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## Early versus delayed stoma closure: A prospective study

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### Abstract

**Background:** Stoma is often constructed in emergency surgical conditions like enteric or tubercular perforations when patients present late in the course of illness to preclude primary closure. The early closure of stoma can minimize the associated morbidity and help the patient to enjoy better quality of life. The aim of our study was to compare the outcome of early stoma closure with delayed closure.

**Methods:** The present study was conducted in the Postgraduate Department of Surgery, Government Medical College, Jammu with effect from 1<sup>st</sup> July 2016 to 30<sup>st</sup> June 2017. The study was conducted on 32 patients on whom temporary stoma was performed. Patients were divided into two groups with 16 patients in each group after matching the parameters like age, sex, co morbid conditions, using simple random sampling technique. Parameters analyzed were Duration of surgery, stoma related complications, intra and post operative complications and hospital stay.

**Results:** The mean age of patients in group A (early stoma closure) was 30.20±10.08 years while in group B (delayed stoma closure) was 38.03±12.60. The number males patients in group A was 10 while no females was 6 whereas in Group B number of males was 12 and females were 4. Cause of stoma formation was enteric perforation 18(56.25%), tubercular abdomen 6(37.5%), caecal perforation 1(6.25%), trauma 2(12.5%), defunctioning stoma 3(12.56%). The duration of surgery in group A was 52±0.50min and in group B was 70±0.80min. The difference was statistically significant between group A and B ( $p<0.05$ ). The mean hospital stay in group A was 15.70±2.13 days and in group B was 22.43±2.92 days. The difference of hospital stay between two groups was statistically significant ( $p<0.05$ ).

**Conclusion:** According to our study results the outcome of early closure of temporary stoma is a feasible and effective procedure with fewer complications and less duration of hospital stay.

**Keywords:** Stoma, early closure, delayed closure, duration of hospitalization

### Introduction

A stoma is an artificial opening made in the bowel to exteriorize the bowel contents. The stoma may be temporary or permanent. Intestinal stomas are often created in acute abdominal situations when primary repair of bowel carries high risk of failure due to gross peritoneal contamination or severely inflamed bowel as can occur in enteric and tubercular perforations [1, 2]. However, it is associated with well-recognized morbidity, cost and unproven need for a delay in its closure [3]. Boyden was the first to question the timing of stoma closure who in 1995 objected the closure of colostomy for diverticulitis related stomas at 3 to 9 month of its formation [4]. The reported overall complication rate of stoma closure at conventional timing of 2-3 months is between 12 to 20% with a 30 day mortality of 7% [5, 6]. Alves *et al.* reported that reversal of temporary stoma 8-10 days after surgery is feasible; however, with higher wound complications [7]. Early closure of temporary stoma might reduce both stoma-related morbidity and patient discomfort. Other studies have also found that outcome did not differ significantly between early and late stoma closure regarding morbidity and mortality [8]. In developing countries because of poverty, poor education, unreliable supply of collecting appliances and stoma care facilities there is a need for early stoma closure. Keeping in view the above mentioned facts a prospective study to evaluate the safety and efficacy of early over delayed stoma closure was done.

### Material and Method

The present study was conducted in the Postgraduate Department of Surgery, Government Medical College, Jammu with effect from 1<sup>st</sup> July 2016 to 30<sup>st</sup> June 2017. The study was conducted on 32 patients on whom temporary stoma was performed. Patients were divided into two groups with 16 patients in each group after matching the parameters like age, sex, co morbid conditions, using simple random sampling technique.

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All operations were performed by one consultant. All patients were fully informed about the procedure and written consent obtained. In Group A, early stoma closure was carried out while in Group B, delayed stoma closure was done.

**Early Stoma Closure:** This group comprised of those in whom stoma closure was done three weeks following index surgery. As majority of the patients underwent emergency surgical procedures early closure of stoma was not carried out within the same admission. Patients were readmitted after stabilization for stoma closure.

**Delayed Stoma Closure:** This group comprised of those in whom the closure of temporary stoma was carried out between 8 weeks to 12 weeks.

Closure of temporary stoma was performed under general spinal anesthesia with a peristomal skin incision, mobilization, and a sutured anastomosis by hand-sewn interrupted technique in two layers using vicryl 3-0. Postoperatively, patients were given analgesic injection for 2-3 days followed by oral analgesics. Nasogastric tube was removed once the output was less than 200mL, pt has passed flatus and bowel sounds have returned. Supplementary intravenous (IV) fluids were given till start of oral fluids. Oral fluids were started at fourth to fifth POD in majority of patients and resumption of normal diet ranges from 5 days to 7 days postoperatively. Intravenous antibiotics were given for 5 days postoperatively as routine protocol. Patients were monitored for vomiting, abdominal distension, length of ileus, tolerance of regular diet, and evidence of anastomotic leak.

