A comparative Study Between Early Versus Delayed Postoperative Oral Feeding in Patients Undergoing Small Intestinal Anastomosis

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Introduction: Postoperative ileus is a temporary stop of coordinated bowel movement following surgical interference.
Aim of work: To compare the results of delayed and early oral feeding following surgery in cases of small intestinal anastomosis.

Patients and methods: This randomized, controlled prospective study was conducted on 50 cases undergoing small intestine anastomosis at Ain Shams University Hospital and Mansoura International Hospital under the supervision of thesis supervisors from January 2024 to November 2024.

Results: There was a statistically insignificant differences among the examined groups with regard to operative time, drainage amount, drainage removal day, time to open bowel, Hgb, WBCs, CRP, Na+, and re-exploration(P>0.05). Still, there was a statistically significant difference (P<0.05) in the number of nasogastric tubes used, the length of hospital stays, blood transfusions, albumin, platelet, and K+levels. Fever occurred in 76% of participants in the Delayed Oral Feeding Group and 64% in the Early Oral Feeding Group, while vomiting has been reported in 44% and 52% of participants, respectively. Anastomotic leakage was similar between groups, with 12% in the Delayed Oral Feeding Group and 4% in the Early Oral Feeding Group.

Conclusion: Oral feeding following operation after small intestinal anastomosis is beneficial and safe. Cases in the early feeding group had shorter hospitalization, earlier nasogastric tube removal, and lower surgical site infections compared to those in the delayed feeding group. Early feeding was well tolerated and did not increase the risk of adverse outcomes like vomiting or anastomotic leakage.

Key words: Early, Delayed, postoperative oral feeding, intestinal anastomosis, intestinal anastomosis.

Introduction

Proper nutrition has consistently been a primary objective of postoperative care. Due to ileus, early oral feeding following an abdominal surgery is frequently not a good idea. Instead, regular decompression of the nasogastric tube is used.[1]

Ileus following surgery is a temporary stop of coordinated bowel motility following surgical intervention, preventing the efficient passage of intestinal contents or the ability to tolerate oral intake, leading to symptoms such as vomiting, nausea, and failure to pass stool or flatus. Additionally, it could cause the case discomfort and pain, which could lead to poor nutrition and a lack of protein. This could cause the patient to stay in the hospital longer, be more likely to get an infection, and have higher costs,[2]

Early oral feeding following operation hasn't been tried following upper gastrointestinal anastomosis due to a fear of potential anastomotic leak because of mechanical stimulation & the increased intraluminal pressure resulting from early oral feeding following upper gastrointestinal anastomosis.[3] Early oral feeding (EOF) within twenty-four hours post-gastrointestinal operation is safe, well-tolerated, can enhance gastrointestinal motility following surgery, and is crucial for improved recovery and outcomes.[4]

Early oral feeding is characterized by the beginning of oral feeding within twenty-four to forty-eight hours postoperatively, whereas the late oral feeding (LOF) regimen starts five to seven days following operation. Although multiple randomized clinical trials (RCTs) show the advantages of early oral feeding, this technique isn't widely utilized. Early oral feeding appears to be more advantageous in the surgical profession to recover cases more quickly and reduce hospitalization time.[5]

The goal of this research was to compare the results of delayed and early oral feeding following surgery in cases of small intestinal anastomosis.

Patients and methods

This randomized, controlled prospective study has been performed on 50 cases undergoing small intestine anastomosis at Ain Shams University Hospital and Mansoura International Hospital under the supervision of thesis supervisors from January 2024 to November 2024. We randomly divided the cases into two equal groups, A and B, as follows: Group 1 (Delayed oral feeding): 25 patients managed with traditional 3-day delayed oral feeding and Group 2 (Early oral feeding): 25 patients started oral fluid within the first 3 days.

Inclusion criteria: Patients undergoing open small intestinal anastomosis (End to end), having no other serious illness including hemorrhagic disorders, uncompensated heart or lung disease, patient agreement to undergo an open small intestinal anastomosis, and patients between 16-70

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years old.

