

# A Prospective Randomized Controlled Study on Early Enteral Nutrition Therapy Following Gastrointestinal Surgery

Dr. Manas Pandey<sup>1</sup>, Dr. Biranchi Narayan Lenka<sup>2</sup>, Dr. Prajit Nayak<sup>3</sup>, Dr. Debashis Nanda<sup>4</sup>

<sup>1</sup>PG Resident 3<sup>rd</sup> Yrs, Department of General Surgery

<sup>2</sup>Professor, Department of General Surgery

<sup>3</sup>SR, Department of Surgery

<sup>4</sup>PG Resident 3<sup>rd</sup> Yrs, Department of General Surgery

**Abstract:** Background: In recent years, early enteral nutrition therapy (EEN) has gained attention as a potential strategy to enhance recovery following gastrointestinal (GI) surgery. Traditionally, postoperative feeding has been delayed due to concerns about complications such as illus and anastomotic failure. This study aims to evaluate the safety and outcomes of implementing EEN after GI surgery, investigating its impact on recovery, complications, and length of hospitalization. Methods: This randomized controlled study was conducted at Hi - Tech Medical College and Hospital, Bhubaneswar, Odisha, from February 2023 to January 2025. Participants included patients from emergency and elective surgical wards who underwent gastric, small bowel, large bowel, or uncomplicated biliary - enteric anastomosis. Patients receiving feeding proximal to the anastomotic site within 24 hours post - surgery, either orally or via a nasogastric tube, were included. Informed consent was obtained from all participants. Detailed data, including demographics, clinical presentation, commodities, operative findings, nutritional assessments, postoperative complications, recovery outcomes, previous treatments or surgeries, and routine blood and radiological test results, were systematically recorded in a standardized proforma. Results: This study reported notably lower complication rates during recovery, with anastomotic leaks at 13.33%, and surgical site infections at 26.67%. Furthermore, patients had a decreased length of hospital stay, aligning with existing literature and highlighting the safety and benefits of early enteral nutrition after gastrointestinal surgery. Conclusion: This study supports the safety and benefits of early enteral feeding after gastrointestinal anastomosis. Early feeding promotes faster bowel function recovery, improved nutritional status, and shorter hospital stays without increasing the risk of anastomotic leaks or infections. Key findings include quicker return of peristaltic sounds and comparable rates of urinary, respiratory, and wound infections between early - fed and traditionally - fed groups. Gastrointestinal complications and re - exploration rates were also similar. These results suggest early feeding can be safely implemented in clinical practice, though larger, multicenter studies are needed for further validation.

**Keywords:** Gastrointestinal Surgery, Early Enteral Nutrition, Nutrition

## 1. Introduction

Enteral nutrition therapy is frequently delayed unnecessarily after gut resection and anastomosis, patients are kept nil per oral until bowel sounds return or flatus is passed. A nasogastric tube is also inserted to decompress the stomach and allow the gastrointestinal tract to rest, aiming to manage postoperative gut dysmotility and protect the anastomotic site from potential leakage.

Recently, there has been a shift towards early enteral feeding within 6 to 24 hours post - operation, challenging traditional practices. While Total Parenteral Nutrition (TPN) is sometimes used to maintain nutrition, it is expensive and associated with complications such as infections, metabolic disturbances, and immune system issues. Early enteral feeding is gaining attention for several reasons: the gut naturally secretes and reabsorbs about 7 liters of fluid daily regardless of oral intake, undermining the idea that withholding food "rests" the gut; gut motility typically returns within 24–48 hours for the stomach and colon and 4–6 hours for the small intestine; and early feeding helps maintain gut mucosal integrity, preventing bacterial or viral translocation.

Furthermore, many patients are malnourished before surgery, increasing their risk of postoperative complications. Prolonged starvation can reduce collagen content in scar tissue, weakening the healing process, whereas early feeding reverses mucosal atrophy, enhances collagen deposition, and strengthens the anastomotic site. Based on these findings, early enteral feeding is now more commonly practiced in small gut anastomosis procedures.

This present study assessment evaluates the benefits and tolerability of early enteral nutrition initiated within 48 hours after gastrointestinal surgeries, focusing on outcomes related to patient recovery, the rate of anastomotic leaks, postoperative paralytic ileus, surgical site infections, minor gastrointestinal disturbances, and hospital stay duration.

