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Original Research Article

A prospective comparative study on early versus traditional late enteral feeding after loop ileostomy reversal

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ABSTRACT

Background: Loop ileostomy reversal, though a routine procedure, is often associated with postoperative morbidity and delayed recovery. Traditional delayed feeding protocols prolong ileus and hospital stay. This study aimed to evaluate the safety and efficacy of early enteral feeding compared to conventional delayed feeding following loop ileostomy reversal.
Methods: A prospective, randomized controlled trial was conducted on 40 patients undergoing loop ileostomy reversal, equally divided into early and late enteral feeding groups (n=20 each). The early group received oral fluids 4 hours postoperatively, while the late group resumed oral intake after the return of bowel activity. Parameters assessed included time to bowel recovery, duration of hospitalization, postoperative complications, and cost-effectiveness. Statistical analysis was performed using the Chi-square and independent t-tests, with $p<0.05$ considered significant.
Results: Baseline demographic and biochemical characteristics were comparable between groups. Early enteral feeding significantly reduced recovery time—clear liquids (6 hours versus 54 hours), stool passage (18 hours versus 67 hours)—and shortened hospital stay (43±5 hours versus 94±9 hours; $p<0.001$). No increase in postoperative complications such as nausea, vomiting, distension, or anastomotic leakage was observed. All patients tolerated feeds within 24 hours, with complete wound healing by day 14.
Conclusions: Early enteral feeding after loop ileostomy reversal is safe, well tolerated, and accelerates gastrointestinal recovery, thereby reducing hospital stay and healthcare costs. Its integration into enhanced recovery protocols can substantially improve postoperative outcomes and surgical efficiency.

Keywords: Loop ileostomy reversal, Early enteral feeding, Delayed feeding, Postoperative ileus, ERAS, Hospital stay

INTRODUCTION

A loop ileostomy, defined as the exteriorization of a loop of ileum through the abdominal wall to divert intestinal effluent, is a commonly employed temporary procedure in colorectal surgery to protect distal anastomoses or bypass diseased bowel segments.[1] Common indications include typhoid-, tubercular-, iatrogenic- perforations; inflammatory bowel diseases; low rectal or colo-anal anastomoses; and relief of distal obstruction such as diverticular, malignant, or radiation-induced strictures.[2] Although reversal of a loop ileostomy is considered a routine surgical procedure, it carries notable morbidity, particularly in malnourished patients, and predisposes to delayed wound healing and septic complications, leading to prolonged hospitalization.[3]

Traditionally, postoperative management involves keeping patient's nil per oral (NPO) until bowel function returns, as indicated by passage of flatus or stool. However, postoperative ileus—resulting from intraoperative bowel handling, anesthetic effects, opioid use, and electrolyte imbalance—can delay recovery.[4,5]

Physiologically, intestinal motility resumes in a predictable pattern: the small intestine recovers within hours, the stomach within 24 hours, and the colon within 48–72 hours.[6] Therefore, withholding oral intake until full

colonic recovery may be unnecessary. Early oral feeding, initiated within 24 hours postoperatively, has been shown to enhance enterocyte function, reduce catabolic stress, and improve anastomotic healing.[7-9]

Incorporating early enteral nutrition into enhanced recovery after surgery (ERAS) protocols has been associated with shorter hospital stays, fewer postoperative complications, and reduced healthcare costs.[10-12]

The present study evaluates the clinical impact of early versus delayed enteral feeding following loop ileostomy reversal.

METHODS

This prospective, randomized controlled trial was conducted in the Department of General Surgery, Aadhar Health Institute, Hisar, Haryana, India, over a period of 21 months (March 2023–December 2024).

Forty patients undergoing loop ileostomy reversal were enrolled and randomly assigned into two equal groups (n=20 each) using a computer-generated sequence and sealed-envelope allocation to ensure concealment.

Inclusion criteria

Patients aged 18 years and above who provided written informed consent were included.

Exclusion criteria

Exclusion criteria included ASA grade ≥3, distal loopogram abnormalities, coagulation disorders, pregnancy, immunosuppression, severe malnutrition, or refusal to consent.

Group 1 (early feeding)

This group received sips of water 4 hours post-surgery, followed by clear liquids and a liquid diet as tolerated, irrespective of bowel activity.