#### Exclusion criteria

Permanent ileostomy or colostomy, more than one stoma, Signs of active infection, repeated complication of stoma, medical causes for delayed laparotomy.

Data was collected and following parameters were analysed: Duration of surgery, stoma related complications, intra and post operative complications and hospital stay.

#### Results

The present study was conducted in the Postgraduate Department of Surgery, Government Medical College, Jammu with effect from 1<sup>st</sup> July 2016 to 30th June 2017. The study was conducted on 32 patients who had temporary stoma, patients were divided into two groups with 16 patients in each group. In group A, early stoma closure was carried out while in group B, delayed stoma closure was done. Following observations were made:

The mean age of patients in group A (early stoma closure) was  $30.20 \pm 10.08$  years while in group B (delayed stoma closure) was  $38.03 \pm 12.60$ . The number of males patients in group A was 10 while no females was 6 whereas in Group B number of males was 12 and females were 4. Cause of stoma formation was enteric perforation 18(56.25%), tubercular abdomen 6(37.5%), caecal perforation 1(6.25%), trauma 2(12.5%), defunctioning stoma 3(12.56%).

Skin excoriation was present in 3(12.56%) patients, while no patient had stomal retraction or prolapse in group A. In group B 6(37.5%) patients suffered from skin excoriation, 1(6.25%) patient had retraction and 1(6.25%) patient had prolapse.

The duration of surgery in group A was  $52 \pm 0.50$ min and in group B was  $70 \pm 0.80$ min. The difference was statistically highly significant between group A and group B ( $p < 0.05$ )

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 both the groups.

The mean hospital stay in group A was  $15.70 \pm 2.13$  days and in group B was  $22.43 \pm 2.92$  days. The difference of hospital stay between two groups was statistically highly significant ( $p < 0.05$ ). Minor post operative complications were recorded in group A in which 2 patients had wound infection and one patient had wound dehiscence which were managed conservatively. In Group B 1 patient had wound infection and 1 patient had anastomotic leak which required relaprotomy.

#### Discussion

Stoma formation is still the standard of care for a variety of traumatic and non traumatic intestinal pathologies. However, it is associated with physical stress, leading to an adverse effect on quality of life, morbidity, cost and unnecessary delay until closure<sup>[9]</sup>.

Early stoma closure is based on sound principles of collagen synthesis at the margins of gut and wound, which is in proliferative phase at seven to eleven days. This ensures better anastomotic and wound healing<sup>[10]</sup>.

The mean age of patients in Group A (early stoma closure) was  $30.20 \pm 10.08$  years while in Group B (delayed stoma closure) was  $38.03 \pm 12.60$ . A study was done by Khalid *et al.*<sup>[11]</sup> in which mean age was  $27.9 \pm 9.7$  in early group and  $28.6 \pm 10.6$  in delayed group.

The duration of surgery in group A was  $52 \pm 0.50$ min and in group B it was  $70 \pm 0.80$ min. The difference was statistically significant between group A and B ( $p < 0.05$ ). In contrast to our study a study conducted by Tang *et al.*<sup>[12]</sup> showed that there was no significant difference in the time taken and the difficulty encountered during stoma closure in the two groups.

The mean hospital stay in group A was  $15.70 \pm 2.13$  days and in group B was  $22.43 \pm 2.92$  days. Similarly a study done by Khalid *et al.*<sup>[11]</sup> showed that the early group had a significantly shorter hospital stay  $16.4 \pm 2.6$  days versus  $21.3 \pm 2.9$  days for the delayed group. Another study done by Amna S *et al.*<sup>[13]</sup> in their study showed hospital stay of patients undergoing early stoma closure of  $17.70 \pm 2.13$  and for those undergoing delayed closure of  $22.43 \pm 2.92$  ( $p < 0.001$ ) which is similar to our study.

The stoma related complications were present in both groups. Skin excoriation was present in 6(37.5%) patients, while no patient had stomal retraction or prolapse in group A. In group B 3(12.56%) patients suffered from skin excoriation, 1(6.25%) patient had retraction and 1(6.25%) patient had prolapse. Robertson *et al.*<sup>[14]</sup> 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.

Minor post operative complications were recorded in group A 3(12.56%), in which 2 patients had wound infection and one patient had wound dehiscence which were managed conservatively. In Group B 1 patient had wound infection and 1 patient had anastomotic leak which required relaprotomy this is in contrast to a recorded leak rate of 4.5% and mortality of 2.2% by Samiullah *et al.*<sup>[15]</sup> and 5.76% leak rate plus mortality of 1.2% by Nadim Khan *et al.*<sup>[16]</sup>

#### Conclusion

According to our study results the outcome of early closure of temporary stoma is a feasible and effective procedure with fewer complications and less duration of hospital stay.

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