Exclusion criteria: Patients with decompensated liver disease, patients with severe cardiac or pulmonary diseases, patients above 70 and below 16 years old, patients with types of cancers, and patients with serum albumin less than 3 g/dL. Patients had had anastomosis of the first 100 cm and the last 50 cm of the small intestine, end-to-side anastomosis, and side-to-side anastomosis.

Statistical analysis: All statistical analyses have been conducted utilizing Microsoft Excel version 7 (Microsoft Corporation, NY, the United States of America) and SPSS for Windows. SPSS (Statistical Package for the Social Sciences; SPSS Inc., Chicago, IL, United States of America) We have subsequently utilized appropriate statistical analyses. In all tests, a p-value under 0.05 is deemed significant.

Results

There was a statistically insignificant difference among examined groups with regard to age, sex, and smoking (P-value above 0.05) **(Table 1).**

Table 1: Distribution of patient characteristics among the examined groups

	Delayed oral feeding Number=25	Early oral feeding Number=25	p-value	
Age				
Mean±SD	42.2±10.7	37.5±12.3	0.15	NS
Sex				
Male	9 (36%)	11(44%)		
Female	16 (64%)	14 (56%)	0.5	NS
Smoking				
Yes	6 (24%)	7 (28%)		
No	19 (76%)	18 (72%)	0.7	NS

P value above 0.05: Not significant. A p-value under 0.05 is statistically significant, and a p-value under 0.001 is highly significant. SD: standard deviation, NS: not significant.

There was a statistically insignificant difference among examined groups with regard to malignancy, recurrent volvulus, secondary intussusceptions, iatrogenic (During caesarian section), and trauma P-value above 0.05 **(Table 2).**

Table 2: Distribution of the causes of surgical interference among the examined groups

	Delayed oral feeding Number = 25	Early oral feeding Number = 25	p-value	
Malignancy	4 (16%)	5 (20%)	0.71	NS
Recurrent volvulus	1 (4%)	2 (8%)	0.55	NS
Secondary intussusceptions	1 (4%)	1 (4%)	1.00	NS
Iatrogenic (during caesarian section)	6 (24%)	8 (32%)	0.53	NS
Trauma	4 (16%)	1 (4%)	0.16	NS

There was a statistically insignificant difference among examined groups with regard to operative time, drainage amount, and drainage removal day P-value above 0.05. A statistically significant difference has been detected among examined groups with regard to nasogastric tube amount, hospitalization duration, and blood transfusion P-value under 0.05 **(Table 3).**

Table 3: Distribution of operative variables among the examined groups

	Delayed oral feeding Number = 25	Early oral feeding Number = 25	p-value	
Operative time (Min)				
Mean±SD	87.9±21.1	86.7±14.1	0.8	NS
Nasogastric tube amount (ml)				
Mean±SD	221.16±81.17	195.92±87.1	0.294	NS
Drainage amount (ml)				
Mean±SD	400.8±282.9	329±200.34	0.3	NS
Drainage removal day				
Mean±SD	2.92±0.64	2.92±0.86	1	NS
Hospitalization duration (Day)				
Mean±SD	7.4±1.04	5.0±0.95	≤0.001*	HS
Blood transfusion				
Yes	0 (0%)	6 (24%)	0.009*	S
No	25 (100%)	19 (76%)		

1. There was a statistically insignificant difference among examined groups with regard to time to open the bowel. The P-value was above 0.05 **(Table 4).**

Table 4: Distribution of gastrointestinal recovery times among the examined groups

	Delayed oral feeding Number = 25	Early oral feeding Number = 25	p-value	
Time to open bowel				
Mean±SD	2.76±0.59	2.54±0.56	0.1	NS

1. For Hgb, WBCs, CRP, and Na+, there was a statistically insignificant difference among the groups that have been examined (p-value above 0.05). However, for albumin, platelets, and K+, there was a statistically significant difference (p-value below 0.05) **(Table 5).**