## 2. Materials and Methods

This research was conducted as a randomized controlled study. The study took place at Hi - Tech Medical College and Hospital, Bhubaneswar, Odisha. . Participants were patients admitted to both emergency and elective surgical wards at Hi - Tech Medical College and Hospital. Informed consent was obtained from all participants before inclusion in the study. The study was carried out over a period from

Feb 2023 to Jan 2025. The study included all patients who met the inclusion and exclusion criteria during the study period as follows,

#### Inclusion Criteria:

- 1) Patients undergoing gastric, small bowel, large bowel, or uncomplicated biliary - enteric anastomosis, performed either in emergency or elective settings.
- 2) Patients receiving feeding proximal to the anastomotic site within 24 hours post - surgery, either orally or through a nasogastric tube

#### Exclusion Criteria:

- 1) Patients with ASA grade IV to VI.
- 2) Re - laparotomies following anastomosis.
- 3) Operations with operative time exceeding 4 hours.
- 4) Postoperative patients requiring ventilator support.
- 5) Cases with gross contamination of the peritoneal cavity prior to surgery.
- 6) Immunocompromised patients.
- 7) Pediatric patients (under 12 years).

8) Pregnant patients.

9) Patients with stomas.

10) After patient were selected on basic of inclusion and exclusion criteria patient were randomly divided in 2 groups

Group A: Patients were fed within 48 hours after enteric anastomosis.

Group B: Patients were fed after 48 - 72 hours or later, depending on the return of full peristaltic sounds.

Detailed history of demographic data, clinical presentation, comorbidity, operative findings, nutrition assessment, complication if any outcome, post operative recovery and any previous treatment or surgery and routine blood and radio - logical test result are recorded in a proforma.

### 3. Result

Table 1

Characteristics	Group A		Group B	
1. Age (In Yrs)	N	Percentage	N	Percentage
18 - 20	3		4	
21 - 40	16		15	
41 - 60	9		9	
>60	2		2	
Mean Age	38.1	-	36.133	-
2. Sex				
Female	9	30%	7	23.3%
Male	21	70%	23	76.67%
3. Emergency Vs Elective Cases				
Emergency OT	12	40%	10	33.13%
Elective OT	18	60%	20	66.67%
4. Malignant Vs Benine Condition				
Malignant	12	40%	11	37%
Non Malignant Cases	18	60%	19	63%
4. Presence Of Gangrenous Gut				
Gangrenous Bowel	6	20%	4%	13.33%
Healthy Gut	24	80%	26	86.67%
5. Anastomosis				
Stapled	4	13.33%	26	86.67%
Hand Sewn	6	20%	24	80%
6. Patinet Receiving Chemotherapy	1	3.33%	1	3.33%
7. Comorbidity				
Htn	3	10%	2	6.66%
Copd	0		1	3.33%
T2dm	2	6.66%	1	3.33%
Post Operative Data				
8. Incidence Of Clinical Leakage				
Present	4	13.33%	2	6.67%
Absent	26	86%	28	93.33%
9. Re Exploration				
Required	2	6.66%	1	3.33%
Not Required	28	93.33%	29	96.66%
10. Rate Of Wound Infection				
Present	8	26.67%	6	20%
Absent	22	84.31%	24	80%
9. Respiratory Tract Infection				
Present	7	23.33%	5	16.66%
Absent	23	76.66%	25	83.33%
11. Urinary Tract Infection				
Present	5	16.66%	8	26.66%
Absent	25	83.33%	22	73.33%
12. Mortality	2	6.66%	0	0%

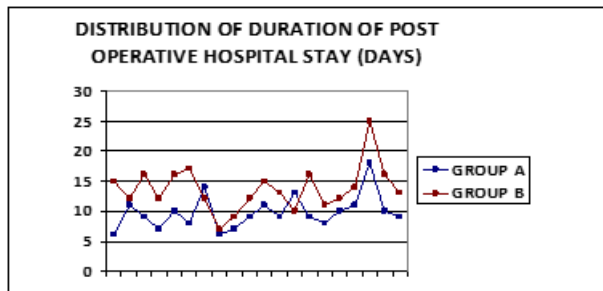


Figure 2

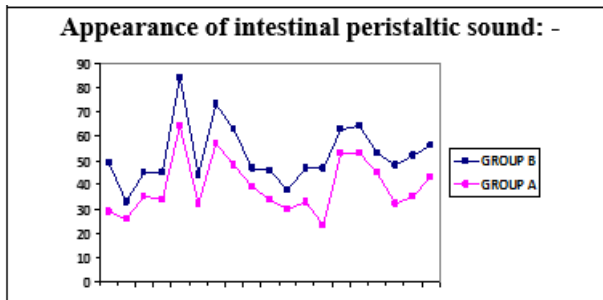


Figure 3

#### 4. Discussion

Traditionally, the return of bowel function—marked by the passage of flatus or bowel movements—has been the clinical cue to resume oral intake following abdominal surgery. After gastrointestinal (GI) anastomosis, patients are typically kept nil by mouth until this occurs, with a nasogastric tube used for gastric decompression. While this practice aims to protect the anastomotic site and mitigate postoperative dysmotility, growing evidence suggests that delaying oral feeding may lead to nutritional depletion and its associated complications.

