TO ASSESS A STUDY ON EARLY ENTERAL FEEDING IN CASES OF INTESTINAL ANASTOMOSIS

DR. RAKESH POLISETTI[1], *DR. C. Z. PARDESHI[2], DR VIJAY KANASE[3]

PG Resident 3rd Year ,[2]M.S. (GENERAL SURGERY) PROFESSOR,[3]Professor and Head
DEPARTMENT OF GENERAL SURGERY, KRISHNA INSTITUTE OF MEDICAL SCIENCES, KRISHNA VISHWA VIDYAPEETH (DEEMED TO BE UNIVERSITY), KARAD – 415 539, MAHARASHTRA, INDIA

KEYWORDS

EEF, INTESTINAL ANASTOMOSIS, ENTERAL FEEDING

ABSTRACT

Introduction: This study evaluates the safety and efficacy of early enteral feeding in patients undergoing intestinal anastomosis, aiming to optimize postoperative care and provide clear guidelines for clinicians. It aims to improve patient outcomes, reduce complications, and optimize recovery for gastrointestinal surgery patients. **Aims:** The study investigates the impact of early enteral feeding on clinical outcomes, recovery metrics, nutritional status, and immunological responses in patients undergoing intestinal anastomosis. **Methodology:** The study assessed the effect of early enteral feeding on adult patients undergoing intestinal anastomosis, excluding those with pre-existing conditions, hemodynamic instability, severe malnutrition, or postoperative mechanical ventilation. **Results:** Early enteral feeding improves postoperative recovery, patient comfort, and pain scores, reducing hospital stays and improving postoperative rehabilitation timelines, according to a study comparing conventional and early methods. **Discussion:** A study comparing early enteral feeding (EEF) and conventional feeding methods found EEF improves patient outcomes and reduces complications in patients undergoing intestinal anastomosis. EEF patients experienced faster recovery, reduced complications, and shorter hospital stays. **Conclusion:** Early enteral feeding after intestinal anastomosis improves patient recovery, reduces postoperative complications, and reduces hospitalization durations, highlighting its economic and healthcare resource utilization advantages.

INTRODUCTION:

The gastrointestinal tract is crucial for nutrient absorption, digestion, and homeostasis. Anastomosis procedures, which connect two intestine segments, are essential for treating GI diseases like cancers, inflammatory bowel diseases, and trauma.[1]

Despite advancements in surgical techniques and postoperative care, intestinal anastomosis still presents complications like anastomotic leakage, infections, bowel obstructions, and impaired nutrient absorption, influenced by patient's nutritional status and medical conditions.[2]

Nutritional support is crucial for postoperative care in intestinal anastomosis patients. Traditional approach involves delayed enteral feeding due to anastomotic integrity and leakage risks, keeping patients nil per os(NPO).[3]

Delayed enteral feeding can lead to complications like muscle wasting, immunosuppression, and prolonged hospital stays, while prolonged parenteral nutrition also poses risks like infections and metabolic issues.[4]

Early enteral feeding post-surgery offers benefits like enhanced gut function recovery, reduced infectious complications, shorter hospital stays, and improved overall outcomes by promoting gut motility and immune system stimulation.[5]

Early enteral feeding, based on "nutritional immunology," supports the mucosal barrier, prevents bacterial translocation, and modulates the immune response by providing nutrients directly to the gut.[6]

This study evaluates the safety and efficacy of early enteral feeding in patients undergoing intestinal anastomosis, aiming to optimize postoperative care and provide clear guidelines for clinicians. It aims to bridge the gap between research and clinical practice, improving patient outcomes and reducing healthcare costs.[7]

The study aims to improve clinical practice by analyzing early enteral feeding benefits and challenges, thereby enhancing patient outcomes, reducing complications, and optimizing recovery for gastrointestinal surgery patients.[8]

AIM & OBJECTIVES:

The study aims to assess the effects of early enteral feeding on clinical outcomes, recovery metrics, nutritional status, and immunological responses in patients undergoing intestinal anastomosis. It will determine the incidence of anastomotic leakage, measure nutritional changes, and compare hospital stay, first bowel movement, and recovery time.

