# Outcome of Early Versus Delayed Stoma Closure

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## ABSTRACT

**Aim:** To compare the outcome of early stoma closure with delayed closure.
**Study Design:** Quasi experimental study.
**Place and duration of study:** Department of General Surgery Unit IV of Jinnah Hospital, Lahore six months from February 2010 to July 2010.
**Methodology:** 60 patients of all ages and both sex in whom ileostomy or colostomy was made for various reasons were included in the study. These patients were randomly allocated into two groups; group A (early stoma closure) and group B (delayed stoma closure).
**Results:** The mean age in early group was 27.03±12.28 while in delayed group 28.03±11.57. Male to female ratio was 4:1 in early group and 2:1 in delayed group. The most common presentation was firearm injury (30%), followed by blunt abdominal trauma (18.3%) and intestinal obstruction (18.3%). Stoma related complications i.e. skin excoriation occurred only in 1 patient (3.3%) in early group while in delayed group skin excoriation occurred in 10 (34%), retraction 1 (3.3%) and prolapse in 1 patient (3.3%). Hospital stay was lesser in group A than group B.
**Conclusion:** We concluded that early stoma closure is a safe and effective method. The results of early stoma closure are superior to delayed stoma closure in experienced hands.
**Keywords:** Ileostomy, Colostomy, Early Stoma Closure, Delayed Stoma Closure.

## INTRODUCTION

A stoma is an artificial opening made in the bowel to exteriorize the bowel contents. The common indications for stoma formation in our country are firearm injury, blunt abdominal trauma and peritonitis[1]. In Western literature there are no reliable figures for the number of stomas formed each year but it is estimated that at any one time 100,000 to 150,000 people have abdominal stomas in United Kingdom[2]. The stoma may be temporary or permanent. There are two surgical strategies for the closure of a stoma, early and delayed. Early stoma closure refers to the reversal of a stoma within two weeks following its formation i.e., within the same admission where as conventionally it is recommended six to twelve weeks after the initial operation[3].

The concept of early closure is becoming more popular and it is highly attractive and acceptable for the patient. Early closure is undertaken if the patient is in good general condition without any intra-abdominal sepsis, wound infection and stomal edema[4]. Both ileostomy and colostomy result in significant quality of life impairment placing a negative impact on patient's psychological, physical, sexual and social welfare[5]. A temporary loop

ileostomy is often created to minimize the impact of peritoneal sepsis from an anastomotic dehiscence after a coloanal or low colorectal anastomosis. Such a stoma is usually closed after 6 to 12 weeks when the intestinal edema is reduced and the peristomal adhesions are less dense. This period is three to four times longer than necessary for assurance of anastomotic healing, which is usually achieved by the second week after surgery[6]. An adhesion barrier membrane placed around the limbs of a defunctioning loop ileostomy reduces peristomal adhesion and facilitates early closure at three weeks with minimal complications.[7] The early postoperative adhesions tend to be soft, flimsy and avascular which can be swept away with minimal tissue injury. Later on the adhesions become dense and adherent and it is quite an ordeal to deal with these adhesions thus increasing the degree of operative difficulty and the risk of injury[8].

In our setting there is a need for early closure, as stomas are generally poorly managed by patients due to poor education, poverty, unreliable supply of collecting appliances and stoma care facilities. It was our intention to evaluate the safety and efficacy of early over delayed stoma closure.

## PATIENTS AND METHODS

This study was carried out in the Surgical Department of Jinnah Hospital Lahore. Sixty patients of either sex and all ages in whom ileostomy or colostomy was made for both traumatic and non-traumatic reasons

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were included in the study. Patients who required permanent stoma, having inflammatory bowel disease, abdominal tuberculosis and with poor general condition not fit for immediate surgical intervention were excluded from the study. After taking informed consent, patients were randomly allocated in two groups; group A (early closure) and group B (delayed closure) with 30 patients in each group. Diagnosis was made on the basis of previous history, symptoms and signs and operative findings. Reversal in both groups was performed under general anaesthesia through a midline laparotomy incision. Resection and anastomosis was done in a single layer interrupted extra-mucosal fashion using vicryl 3/0. The midline laparotomy wound and stomal skin wound was closed primarily. The duration of surgery, types of adhesions and occurrence of iatrogenic injury was noted. Follow up was done fortnightly after discharge for two months and development of surgical site infection and features of intestinal obstruction were assessed. All the information collected through a proforma was analyzed through a statistical programme.

## RESULTS

The mean age of patients in group A (early stoma closure) was 27.03±12.28 years while in group B (delayed stoma closure) was 28.03±11.57.

In group A, 24 (80%) patients were male and 6 (20%) were female while in group B, 20 (66.7%) patients were male and 10 (33.3%) were female. Male to female ratio was 4:1 in group A and 2:1 in group B.

