

THE OUTCOMES OF EARLY VERSUS LATE ILEOSTOMY CLOSURE

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ABSTRACT

The best time to reverse an ileostomy is still largely unclear, however, there is growing evidence that delaying ileostomy closure may raise the risk of complications after the operation. The study's goal was to compare the outcomes of early ileostomy closure with late ileostomy closure after surgery. A prospective study was done to evaluate the results of patients who went through early ileostomy closure (within 6 weeks) to those who had late ileostomy closure (>6 weeks). All patients above 18 years old who had stoma subsequent surgery of bowel both in emergency and elective settings. In this prospective observational study, 60 patients were randomly assigned into two groups by the SNOSE method for closure of ileostomy at different intervals of time: early ileostomy closure (<6 weeks), n=30, and late ileostomy closure (>6 weeks), n=30. During three months, all patients were monitored for surgical complications. Early closure was performed on 30 of the 60 trial participants, with the mean time for closure in the early group being 4 weeks and 7.2 weeks in the late group. The post-operative problems and hospital stay did not vary considerably. In conclusion, based on our experience in both ileostomy closure groups at varied time intervals, the early group within 6 weeks did not increase post-operative problems and morbidity. The systematic assignment of patients with temporary loop stomas to early closure may improve patient well-being. Individualization of the usual approach of reserving patients for long-term stoma care is required, and further study is needed to compare disease-specific closure success.

KEYWORDS: Ileostomy, Time of Ileostomy Closure, Postoperative Complications, Length of Stay, Prospective Study

INTRODUCTION

An ileostomy is a faecal matter diversion device that uses the distal ileum, but often a more proximal small intestine (1) termed a stomat (Greek meaning "mouth").

The question of whether the conventional idea of when to closure a temporary ileostomy should be followed has been debated for quite some time (2).

N. J. O'Sullivan (2022) (3) did a research on 275 patients for early ileostomy reversal issues and 259 patients for late reversal difficulties. The outcomes in both groups were almost same (25.5% vs. 21.6%). Nevertheless, additional problems such as obstructions/ileus were identified more often in the late group (9.3% vs. 4.4%), indicating that early closure is more advantageous.

The most frequent kind is the Brooke-Turnbull end ileostomy. Since the mesentery is flexible, it is the most straightforward stoma for small bowel operations. Since effluent escapes below the stoma flange, short ileostomies induce skin excoriation,

weeping sores, discomfort, and pouching problems. A prolonged loop-end ileostomy protects the mesentery and blood supply.

Nils Kock, a Swedish surgeon, was the first to introduce the continent ileostomy, or pouch without an external device. Individuals with ulcerative colitis and indeterminate colitis who are not candidates for ileal pouch-anal anastomosis or whose pouch cannot reach the anal canal are often given the large intestine.

Hernia, fistula, prolapse, recession, and leaking that does not respond to revisional surgery are examples of ileostomy problems. People with ileostomies cannot use external devices.

Some individuals prefer end-to-end ileostomy to escape the social, psychological, and sexual consequences of external devices. (4)

In some cases, an early takedown with little morbidity and postoperative problems has been advised as a technique of easing patient suffering, shortening a patient's hospital stay, and lowering the expenditures associated with that stay.

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We recognized the issues and results of early and late ileostomy closure to determine the effect of length of closure for temporary ileostomy in order to determine the effect of length of closure for temporary ileostomy in order to have a more favorable impact on the outcome for patients with a temporary ileostomy.

MATERIALS AND METHODS

The present observational research was carried out in the Department of General Surgery at Era's Lucknow Medical College in Lucknow from 2020 to 2022. After approval from the Institutional Ethics Committee (ELMC&H/R Cell/EC/2021/19) and informed permission, 60 patients over the age of 18 were involved in the research and underwent temporary stoma following bowel surgery in both emergency and elective situations. Patients who are showing indications of organ failure or pregnancy or an immunocompromised condition like HIV or has history of steroid intake were ruled out from the study. The patients were separated into two groups: early ileostomy closure (n = 30) using the SNOSE procedure and late ileostomy closure (> 6 weeks).

A distal loopogram (distal segment contrast) was performed prior to surgery to rule out any leaks or distal obstructions.(5) Ileostomy closure was performed on all patients. The procedures were performed by the same surgeon, who was assisted by two scrub nurses.

Each patient got a broad-spectrum intravenous antibiotic (injection cefoperazone 30 mg/kg body weight) prior to spinal anaesthesia, and all patients had the identical operational methods. All patients were followed for up to three months following surgery, at one-week, one-month, and three-month intervals, to evaluate post-operative complications and results.

