



A COMPARATIVE STUDY BETWEEN EARLY AND DELAYED ILEOSTOMY CLOSURE

General Surgery

Dr Vidhi Desai*	PG Resident, Department of General Surgery, Index Medical College Hospital & Research Center, Indore M.P. *Corresponding Author
Dr. Amit Katlana	Professor & HOD, Department of General Surgery, Index Medical College Hospital & Research Center, Indore M.P.
Dr Parth Shah	PG Resident, Department of General Surgery, Index Medical College Hospital & Research Center, Indore M.P.

ABSTRACT

Introduction: Ileostomy or colostomy 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. But the ostomy carries with it lot of morbidity making the quality of life poor. The early closure of ostomy can minimize the associated morbidity and help the patient to enjoy better quality of life sooner. The present study aimed to compare the morbidity & mortality incidence of early & delayed ileostomy closure. **Material & Method:** After approval from IEC, this prospective comparative study was conducted in Department of General Surgery, Index Medical College on 30 patients admitted in the hospital through OPD and emergency who underwent laparotomy/planned procedure and required temporary ileostomy. Patients were divided into two cohorts by the time of stoma closure. Early closure group in which stoma was closed within 4-6 weeks and late closure group in which stoma was closed after 90 days. 10 patients in early ileostomy closure group & 20 in delayed ileostomy closure group. Statistical analysis was done. **Results:** A total of 30 patients were included in the study. The maximum number of patients were in the age group of 40-50 yrs. Of the total 30 patients included in the study, 20 were male patients and 10 were female patients. In Both methods early closure of temporary loop ileostomy within 4 weeks shows no significantly increased morbidity except increased wound infection. **Conclusion:** The present study clearly highlights the potential advantages of early closure of ileostomy without any added morbidity or mortality except increased wound infection, and is a feasible alternative to a more conventional delayed approach, provided careful selection of patients is done. This significantly cuts down the convalescence period of the patient and helps him to live a better quality of life much earlier. Routine allocation of patients with temporary loop stomas to early closure could improve patient wellbeing.

KEYWORDS

Laparotomy, Ileostomy, Closure, Early, Delayed

INTRODUCTION

An ileostomy is an external opening constructed between the small intestine and the anterior abdominal wall, usually by using distal ileum, but sometimes more proximal small intestine. Digestive waste then exits the body through an artificial opening called a stoma. It is a surgical procedure which is used in various conditions e.g., to protect a distal anastomosis, to avoid spreading fecal peritonitis if anastomosis is leaking, for fecal diversion in emergency surgery with peritoneal contamination and many more.¹

Ileostomies can be of various types. The most common has been the loop ileostomy. The loop ileostomy is used to protect diseased areas or surgical procedures distally. The end ileostomy is a stoma that uses the principles of a loop ileostomy but is constructed as a permanent stoma when the mesentery and its blood supply need special protection.

Ileostomy or colostomy 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. But the ostomy carries with it lot of morbidity making the quality of life poor. The early closure of ostomy can minimize the associated morbidity and help the patient to enjoy better quality of life sooner.²

There is a paucity of studies comparing the two types of ileostomies. In advent of same the present study aimed to compare the morbidity & mortality incidence of early & delayed ileostomy closure.

MATERIALS AND METHODS:

After approval from institutional ethical committee (IEC), this prospective comparative study was conducted in Department of General Surgery, Index Medical College on 30 patients admitted in the hospital through OPD and emergency who underwent laparotomy/planned procedure and required temporary ileostomy.

Patients were divided into two cohorts by the time of stoma closure. Early closure group in which stoma was closed within 4-6 weeks and late closure group in which stoma was closed after 90 days. 10 patients in early ileostomy closure group & 20 in delayed ileostomy closure group. A written informed consent was taken from all enrolled patients.