MATERIALS & METHODS:

Study Design

The study assessed the impact of early enteral feeding on adult patients undergoing intestinal anastomosis, excluding those with pre-existing conditions, hemodynamic instability, severe malnutrition, or those requiring postoperative mechanical ventilation.

Inclusion Criteria: Patients aged 18+, undergoing elective surgery, capable of providing written informed consent, and eligible for enteral feeding are eligible.

Exclusion Criteria: Patients with pre-existing gastrointestinal conditions, postoperative hemodynamic instability, severe malnutrition, prolonged mechanical ventilation, and severe co-morbid conditions may face complications during enteral feeding, postoperative recovery, or postoperative recovery, including advanced heart failure or end-stage renal disease.

The study involved participants who were randomly assigned to either an early enteral feeding group or a delayed enteral feeding group. The intervention was initiated within 24 hours postoperatively, with clear liquids and solid foods gradually increasing. The primary outcome was the time to return of bowel function, followed by secondary outcomes such as postoperative complications, length of hospital stay, mortality, nutritional status, and patient satisfaction. Data collection included demographic information, comorbidities, surgery type and duration, and preoperative nutritional status. The study was a randomized controlled trial with computer-generated randomization for group assignment. The study adhered to the Declaration of Helsinki and Good Clinical Practice guidelines, and participants were free to withdraw at any time without affecting their standard care.

OBSERVATION & RESULTS

The study compared early enteral feeding and conventional feeding across different age groups. Participants receiving early enteral feeding had a mean age of 45.6 years, while those receiving conventional feeding had a mean age of 46.2 years. Gender distribution showed slight variations, suggesting a balanced distribution of age and gender between the two feeding methods.

Table 1 : Age Range wise distribution of patients

Age Range (years)	Early Enteral Feeding (n=26)	Conventional Feeding (n=26)
20-29	3	2
30-39	5	4
40-49	7	8
50-59	6	7
60-69	4	5
70-79	1	0

The study examined the distribution of anastomosis types between early enteral and conventional feeding groups. Results showed a balanced distribution, indicating comparable anastomosis types, indicating their impact on patient outcomes.

Table 2: Type of Anastomosis

Type of Anastomosis	Early Enteral Feeding (n=26)	Conventional Feeding (n=26)
Sutured	**14**	**13**
Stapled	**12**	**13**

The study found that early enteral feeding and conventional feeding significantly differed in the time of nasogastric tube removal, with early participants having their tubes removed after 24 hours, potentially affecting recovery and postoperative outcomes.

Table 3: Time of NG Tube Removal (hours)

Parameter	Early Enteral Feeding (n=26)	Conventional Feeding (n=26)
Time of NG tube removal (hrs)	**24**	**48**

The study compared early enteral feeding and conventional feeding, finding that early enteral feeding led to quicker gastrointestinal recovery, with bowel sounds appearing at 36 hours post-operation, indicating potential differences in postoperative bowel function.

Table 4: Time of Appearance of Bowel Sounds (hours)

Parameter	Early Enteral Feeding (n=26)	Conventional Feeding (n=26)
Time of appearance of bowel sounds	**36**	**48**

The study compared early enteral feeding to conventional feeding, finding that participants who received early enteral feeding passed flatus at 48 hours post-operation, indicating a potential benefit in faster bowel function return and postoperative recovery.

Table 5: Time of Passage of Flatus (hours)

Parameter	Early Enteral Feeding (n=26)	Conventional Feeding (n=26)
Time of passage of flatus (hrs)	48	72

The study compared early enteral feeding and conventional feeding, measuring the time of first stool passage. Participants in the early group passed their first stool 2.5 hours faster, suggesting potential benefits for postoperative recovery and gastrointestinal motility.

Table 6: Time of First Stool Passage (days)

Parameter	Early Enteral Feeding (n=26)	Conventional Feeding (n=26)	P-value **Independent Samples t-test**.
Time of first stool passage	2.5 ± 0.5	3.5 ± 0.6	0.0001

The study compared early enteral feeding and conventional feeding, finding that 10 out of 26 participants experienced abdominal pain, while 15 experienced it, suggesting an advantage in postoperative pain reduction, but further analysis is needed.

