

# Association of Early Oral Feeding with Traditional Oral Feeding in Emergency Gastrointestinal Surgery

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## Abstract

**Introduction:** Conventionally after abdominal surgery, the passage of flatus or bowel movement is considered the clinical evidence for starting an oral diet. The resolution of post-operative ileus defined by the passage of flatus usually occurs within 5 days. There is thus no evidence that early post-operative enteral feeding should be restricted to malnourished patients undergoing gastrointestinal (GI) surgery.

**Aim:** This study aims to compare the effect of early oral feeding (EOF) with traditional delayed oral feeding on accountability, benefits, and GI function in patient who have undergone GI surgery.

**Materials and Methods:** This was a prospective, randomized, comparative study. Patients who were undergo GI surgery in emergency condition in the Department of Surgery of ICARE Institute of Medical Science and Research, Kolkata, during the period of July 2019–May 2022 were randomly assigned into two groups in a consecutive manner as either the EOF group or traditional oral feeding group. Both groups were received similar prophylaxis antibiotics and anesthetic drugs. Indications of anastomosis and surgery were approximately similar between two groups. The operation techniques and suture ties were almost similar in all patients. A nasogastric tube was placed in all patients during the operation.

**Results:** In our study, 48 (100.0%) patients had pain, 27 (56.3%) patients had N/V, 34 (70.8%) patients had distension, 11 (22.9%) patients had constipation, 25 (52.1%) patients had fever, 37 (77.1%) patients were rigidity, 10 (20.8%) patients had lump, 36 (75.0%) patients had liver dullness, 6 (12.5%) patients had ileus, 5 (10.4%) patients had fecal fistula, 10 (20.8%) patients had WI, and 41 (85.4%) patients had tolerance in emergency GI surgery.

**Conclusion:** Early post-operative oral intake results in a decreased length of hospitalization and is well tolerated when compared with traditional dietary management in patients undergoing emergency GI surgery. EOF after emergency GI surgery is safe and can be tolerated by the majority of patients. Thus, it may become a routine feature of post-operative management in these patients.

**Key words:** Early oral feeding, Gastrointestinal surgery, Traditional oral feeding

## INTRODUCTION

Conventionally after abdominal surgery, the passage of flatus or bowel movement is considered the clinical evidence for starting an oral diet. The resolution of post-operative ileus defined by the passage of flatus usually occurs within 5 days. Post-operative dysmotility predominantly affects the stomach and colon, with the small bowel recovering

normal function 4–8 h after laparotomy. Then, the stomach is decompressed with a nasogastric tube (NGT) and intravenous fluids are given, with oral feeding being introduced as the gastric dysmotility resolves. The rationale of nil by mouth is to prevent post-operative nausea and vomiting and to protect the anastomosis, giving it time to heal before being stressed by food. However, it is unclear for how long the deferral of enteral feeding is beneficial.<sup>[1]</sup>

Contrary to the widespread belief, evidence from clinical studies and animal experiments suggests that initiating early feeding is advantageous. In animals, starvation reduces the collagen content in anastomosis scar tissue and diminishes the quality of healing, whereas feeding reverses the mucosal atrophy induced by starvation and increases

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**Month of Submission :** 12-2021  
**Month of Peer Review :** 01-2022  
**Month of Acceptance :** 01-2022  
**Month of Publishing :** 02-2022

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anastomosis collagen deposition and strength. Recovery was shown within 1 week in the enteral nutrition group in some studies, and experimental data in both animals and humans suggest that enteral nutrition is associated with improvement in wound healing. Early feeding improves the outcome in patients with trauma and burns, although few studies have examined its use after lower gastrointestinal (GI) anastomosis.<sup>[2]</sup>

Early enteral nutrition (NGT) or oral feeding appears to be a useful and safe therapeutic alternative for the post-operative management of patients undergoing GI surgery in emergency. However, careful selection of patients is necessary to obtain the greatest benefit of early oral feeding (EOF) in these patients. In this regard, the role of EOF in GI surgery needs to be clarified by controlled randomized trials.<sup>[3]</sup>

Even today, many surgeons do not believe in the effects of EOF in the treatment of GI surgery patients. Due to the lack of interest in using EOF and so there is a need for a trial study in this regard; this study will be aimed to compare the outcome of EOF and traditional oral feeding (TOF) in patients who underwent GI surgery in emergency.<sup>[3]</sup> There is thus no evidence that early post-operative enteral feeding should be restricted to malnourished patients undergoing GI surgery.<sup>[4]</sup>

## MATERIALS AND METHODS

### Study Design

This was a prospective, randomized, comparative study.

### Sample Size

A prospective randomized clinical trial study was carried out in GI surgical patients of the Department of Surgery of ICARE Institute of Medical Science and Research, Kolkata. An approval was taken from the ethics committee before the beginning of the study. Written informed consent was obtained from all patients before their enrolment in the study. If any of the patients who were incapable of understanding the information regarding the study, they were excluded from the study.

