

A Study to Compare the Outcomes of the Early vs Late Intestinal Stoma Closure in Selective Group of Patients

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Abstract

Background: Temporary intestinal stomas are commonly created during gastrointestinal surgeries to protect distal anastomoses and reduce morbidity from anastomotic leakage. However, the optimal timing for stoma closure—early (<14 days) or late (3–6 months)—remains a topic of debate. This study evaluates the clinical outcomes associated with early versus late stoma closure. **Material and Methods:** A prospective, randomized control trial was conducted on 110 patients, aged 18–60 years who underwent laparotomy and temporary intestinal stoma formation at Teerthanker Mahaveer Medical College, Moradabad. Patients were randomly divided into two groups: Group A (early closure, n=55) and Group B (late closure, n=55). Outcomes assessed included complications such as skin excoriation, prolapse, retraction, parastomal hernia, electrolyte imbalance, surgical site infection, anastomotic leak, hospital stay, and mortality. Follow-ups were conducted at 4 weeks and 3 months post-closure. **Results:** Both groups were comparable in demographics and diagnosis. Early closure demonstrated a trend towards fewer stoma-related complications, including a lower incidence of skin excoriation (10.9% vs. 12.7%), retraction (0% vs. 7.3%), and parastomal hernia (0% vs. 10.9%). No statistically significant differences were found in terms of surgical site infections, electrolyte imbalance, anastomotic leaks, or length of hospital stay. No mortality was observed in either group. **Conclusion:** Early stoma closure appears to be a safe and feasible alternative to delayed closure in selected patients, with a tendency toward reduced morbidity and improved quality of life. Larger, multicentric studies are warranted to validate these findings and establish definitive clinical guidelines.

Keywords: Stoma, Anastomosis, Stoma reversal.

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INTRODUCTION

The creation of a temporary intestinal stoma is a widely adopted surgical strategy in both elective and emergency gastrointestinal procedures to mitigate the risks associated with distal anastomotic leaks. Despite its life-saving role, stoma formation can significantly impact the patient's physical and psychological quality of life (QoL) due to associated complications such as prolapse, skin excoriation, parastomal hernia, and retraction.^[1,2] Traditionally, stoma closure is performed between 8 to 12 weeks postoperatively, allowing for healing and stabilization.^[3] However, prolonged stoma duration is often linked to higher rates of stoma-related morbidity and increased healthcare burden.^[4,5] Recent studies have questioned the necessity of delayed closure, proposing that early closure—performed within 14 days of the index surgery—may offer comparable safety profiles with added benefits such as reduced complication rates, shorter hospital stays, and improved patient satisfaction.^[6,7] Evidence suggests that early closure may not significantly increase the risk of postoperative complications such as anastomotic leak, surgical site infection, or electrolyte imbalance, and may even prevent long-term stoma-related morbidity.^[8,9]

Despite the growing body of literature, there remains no

global consensus on the optimal timing for stoma closure, especially in resource-constrained healthcare settings where delayed follow-up is common and patient compliance is inconsistent.^[10] This study aims to compare the outcomes of early versus late intestinal stoma closure in a selected group of patients, focusing on postoperative morbidity, hospital stay, and safety, thereby contributing to evidence-based recommendations for clinical practice.

MATERIALS AND METHODS

Study carried out in the Department of General Surgery at Teerthanker Mahaveer Medical college, Moradabad.

Study design: Experimental randomised control trial.

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Duration of study: After getting an approval from the ethical committee, this study was conducted for 18 months.

Sample size: 55 in each group (110)

Inclusion criteria

All patients who underwent laparotomy and temporary intestinal stoma is made.

- Age – 18 to 60 yrs
- Patient with S. Albumin >3gm/dl.
- Patient with normal BMI 18.5 to 24.9
- Patient with Hemoglobin >10gm/dl.

Exclusion criteria

Patients who developed abdominal wall dehiscence after primary operation.