Table 7: Incidence of Abdominal Pain

Parameter	Early Enteral Feeding (n=26)	Conventional Feeding (n=26)
Presence of abdominal pain	10	15

The study found that early enteral feeding may reduce nausea and vomiting in participants compared to conventional feeding, potentially benefiting gastrointestinal tolerance and patient comfort postoperatively, compared to the higher incidence of nausea and vomiting in conventional feeding.

Table8:IncidenceofNauseaandVomiting

Parameter	EarlyEnteralFeeding(n=26)	ConventionalFeeding(n=26)
Nausea	5	10
Vomiting	4	8

The study compared early enteral feeding and conventional feeding, finding that early feeding reduced abdominal distention in 26 participants, suggesting improved gastrointestinal tolerance and faster postoperative recovery.

Table 9: Incidence of Abdominal Distention

Parameter	Early Enteral Feeding (n=26)	Conventional Feeding (n=26)
Abdominal distention	6	12

The study compared early enteral feeding and conventional feeding, finding a lower incidence of surgical site infections among participants receiving early enteral feeding compared to conventional feeding, suggesting potential benefits in postoperative complication rates and patient outcomes.

Table 10: Presence of Surgical Site Infection

Parameter	Early Enteral Feeding (n=26)	Conventional Feeding (n=26)
Surgical site infection	2	4

The study compared early enteral feeding and conventional feeding, finding that early enteral feeding resulted in a shorter hospital stay of 7.5 days compared to 10.2 days for conventional feeding, suggesting potential benefits in healthcare resource utilization and patient recovery time.

Table 11: Duration of Hospitalization (days)

Parameter	Early Enteral Feeding (n=26)	Conventional Feeding (n=26)	p-value (Independent Samples t-test)
Duration of hospitalization	7.5 ± 1.2	10.2 ± 1.5	< 0.0001

A study found that early enteral feeding, compared to conventional feeding, resulted in a lower mean pain score of 3.2 at 48 hours post-operation, potentially improving patient comfort and recovery experience, compared to conventional feeding.

Table 12: Post-Op Pain Scores (NRS)

Pain Score (NRS)	Early Enteral Feeding (n=26)	Conventional Feeding (n=26)	p-value (Independent Samples t-test)
Pain at 48 hrs (mean)	3.2 ± 1.1	4.5 ± 1.3	< 0.001

The study found that early enteral feeding, compared to conventional feeding, resulted in a lower mean pain score of 2.8 at 48 hours post-operation, suggesting potential benefits in postoperative pain management and patient comfort during recovery.

Table 13: Post-Op Pain Scores (FRS)

Pain Score (FRS)	Early Enteral Feeding (n=26)	Conventional Feeding (n=26)	p-value (Independent Samples t-test)
Pain at 48 hrs (mean)	2.8 ± 0.9	4.2 ± 1.1	< 0.001

The study compared early enteral feeding and conventional feeding, finding that early enteral feeding took an average of 14.2 days to return to normal activity, indicating potential advantages in postoperative rehabilitation and patient recovery timelines.

Table 14: Return to Normal Activity (days)

Parameter	Early Enteral Feeding (n=26)	Conventional Feeding (n=26)	p-value (Independent Samples t-test)
Time to return to normal activity	14.2 ± 2.3	20.4 ± 3.1	< 0.001

Early enteral feeding significantly reduced postoperative complications like wound infection, port site hernia, and symptom recurrence compared to conventional feeding, suggesting potential benefits for improved recovery outcomes and patient satisfaction.

Table 15: Follow-Up Complications

Parameter	Early Enteral Feeding (n=26)	Conventional Feeding (n=26)
Wound infection	1	3
Port site hernia	0	2
Recurrence of symptoms	1	2

The study found a significant difference in hospitalization duration between early enteral feeding and conventional feeding groups, with participants in the early group having a shorter average stay of 7.5 days compared to 10.2 days in the conventional group, indicating potential benefits in healthcare resource utilization and faster recovery.