Table 5: Distribution of postoperative laboratory data among the examined groups

	Delayed oral feeding Number = 25	Early oral feeding Number = 25	p-value	
Hgb (mg/dl) Mean±SD	11.85 ±0.8	11.44±1.45	0.221	NS
WBC (µL) Mean±SD	12.55 ±1.75	12.15 ±1.25	0.35	NS
Platelets (µL) Mean±SD	304 ±88.88	202 ±65.31	≤0.001*	HS
Albumin (mg) Mean±SD	3.57 ±0.47	3.94 ±0.22	≤0.001*	HS
Na^+ (ml) Mean±SD	140.6 ±4.08	140.68 ±4.08	0.9	NS
K^+ (ml) Mean±SD	3.51 ±0.41	4.13 ±0.27	≤0.001*	HS
	CRP (mg/dl)			
<10	10 (40%)	16 (65%)	0.08	NS
>10	15 (60%)	9 (35%)		

BMI: Body mass index, Hgb: Hemoglobin, WBCs: White blood cells, RBG: Random blood glucose, CRP: C-reactive protein. NS: Not significant. HS: highly significant.

76% of participants developed fever in the Delayed Oral Feeding Group, while 64% in the Early Oral Feeding Group. Additionally, 44% experienced vomiting in the Delayed Oral Feeding Group, while 52% experienced it in the Early Oral Feeding Group.

Anastomotic leakage has also been found to be similar between the two groups, with 12% in the delayed oral feeding group and 4% in the early oral feeding group **(Table 6)**.

Table 6: Distribution of clinical symptoms postoperatively among the studied groups

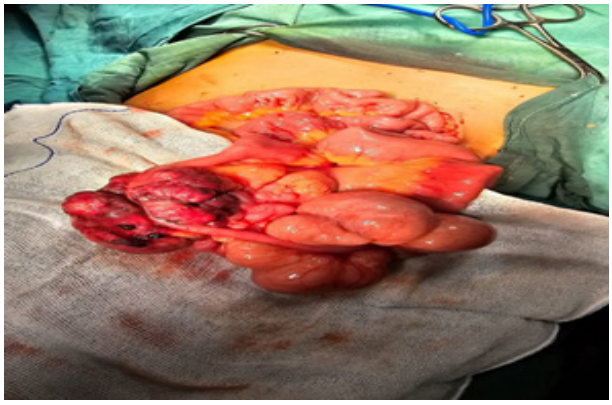
	Delayed oral feeding Number = 25	Early oral feeding Number = 25	p-value	
Fever	19 (76%)	16 (64%)	0.3	NS
Vomiting	11(44%)	13(52%)	0.5	NS
Anastomotic leakage	3 (12%)	1 (4%)	0.2	NS
Surgical site infection	12 (48%)	5 (20%)	**0.03***	S

There was a statistically insignificant variance among examined groups regarding the re-exploration P-value above 0.05 **(Table 8)**.

Table 8: Distribution of Re-exploration among the examined groups

	Delayed oral feeding Number=25	Early oral feeding Number=25	P-value	
Re-exploration				
Yes	3 (12%)	0 (0%)	0.07	NS
No	22 (88%)	25 (100%)		

Case presentation



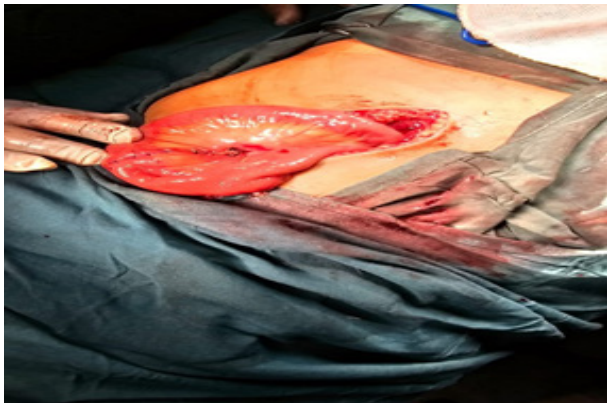


Fig 1a: A case of a small intestinal mass about 200 cm from the ileocecal valve. Resection anastomosis was performed (End-to-end 2-layer' anastomosis by hand-sewn technique).