SURGICAL TECHNIQUE

The surgery began with a circular incision around the stoma, leaving a 2 mm skin margin. Forceps were used to hold the bowel wall, and traction was used to promote dissection between the intestinal border and abdominal wall in order to reach the peritoneal cavity. After sufficient adhesiolysis, the bowel was mobilized. To avoid tension during the closure, both sides mobilized adequately. The bowel's margin was trimmed to remove skin and fat, and vascularity was assessed. Two layers were used for end-to-end closure. 3-0 vicryl was used for an inner layer continuous (Connell) suture. 3-0 vicryl was used to sew the outer layer interrupted (Lambert) suture. Rectus was closed with 2-0 vicryl in a single interrupted layer. The skin was closed with 1-0 polypropylene and a sterile dressing was done.

DATA ANALYSIS

MS Excel (R) office 365 and SPSS version 25 were used to assemble and analyse the data. For continuous data variables, mean and standard deviation were employed for descriptive statistics. The chi square test was employed for categorical data. Based on the normality of the data, the student T-test was employed for the continuous variable (Independent group) and the Paired T-test for unpaired data (wherever applicable). The risk variables for complications were estimated using logistic regression analysis. A P value of 0.05 was deemed significant.

RESULTS

The age range of the patients in this study (n = 60) ranged from 18 to 70 years. The early group had a mean age of 41.80 15.522 years, whereas the late group had a mean age of 43.87 14.48 years.

The majority of patients in both categories had benign perforation. 56.7% and 21.7% had cancer, respectively. 11.7% had an obstruction, 6.7% experienced trauma, and 3.3% had another cause.

Post-operative problems were noted in all groups three months following the ileostomy closure.

Variable	EARLY CLOSURE ILEOSTOMY		LATE CLOSURE ILEOSTOMY		chi sq	p-value
	No.	%	No.	%		
ILEUS	3	10.0%	2	6.7%	0.22	0.640
Anastomosis Leak	1	3.3%	0	0.0%	1.02	0.313
Anastomosis Bleed	0	0.0%	0	0.0%	NA	NA
Small Bowel Obstruction	1	3.3%	0	0.0%	1.02	0.313
Enterocutaneous Fistula	1	3.3%	0	0.0%	1.02	0.313
Surgical Site Infection	4	13.33%	5	6.7%	0.13	0.718
Nausea / Vomiting	7	23.3%	6	20.0%	0.10	0.754
Readmission rate	1	3.3%	3	10.0%	1.07	0.301
Reoperation	0	0.0%	0	0.0%	NA	NA

Table 1: Comparison of Early and Late Closure Ileostomy Complications

Few complications were seen more frequently in early closure ileostomy, such as ileus, which was found in 3 patients (10%) compared to 2 patients (6.7%) in late closure ($P=0.64$), anastomosis leak in 1 patient (3.3%) compared to 0 (0.0%) in late closure ($P=0.31$), small bowel obstruction in 1 patient (3.3%) ($P=0.31$), enterocutaneous fistula in 1 patient (3.3%) compared to 0 (0.0%) (Table-1)

Nevertheless, none of the aforementioned issues were statistically significant.

There were no anastomosis bleeds or reoperations among the participants in the following research.

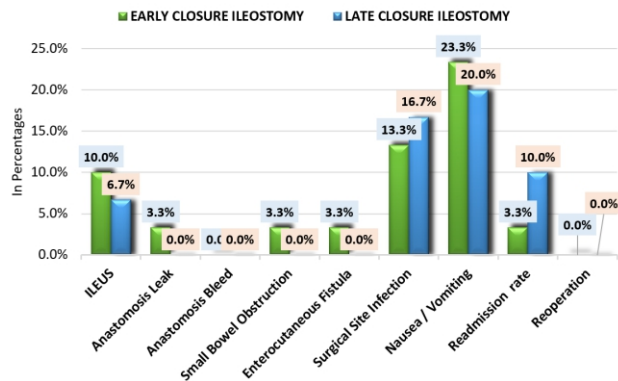


Fig. 1: Complications after Reversal of Ileostomy

Procedure	TOTAL NO. OF HOSPITAL STAY (DAYS)		unpaired t-test	
	Mean	SD	t-value	p-value
EARLY CLOSURE ILEOSTOMY	7.03	2.54	-.248	.805
LATE CLOSURE ILEOSTOMY	7.20	2.66		