Table 16: Test of Significance (t-test) for Duration of Hospitalization

Parameter	Early Enteral Feeding (n=26)	Conventional Feeding (n=26)	p- value
Duration of Hospitalization (days)	7.5 ± 1.2	10.2 ± 1.5	<0.001

The study found a significant difference in post-operative pain scores (NRS) between early enteral feeding and conventional feeding groups at 48 hours. The analysis of variance (ANOVA) table showed an F-value of 15.47 and a p-value of less than 0.001, indicating a significant effect of the study factor.

Table 17: ANOVA for Post-Operative Pain Scores (NRS) at 48 Hours

Source of Variation	Sum of Squares (SS)	Degrees of Freedom (df)	Mean Square (MS)	F-Value	p- value
Between Groups	20.56	1	20.56	15.47	<0.001
Within Groups	67.44	50			
Total	88.00	51	1.35		

DISCUSSION:

The study aims to evaluate the efficacy and safety of early enteral feeding (EEF) compared to conventional feeding methods in patients undergoing intestinal anastomosis, a critical surgical procedure that requires meticulous postoperative care. Emerging evidence suggests EEF can enhance patient outcomes and reduce complications. {9,10]

The study compared early enteral feeding to conventional management in patients undergoing intestinal anastomosis. Patients were selected postoperatively and received clear liquids orally after 24 hours of surgery. They gradually adapted to soft and regular diets. A control group received maintenance intravenous fluids initially, transitioning to oral feeds. Postoperative complications and outcomes were assessed. Data was collected from 52 patients over 18 months. Statistical analyses were used to evaluate the efficacy and feasibility of early enteral feeding.

The study compared the age and gender distribution of participants receiving early enteral feeding (EEF) and conventional feeding (CF) in postoperative care. The study included 52 participants, evenly split between EEF and CF groups. The gender distribution showed slight variations, with 15 males and 11 females in the EEF group and 14 males and 12 females in the CF group. This demographic data supports the relevance and reliability of the comparative analysis of EEF and CF in postoperative care, indicating a balanced distribution of age and gender. [11,12]

The study examined the distribution of anastomosis types between early enteral feeding (EEF) and conventional feeding (CF). A balanced distribution was observed, with 14 participants in the EEF group and 13 in the CF group undergoing sutured anastomosis, and 12 participants in the EEF group and 13 in the CF group undergoing stapled anastomosis. This balance was crucial for assessing patient outcomes.[11,12]

The study compared early enteral feeding and conventional feeding, finding that participants in the early enteral feeding group had their nasogastric tubes removed after 24 hours, compared to those in the conventional group. This difference in clinical management could influence recovery and postoperative outcomes. The timing of NG tube removal is crucial in postoperative care, and early enteral feeding facilitates earlier removal, improving patient comfort and faster recovery. This consistency across studies supports the benefits of early enteral feeding.[13]

The study compared early enteral feeding (EEF) and conventional feeding, focusing on bowel sounds and first stool passage. EEF participants showed bowel sounds at 36 hours post-operation, while conventional participants showed them at 48 hours. This suggests early EEF may contribute to quicker gastrointestinal recovery. The study also found that EEF participants passed their first stool 2.5 days earlier than conventional participants, indicating its potential benefits in enhancing postoperative outcomes.[13]

The study compared early enteral feeding and conventional feeding, focusing on the time of flatus passage, first stool passage, abdominal pain, nausea and vomiting, abdominal distention, surgical site infection, and surgical site infection. Participants in the early enteral feeding group passed their first stool at an average time of 2.5 hours, suggesting a quicker initiation of gastrointestinal function.Abdominal pain was reported by 10 out of 26 participants receiving early enteral feeding, while 15 out of 26 participants who received conventional feeding reported abdominal pain. This suggests a potential advantage of early enteral feeding in reducing postoperative abdominal pain compared to conventional feeding methods. However, further analysis is needed to understand the factors contributing to this difference and its impact on overall patient comfort and recovery. Nausea and vomiting were reported by 5 out of 26 participants receiving early enteral feeding, while 4 reported in the conventional feeding group. This suggests a potential trend towards lower incidence of nausea and vomiting with early enteral feeding compared to conventional feeding, highlighting a possible benefit in terms of gastrointestinal tolerance and patient comfort postoperatively.Abdominal distention was reported by 6 out of 26 participants receiving early enteral feeding, while 4 experienced a surgical site infection. This suggests a potential trend towards a lower incidence of surgical site infections with early enteral feeding compared to conventional feeding, indicating a possible benefit in terms of postoperative complication rates and patient outcomes.[11,12,13]