Group 2 (traditional delayed feeding)

This group remained NPO until bowel sounds or flatus returned, usually within 72 hours, after which oral intake was resumed.

Figure 1 shows flow diagram of the progress through the phases of the randomization trial of the two groups.

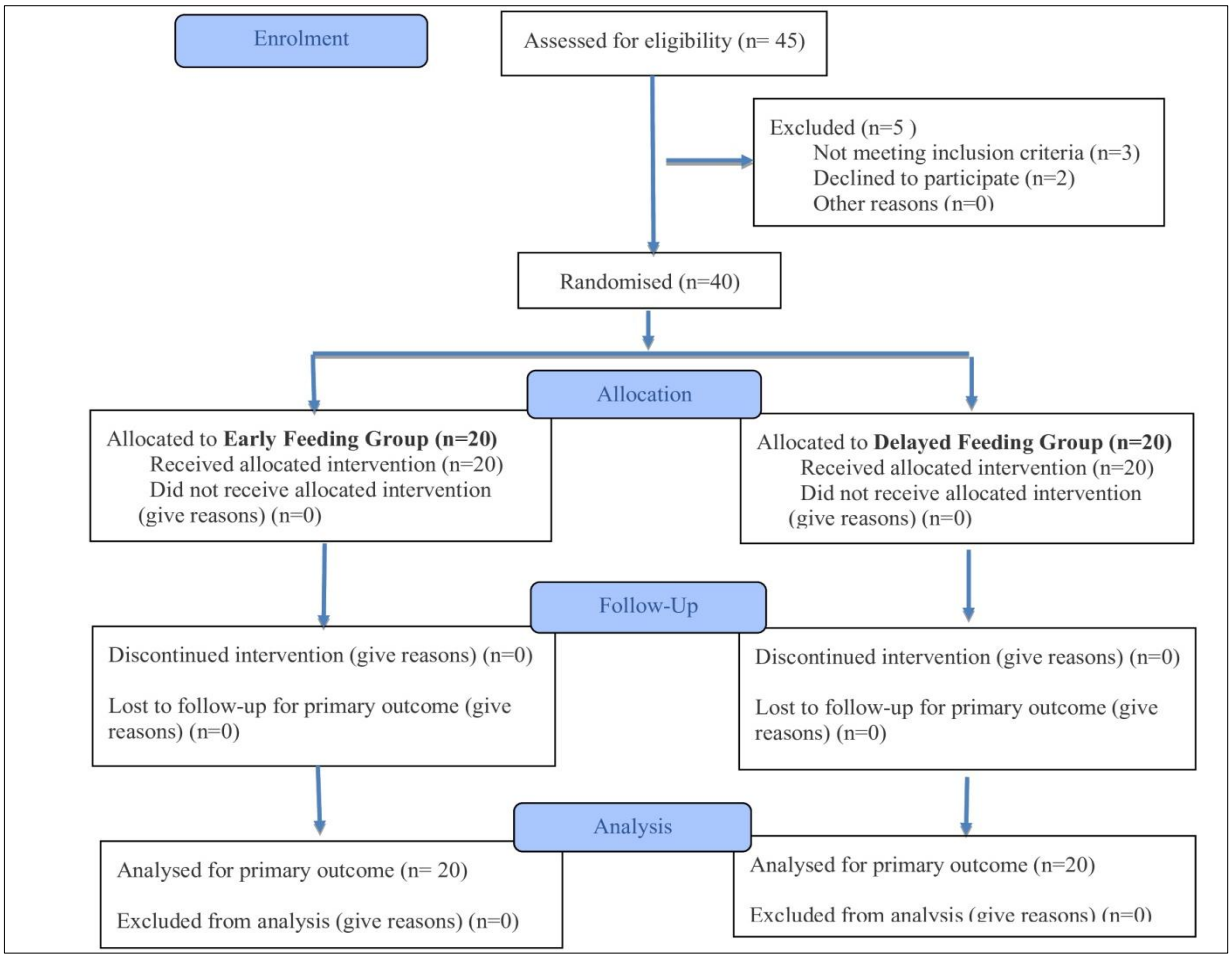

Figure 1: CONSORT 2025 flow diagram.