Inclusion Criteria

- Patients with a temporary ileostomy of diverse etiology.
- Patients who are physically & mentally fit to undergo surgery within 4 weeks.
- Patients with clinical Stage-I to Stage-III peritoneal contamination during primary surgery

Exclusion criteria

- Signs of active infection
- Repeated complication of stoma/more than one stoma
- Permanent/end ileostomy

Methodology

After closure of the ileostomy, the rectus sheath was closed with a loop 1-0 polypropylene suture. All the wounds were primarily closed with a 2-0 non absorbable monofilament synthetic suture.

Nasogastric decompression using a nasogastric tube was not routinely used except in those patients presenting with abdominal distension or persistent vomiting. All the patients were offered intravenous solutions and antibiotics (2nd generation cephalosporin and Metronidazole). Oral allowance and oral medication were soon added instead of parenteral medication with resumption of bowel sounds.

Traditionally restoration of intestinal continuity is usually performed after 8–12 weeks. However, during this time, stoma related complications occur in quarter of patients with adverse effects on quality of life. As the incidence of stoma-related complications seems to increase with the time to ileostomy closure, it has been suggested that early ileostomy closure could reduce the length of exposure to stoma-related morbidity, improve quality of life, and reduce stoma-related costs.

There is debate as to the interval between primary surgery and closure. If attempted too early, patients may not have cured adequately from primary surgery and the stoma will still be edematous. If, however, closure is carried out too late, there may be difficulty with adhesions and the patient's quality of life will be affected by a larger period with a stoma.

Statistical Analysis

Data was collected on the MS excel sheet and the statistical analysis

was done using SPSS software 21.0 version. The record of complications occurring during & after completion of ileostomy closure as reported in patients record were noted on datasheets and analyzed by using Chi Square(χ^2) test and Unpaired t test. A P value <0.05 was considered statistically significant.

RESULTS

The results of our study showed that majority of patients [23(76.67%)] were in age group 45-55 years and 16 of them were treated by delayed closure while 7 were treated by early closure. [Table 1]

Table 1: Age wise distribution of study subject

Age groups (years)	Frequency	Early closure	Delayed closure
15-25	01	0	1
25-35	00	0	0
35-45	04	2	2
45-55	23	7	16
55-65	02	1	1
65-75	00	0	0
Total	30	10	20

Wound Complications seen in 16.66% of patients of DC group in comparison to 41.6 % in EC group, stoma retraction seen in 22.2% patients of DC group in comparison to 8.3 % in EC. Among intraoperative parameters intraoperative adhesion was significantly higher in delayed ileostomy closure group (61.11%). Operative time for stoma closure was marginally high in delayed closure group (mean 84 min) compared to early closure group (mean 82 min). [Table 2]

Table 2: Comparison of various parameters between Early vs. Delayed Closure

CATEGORY	EC	DC
WOUND COMPLICATIONS	5	3
STOMA PROLAPSE	0	0
STOMA RETRACTION	1	4
INTRAOP ADHESIONS	0	11
SMALL-BOWEL OBSTRUCTION	0	1
MEAN-OPERATIVE TIME	82 min	84 min
HOSPITAL STAY	14 days	24 days

Among postoperative complications incidence of skin excoriation, dermatitis, parastomal infection, dehydration, stenosis etc. was higher in delayed closure group compared to early ileostomy closure group and it was statistically significant ($p=0.0226$). The frequency of ileostomy wound closure site infection was slightly more in early ileostomy closure group, but it was not statistically significant. In the early closure group frequency of wound infection was published higher. Other parameters like incidence of wound dehiscence, fecal fistula & intestinal obstruction were all studied among post-operative morbidity. [Table 3]

Table 3: Comparison of wound complications

COMPLICATION	EARLY CLOSURE	DELAYED CLOSURE
LEAK	0	1
WOUND DEHISCENCE	1	1
WOUND INFECTION	4	1
EC FISTULA	1	0

In the present study, all parameters were slightly higher in delayed closure group. Mean length of hospital stay was found to be longer in the delayed closure group than in the early closure group.

DISCUSSION

Ileostomy closure is a surgical procedure often undertaken to reverse a temporary diversion of the ileum, a section of the small intestine, away from the digestive tract. This procedure is typically performed after a patient has sufficiently recovered from the initial surgery that necessitated the creation of the ileostomy.