Fig 1b: A case of MVO about 250 cm from the ileocecal valve resection anastomosis was performed (End-to-end 2-layer anastomosis by hand-sewn technique).

Fig 1a, b: Shows cases of the study.

Discussion

Proper nutrition after major operations is a primary objective of supportive care after operation, with rising numbers of cases requiring abdominal surgery.[6]

It is best to start enteral feeding right away after a gastrointestinal surgery because it prevents malnutrition, reduces surgical stress, and cuts down on problems like anastomosis leaks and hospital stays.[7]

The current randomized controlled prospective research aimed to compare the results of early and delayed oral feeding following operation in cases having small intestinal anastomosis and was conducted on 50 patients divided equally into 2 groups. Group (A) was managed with traditional 3-day delayed oral feeding, and Group (B) started oral fluids within 24 hours at Ain Shams University Hospital and Mansoura International Hospital, starting in November 2023.

The current study revealed the following results

The present findings illustrated that there was a statistically insignificant difference among examined groups with regard to age, sex, and smoking.

Additionally, the current research corroborates the findings of Nematihonar et al.,[6] who demonstrated that there were 26 males (48%) and 28 females (51%) for early feeding with an average age of 64.10 ± 13.9 years.

Moreover, there were 24 males (44%) and 30 females (55%) for late feeding with an average age of 50.58 ± 18.20 years. Statistically, there was an insignificant difference in age or gender among both groups.

Also, the present outcomes agreed with Imran et al.,[8] who presented comparative research among late and early enteral nutrition following gastrointestinal anastomosis surgeries. They reported that there was an insignificant difference among the 2 examined groups with regard to age (p=0.271), gender (p=1), and smoking (p=0.232).

The preoperative laboratorial findings illustrate that there was a statistically insignificant variance among examined groups with regard to WBCs, platelets, albumin, RBG, INR, and Na+, while a statistically significant difference has been detected among examined groups with regard to Hgb, bilirubin total, bilirubin direct, and K+.

In addition, the results gained agreed with the results of Nematihonar et al.,[6] who determined that there was a statistically insignificant variance among the groups that were examined in terms of albumin (3.7±0.47 vs 3.9±0.55) (p=0.098), Na (139.3±0.5 vs 139.15±9.2) (p=0.283), and Na (139.3±0.5 vs 139.15±9.2) (p=0.283). But they were different because they showed that there wasn't a big difference between them in terms of k (4.0±0.25 vs. 4.1±0.31) (p=0.924), and the outcomes illustrated that (Early vs. delayed oral feeding after surgery).

Our outcomes illustrated that there was a statistically insignificant difference among examined groups with regard to malignancy, recurrent volvulus, secondary intussusceptions, iatrogenic (During Caesarian section), and trauma.

According to Bahram et al.,[9] who conducted a study with the objective of evaluating the effects of EOF in comparison to the conventional delay of five days following small intestinal and colonic anastomosis, the researchers found that there was a statistically insignificant difference among the groups that were examined in terms of malignancy, recurrent volvulus, secondary intussusceptions, and trauma.

As well, Sharaf et al.,[10] aimed to evaluate the results of EOF compared to the five-day delay following large and small bowel anastomosis, stating that there was a statistically insignificant difference among examined groups with regard to malignancy, volvulus sigmoid, intussusceptions, iatrogenic (During caesarian section), and trauma.

A statistically significant variance has been observed among the groups when it came to the length of hospital stay, the number of blood transfusions, the amount of drainage, and the day that the drainage was removed. On the other hand, there was a statistically significant difference when it came to the number of blood transfusions, the length of hospital stays, and the day that the nasogastric tube was removed.