All patients underwent standard loop ileostomy reversal with intraoperative leak testing. Primary outcomes included safety and tolerability of early feeding, time to resolution of postoperative ileus, hospital stay, early complications (nausea, vomiting, abdominal distension), and cost-effectiveness. Secondary outcomes assessed anastomotic leakage, wound infection, and readmission rates, with follow-up on postoperative days 7 and 14.

Data were collected prospectively and analyzed using standard statistical software. Categorical variables were compared using the Chi-square test and continuous variables using the independent t-test, with $p<0.05$ considered significant. Ethical approval was obtained from the Institutional Ethics Committee, and the study adhered to the principles of autonomy, beneficence, non-maleficence, and justice.

RESULTS

Forty patients undergoing loop ileostomy reversal were equally divided into early and late enteral feeding groups. Both groups were comparable in age (mean 46 versus 51 years, p=0.302) (Table 1), sex distribution (male: 60% versus 65%) (Table 2), and baseline biochemical parameters (Table 3), indicating no significant preoperative differences. Distal loopogram findings were normal in 92.5% of cases, with partial stricture at anastomotic site in 7.5% of cases with no significant variation between groups (p=0.198).

Postoperative recovery was significantly faster in the early feeding group. Initiation of clear liquids (6 hours versus 54 hours), first liquid diet (8 hours versus 56 hours), passage of flatus (12 hours versus 54 hours), and stool (18 hours versus 67 hours) all occurred earlier ($p<0.001$). The mean hospital stay was markedly shorter in the early feeding group (43±5 hours) than in the late feeding group (94±9 hours, $p<0.001$) (Table 4).

There were no significant differences in postoperative complications, including nausea (p=1.000) (Table 5), vomiting (p=0.311) (Table 6), abdominal distension, or anastomotic leakage (none in either group). All patients tolerated clear liquids and full feeds within 24 hours of initiation. Wound healing was comparable, with 95% showing healthy wounds at day 7 and complete healing by day 14 in both groups (p=1.000). No patient required readmission.

Table 1: Age distribution of patients.

Group	Early		Late	
Age (years)	**Frequency**	**Percent**	**Frequency**	**Percent**
20-40	8	40	6	30
40-60	7	35	7	35
60-80	5	25	7	35
Total	20	100	20	100

Table 2: Sex distribution of patients.

Group	Early		Late	
Sex	**Frequency**	**Percent**	**Frequency**	**Percent**
Female	8	40	7	35
Male	12	60	13	65
Total	20	100	20	100

Table 3: Biochemical parameters.

Group	Early		Late		P value
	Mean	**SD**	**Mean**	**SD**	
Age (years)	46	18	51	16	0.302
BMI (kg/m^2)	20.65	4.37	23.65	5.74	0.07
Hb (g/dl)	13.13	1.42	12.11	1.90	0.06
TLC (×1000/mm^3)	9.85	7.22	8.85	2.54	0.56
Platelets (×1000/mm^3)	289.1	88.6	321.3	74.6	0.22
Creatinine (mg/dl)	0.78	0.18	0.96	0.40	0.07
Sodium (mEq/l)	132.9	6.9	134.2	3.2	0.45
Potassium (mEq/l)	4.58	0.83	4.25	0.55	0.45
Albumin (g/dl)	4.19	0.43	3.94	0.51	0.14
INR	1	0	1	0	1.00

Table 4: Post-operative recovery parameters.

Group	Early		Late		P value
	Mean	SD	Mean	SD	
Clear liquids allowed (post op hours)	6	0	54	9	<0.001
First liquid diet (post op hours)	8	0	56	9	<0.001
Passage of flatus (post op hours)	12	4	54	9	<0.001
Passage of stool (post op hours)	18	6	67	9	<0.001
Length of hospital stay (hours)	43	5	94	9	<0.001

Table 5: Incidence of nausea.

Characteristics		Group		Total
		Early	Late	
Nausea	No	19	19	38
	Yes	1	1	2
Total		20	20	40

Pearson Chi-square=0.000, p value=1.000

Table 6: Incidence of vomiting.

