



WOUND INFECTIONS; FREQUENCY FOLLOWING INTESTINAL STOMA CLOSURE

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ABSTRACT... Background: An intestinal stoma is a surgically created opening of the bowel onto the body surface. Temporary ostomies can be created from small or large bowel in a variety of manners and serves a valuable role in persons undergoing surgery for acute infectious events, malignancy or trauma. Temporary faecal diversion is recommended with a low colorectal, coloanal or ileoanal anastomosis. **Objective:** To find the frequency of wound infection following intestinal stoma closure. **Materials and methods:** The case series study was conducted in surgical unit Hayatabad medical complex Peshawar over 139 patients between March 2008 to August 2009. Closure was done on the next day of admission. Patients were advised to report to OPD if they develop wound infection in between follow up visits. Data were collected using a specially designed proforma. **Results:** Out of 139 patients, 104(74.82%) were male and 35(25.18%) were female. Colostomy was done in 78(56.1%) patients and ileostomy in 61(43.9%) of patients. Average age was 35.69 years \pm 16.5SD. There are 11(7.9%) wound infection observed during the hospital while at 30th day of post-op follow up decreased to just 3(2.2%). Average hospital stay was 4.96 days \pm 2.06SD with a range of 3-10 days. **Conclusions:** Wound infection was observed as compared to other national and international studies. Male were three times more than females and wound infection was seen more in males.

Key words: Colostomy, Ileostomy, Indications, Complications.

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INTRODUCTION

Temporary faecal diversion is recommended with a low colorectal, coloanal or ileoanal anastomosis¹. Despite the major advancements in the field of intestinal surgery, construction of an intestinal stoma is still a common and one of the most frequent operations in visceral surgery^{2,3}.

Temporary stoma creation is an essential part of emergency and elective colonic surgery⁴. Surgical patients frequently need some type of intestinal stomas for a wide spectrum of disorders. Maintaining effective and enough decompression of gastrointestinal tract, securing distal bowel segments and anastomosis are the primary goals of ostomy formation as well as providing a minimum complication rate of closure⁵.

Despite new operation techniques and a more

restrictive use of stomas, stoma formation remain an often necessary procedure⁴. Stoma closure is so often considered a "minor" procedure but it is associated with significant morbidity and mortality^{2,4,5}.

The commonest complication of stoma closure is wound infection/sepsis³⁻⁷. Wound infection remains the commonest post-operative complication which not only prolongs the hospital stay, increases cost of treatment but can also lead to septicemia and long term complications like incisional hernia⁸. It is the most common nosocomial infection accounting for 28% of all such infections⁹.

It remains a major clinical problem in terms of morbidity, mortality and cost of treatment¹⁰⁻¹³. Patients who develop wound infection are up to

60% more likely to spend time in an ICU, 5-times more likely to be re-admitted to the hospital and 2-times more likely to die than are patient without wound infection¹⁴. The incidence of wound sepsis ranges from 2 to 37% but most series report an incidence of approximately 10%⁵.

Surgical site infection has a tendency to occur more often in the colostomy group [5-15% in colostomy vs. 0.5-6% in ileostomy],¹⁵ as in the pre closure period, and this might be due to the nature of microbial flora in the stoma¹⁶.

OBJECTIVE OF THE STUDY

To find the frequency of wound infection following intestinal stoma closure.

OPERATIONAL DEFINITIONS

WOUND INFECTION

It is skin and soft tissue infection and identified by the presence of all of the following signs and symptoms: pain in the wound, redness (erythema), swelling (cellulites) and/or purulent discharge from the wound with or without systemic features (fever) and yielding positive or negative bacterial growth on culture and sensitivity testing.

INTESTINAL STOMA

It is a surgically created opening of the bowel onto the body surface and include both temporary colostomy and ileostomy which require subsequent closure.

CLOSURE OF INTESTINAL STOMA

Reversal of the continuity of the gut by hand sewen technique through the same stomal site incision or laparotomy.

MATERIALS AND METHODS

The case series study was conducted at surgical unit Hayatabad medical complex Peshawar over 139 patients after the approval of hospital ethical committee. Patients requiring stoma closure were booked and admitted through OPD. Pre-operative distal loopogram was done to check any distal pathology like stricture or leakage in patients who required stoma to protect distal anastomosis.