In conclusion, early enteral feeding has shown potential benefits in promoting faster return of bowel function, reducing abdominal pain, improving gastrointestinal tolerance, and potentially reducing surgical site infections, which are crucial for patient recovery and healthcare costs. The study compared the duration of hospitalization between early enteral feeding (EEF) and conventional feeding (CF). The EEF group had a shorter average hospital stay of 7.5 days, compared to the CF group's 10.2 days. This suggests a potential benefit in healthcare resource utilization and patient recovery time. The study also found that early enteral feeding may be associated with lower pain levels compared to conventional feeding, potentially improving patient comfort and recovery experience.Post-operative pain scores showed that early enteral feeding may be associated with lower perceived pain levels compared to conventional feeding, potentially contributing to improved

patient comfort and recovery experience. The time to return to normal activity was also found to be shorter for early enteral feeding participants.Follow-up complications were assessed, showing lower incidences of wound infection, port site hernia, and recurrence of symptoms compared to conventional feeding. These findings suggest a potential benefit of early enteral feeding in reducing certain postoperative complications, potentially contributing to improved recovery outcomes and patient satisfaction following surgery.The study's analysis of variance (ANOVA) showed a significant difference between the groups, suggesting that the factor under study has a substantial effect on the outcome measured. These findings underscore the effectiveness of early enteral feeding in reducing hospital stays, improving healthcare resource utilization, and potentially enhancing patient recovery and postoperative management efficiency. {11,12,13]

The study compared the efficacy and safety of early enteral feeding (EEF) compared to conventional feeding in patients undergoing intestinal anastomosis. The study included 52 participants, with mean ages of 45.6 and 46.2 years, respectively. The study found that EEF promoted gut motility and reduced the risk of septic complications. It also helped maintain the integrity of the gut mucosa, which is crucial in preventing bacterial translocation and subsequent infections. The EEF group experienced a faster return of bowel sounds and flatus, indicating quicker gastrointestinal recovery. The shorter time to first stool passage in the EEF group compared to the conventional feeding group further supports the benefits of EEF in promoting gastrointestinal function. The study also found a lower incidence of complications such as surgical site infections, abdominal pain, nausea, vomiting, and abdominal distention, suggesting that early nutrition may enhance the body's ability to heal and fight infections. These findings are consistent with previous studies, which found lower rates of surgical infections and faster recovery in the EEF group. [11,17,18}

The study demonstrates that patients receiving early enteral feeding (EEF) have a significantly shorter hospital stay compared to those receiving conventional feeding. This reduction in hospital stay indicates faster recovery, cost savings for healthcare systems, and reduced burden on hospital resources. EEF also improves patient comfort and satisfaction, as it is associated with lower pain scores at 48 hours post-operation. This leads to improved patient comfort and overall satisfaction with the surgical experience. EEF also supports clinical decision-making regarding postoperative nutritional management, helping healthcare providers make informed decisions that enhance patient care. The study contributes to the growing body of evidence supporting the benefits of EEF after intestinal anastomosis, with a balanced sample size and detailed analysis of clinical parameters. However, the study also highlights the need for further research to address limitations, such as a larger sample size and exploring the long-term outcomes of EEF. In conclusion, EEF is a valuable strategy in postoperative care, promoting faster recovery, reducing complications, shortening hospital stays, and enhancing patient comfort.

SUMMARY:

The study compared early enteral feeding and conventional feeding in patients undergoing intestinal anastomosis. Results showed that early enteral feeding facilitated quicker bowel function restoration, reduced postoperative complications, and shorter hospital stays. Patients with early enteral feeding also had lower pain scores postoperatively. However, limitations include a small sample size, short-term follow-up, potential selection bias, and lack of blinding in outcome assessment. Future research should focus on larger, multi-center studies and patient-reported outcomes to validate these findings.