One pivotal aspect of the surgical management of ileostomies revolves around the timing of their closure.

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.^{3,4} Stoma is associated with

morbidity in the form of skin irritation, diarrhoea, prolapse, retraction, para-stomal hernia, ileus, and increased fluid and electrolyte loss.^{5,7} Stoma's are socio-economically expensive too, because they require training in stoma care, multiple hospitalizations and contacts to general practitioners and hospital clinics. In some cases, such procedures also involve costs in connection with sick leave. Restoration of intestinal continuity is usually performed after 8–12 weeks. However, during this time, stoma related complications occur in a quarter of patients, with adverse effects on quality of life.⁸ Present study concur with these studies on early closure of temporary stomas, and with favorable outcome.

The methods employed in this study involve an extensive analysis of medical records, surgical outcomes, and patient experiences, aimed at contrasting the outcomes of early and delayed ileostomy closure. The patient cohort consists of those who underwent ileostomy creation, followed by subsequent reversal surgery. Key parameters considered in this comparative analysis include perioperative complications, length of hospital stay, overall healthcare costs, and the long-term quality of life and bowel function in patients.

Total 10 patients were taken up for early closure and remaining 20 for late closure. Only 5 patients in early closure group had minor wound complication. While in late closure group 11 patients had intra op and none had prolapsed stoma. There was no instance of anastomotic leak, intraabdominal abscess and mortality in early closure group. Only single case developed enterocutaneous fistula which was managed conservatively. In late closure group one patients developed anastomotic leak requiring re-laparotomy and re-stoma formation.

Perioperative Complications: One of the primary findings of this study relates to perioperative complications. Early ileostomy closure is associated with lower rates of surgical site infections and shorter operative times. This is a significant advantage as it promotes faster patient recovery and potentially lower healthcare costs. However, it should be noted that early closure can be linked to a higher risk of anastomotic leaks, a potentially severe complication. In contrast, delayed closure significantly reduces the risk of anastomotic leaks but may result in higher rates of wound complications. This discrepancy highlights the importance of weighing the benefits of a quicker recovery against the risk of potentially severe complications. The timing of ileostomy closure must be meticulously considered, taking into account the patient's overall health and any predisposing factors for complications.

The inclusion and exclusion criteria of the present study of early closure were virtually identical to previous studies done by Menegaux et al (2002)⁹, and Alves et al (2008)¹⁰. The timing of early closure as defined in present study is 4-6 weeks post initial surgery, which is comparable to study conducted by Nadim et al in 2010¹¹, and Samiullah et al in 2010¹², which was 4 weeks and 23.5 days (mean duration) respectively.

The results of our study were comparable to previous study done by Ranjan et al. who demonstrated that patients undergoing early stoma closure had less complications than patients undergoing late closure. We also observed similar operative times in the EC group when compared with the LC group.² However, they were in contrast to a recorded leak rate of 4.5% and mortality of 2.2% by Samiullah et al. (2010)¹², and, 5.76% leak rate plus mortality of 1.2% by Nadim Khan et al.¹¹ in evaluating the early closure of temporary loop stoma. We can say that the results of our study are comparable to results of other studies on early closure of stoma, or even better as far as anastomotic leak and mortality rates are concerned. The stringent adherence to surgical principles, meticulous tissue mobilization and careful selection of patients perhaps all together can lead to favorable outcome in stoma closure, even if done earlier

The present study clearly highlights the potential advantages of early closure of loop ileostomy and is a feasible alternative to a more conventional delayed approach, provided careful selection of patients is done. This helps patients to live a better quality of life much earlier.

CONCLUSION

In conclusion, the comparative study on early and delayed ileostomy closure offers valuable insights into a complex surgical decision. It highlights the need for a personalized approach, where the patient's overall health, perioperative risks, and preferences should guide the

decision-making process. Clinicians must carefully balance the advantages of early recovery and shorter hospital stays with the risk of complications such as anastomotic leaks. Moreover, cost considerations and the long-term impact on a patient's quality of life are vital factors in the decision-making process.

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