Patients fulfilling the exclusion and inclusion criteria were included in the study. Detailed history, clinical examination, routine pre-operative investigations like CBC, ECG, X-ray chest, blood sugar, HBsAg and Anti HCV were done in each case pre-operatively.

Mechanical bowel preparation was done the day before surgery. Proximal loop was prepared using 200ml 20% mannitol solution mixed with 1-litre fruit juices taken orally. Distal loop was cleaned by orthograde lavage using normal saline and Kleen enemas per rectally. Informed written consent signed by the patient and the operating surgeon was taken for surgery following explanation to the patients of their inclusion in this study.

Closure was done on the next day of admission by a senior resident, registrar or consultant blinded from the details and inclusion of the patient in the study. Prophylactic antibiotics (ceftriaxone 1gm+metronidazole 500mg) were administered intravenously after induction of anaesthesia. Elliptical incision was given around stoma and deepened into the peritoneum. Upon full mobilization of the loop, gut continuity was restored using polyglycolic acid 3/0 suture in extra-mucosal single interrupted layer. Both layers of rectus sheath were closed with polypropylene no.1 in continuous layer. Skin was approximated with polypropylene 2/0 suture in simple interrupted layer.

Patients were kept nil by mouth and started on i/v antibiotics (as mentioned earlier) and fluids for 2-3 days post-operatively and/or till they pass stools and flatus. Daily progress including bowel sounds, passage of stool and flatus and any complication like wound infection were noted. Patients were discharged from the hospital when they started oral intake, stable clinically and there were no complications which were decided by the attending surgeon.

All patients were followed up on day 14th, 21st and 30th after surgery. Patients were advised to report to OPD if they develop wound infection in between follow up visits.

Patient having pre-existing stomal site wound infection, death of the patient during stay in the hospital from causes other than wound infection, post-operative anastomotic leak were excluded as they are confounders and make the study results bias.

Bias and confounders in the study were controlled by strictly following the exclusion criteria. SPSS(version 14) were used for data analysis.

RESULTS

In this study, 139 patients with intestine stoma closure were observed, in which 104(74.82%) were male and 35 (25.18%) were female patients. Male to female ratio was 2.9:1.

There were two types of stoma closure performed, in which colostomy closure was done in 78(56.1%) patients (out of which 18-end,28-loop and rest of double barrel) and ileostomy closure was carried out in 61(43.9%) of patients.(out of which 20 are double-barrel and 30 were loop double-barrel and the rest were ilio-colostomies). Patient’s age was divided in five categories, out of which most common age group for ileostomies was 13–20 years and 21–30 years for colostomies. (Fig 1).

Wound infection was 11(7.9%) observed during the hospital. After 14th days of post op follow up, wound infection was recorded in 9(6.5%) of patients, at 21 days of followup it was seen in 9(6.5%) and decrease to 8(5.88%) after 30th day of post follow up.

Average hospital stay was 5.63 days ± 2.06SD with a range of 3-10 days. Majority of the patients 71(51.1%) were discharge of at 5-6 days of hospital duration, 34(24.5%) patients were discharge with in 3-4 days, 17 (12.2%) patients quit the hospital with in 7-8 days and 17(12.2%) patients have more than 9 days of hospital stay.

There were 5(45.5%) presented with stoma have wound infection of age more than 40 years.Table-I.

Gender wise distribution shows that the infection in hospital was found in male more than females.

Out of 104 male patients, 9 (8.7%) were wound infection while out of 35 female patients, 2 (5.7%) have wound infection in hospital post operatively. Majority of the patients were presented with penetrating/blunt injury 79(56.83%), followed by intestinal tuberculosis 9(6.47%). (Fig 2)