Table 2: Total Hospital Stay Duration between Early and Late Closure Ileostomy

The hospital stay for early and late ileostomy closure was 7.03 days and 7.2 days respectively ($p=0.805$) (Table-3)

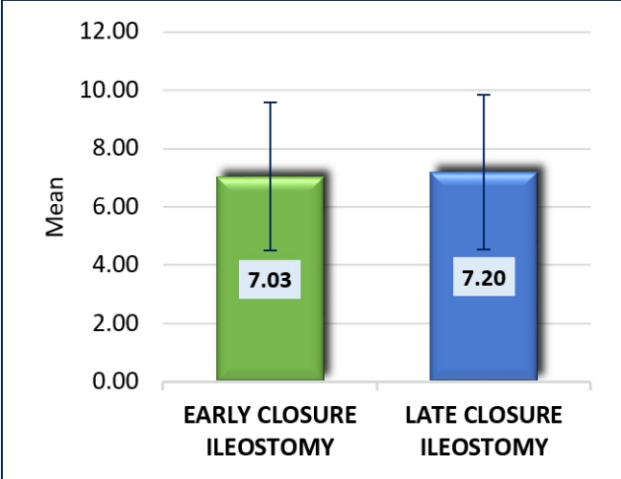


Fig. 2: Duration of Hospital Stay after Ileostomy Closure

Procedure	Duration between primary & secondary surgery (days)		unpaired t-test	
	Mean	SD	t-value	p-value
EARLY CLOSURE ILEOSTOMY	28.00	31.23	-6.959	<0.001
LATE CLOSURE ILEOSTOMY	50.43	61.62		

Table 3: Comparison of Duration within Primary and Secondary Surgery between Early and Late

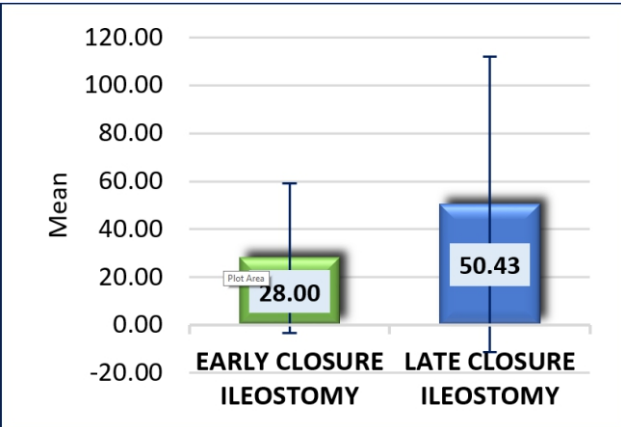


Fig. 3: Duration of Reversal of Ileostomy after the Primary Surgery

DISCUSSION

In an emergency, an ileostomy may be created to divert faecal waste and save the patients' lives. To safeguard surgical anastomosis, a temporary ileostomy (loop ileostomy) is suggested (6). The majority of surgeons choose the loop ileostomy owing to its ease of fabrication (7).

In this prospective research, we compare the results of ileostomy closures within 6 weeks to those beyond 6 weeks, as well as the post-operative outcomes at these precise time intervals of 1 week, 1 month, and 3 months. A notable result from our investigation and findings consistent with previous studies is that patients who had early ileostomy closure vs late ileostomy closure had no higher post-operative problems and were statistically insignificant.

The study's 60 patients had an average age of 42.83 ± 14.92 years, with a median age of years. The ages ranged from 20 to 75. The majority of patients (50%) are between the ages of 20 and 40.

In our study, the average time between Early and Late ileostomy closure was 4 weeks and 7.2 weeks, respectively, and was not linked with greater post-operative complications. Intestinal continuity restoration is generally completed within 8- 12 weeks, according to Cleary DP et al (2001) and Mengeaux F et al (2002). Yet, at this time, one-quarter of patients have stoma-related issues, which have a detrimental influence on quality of life (8,9). Alves A et al (2008) and MC Ardle CS et al (2010) have challenged the time lag between first surgery and closure (2005). If the initial operation is conducted too soon, patients may not be properly recovered, and the stoma may stay edematous (10,11). If the closure is done too late, adhesions may develop, and the patient's quality of life may decrease as a consequence of living with a stoma for a longer length of time.

In our investigation, the difference in hospital stay duration between groups was not statistically significant (7.0 vs 7.2 days, respectively; $P = 0.80$). Danielsen AK et al (2016) () conducted a comprehensive review that included 6 randomised controlled trials with 457 participants. All trials compared early ileostomy closure versus delayed ileostomy closure. Early ileostomy closure decreased hospital stay (mean difference -3.14 days, 95% confidence interval -4.79 to -1.49). For both early and delayed closure, anastomotic leaking wound infection and reoperation were comparable. Patients' hospital stays were decreased when ileostomies were closed early. Further research is needed to validate the validity and long-term effects of early closure.