Patients who were undergo GI surgery in emergency condition in the Department of Surgery of ICARE Institute of Medical Science and Research, Kolkata, during the period of July 2019–May 2022 were randomly assigned into two groups in a consecutive manner as either the EOF group or TOF group. In both groups, effort was made so that no significant difference occurs in terms of age, sex, place of residence, operation site, nausea, vomiting, and ileus between two groups. Both groups were received

similar prophylaxis antibiotics and anesthetic drugs. Indications of anastomosis and surgery were approximately similar between two groups. The operation techniques and suture ties were almost similar in all patients. A NGT was placed in all patients during the operation.

In the EOF group, the NGT was removed 24–48 h after the operation. Afterward, patients were given 30–50 ml of water and liquid fibreless diet every 3 h after the 2<sup>nd</sup> post-operative day (i.e., after 48 h). The patients without ileus and complications were receive soup, high-protein liquid, and juice on the 4<sup>th</sup> post-operative day and discharged after fulfillment of criteria for the discharge.

### Statistical Analysis

For statistical analysis, data were entered into a Microsoft Excel spreadsheet and then analyzed by SPSS 24.0. and GraphPad Prism version 5. A Chi-squared test ( $\chi^2$  test) was any statistical hypothesis test wherein the sampling distribution of the test statistic is a Chi-squared distribution when the null hypothesis is true. Without other qualification, “Chi-squared test” often is used as short for Pearson’s Chi-squared test. Unpaired proportions were compared by Chi-square test or Fisher’s exact test, as appropriate.  $P \leq 0.05$  was considered for statistically significant.

## RESULTS AND DISCUSSION

This prospective, randomized, clinical trial study was carried out in GI surgical patients of TATA Motors Hospital Jamshedpur, Jharkhand. An approval was taken from the ethics committee before the beginning of the study. All patients presenting undergone GI surgery in ward of their department.

All patients were monitored prospectively by the nursing staff and general physician to record the NGT removal time, tolerance of oral feeding, ileus, fever, control of vital signs, time of first passage of flatus, time of first passage of stool, duration of post-operative stay, patient satisfaction, and complications (including body temperature  $>38.5^\circ\text{C}$  after the 2<sup>nd</sup> post-operative day, wound infection, leakage from anastomosis, intra-abdominal abscess, peritonitis, pneumonia, and sinusitis).

In our study, male population [31 (64.6%)] was higher than the female population [17 (35.4%)]. Twenty (41.7%) patients were 21–30 years old, 14 (29.2%) patients were 31–40 years old, 5 (10.4%) patients were 41–50 years old, and 9 (18.8%) patients were  $>50$  years old. The mean age (mean  $\pm$  SD) of patients was  $37.2292 \pm 11.9809$  years.

**Table 1 : Distribution of all parameters**

Characteristics	Frequency	Percent
Pain		
Yes	48	100.0
Total	48	100.0
N/V		
No	21	43.8
Yes	27	56.3
Total	48	100.0
Distension		
No	14	29.2
Yes	34	70.8
Total	48	100.0
Constipation		
No	37	77.1
Yes	11	22.9
Total	48	100.0
Fever		
No	23	47.9
Yes	25	52.1
Total	48	100.0
Rigidity		
No	11	22.9
Yes	37	77.1
Total	48	100.0
Lump		
No	38	79.2
Yes	10	20.8
Total	48	100.0
Liver dullness		
No	12	25.0
Yes	36	75.0
Total	48	100.0
Ileus		
No	42	87.5
Yes	6	12.5
Total	48	100.0
Fecal fistula		
No	43	89.6
Yes	5	10.4
Total	48	100.0
Wi		
No	38	79.2
Yes	10	20.8
Total	48	100.0
Tolerance		
No	7	14.6
Yes	41	85.4
Total	48	100.0

Petrelli *et al.*<sup>[5]</sup> (2002) found that 16 had nausea or emesis, and eight required readmission for post-operative complications (small-bowel obstruction [four patients], wound dehiscence [one patient], abdominal pain [one patient], and anastomotic leak [two patients]). We found that 48 (100.0%) patients had pain, 27 (56.3%) patients had N/V, 34 (70.8%) patients had distension, 11 (22.9%) patients had constipation, 25 (52.1%) patients had fever, 37 (77.1%) patients were rigidity, 10 (20.8%) patients had lump, 36 (75.0%) patients had liver dullness, 6 (12.5%) patients had ileus, 5 (10.4%) patients had fecal fistula, 10 (20.8%) patients had WI, and 41 (85.4%) patients had tolerance [Table 1].

Ng *et al.*<sup>[6]</sup> (2006) reviewed 15 studies comprising 1352 patients all studies concluded early feeding was safe, based on complications rates. Total complications were 12.5% (range 0–25%) for 935 early feeding patients, with no increased risk of anastomotic leak, aspiration pneumonia, or bowel obstruction. For all studies, an average of 86% patients (range 73–100%) tolerated early feeding.

In our study, 24 (50.0%) patients were in delay group and 24 (50.0%) patients were in early group. We examined that the mean SOT (mean ± SD) of patients was 52.8750 ± 14.9262. The mean duration of surgery (mean ± SD) of patients was 1.7500 ± 0.8873 h. The mean Hb% (mean ± SD) of patients was 11.3333 ± 1.9606. The mean LOHS (mean ± SD) of patients was 15.5000 ± 6.6204.