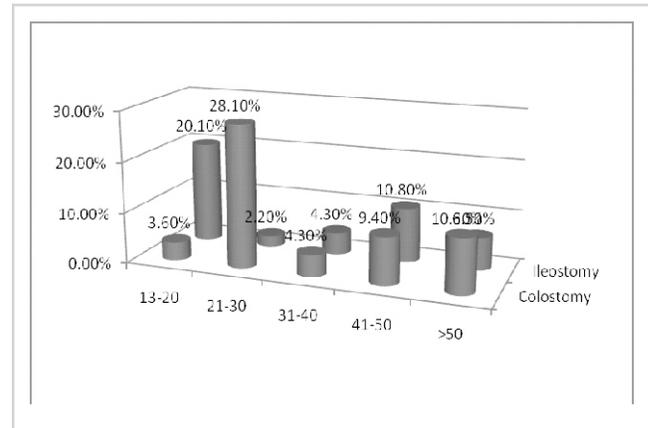


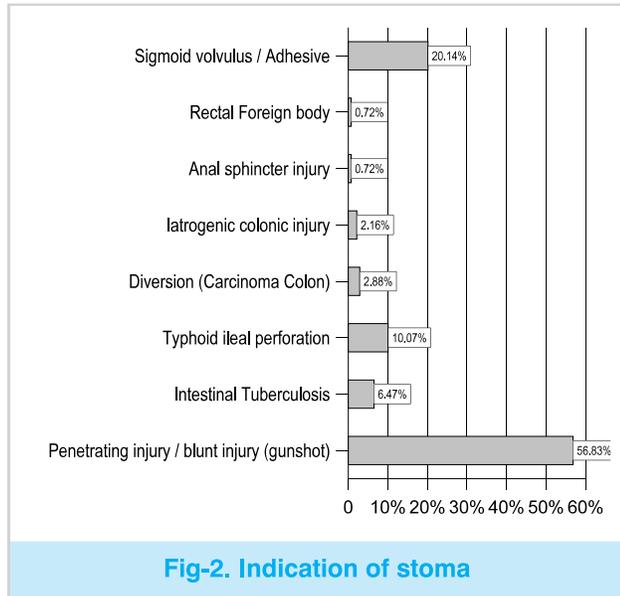
Fig-1. Age wise distribution of stoma

		Wound infection at hospital		Total
		Yes	No	
Age (In yrs)	<=20.00	3 27.3%	30 23.4%	33 23.7%
	21.00-30.00	1 9.1%	41 32.0%	42 30.2%
	31.00-40.00	2 18.2%	10 7.8%	12 8.6%
	41.00-50.00	2 18.2%	26 20.3%	28 20.1%
	51.00+	3 27.3%	21 16.4%	24 17.3%
Total		11 100.0%	128 100.0%	139 100.0%

Table-I. Age wise distribution of wound infection in hospital

DISCUSSION

Males were three times more common to have stoma than females. Compared to ulcerative colitis in western world, the main indications of ileostomy were intestinal tuberculosis (58.4%) and enteric perforation (30.6%)¹⁷. This was in contrast to a



study reported from Karachi in which main indication was typhoid perforation, accounting for two third of all cases. Other less common included iatrogenic perforation, rectal cancer, tuberculosis, blunt abdominal trauma and anastomotic leakage⁷. Tuberculous abdomen is quite common in this part of the world. The incidence of perforated tuberculous ulcer in operated cases varies from 10.5 – 39% whereas the incidence of intestinal stricture and ileocecal mass were 66% and 20% respectively¹⁸. Our results are also contrast to these studies because this part of country has extremely hit under terrorism and extremism that is why the penetrating injuries are found in majority of cases in our study.

Reported complication rates after stomas range from 2.4% to 50%^{19, 20}. One of the other study show that stomas have risks and costs of their own including local, systemic complications and a second hospitalization for closure. Major complications like sepsis, intra-abdominal abscesses, wound infection or dehiscence and pneumonia are important indicators of clinical outcome but gut related complications are often used to gauge effectiveness and risks of gut procedures. Blunt trauma by roadside accidents resulted in 22.4% colostomies. In the present study colostomy was made in 14% cases of anorectal malignancy, 12% sigmoid volvulus

and only 2% cases of adhesive obstruction study. This is in comparison to a study who reported colostomy formation in 9.7% cases of acute intestinal obstruction²¹.