Lewis et al. 's meta - analysis of 11 studies, along with other research, has highlighted several benefits of early feeding after GI anastomosis, including improved immunocompetence, decreased septic complications, enhanced wound healing, and possibly stronger anastomoses. This study aligns with those findings, offering further insights into the feasibility and safety of early enteral feeding.

Demographics and Baseline Comparability: (Table 1)

The mean age of participants was comparable between Group A (38.1 years) and Group B (36.1 years). Female representation was also similar, with 30% in Group A and 23.33% in Group B. Both groups were balanced in terms of emergency versus elective cases, malignancy status, preoperative health markers (hemoglobin and albumin levels), anastomotic techniques, and comorbidities.

Surgical Characteristics: (Table 1)

Most patients underwent enteric anastomosis for stoma closure (ileostomy/colostomy) or resection due to GI malignancies. All procedures were performed under general anesthesia, with abdominal drains placed in all cases, ensuring comparability.

Clinical Outcomes: (Table 1)

Anastomotic leakage occurred in 13.33% of Group A and 6.67% of Group B, with no statistically significant difference. Re - exploration was necessary in 2 patients from Group A and 1 from Group B. These findings suggest that early feeding does not significantly increase the risk of leakage, corroborating prior studies.

Feeding Tolerance: (Table 1)

Early enteral feeding within 48 hours was well - tolerated in 73.33% of Group A, while 26.67% initially experienced intolerance but improved within 6 - 12 hours. In comparison, 83.33% of Group B tolerated feeding well. The tolerance levels are consistent with previous studies, such as those by Stewart et al., who noted lower tolerance when feeding was initiated within 4 hours, likely due to residual anesthetic effects.

Complications: (Table 1)

Wound infection rates were slightly higher in Group A (26.67%) compared to Group B (20%), but this was not statistically significant. Interestingly, Lewis et al. 's meta - analysis reported lower infection rates in early - fed groups, although the results were also not significant. The variation in findings may be influenced by factors such as patient health status, surgical technique, and perioperative care.

Other Infections: (Table 1)

There was no significant difference in postoperative respiratory tract infections (RTIs), urinary tract infections (UTIs), or intra - abdominal abscesses between the two groups. This aligns with previous studies, including Lewis et al. 's meta - analysis, which reported no significant differences in these complications.

Return of Bowel Function: (Figure 3)

Intestinal peristaltic sounds returned significantly earlier in Group A (mean 42.8 hours) compared to Group B (mean 53.6 hours), supporting the notion that early feeding accelerates the return of bowel function. This finding contrasts with Fanaie et al. 's study, which found no significant difference in the timing of bowel sound return.

Length of Hospital Stay: (Figure 2)

The mean postoperative hospital stay was significantly shorter in Group A (7.4 days) compared to Group B (10.13 days). This suggests that early feeding promotes faster recovery and discharge. These results are consistent with prior studies, except for Kamei et al., who reported longer hospital stays due to the inclusion of patients undergoing radical gastrectomy for gastric cancer.

Mortality and Severe Complications:

Anastomotic Leak Outcomes: (Table 1)

In Group A, two patients with anastomotic leaks required re - exploration, and two patients died—one from severe sepsis and another from acute myocardial infarction. In Group B, both cases of leakage were managed conservatively, and no deaths occurred. While mortality was higher in Group A, the sample size was too small to draw definitive conclusions, and further large - scale studies are needed.

## 5. Conclusion

The findings of this study support the safety and benefits of early enteral feeding after GI anastomosis. Early feeding leads to faster return of bowel function, improved nutritional status, and reduced hospital stays without significantly increasing the risk of anastomotic leaks or infections. These results encourage the practice of early enteral feeding therapy, suggesting that early feeding can be safely implemented in clinical practice. However, larger, multi - center studies are required to validate these findings and address any potential risks associated with early enteral feeding.

This study also leads to the following key inferences:

- **Earlier Return of Bowel Function:** Intestinal peristaltic sounds appeared sooner in patients who received early enteral feeding.
- **Reduced Hospital Stay:** The mean duration of postoperative hospital stay was shorter in the early - fed group.
- **Infective Complications:** Rates of urinary tract infections (UTI), respiratory tract infections (RTI), and wound infections were comparable between both groups.
- **Gastrointestinal Complications:** The incidence of clinical anastomotic leakage and nausea/vomiting was similar in both groups.
- **Re - exploration Rates:** The need for re - exploration due to anastomotic leakage was equal in both groups. The traditional practice of withholding enteral feeds until the return of bowel sounds may no longer be necessary. Early enteral feeding does not negatively affect anastomotic outcomes and offers benefits such as faster recovery and reduced hospital stay. However, larger studies are needed to further validate these findings and support widespread adoption of early feeding protocols.

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