CONCLUSION

The study suggests that early enteral feeding after intestinal anastomosis can improve patient recovery, reduce postoperative complications like abdominal pain, nausea, vomiting, and surgical site infections, and reduce hospitalization durations. It also suggests that early feeding protocols can optimize patient recovery and improve postoperative management strategies, thus advocating for their adoption in clinical practice. This underscores the significant economic and healthcare resource utilization advantages of early enteral feeding.

Reference

1. Ashjaei B, GhamariKhameneh A, Darban Hosseini Amirkhiz G, Nazeri N (2019) Early oral feeding versus traditional feeding after transanal endorectal pull- through procedure in Hirschsprung's disease. Medicine (Baltimore) 98(10):e14829
2. Shang Q, Geng Q, Zhang X, Xu H, Guo C (2018) The impact of early enteral nutrition on pediatric patients undergoing gastrointestinal anastomosis a propensity score matching analysis. Medicine (Baltimore) 97(9):e0045
3. Short HL, Heiss KF, Burch K, Travers C, Edney J, Venable C et al (2018) Implementation of an enhanced recovery protocol in pediatric colorectal surgery. J Pediatr Surg 53(4):688–692
4. Early enteral feeding after pediatric abdominal surgery: a systematic review of the literature. Greer D, Karunaratne YG, Karpelowsky J, Adams S. J Pediatr Surg. 2020;55:1180–1187.
5. Synergistic strategies for gastrointestinal cancer care: unveiling the benefits of immunonutrition and microbiota modulation. Martinelli S, Lamminpää I, Dübüş EN, Sarıkaya D, Niccolai E. Nutrients. 2023;15:4408.
6. Mineral disorders in adult inpatients receiving parenteral nutrition. Is older age a contributory factor? HortencioTD, Golucci AP, Marson FA, Ribeiro AF, Nogueira RJ. J Nutr Health Aging. 2018;22:811–818.
7. Early oral feeding compared with traditional postoperative care in patients undergoing emergency abdominal surgery for perforated duodenal ulcer. Masood A, Viqar S, Zia N, Ghani MU. Cureus. 2021;13:0.
8. Strine AC, Chu DI, Brockel MA, Wilcox DT, Vricella GJ, Coplen DE, Traxel EJ, Chaudhry R, VanderBrink BA, Yerkes EB, Chan YY, Burjek NE, Zee RS, Herndon CDA, Ahn JJ, Merguerian PA, Meenakshi-Sundaram B, Rensing AJ, Frimberger D, Rove KO; PURSUE Study Group.JPediatr Urol. 2024 Apr;20(2):256.e1-256.e11.
9. Li X, Yan S, Ma Y, Li S, Wang Y, Wang X, et al. . Impact of early oral feeding on anastomotic leakage rate after esophagectomy: a systematic review and meta-analysis. World J Surg. (2020) 44:2709–18.
10. YanXX,ZhangX,AiH,WangD,SongKY.Changesofintestinalmucosal barrierfunctionandeffectsofearlyenteralnutrition inpatientswithsevere organophosphoruspoisoning. Zhonghua Yi Xue Za Zhi. (2019)99:442–6.
11. Tian Y, ZhuH,GulackBC, AlganabiM,Ramjist J,Sparks E, Wong K,ShenC, Pierro A. Early enteral feeding after intestinal anastomosis inchildren:a systematic review and meta-analysis of randomized controlled trials.PediatrSurgInt.2021Mar;37(3):403-410.

12. Imran A,IsmailM,Raza AA,GulT,Khan A,ShahSA.AComparativeStudyBetweentheEarlyandLateEnteralNutritionAfterGastrointestinalAnastomosisOperations.Cureus. 2024Jan21;16(1):e52686.
13. LuC,Sun X, Geng Q, Tang W. Early oral feeding followingintestinal anastomosis surgery in infants: a multicenterreal world study. FrontNutr.2023Jul20;10:1185876.