Most of the complications in the present study appeared in stomas constructed by residents or less experienced senior registrar in emergency. A surgeon trained in stoma formation observing all technical details usually give good results¹⁹. In reversal of 62 stomas, there were three anaestomatic leakage and nine cases of wound infection. This was in accordance with a study that showed a morbidity of 16% including extra abdominal complications²⁰.

There is no recognized optimal timing for reversal of temporary ileostomies. However, most surgeons would advocate early reversal of ileostomies in medically fit and willing patients. The vast majority of patients experience an overall improvement in quality of life, physical function and social function following stoma reversal. A patient's general medical fitness, which includes age and co-morbidity, may worsen after major surgery and is important in planning any further surgical procedures. A further factor is the patients' experience of the primary procedure, particularly if they suffered any post-operative complications²². In the present study, 69% of stomas were reversed within 12 weeks. There were no significant differences in outcome among early or delayed closure; although some authors have mentioned increasing the delay from creation to reversal may result in fewer complications while others argue that early reversal is feasible²³.

A routine contrast study is not practiced in Patan Hospital. Among the 23 patients, only 1 had a distal loopogram for suspicion of obstruction as multiple inter-loop adhesions were noted in the index operation. The loopogram revealed contrast passing normally up to the rectum. In patients with an ileostomy, with a smooth postoperative course, a radiological examination of the anastomosis prior to ileostomy reversal appears unnecessary²⁴.

Prospective comparison between primary closure and delayed primary closure of the wound has unexpectedly shown less wound infection in primary closure than in delayed primary closure²⁵.

Post reversal complications have been reported to be between 20 and 48%^{26,27} wound infections and anastomotic leakage being the most common surgical complications. The results are comparable to our study.

The mean hospital stay after stoma reversal was 7 days with the patients undergoing loop ileostomy reversal being discharged earlier (mean 3 days). There was no readmission. This practice significantly reduces the use of hospital resources and decreases economic cost without compromising care²⁸.

CONCLUSIONS

Advantages of stoma creation clearly outweigh the disadvantages considering the very low percentage of serious complications associated with stoma creation and reversal. Our study did not find any differences in the complication rates associated with the type of stoma formation, timing of reversal. Wound infection was observed as compared to other national and international studies. Male were three times more than females and wound infection was seen more in males.

We therefore conclude that stoma reversal can be done safely at an earlier date, with minimal requirement of special anesthesia and minimal access to the abdomen, and that early discharge is safe without expecting serious complications and re admissions.

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REFERENCE

- Alves A, Panis Y, Lelong B, Donsset B, Benoist S, Vicaud E. **Randomized clinical trial of early VS delayed temporary stoma closure after proctocolectomy.** Br J Surg 2008;95:693-8.
- Renzulli P, Candinas D. **Intestinal stomas- indications, stoma types, surgical technique.** Ther Umsch 2007;64:517-27.
- Rajput A, Samad A, Khanzada TW. **Temporary loop ileostomy: prospective study of indications and complications.** Rawal Med J 2007;32:159-62.
- Pokorny H, Herkner H, Jakesz R, Herbst F. **Mortality and complications after stoma closure.** Arch Surg 2005;140:956-60.
- Sutton CD, Williams N, Marshall LJ, Lloyd G, Thomas WM. **A technique for wound closure that minimizes sepsis after stoma closure.** ANZ J Surg 2002;72:766-7.
- Iqbal P, Saddique M, Baloch TA. **Closure of ileostomy - a study of 74 cases.** Pak J Surg 2008;24:98-101.
- Kaiser AM, Israelit S, Klaristenfeld D, Selvindoss P, Vukasin P, Ault G, et al. **Morbidity of ostomy takedown.** J Gastrointest Surg 2008;12:437-41.
- Siddiqui K, Khan AAF. **Comparison of frequency of wound infection: Open Vs laparoscopic cholecystectomy.** J Ayub Med Coll Abbottabad 2006;18:21-4.
- Parker MC, Wilson MS, Menzies D, Sunderland G, Clark DN, Knight AD, et al. **Surgical and clinical adhesions research (SCAR) Group. "The SCAR-3 study: 5-year adhesion-related readmission risk following lower abdominal surgical procedures."** Colorectal Dis. 2005;7:551-8.
- Petrosillo N, Drapeau CM, Nicastri E, Martini L, Ippolito G, Moro ML, et al. **Surgical site infections in Italian hospitals: a prospective multicenter study.** BMC Infect Dis 2008;8:34.
- Sangrasi AK, Leghari AA, Memon A, Talpur AK, Qureshi GA, Memon JM. **Surgical site infection rate and associated risk factors in elective general surgery at a public sector medical university in Pakistan.** Intern Wound J 2008;5:74-8.
- Smith RL, Bohl JK, McElearney ST, Friel CM, Barclay MM, Sawyer RG. **Wound infection after elective colorectal resection: Ann Surg 2004;239:599-605.**
- Petherick ES, Dalton JE, Moore PJ, Cullum N. **Methods for identifying surgical wound infection after discharge from hospital: a systematic review.** BMC Infect Dis 2006;6:170.
- Khan SA, Rodrigues G, Kumar P, Rao PGM. **Current challenges in adherence to clinical guidelines for antibiotic prophylaxis in surgery.** J Coll Physicians Surg Pak 2006;16:435-7.
- Mackeigen JM, Cataldo PA. **Ostomy take down.** In:

- Mackeigen JM, Cataldo PA, eds. **Intestinal stomas: principles, techniques, and management.** 2nd ed. New York: Informa Health Care, 2004:211-3.
16. Lertsithichai P, Rattanapichart P. **Temporary ileostomy versus temporary colostomy: a meta-analysis of complications.** Asian J Surg 2004;27:202-9.
 17. Gunnarsson U, Karlbom U, Docker M, Raab Y, Pahlman L. **Proctocolectomy and pelvic pouch is a diverting stoma dangerous for the patient?** Colorectal Dis. 2004 Jan;6(1):23-7.
 18. Menegaux F, Jordi-Galais P, Turrin N, Chigot JP. **Closure of small bowel stomas on postoperative day 10.** Eur J Surg. 2002; 168(12):713-5.
 19. Mansfield SD, Jensen C, Phair AS, Kelly OT, Kelly SB. **Complications of loop ileostomy closure: A retrospective cohort analysis of 123 patients.** World J Surg. 2008 Jun 19.
 20. Thalheimer A, Bueter M, Kortuem M, Thiede A, Mever D. **Morbidity of temporary loop ileostomy in patients with colorectal cancer.** Dis Colon Rectum 2006 Jul;49(7):1011-7.
 21. Salum M, Wexner SD, Nogueras JJ et al. **Does sodium hyaluronate and carboxymethylcellulose-based bioresorbable membrane (seprafilim) decrease operative time for loop ileostomy closure?** Tech Coloproctol. 2006 Oct;10(3):187-90.
 22. Kong-Weng-Eu, MMed, David G. Layne. **A randomized controlled trial of 0.5% ferric hyaluronate Gel (Intergel) in the prevention of Adhesions following abdominal surgery.** Annals Surg. 2003;567-70.
 23. 98Khair G, Alhamarneh O, Avery J, Cast J, Gunn J, Monson JRT, Hartley J. **Routine use of gastrograffin Enema prior to the Reversal of a loop ileostomy.** Dig Sur 2007; 24:338-41.
 24. 100Dowson HM, Bong JJ, Lovell DP. **Reduced adhesion formation following laparoscopic versus open colorectal surgery.** British J surg. 1998;95(7):909-14.
 25. Tsang WWC, Chung, CC. **Laparoscopic sphincter preserving total mesorectal excision with colonica-J-pouch reconstruction: five year results.** Annals surg 2006;243(3):353-8.
 26. Brand MI, Dujovny N. **Preoperative Considerations and Creation of Normal Ostomies.** Clin Colon Rectal Surg. 2008;21(1):5-16.
 27. Aziz A, Sheikh I, Jawaid M, Alam SA, Saleem M. **Indications and complications of loop ileostomy.** J Surg Pak 2009;14 (3):128-31.
 28. Akhtar AT. **Typhoid ileal perforation: a study of 75 patients.** Specialist 1994;10(3):219-26.



Always forgive your enemies;
nothing **annoys** them so much.

Oscar Wilde