It was found that in delay group, 9 (37.5%) patients were female and 15 (62.5%) patients were male. In early group, 8 (33.3%) patients were female and 16 (66.7%) patients were male. It was not statistically significant ( $P = 0.7628$ ). We also found that in delay group, 7 (29.2%) patients were 21–30 years old, 6 (25.0%) patients were 31–40 years old, 4 (16.7%) patients were 41–50 years old, and 7 (29.2%) patients were >50 years old. In early group, 13 (54.2%) patients were 21–30 years old, 8 (33.3%) patients were 31–40 years old, 1 (4.2%) patient was 41–50 years old, and 2 (8.3%) patients were >50 years old. It was not statistically significant ( $P = 0.0834$ ).

In our study, in both groups, equal number of patients was present. In delay group, 24 (100.0%) patients had pain, and in early group, 24 (100.0%) patients had pain, we found that in delay group, 13 (45.8%) patients had N/V, and in early group, 14 (58.3%) patients had N/V which was not statistically significant ( $P = 0.7710$ ).

Ashjaei *et al.*<sup>[7]</sup> (2019) found that abdominal distension occurred in four patients in Group 1 and three patients in Group 2. Fever occurred in two patients in Group 1 and one patient in Group 2 within the first 24 h and it occurred in 13 and 17 patients, respectively, within 48 h.

Zhou *et al.*<sup>[8]</sup> (2006) showed that in experimental group ( $n = 161$ ), the NGT was removed after the operation from 12 to 24 h and was promised immediately oral feeding; in control group ( $n = 155$ ), the NGT was maintained until the passage of flatus per rectum. Fever (3.73% vs. 9.68%,  $P < 0.05$ ), pulmonary infection (0.62% vs. 4.52%,  $P < 0.05$ ), and pharyngolaryngitis (3.11% vs. 23.23%,  $P < 0.001$ ) were much more in the control group than in the experimental group. The present study shows that the application of GI decompression after colectomy cannot effectively reduce post-operative complications. On the contrary, it may increase the incidence rate of fever, pharyngolaryngitis, and pulmonary infection.

We found that in delay group, 17 (70.8%) patients had distension, and in early group, 17 (70.8%) patients had distension which was not statistically significant ( $P = 1.0000$ ). It was found that, in delay group, 6 (25.0%) patients had constipation, and in early group, 5 (20.8%) patients had constipation. It was not statistically significant ( $P = 0.7312$ ). In delay group, 12 (50.0%) patients had fever, and in early group, 13 (54.2%) patients had fever. It was not statistically significant ( $P = 0.7726$ ).

Our study showed that in delay group, 18 (75.0%) patients were rigidity, and in early group, 19 (79.2%) patients were rigidity which was not statistically significant ( $P = 0.7312$ ). In delay group, 5 (20.8%) patients had lump, and in early group, 5 (20.8%) patients had lump which was not statistically significant ( $P = 1.0000$ ).

In our study, we found that in early group, higher number of patients had liver dullness [19 (79.2%)] compared to delay group patients [17 (70.8%)] which was not statistically significant ( $P = 0.5049$ ). Moss *et al.*<sup>[9]</sup> (1980) found that the mature collagen content of the fed subjects' ileal wound was undiminished from that of normal ileum,  $2223 \pm 336$  versus  $2250 \pm 577$ , contrasting with the 45% decrease of this structural component (OHP) in the wounds of the unfed controls,  $1237 \pm 820 \mu\text{g/g}$  of tissue ( $P > 0.001$ ).

Our study showed that in delay group, 10 (41.7%) patients had duodenal perforation diagnosis, 2 (8.3%) patients had ileal carcinoma diagnosis, 5 (20.8%) patients had ileal perforation diagnosis, 4 (16.7%) patients had intussusception diagnosis, and 3 (12.5%) patients had jejunal perforation diagnosis. In early group, 11 (45.8%) patients had duodenal perforation diagnosis, 2 (8.3%) patients had ileal carcinoma diagnosis, 4 (16.7%) patients had ileal perforation diagnosis, 3 (12.5%) patients had intussusception diagnosis, and 4 (16.7%) patients had jejunal perforation diagnosis. It was not statistically significant ( $P = 0.9787$ ).

## CONCLUSION

It was showed that tolerance was not significantly associated with early and late oral feeding. We also found that duration of surgery was not significantly difference in early and late oral feeding. Mean length of hospital stay was higher in delay oral feeding compared to EOF which was statistically significant.

Early post-operative oral intake results in a decreased length of hospitalization and is well tolerated when compared with traditional dietary management in patients undergoing emergency GI surgery. We concluded that EOF after emergency GI surgery is safe and can be tolerated by the majority of patients. Thus, it may become a routine feature of post-operative management in these patients.

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**How to cite this article:** Kanjilal N, Jana D. Association of Early Oral Feeding with Traditional Oral Feeding in Emergency Gastrointestinal Surgery. *Int J Sci Stud* 2022;9(11):78-81.

**Source of Support:** Nil, **Conflicts of Interest:** None declared.