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Original Research Article

Comparative Study of Early Versus Late Enteral Feeding in Patients Undergoing Gastrointestinal Surgery

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Abstract:

Background: Enteral feeding has traditionally been delayed following gastrointestinal (GI) surgeries due to concerns of impaired gut motility, aspiration, and anastomotic leakage. However, modern surgical recovery protocols such as Enhanced Recovery After Surgery (ERAS) recommend early postoperative nutrition to reduce catabolism and enhance gut function. This study compares the effects of early versus late enteral feeding on patient outcomes following elective GI surgeries.

Objective: To evaluate the safety, tolerance, and benefits of early enteral feeding (within 24 hours post-op) compared to late feeding (after 72 hours post-op), focusing on bowel recovery, postoperative complications, and hospital stay.

Methods: A prospective observational study was conducted on 70 patients. Group A (n=35) received early enteral feeding within 24 hours of surgery, while Group B (n=35) received late feeding (≥72 hours). Outcomes analyzed included feed tolerance, duration of ileus, wound infection, anastomotic leak, mortality, and length of hospital stay.

Results: Early feeding significantly reduced the duration of ileus (4.23 vs 5.60 days, $p<0.01$), decreased overall complications (5.7% vs 20.0%), and shortened mean hospital stay (5.74 vs 7.11 days, $p<0.01$). No anastomotic leaks occurred in the early feeding group, while 8.6% occurred in the late group. Mortality was reported only in the late group (5.7%).

Conclusion: Early enteral feeding is safe, well tolerated, and significantly improves postoperative outcomes in GI surgery patients. It accelerates return of bowel function and reduces hospital stay without increasing complication rates. Early feeding should be incorporated as a standard element of enhanced recovery protocols in elective gastrointestinal surgeries.

Introduction

Malnutrition is highly prevalent among patients undergoing gastrointestinal surgery and is associated with impaired wound healing, prolonged ileus, higher risk of infections, and increased hospital stay [1,2]. Traditional practice delayed oral or enteral feeding until the return of bowel sounds, based on the belief that early feeding predisposes to anastomotic leaks or aspiration [3].

Emerging evidence has demonstrated that early enteral nutrition is safe and beneficial. It maintains mucosal integrity, stimulates peristalsis, enhances immune response, and reduces septic complications [4,5]. The ERAS guidelines now strongly recommend initiating feeding within 24 hours following gastrointestinal procedures [6].

This study evaluates the comparative outcomes of early versus late enteral feeding in patients undergoing gastrointestinal surgeries at a tertiary-care center in India.

Review of Literature

Several randomized controlled trials and meta-analyses have highlighted the safety and advantages of early feeding. Lewis et al. [1] showed reduced infection and mortality with early feeding. Han-Geurts et al. [2] reported faster bowel recovery after colorectal resections with early enteral feeding. Osland and Memon [3] confirmed reduced hospital stay in gastrointestinal surgeries.

Physiological mechanisms include maintenance of gut mucosal barrier, reduction of bacterial translocation, and early stimulation of peristalsis [4,5]. ERAS Society recommendations emphasize early feeding as a standard of care [6].

Aims and Objectives

To compare the impact of early versus late enteral feeding in patients undergoing gastrointestinal surgery with respect to:

- Tolerance to feeds
- Duration of postoperative ileus
- Postoperative complications (surgical site infection, anastomotic leak)
- Mortality
- Duration of hospital stay

Materials and Methods

Study design: Prospective observational study

Setting: Department of General Surgery, People's Hospital, Bhopal

Duration: May 2023 – October 2024

Sample size: 70 patients (Group A: 35, Group B: 35)

Inclusion criteria:

- Patients aged 14–60 years
- Undergoing gastrointestinal surgeries (perforation repair, resection & anastomosis, stoma closure)

Exclusion criteria:

- Hepatobiliary surgeries
- Diabetes mellitus, jaundice, immunocompromised states
- Patients unwilling to consent

Feeding protocol:

- **Group A (Early feeding):** Clear liquids within 24 hours, advanced as tolerated
- **Group B (Late feeding):** Enteral feeding commenced ≥72 hours postoperatively

In the study, Group A consisted of cases in the early enteral feeding group, where enteral feeding was initiated within 24 hours post-surgery, regardless of the presence of bowel sounds. The feeding began with clear liquids at a rate of 20 mL per hour, administered intermittently. During the first postoperative day, approximately 150 mL of clear liquids, such as water and oral rehydration solution (ORS), was provided, while intravenous fluids were continued to maintain adequate fluid volume.

On the second postoperative day, for patients who tolerated the initial feeding, the nasoenteric tube was removed, and oral feeding was commenced. The proposed liquid oral diet was introduced at a rate of 30 mL per hour, also given intermittently, with a total of around 650 mL continued throughout the day. Subsequently, patients transitioned to an oral soft diet, and eventually progressed to a normal diet.

In contrast, Group B comprised cases in the delayed enteral feeding group, where enteral feeding was started 72 hours postoperatively, regardless of bowel sounds.

In both groups, tolerance to feeding was defined as the ability of patients to consume their diet through either the nasoenteric tube or orally without experiencing nausea, vomiting, abdominal distension, or abdominal cramp.

Outcomes studied: Tolerance to feeds, ileus duration, wound infection, anastomotic leak, mortality, and hospital stay.

Statistical analysis: Continuous variables were expressed as mean ± SD and analyzed with Student's t-test. Categorical variables were analyzed with Chi-square test. A p-value <0.05 was considered statistically significant.