- Patient undergoing chemotherapy
- Patients with tubercular perforation
- Patient with signs of active infection
- Immunocompromised patient
- Patient on steroid
- Diabetic patient
- Poor nutritional status

Methodology Flowchart

All patients presenting to the surgical emergency and admitted under the Department of Surgery, who underwent laparotomy with temporary intestinal stoma formation at TMMC & RC, were considered. CRC & Institutional Ethical Committee clearance was obtained before starting the study. Patients considered eligible as per inclusion and exclusion criteria. Prior written informed consent was obtained from all study subjects for the surgery. Detailed history taking and thorough clinical examination done. After admission, the patient underwent routine blood investigation (CBC, LFT, KFT, Blood grouping, HIV, hbsag & HCV), radiological investigation-(USG whole abdomen & X RAY Chest PA view) and special investigations (CECT whole abdomen), if indicated. Eligible patients divided into two groups based on inclusion and Exclusion criteria by chit method. GROUP A (early closure of stoma i.e <14 days) and GROUP B (late closure of stoma i.e. 3 to 6 months). Patient in GROUP A compared to GROUP B in terms of: Skin excoriation, Prolapse, Obstruction, Parastomal hernia, Retraction, Electrolyte imbalance, SSI, Leakage of anastomosis, Hospital Stay(length), Cost of Hospital Stay, Mortality.

RESULTS

Statistical analysis was carried out using Statistical Package of Social Sciences (SPSS) software version 20.0 (SPSS Inc., Chicago, IL, USA). Statistical analysis was carried out using descriptive statistics, by calculating frequencies and percentage for qualitative data; mean with standard deviation and median for quantitative data of each parameter in the study. Independent t-test was used to compare mean values. Chi square statistical analysis was used to assess the level of significance. The level of significance was adjusted at p-value being less than 0.05.

A total of 110 patients who underwent temporary intestinal stoma formation were enrolled and randomly assigned to two groups: Group A (early closure within 14 days, n=55) and Group B (late closure between 3 to 6 months, n=55). The mean age of participants was 46.2 ± 14.3 years, with a slight female predominance (52.7%). The most common indication for stoma formation was exploratory laparotomy with loop ileostomy (54.5%) [Table 1].

In terms of stoma-related complications, Group B (late closure) had a higher incidence of skin excoriation (12.7%) compared to Group A (10.9%), although the difference was not statistically significant ($p=0.056$) [Table 2]. Stoma prolapse occurred in 1.8% of early closure cases and 3.6% of late closure cases ($p=0.066$) [Table 3], while stoma retraction was reported in 7.3% of Group B patients and none in Group A ($p=0.118$) [Table 4]. Parastomal hernia was observed exclusively in the late closure group (10.9%), though the difference did not reach statistical significance ($p=0.112$) [Table 5].

Electrolyte imbalance was more common in Group B (7.3%) than in Group A (3.6%) ($p=0.223$), and surgical site infections were slightly more frequent in the early closure group (7.3%) versus the late group (3.6%) ($p=0.880$) [Table 6]. Anastomotic leaks occurred in 2 cases (3.6%) of early closure and 5 cases (9.1%) of late closure ($p=0.058$) [Table 7]. There were no cases of obstruction or mortality in either group.

The mean length of hospital stay was comparable between both groups, with Group A having a slightly longer stay (10.98 ± 2.65 days) compared to Group B (10.83 ± 2.39 days) ($p=0.401$). All patients were followed up at 4 weeks and 3 months postoperatively. At the 3-month follow-up, 96.4% in both groups had no complaints, while 2 patients from each group were lost to follow-up.

Table 1: Distribution of study subjects according to demographics

Parameters	Frequency (n)	Percentage (%)
Age groups (yrs)		
<20	6	5.45
20–30	11	10.00
31–40	24	21.82
41–50	10	9.09
51–60	50	45.45
>60	9	8.18
Mean age $\pm$ SD	46.200 ± 14.36	–
Gender		
Female	58	52.7
Male	52	47.3
Diagnosis		
Exploratory laparotomy with double barrel ileostomy	32	29.1
Exploratory laparotomy with end ileostomy	18	16.4
Exploratory laparotomy with loop ileostomy	60	54.5

Procedure		
Early stoma reversal	55	50.0
Late stoma reversal	55	50.0
Total	110	100.0

Table 2: Distribution of study subjects in both the study groups according to skin excoriation

Skin excoriation	Group A (Early closure)		Group B (Late closure)	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
No	49	89.1	48	87.3
Yes	6	10.9	7	12.7
Total	55	100.0	55	100.0
Chi square	2.019			
p-value	0.056*			

Table 3: Distribution of study subjects in both the study groups according to stoma prolapse

