.63±11.92**	

Table-I. Age distribution (n=60)

Gender distribution of the patients was done and the results are shown in Table No. II.

Gender	Purse-string closure (n=30)		Linear closure (n=30)	
	No. of patients	%	No. of patients	%
Male	18	60	20	66.67
Female	12	40	10	33.33
Total	**30**	**100**	**30**	**100**

Table-II. Gender distribution (n=60)

Comparison of infection in stoma site skin wound closure done by purse string suture and linear suturing techniques was done which shows presence of infection in 36.67%(n=11) in Linear closure and 10%(n=3) in Purse-string closure group while remaining 63.33%(n=19) and 90%(n=27) respectively case had no infection, p value was calculated as 0.01 which shows a significant difference. (Table No. III)

Infection	Linear closure (n=30)		Purse-string closure (n=30)	
	No. of patients	%	No. of patients	%
Yes	11	36.67	3	10
No	19	63.33	27	90
Total	**30**	**100**	**30**	**100**

Table-III. Comparison of infection in stoma site skin wound closure done by purse string suture and linear suturing techniques (n=60)

P value=0.01

Stratification for age shows that 3 out of 11 cases in Linear closure group and 1 out of 3 cases of Purse-string closure group of infection were between 12-30 years, p value was calculated as 0.26 while 8 out of 11 cases in Linear closure group and 2 out of 3 cases of Purse-string closure group were between 31-60 years of age, p value was calculated as 0.07. (Table No. IV)

Group	Infection in stoma site skin wound		P value
AGE: 12-30			
	Yes	**No**	
Linear closure	3	5	0.26
Purse-string closure	1	10	
AGE: 31-60			
Linear closure	8	14	0.07
Purse-string closure	2	17	

Table-IV. Stratification for infection in stoma site skin wound closure done by purse string suture and linear suturing techniques with regards to age

Stratification for gender shows that 5 out of 11 cases in linear closure group and 2 out of 3 cases of infection in purse-string closure group were male, p value was calculated as 0.22 while 6 out of 11 cases in linear group and 1 out of 3 cases of purse-string closure infection were females, p value was calculated as 0.07. (Table No. V).

Group	Infection in stoma site skin wound		P value
Gender : Male			
	Yes	**No**	
Linear closure	5	13	0.22
Purse-string closure	2	18	
Gender : Female			
Linear closure	6	6	0.07
Purse-string closure	1	9	

Table-V. Stratification for infection in stoma site skin wound closure done by purse string suture and linear suturing techniques with regards to gender

DISCUSSION

Intestinal stoma closure is associated with high risk of surgical site infection (SSI) at stoma reversal site. To reduce wound-related complications, purse-string skin closure was introduced as an alternative to conventional linear skin closure. This study was designed to compare the wound infection rate between the two techniques.

The findings of our study are in agreement with study by Reid K and colleagues.[2] Their study has recorded that patients undergoing reversal by an elliptical incision and linear closure have a greater incidence of wound infection compared to those undergoing a circular incision and purse-string closure, 38.7% and 6.67% respectively.[2] Similar benefits of this technique have been shown in the study conducted by Klink CD at el.[7]

Jung Ryeol Lee and colleagues[4] compared wound infection rates and operative outcomes between linear (L) and purse-string (P) skin closure after a loop ileostomy reversal.

They revealed that between group L and P, there were no differences of age, gender, body mass index, and American Society of Anesthesiologists (ASA) scores, similar to the finding of our study. Wound infection was found in 5 cases (16.7%) in group L and in one case (5.6%) in group L ($P = 0.26$), our findings are consistent regarding significantly increased risk of infection in Linear closure group than Purse-string closure group. Another retrospective cohort study[7] was to determine the outcome of purse string approximation (PSA) compared to primary linear closure (PLC) of the skin after loop ileostomy reversal, they recorded that SSI occurred significantly more often in the PLC group in comparison to the PSA group (17% vs. 5%; $p = 0.047$), they concluded that the risk for SSI is lower in patients with PSA in comparison to patients with PLC. In order to diminish SSI we recommend performing a PSA in patients with loop ileostomy reversal, the findings of the study are in agreement with the findings of our study.

CONCLUSION

The frequency of infection in stoma site skin wound closure done by purse-string suturing technique is significantly less than linear suturing technique.

Copyright© 10 June, 2015.

REFERENCES

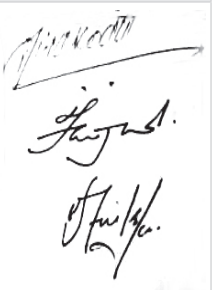
1. Aziz A, Sheikh I, Jawaid M, Alam SN, Saleem M. **Indications and complications of loop Ileostomy.** J Surg Pak. 2009;14(3):128-31.
2. Reid K, Pockney P, Pollitt T, Draganic B, Smith SR. **Randomized clinical trial of short-term outcomes following purse-string versus conventional closure of Ileostomy wounds.** Br J Surg. 2010;97(10):1511-7.
3. Margaret Farquharson, Brendan Moran. **Farquharson's textbook of operative general surgery. 9th edition.** Great Britian: Hodder education;2005.
4. Lee JR, Kim YW, Sung J, Song OP, Kim HC, Lim CW et al. **Conventional linear versus purse-string closure after loop ileostomy reversal: comparison of wound infection rates and operative outcome.** J Korean Soc Coloproctol. 2011;27(2):58-63.
5. Akiyoshi T, Fujimoto Y, Konishi T, Kuroyanagi H, Ueno M, Oya M et al. **Complications of loop Ileostomy closure in patients with rectal tumor.** World J Surg. 2010;34(8):1937-42.
6. Harold DM, Johnson EK, Rizzo JA, Steele SR. **Primary closure of stoma site wounds after -ostomy takedown.** Am J Surg. 2010;199:621-4.
7. Klink CD, Wünschmann M, Binnebösel M, Alizai HP, Lambertz A, Boehm G, et al. **Influence of skin closure technique on surgical site infection after loop ileostomy reversal: Retrospective cohort study.** Int J Surg 2013;11:1123-5.
8. Bax TW, McNevin MS. **The value of diverting**

loop ileostomy on the high-risk colon and rectal anastomosis. Am J Surg 2007;193:585.

"The more you know about the subject, The more you know that you don't know the subject."

Shuja Tahir

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Dr. Muhammad Faisal Bilal Lodhi	Performed operations, Designed the study.	
2	Dr. Farhan Javed	Helped us data collection & statistics	
3	Dr. Sofia Irfan	Contibuted by patient councelling, assisting in operation & following of patients.	