Table 1 shows the presentation of patients with different pathologies in both groups. Firearm injury (30%) was the most common indication of stoma formation, followed by blunt abdominal trauma (18.3%), intestinal obstruction (18.3%) and induced abortion (11.7%).

In group A 5 (16.7%) patients had jejunostomy and none in group B. In group A, 18 (60%) patients had an ileostomy while in group B 22 (73%) had ileostomy. Colostomy was present in 7 (23.3%) patients in group A and 8 (26.6%) patients in group B.

In group A the interval in days between first and second operation was Mean±SD 10.93±2.16 and in group B was 56.72±11.36 which is statistically highly significant (p <0.001). All patients 30 (100%) were operated within 7-14 days in group A, while in group B 11 (36.6%) patients were operated between 39-46 days and 4 (13.3%) patients operated between 47-54 days and 9 (30.0%) patients operated between 55-62 days and remaining 6 (20%) patients operated more than 70 days.

The duration of surgery (hours) in group A was 1.04±0.15 and in group B was 1.56±0.38. Most of the patients in group A 24 (80%) were operated within 75 minutes while in group B 18 (60%) patients were operated within 1 hour & 40 minutes. The difference was statistically highly significant between group A and B (p <0.001) (Table 2).

The operative difficulty was assessed from the number of iatrogenic injuries that occurred and whether the adhesions were dense or flimsy. There was no iatrogenic injury in group A while 5 (16.7%) occurred in group B. Twenty eight (93.3%) patients had flimsy adhesions and only 2 (6.7%) had dense adhesions in group A. In group B, all 30 (100%) patients had dense adhesions (Table 3)

The mean and standard deviation of total hospital stay in group A was 17.70±2.13 days and in group B was 22.43±2.92 days. The difference of hospital stay between two groups was statistically highly significant (p<0.001) (Table 4).

Table 5 shows the stoma related complications. Only 1 (3.3%) patient had skin excoriation while no patient had stomal retraction or prolapse in group A. In group B 10 (34%) patients suffered from skin excoriation, 1 (3.3%) patient had retraction and also 1 (3.3%) patient had prolapse.

Postoperative wound infection developed in 4 patients (13.4%) in group A and 2 patients (6.7%) in group B. Only 1 patient (3.3%) showed features of obstruction due anastamotic edema in group A which was managed conservatively.

Table 1: Frequency of patients with different pathologies (n=60)

| Pathologies | Group A (n=30) | Group B (n=30) | Total (n=60) |
|---|---|---|---|
| Blunt abdominal trauma | 9(30%) | 2(6.7%) | 11(18.3%) |
| Fire arm injury | 8(26.7%) | 10(33.3%) | 18(30%) |
| Induced abortion | 2(6.7%) | 5(16.7%) | 7(11.17%) |
| **Intestinal obstruction** | | | |
| *Volvulus* | 4(13.3%) | 2(6.7%) | 11(18.3%) |
| *Psdudoobstruction* | 0 | 2(6.7%) | |
| *Adhesive* | 0 | 1(3.3%) | |
| *Band* | 2(6.7%) | 0 | |
| Iatrogenic injury | 1(3.3%) | 3(10%) | 4(6.7%) |
| Strangulated inguinal hernia | 0 | 2(6.7%) | 2(3.3%) |
| Appendicular mass | 1(3.3%) | 1(3.3%) | 2(3.3%) |
| Rectal impalement | 1(3.3%) | 1(3.3%) | 2(3.3%) |
| Stab injury | 1(3.3%) | 1(3.3%) | 2(3.3%) |
| Mesenteric vascular occlusion | 1(3.3%) | 0 | 1(1.7%) |

Table 2: Comparison of duration of surgery (in hours) (n=60)

| Duration (hrs) | Group A | Group B |
|---|---|---|
| 0.45–1.15 | 24(80%) | 2(6.7%_ |
| 1.16–1.45 | 6(20%) | 18(60%) |
| 1.46–2.15 | 0 | 8(26.6%) |
| >2.16 | 0 | 2(6.7%) |

Mean±SD =1.04±0.15  1.56±0.38

Table 3: Frequency of Operative Difficulty in both Groups (n=60)

| Operative difficulty | Group A | Group B |
|---|---|---|
| Iatrogenic injury | 0 | 5(16.7%) |
| Type of adhesion | | |
| Dense | 2(6.7%) | 30(100%) |
| Flimsty | 28(93.3%) | 0 |

Table 4: Comparison of Total Hospital Stay in both Groups (n=60)

| Hospital stay (days) | Group A | Group B |
|---|---|---|
| 12 – 17 | 16(53.3%) | 1(3.3%) |
| 18 – 22 | 14(46.7%) | 12(40%) |
| 23 – 28 | 0 | 16(53.4%) |
| >28 | 0 | 1(3.3%) |

Mean±SD = 17.70±2.13    22.43.±2.92

Table 5: Comparison of Stoma Related Complications in both Groups (n=60)

| Complications | Group A | Group B |
|---|---|---|
| Retraction | 0 | 1(3.3%) |
| Prolapse | 0 | 1(3.3%) |
| Skin excoriation | 1(3.3%) | 10(34%) |

## DISCUSSION

Stoma formation is still the standard of care for a variety of traumatic and non traumatic intestinal pathologies. However, it is associated with a well recognized morbidity, cost and unnecessary delay until closure. In our study, early closure of stoma is considered the most effective strategy as it proves helpful for the patient in a number of ways.