Characteristics		Group		Total
		Early	Late	
Vomiting	No	19	20	39
	Yes	1	0	1
Total		20	20	40

Pearson Chi-square=1.026, p value=0.311

DISCUSSION

This prospective comparative study evaluated the safety, efficacy, and outcomes of early enteral feeding versus traditional late feeding following loop ileostomy reversal. The primary endpoints included time to return of bowel function, length of hospital stay, and postoperative complications. The findings demonstrate that early enteral feeding is a safe, well-tolerated, and clinically superior strategy that accelerates gastrointestinal recovery without increasing morbidity or anastomotic complications.

Demographic and baseline characteristics

The age and sex distribution between groups were comparable, minimizing potential confounders. Most patients were aged 20–60 years, with a slight male predominance (60–65%) in both groups. This balance strengthens the internal validity of the study, ensuring that observed differences in recovery are attributable to feeding strategy rather than demographic variability. Similar observations have been reported by Seenu and Goel, Siddiqui et al, and Rehman et al, who emphasized that homogeneous demographic profiles are critical for accurate comparison of postoperative recovery metrics.[8,13,14]

The results of the present study further confirm that early feeding protocols can be safely implemented across varied age groups and both sexes without adverse effects.

Surgical indications and preoperative assessment

Both cohorts represented a heterogeneous mix of indications for loop ileostomy creation, including low anterior resection for carcinoma rectum, right hemicolectomy for carcinoma colon, adhesive intestinal obstruction, and perforation peritonitis. The uniformity of these surgical indications ensured a fair comparative framework. Similar methodological rigor was demonstrated in the studies by Baraza et al and Thapa et al, who also included diverse gastrointestinal pathologies to reflect real-world clinical practice.[12,15]

Preoperative biochemical profiles—including hemoglobin, electrolytes, albumin, creatinine, and INR—were statistically similar between groups ($p>0.05$). This parity confirms that both groups were metabolically and nutritionally equivalent before intervention, allowing postoperative outcomes to be attributed primarily to the feeding protocol rather than baseline nutritional status. Comparable biochemical findings have been reported in early feeding trials by Seenu and Goel and Rehman et al, reinforcing the reliability of the present results.[8,14]

Postoperative recovery parameters

The most striking finding of this study is the significant acceleration of bowel recovery in the early enteral feeding group. Patients commenced clear liquids at 6 hours and full liquids at 8 hours postoperatively, compared with 54 and 56 hours, respectively, in the late feeding group ($p<0.001$).

Similarly, passage of flatus and stool occurred markedly earlier (12 and 18 hours versus 54 and 67 hours; p<0.001). These improvements directly translated into a substantial reduction in hospital stay-43±5 hours in the early group versus 94±9 hours in the late group (p<0.001).

These findings are in line with multiple studies demonstrating the advantages of early enteral nutrition in postoperative recovery. Seenu and Goel and Mohamed et al reported similar reductions in postoperative ileus and faster restoration of bowel activity.[8,16] Thapa et al also highlighted early enteral feeding as a key element in reducing postoperative ileus duration.[15] Collectively, these studies support the growing consensus that early nutritional stimulation enhances peristalsis, facilitates gut hormone secretion, and prevents mucosal atrophy, leading to faster functional recovery.

Tolerance and complications

The safety profile of early enteral feeding was reinforced by the absence of serious gastrointestinal complications. Nausea occurred in only one patient (5%) from each group (p=1.000), and vomiting was observed in one patient (5%) in the early group, without statistical significance (p=0.311). No patients developed abdominal distension. These findings correspond with previous research by Ahmed et al, Siddiqui et al, and Sundresh, which demonstrated that early oral feeding neither increases gastrointestinal discomfort nor contributes to postoperative ileus.[13,17,18]

All patients tolerated clear liquids and continued feeds for at least 24 hours post-initiation, demonstrating 100% tolerance. This uniform success rate underscores the feasibility of early feeding and aligns with Baraza et al and Adamina et al, who reported excellent patient tolerance in enhanced recovery after surgery (ERAS) protocols.[12,19] The early initiation of enteral nutrition appears to preserve gut motility and integrity, countering historical concerns about postoperative nausea, vomiting, and distension.