Observations and Results

Demographic Profile

According to age

Age Group (years)	Early Feeding (n=35)	Late Feeding (n=35)	Total (N=70)
14–20	6 (17.1%)	5 (14.3%)	11 (15.7%)
21–30	9 (25.7%)	7 (20.0%)	16 (22.9%)
31–40	7 (20.0%)	8 (22.9%)	15 (21.4%)
41–50	6 (17.1%)	7 (20.0%)	13 (18.6%)
51–60	7 (20.0%)	8 (22.9%)	15 (21.4%)

According to sex

Sex	Early Feeding (n=35)	Late Feeding (n=35)	Total (N=70)
Male	22 (62.9%)	21 (60.0%)	43 (61.4%)
Female	13 (37.1%)	14 (40.0%)	27 (38.6%)

Parameter	Group A (Early)	Group B (Late)	p-value
Mean Age (years)	44.2 ± 10.8	45.6 ± 11.2	NS
Male (%)	61.4%	62.9%	NS
Female (%)	38.6%	37.1%	NS

Groups were comparable with respect to age and sex distribution.

Distribution of Study Groups as per Indication of Surgery

Indication of Surgery	N	%
Stoma closure	30	42.9%
Hemicolectomy	17	24.3%
Diverticulectomy	6	8.6%
Pyloric perforation	5	7.1%
Small bowel resection and anastomosis	12	17.1%
Total	70	100.0%

Association of Timing of Feeding with Type of Surgery

Type of Surgery	Start of Feeding	Total
	Early	**Late**
Stoma closure	18 (51.4%)	12 (34.3%)
Hemicolectomy	7 (20.0%)	10 (28.6%)
Diverticulectomy	2 (5.7%)	4 (11.4%)
Pyloric perforation	2 (5.7%)	3 (8.6%)
Small bowel resection & anastomosis	6 (17.1%)	6 (17.1%)
Total	35 (100%)	35 (100%)

Association of Timing of Feeding with Tolerance to Feeding

Tolerance to Feeding	Start of Feeding	Total
	Early	**Late**
No	2 (5.7%)	1 (2.9%)
Yes	33 (94.3%)	34 (97.1%)
Total	35 (100%)	35 (100%)

Association of Timing of Feeding with Duration of Ileus

Variables	Start of Feeding	N	Mean	SD	p-value
Duration of Ileus (days)	**Early**	35	4.23	1.26	<0.01
	Late	35	5.60	1.40	

Association of Timing of Feeding with Associated Complications

Complications	Start of Feeding	Total	p-value
	Early	**Late**	
Gastrointestinal (N/V/D)	2 (5.7%)	5 (14.3%)	7 (10.0%)
Anastomotic leak	0 (0.0%)	3 (8.6%)	3 (4.3%)
Wound infections	1 (2.9%)	4 (11.4%)	5 (7.1%)

Association of Timing of Feeding with Mortality

Mortality	Start of Feeding	Total
	Early	**Late**
No	35 (100%)	33 (94.3%)
Yes	0 (0.0%)	2 (5.7%)
Total	35 (100%)	35 (100%)

Association of Timing of Feeding with Hospital Stay

Variables	Start of Feeding	N	Mean	SD	p-value
Hospital Stay (days)	**Early**	35	5.74	1.44	<0.01
	Late	35	7.11	1.23	

Clinical Outcomes

Outcome	Group A (Early)	Group B (Late)	p-value
Feed tolerance	94.3%	97.1%	1.0
Ileus duration (days)	4.23	5.60	<0.01
Wound infection	2.9%	11.4%	<0.05
Anastomotic leak	0%	8.6%	NS
Mortality	0%	5.7%	0.49
Hospital stays (days)	5.74	7.11	<0.01

Discussion

This prospective study demonstrates that early enteral feeding within 24 hours following gastrointestinal surgery is both safe and associated with improved clinical outcomes. Early-fed patients had significantly shorter ileus, fewer complications, and reduced length of stay. Importantly, no anastomotic leaks occurred in the early group, which addresses one of the main historical concerns against early feeding.

These results are consistent with existing literature. Lewis et al. [1] reported reduced mortality and infection in patients fed early. Han-Geurts et al. [2] observed faster return of bowel function after colorectal surgery. Osland and Memon [3] confirmed shortened hospital stay without increased risk of anastomotic leak.

Physiological basis: Early feeding preserves mucosal integrity, stimulates peristalsis, maintains gut barrier, and reduces bacterial translocation [4,5,6]. Braga et al. [7] demonstrated improved gut oxygenation and cost savings with early nutrition. Beattie et al. [8] highlighted benefits in malnourished patients, with better nutritional recovery and fewer complications.

Clinical relevance: Our study showed wound infections and mortality were more frequent in late-fed patients. While mortality differences did not reach statistical significance, the trend is consistent with previous trials [1,8]. Feed intolerance was rare in both groups, proving the safety and feasibility of early feeding.

Strengths: Prospective design, standardized feeding protocol, and clinically meaningful outcomes.

Limitations: Small sample size, single-center study, and lack of long-term follow-up (nutritional recovery, quality of life).

Implications: Adoption of early feeding aligns with ERAS Society recommendations [9] and has the potential to reduce postoperative morbidity and optimize recovery, even in resource-constrained settings.

Conclusion

Early enteral feeding within 24 hours of gastrointestinal surgery is a safe, effective, and beneficial intervention. It shortens postoperative ileus, reduces complications, lowers infection rates, and decreases hospital stay without increasing anastomotic leak risk.

The study supports abandoning the traditional “nil per oral until bowel sounds return” policy. Early feeding should be universally incorporated into ERAS protocols. Wider adoption could reduce healthcare costs and improve patient outcomes globally.

Future Directions:

- Multicentre validation for broader applicability.
- Integration into sepsis management protocols.
- Long-term follow-up on morbidity and mortal

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Ethical Approval: This study was approved from institutional committee

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