A study was done by Khalid, in which mean age was 27.9±9.7 in early group and 28.6±10.6 in delayed group[3]. In our study, all age patients were included with their mean±SD 27.03±12.28 in group A and 28.03±11.57 in group B which is comparable with above mentioned studies. Majority of our patients were young in both groups, age group between 16-30 years of age. In the present study, male to female ratio was 4:1 in group A and 2:1 in group B. In a study reported by Hussain, male to female ratio was 4:1[9]. In another study carried out by Platell, male to female ratio was 1.1:1[10].

In the present study, the most common mode of presentation was firearm injury (30%). In a study by Hussain, the common mode of presentation was also

firearm injury 72%. The reported incidence of firearm injury ranges between 53.3-89%[9].

In a study conducted by *Tang*, there was no significant difference in the time taken and the difficulty encountered during ileostomy closure in the two groups.[7] In the present study, mean operative time was 1.04±0.15 hour in group A and 1.56±0.38 hour in group B (p <0.001) which is statistically highly significant. The reason for longer operative time in the delayed group was higher degree of operative difficulty due to dense adhesions, which also increased the risk of iatrogenic injury. In a study by Kairaluoma, pure stoma related complications were observed in 12% of the patients. Six patients (4%) had early complications; 5 patients had stoma necrosis and 1 patient had wound infection at the stoma site. Eleven (8%) patients had long term complications including 6 patients with prolapse, 2 patients with retraction 2 patients with stricture and 1 patient with parastomal hernia. In an analysis done by Kevin, he documented that 34% of peristomal skin problems occurred within 3 weeks of surgery[5,11].

*Robertson* showed that both elective and emergency stomas had similar complication rates. Stenosis occurred in 1-2%, retraction in 8-22% and prolapse in 1-3% patients[12]. In the present study stoma related complications were observed in both the groups. However, in group A only 1(3.3%) patient suffered from peristomal skin excoriation while in group B 10(34%) patients experienced this problem. Other complications like retraction and prolapse did not occur in group A while in group B 1(3.3%) patient had retraction and 1(3.3%) patient had prolapse, which is comparable with above mentioned studies. This low rate of stoma related complications was due to early closure of stoma which makes it more favourable and acceptable for the patients.

A study done by Jordi-Galais showed hospital stay was 23.1±4.6 in early group and 34.5±18.6 days in delayed group (p<0.01). In another study by Menegaux, hospital stay was 18-29 days in early group and in delayed group was 14-84 days[4,13]. A study by Khalid showed that the early group had a significantly shorter hospital stay 16.4±2.6 days versus 21.3±2.9 days for the delayed group.[3] In the present study hospital stay of patients undergoing early stoma closure was 17.70±2.13 and for those undergoing delayed closure was 22.43±2.92 (p <0.001) which is comparable with the above mentioned studies. The longer hospital stay in delayed group may be explained by the logistics of two hospital admissions.

In a study by Alves, time interval between stoma formation and reversal was 8 days for early and 2 months for late closure[14]. A study carried out by Khalid showed time interval of 11.2±3.6 days for early

closure and 12.3±3.6 weeks for delayed closure. Bakx performed early closure after 7-21 days[3,6]. In present study, stoma reversal took place in 7-14 days (10.93±2.16) days in early group and 42-84 days (56.72±11.36) in delayed group. Early closure is more feasible in our setup, as managing a stoma is a costly affair and a nuisance for patients who mostly belong to a low socioeconomic status and lack proper education.

In a study by Khan wound infection occurred in 16.66% in early group and 10.32% in delayed group whereas anastamotic leak was seen in 5.76% in early and 8.38% in delayed group.[15] In our study postoperative wound infection was seen in 13.4% in early group and 6.7% in delayed group.

Most of the researches are focused on early reversal of ileostomy and very little literature is available on early reversal of colostomy. The present study included the reversal of both and showed no mortality in early stoma closure and delayed stoma closure. It is due to proper preoperative work-up, sound surgical technique and performance of procedure by experienced surgeon.

## CONCLUSION

Early stoma closure is a safe and cost-effective method for ileostomy and colostomy closure. In experienced hands, the results of early stoma closure are more acceptable than delayed stoma closure in terms of shorter hospital stay and stoma related complications.

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