Anastomotic safety and wound healing

A major concern with early enteral feeding is its potential impact on anastomotic integrity. In this study, no anastomotic leaks were recorded in either group, confirming that early feeding does not compromise anastomotic healing. These results concur with Seenu and Goel, Ahmed et al, and Siddiqui et al, who found no increase in leakage rates following early feeding.[8,13,17] On the contrary, early enteral nutrition may enhance anastomotic healing through improved perfusion and substrate availability for collagen synthesis.

Wound healing outcomes were similarly favorable. All patients had healthy wounds at discharge, with 95% showing complete healing by day 7 and 100% by day 14. No wound-related complications or infections were observed, paralleling findings by Sundresh and Rehman et al.[14,18] These studies suggest that adequate early nutrition supports tissue repair and immunocompetence, reducing the risk of surgical site infections.

Readmission and postoperative morbidity

None of the patients in either group required hospital readmission, indicating smooth postoperative recovery and stability after discharge. Comparable findings were reported by Peacock et al and Baraza et al, who demonstrated that early postoperative feeding does not increase unplanned readmission rates.[12,20] Early feeding thus appears to promote faster convalescence, higher patient satisfaction, and reduced burden on healthcare systems. Furthermore, the absence of postoperative complications—such as nausea, distension, wound infection, or leakage—suggests that early enteral feeding can be safely integrated into enhanced recovery pathways. These outcomes align with global ERAS principles, which advocate early feeding as a core component for optimizing postoperative outcomes and reducing length of stay.

Cost-effectiveness and healthcare impact

Beyond clinical safety and efficacy, early enteral feeding demonstrated clear economic advantages. The shorter hospital stay—reduced by approximately 2–3 days on average—translated into a projected 20% reduction in hospitalization costs, including savings on bed occupancy, medications, and nursing care. These findings mirror those of Kalady et al and Adamina et al, who emphasized the cost-effectiveness of early postoperative feeding as part of ERAS programs.[19,21] In resource-limited healthcare environments, such as many surgical centers in developing nations, cost-effective interventions that enhance patient outcomes without increasing complications are of particular importance. Early enteral feeding meets these criteria, representing a simple, evidence-based adjustment in perioperative care with significant economic and clinical benefits.

Integration with enhanced recovery pathways

The results of this study substantiate the inclusion of early enteral feeding as a core element of ERAS protocols in colorectal and stoma reversal surgeries. The combination of faster gastrointestinal recovery, reduced hospital stays, lower complication rates, and improved cost efficiency aligns with ERAS objectives of minimizing physiological stress, promoting early mobilization, and expediting discharge. Multiple studies, including those by Adamina et al and Mohamed et al, have established that early nutrition synergizes with multimodal recovery strategies to optimize patient outcomes.[16,19]

Summary and clinical implications

Overall, the present study confirms that early enteral feeding following loop ileostomy reversal is safe, feasible, and advantageous. It does not increase the risk of nausea,

vomiting, anastomotic leak, or wound complications, while significantly reducing postoperative ileus and hospital stay. These findings are consistent with global evidence supporting the shift toward early postoperative nutrition.

From a clinical standpoint, early feeding promotes patient comfort, accelerates recovery, enhances wound healing, and decreases hospital resource utilization. From an institutional perspective, it reduces overall healthcare expenditure without compromising safety. The integration of this approach into standardized postoperative protocols is therefore justified and should be encouraged in surgical practice.

CONCLUSION

This study demonstrates that early enteral feeding following loop ileostomy reversal is a safe, feasible, and effective postoperative strategy that significantly enhances gastrointestinal recovery. Early-fed patients achieved earlier initiation of oral intake, faster return of bowel function, and a markedly shorter hospital stay compared to those managed with traditional delayed feeding. Importantly, these benefits were attained without increasing postoperative complications such as nausea, vomiting, abdominal distension, or anastomotic leakage. The comparable demographic and biochemical profiles between groups confirm that the observed improvements are attributable to the timing of feeding. Moreover, universal tolerance to early feeding and the absence of adverse outcomes highlight its practicality in clinical settings. Integrating early enteral feeding into standard postoperative and enhanced recovery protocols can improve patient comfort, reduce hospital stay, and optimize healthcare resource utilization, representing a valuable advancement in surgical care.

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