Similarly, the current study aligned with Nematihonar et a[l6] , who conducted their study on 108 patients as they were randomly separated to receive EOF or delayed oral feeding. They revealed that the hospital stay was highly significantly reduced in the early feeding group (6.3±1.0 vs. 3.8±1.06; p-value under 0.001).

Regarding time to open bowel, the conducted study illustrated that there was a statistically insignificant difference among examined groups.

However, Jabeen et al.[11] found that after gut anastomosis, starting oral feeding early after twelve hours is better than waiting seventy-two hours to start oral feeding. This is because early oral feeding is better in terms of the average time it takes for bowel sounds to return and the length of time spent in the hospital. The researchers observed that the average duration of time it took for bowel sounds to return in both groups was 1.02±0.25 days and

1.47±0.45 days, correspondingly. It was noteworthy that there was a statistically insignificant difference between the groups that were tested (p-value under 0.05). The present outcomes contradict the findings of Marwah et al.[12] , who carried out the research on twenty-five cases who had early feeding within six hours of operations. They compared this case with twenty-five cases that had late feeding following the appearance of bowel sounds & flatus passage. The results of their research showed that the mean time for the appearance of bowel sounds was 1.08±0.27 days in the early oral feeding group, while it was 2.12±0.6 days in the delayed oral feeding group (p-value under 0.05).

The postoperative laboratorial findings revealed that there was a statistically insignificant variance among examined groups with regard to Hgb, WBCs, CRP, and Na+, while a statistically significant difference has been detected among examined groups with regard to albumin, platelets, and K+.

Imran et al.,[8] concluded that there was a statistically insignificant alteration among the examined groups with regard to Hgb (p=0.866), WBCs (p=0.869), and Na+ (p=0.627), and a significant difference in K+ (p=0.007) and Albumin (p=0.000). The only difference with the current research was that there was an insignificant difference among the examined groups with regard to Platelets (p=0.631).

Our results revealed that 76% of participants developed fever in the Delayed Oral Feeding Group, while 64% in the Early Oral Feeding Group. Additionally, 44% experienced vomiting in the Delayed Oral Feeding Group, while 52% experienced it in the Early Oral Feeding Group. Anastomotic leakage has also been found to be similar between the two groups, with 12% in the delayed oral feeding group and 4% in the early oral feeding group. While there was statistically significant difference between the two studied groups regarding surgical site infection (P-value: 0.03) as 12 out of 25 (48%) developed an infection in the surgical location in the Delayed Oral Feeding Group. Five of the twenty-five babies in the Early Oral Feeding Group (20%) got an infection at the site of surgery (P-value: 0.03). Nematihonar et al.[6] aimed to compare the effects of starting oral feeding early versus traditional oral feeding (TOF) in people who were having selective small intestine anastomosis. These results were similar to what they found. They found that the prevalence of vomiting was 1.85% in the Early Oral Feeding Group and 1.85% in the Delayed Oral Feeding Group, and there was an insignificant difference among the two groups (p-value equal 0.88).

Conclusion

The current study's results show that there were a statistically insignificant difference among the groups in with regards to age, sex, smoking, and a number of lab results before and after surgery. Similarly, the time to open the bowel, operative time, drainage amount, and drainage removal day illustrated an insignificant difference among the early and delayed oral feeding groups. However, there were significant difference in the length of hospitalization, nasogastric tube removal day, blood transfusion requirements, and certain laboratory findings such as albumin, platelets, and potassium levels.

The study further illustrated that early oral feeding was well tolerated and resulted in a significantly shorter hospitalization period. Although insignificant difference were observed in the frequency of complications following operations like vomiting or anastomotic leakage among the groups, the early feeding group had fewer occurrences of surgical site difference compared to the delayed feeding group.

Overall, while the timing of oral feeding did not influence some clinical outcomes, such as time to open the bowel or operative time, early oral feeding contributed to reduced hospitalization duration and improved recovery in some patients.

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