Stoma prolapse	Group A (Early closure)		Group B (Late closure)	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
No	54	98.2	53	96.4
Yes	1	1.8	2	3.6
Total	55	100.0	55	100.0
Chi square	1.783			
p-value	0.066*			

Table 4: Distribution of study subjects in both the study groups according to stoma retraction

Stoma retraction	Group A (Early closure)		Group B (Late closure)	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
No	55	100.0	51	92.7
Yes	0	0	4	7.3
Total	55	100.0	55	100.0
Chi square	3.189			
p-value	0.071*			

Table 5: Distribution of study subjects in both the study groups according to Parastomal hernia

Parastomal hernia	Group A (Early closure)		Group B (Late closure)	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
No	55	100.0	49	89.1
Yes	0	0	6	10.9
Total	55	100.0	55	100.0
Chi square	3.829			
p-value	0.050*			

Table 6: Distribution of study subjects in both the study groups according to Surgical site infection

Surgical site infection	Group A (Early closure)		Group B (Late closure)	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
No	51	92.7	53	96.4
Yes	4	7.3	2	3.6
Total	55	100.0	55	100.0
Chi square	1.012			
p-value	0.880*			

Table 7: Distribution of study subjects in both the study groups according to anastomosis leak

Anastomotic leak	Group A (Early closure)		Group B (Late closure)	
	Frequency (n)	Percentage (%)	Frequency (n)	Percentage (%)
No	53	96.4	50	90.9
Yes	2	3.6	5	9.1
Total	55	100.0	55	100.0
Chi square	1.520			
p-value	0.058*			

DISCUSSION

The creation of a temporary intestinal stoma is a common and often necessary procedure to protect distal anastomoses in gastrointestinal surgery. However, the timing of stoma reversal remains controversial. Our study aimed to evaluate

and compare the outcomes of early stoma closure (within 14 days) and late stoma closure (3–6 months) in a selective group of patients, focusing on morbidity, hospital stay, and safety. Our findings indicate that early stoma closure is not associated with increased postoperative complications. In fact, certain stoma-related morbidities—such as skin excoriation, stoma

retraction, and parastomal hernia—were observed more frequently in the late closure group. These results align with previous studies by Shahab et al. and Nelson et al., who also reported fewer complications and improved patient satisfaction in early closure groups.^[2,3]

Although the differences in complications such as electrolyte imbalance, surgical site infection, and anastomotic leakage between the two groups were not statistically significant, the trends favored early closure. The absence of mortality and obstruction in either group also confirms that stoma reversal, when performed under appropriate selection criteria, is a safe procedure. Similar conclusions were drawn in the studies by Aljorfi et al. and Yadav et al., who noted that early closure may reduce the physical and psychological burden associated with prolonged stoma use.^[4,7]

Notably, hospital stay was nearly equivalent in both groups, reinforcing that early closure does not prolong postoperative recovery. Meyer et al. emphasized that early closure does not negatively affect long-term bowel function or quality of life, which supports the safety and feasibility of this approach in carefully selected patients.^[8]

However, caution must be exercised in patient selection. Our inclusion criteria—such as normal nutritional status, hemoglobin levels >10 g/dL, and absence of infection or immunosuppression—were critical in minimizing complications in the early closure group. Other studies, including those by O’Sullivan et al. and Bananzade et al., also recommend individualized decision-making based on patient comorbidities and intraoperative findings.^[6,9]

CONCLUSION

The present randomized comparative study demonstrates that early intestinal stoma closure (within 14 days of index surgery) is a safe and feasible alternative to late closure (after 3 to 6 months) in selected patients. Early closure was associated with a trend toward reduced stoma-related complications, such as skin excoriation, stoma retraction, and parastomal hernia, without an increased risk of anastomotic leakage, surgical site infections, or electrolyte imbalance. No

mortality or bowel obstruction was reported in either group, and the duration of hospital stay was comparable.

These findings suggest that early stoma closure may improve patient outcomes, enhance postoperative recovery, and reduce the overall burden on the healthcare system, particularly in low-resource settings. However, patient selection based on nutritional status, absence of infection, and adequate clinical stability remains essential for minimizing postoperative complications.

This study adds to the growing body of evidence supporting the early reversal of intestinal stomas. Further multicentric, large-scale studies with long-term follow-up are recommended to confirm these findings and to aid in the development of standardized clinical guidelines.

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Conflicts of interest

There are no conflicts of interest.

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