We discovered that three patients in the early group and two patients in the late group experienced prolonged ileus (10 and 6.7%, respectively) in the first week after surgery. The trend for prolonged ileus was not statistically significant ($P = 0.64$), whereas T. W. Khoo et al (2021) (13) found that late ileostomy reversal is associated with an increased risk of postoperative complications, with a significantly lower incidence of postoperative ileus ($p = 0.006$) and 30-day postoperative complications ($p = 0.011$) in the early closure group.

In our investigation, one early ileostomy closure patient (3.3%) developed an anastomosis leak. The anastomotic leak trend was not statistically significant ($P = 0.31$). Mritunjay Sarawgi et al. (2017) (14) reported that out of 47 patients, 15 had early reversal (within 4-6 weeks) and 32 experienced late reversal (after 90 days). Skin excoriation, enterocutaneous fistula, and surgical site infection were discovered in four patients in the early group who were treated conservatively. In 11 individuals, problems such as stoma prolapse, surgical site infection, and leak were discovered. According to this research, early ileostomy closure is preferable.

In a study conducted by N. J. O'Sullivan (2022) (15), complications in groups of 275 patients for early ileostomy closure and 259 patients for late ileostomy closure were similar in both groups (25.5% vs. 21.6%), reoperation (8.4 vs. 4.2%) and obstructions or ileus (9.3% vs. 4.4%) in the late closure, indicating that early ileostomy closure is a better option. cases chosen at random In our investigation, we discovered that one patient with an early ileostomy closure experienced a slight intestinal blockage (3.3%), which was treated conservatively. The trend for small bowel obstruction was not statistically significant ($P = 0.31$).

One patient in the early ileostomy closure group (3.3%) developed an enterocutaneous fistula, which was treated conservatively. The enterocutaneous fistula trend was not statistically significant ($P = 0.31$). Mritunjay Sarawgi et al (2017) came to the same conclusion (14)

In the current research, four of thirty patients experienced wound infections during the early stages after ileostomy closure. (13.33%), and five patients out of thirty suffered wound infections after late ileostomy closure. (16.66%) The tendency for wound infection was not statistically significant ($P = 0.72$).

Cheng Z et al (2021) (16) included 6 studies, randomly allocating patients, which provided firm evidence that selected patients with ileostomy closure early (three months) had a higher incidence of postoperative infection rate than late ileostomy closure (more than

six months), and Zi Qin Ng et al(2020) studied that surgical site infection was significant in early ileostomy closure ($P=0.047$). (57)

In our research, one patient (3.3%) had readmission in the early ileostomy closure while three patients (10%) had readmission in the late ileostomy closure. The trend in readmission rate was not statistically significant ($P=0.301$). All of the patients were treated with caution. Mritunjay Sarawgi et al. (2017) (14) observed that patients with late ileostomy closure had a higher number of problems, necessitating readmission and re-exploration.

The current study found that there was no significant difference in the frequency of postoperative complications between early and late ileostomy closure. According to a 2006 research by Gupta S. et al, these findings may change in outcomes from patient to patient in various settings (17). Nevertheless, further research with a larger sample size is required to determine the advantages of early ileostomy closure and the conventional time of early ileostomy closure.

CONCLUSION

Despite the possibility of post-operative complications, ileostomy closure has a low death and morbidity rate. The likelihood of stoma-related operational issues, hospital stay, and stoma duration is decreased by early ileostomy closure. We haven't yet determined the ideal time to close the ileostomy.

More prospective randomised trials with longer follow-up periods are likely to be beneficial for establishing the best moment to call the study's work to a close. According to this research, early ileostomy closure within 6 weeks reveals no appreciable increase in post-operative problems based on our experience with early vs late ileostomy closure.

Both groups have negligible effects from surgical complications such as anastomosis haemorrhage, postoperative ileus, small intestinal blockage, enterocutaneous fistula, and an anastomotic leak. As shown by our study, these patients received conservative care, although the treatment may need to be modified in accordance with the severity of the problem.

Several safeguards may aid in preventing surgical site infections. They have little control on the timing of the shutdown, however.

Early ileostomy closure of stomas may be beneficial for patient welfare, but further study is required to compare the results of closure for different diseases.

While the ideal timing for completing a loop ileostomy

is uncertain, early closure often seems to be superior than late closure.

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