ORIGINAL ARTICLE

ROLE OF EARLY ORAL FEEDING IN ENHANCING RECOVERY AFTER ABDOMINAL SURGERY: AN ERAS-BASED STUDY

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ABSTRACT

Background: Early oral feeding (EOF) is a cornerstone of Enhanced Recovery After Surgery (ERAS) protocols, designed to reduce surgical stress, accelerate gastrointestinal recovery, and shorten hospital stay. Traditional postoperative fasting has long been practiced to prevent complications, but emerging evidence suggests that early feeding is both safe and beneficial.

Objective: This study aimed to assess the impact of early oral feeding on postoperative outcomes among patients undergoing elective abdominal surgery within an ERAS-based clinical framework.

Methods: A cross-sectional study was conducted at tertiary care centers across Punjab, Pakistan, from January 2023 to February 2025, involving 100 adult patients undergoing elective abdominal procedures. Participants were divided into two groups: early oral feeding (initiated within 6 hours post-surgery) and delayed feeding (after 24 hours). Parameters assessed included time to first flatus, bowel movement, hospital stay, and postoperative complications such as ileus, nausea, and wound infection. Statistical analysis was performed using SPSS v26, with $p < 0.05$ considered significant.

Results: The mean age of patients was 45.6 ± 12.4 years with 60% males and 40% females. Early-fed patients demonstrated significantly earlier bowel movement (1.8 ± 0.6 vs. 3.2 ± 1.1 days, $p < 0.001$), shorter hospital stay (4.2 ± 1.5 vs. 6.1 ± 2.0 days, $p < 0.01$), and lower rates of postoperative ileus (8% vs. 24%, $p = 0.02$) compared to the delayed feeding group.

Conclusion: Early oral feeding markedly improves postoperative recovery, enhances bowel function, and shortens hospital stay without increasing complications. Integrating EOF into ERAS-based surgical protocols should be prioritized for optimal patient outcomes.

Keywords: Early oral feeding, Enhanced Recovery After Surgery, abdominal surgery, postoperative recovery, gastrointestinal motility, hospital stay.

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INTRODUCTION

Enhanced Recovery After Surgery (ERAS) is a concept in perioperative care, which is evidence-based to reduce surgical stress levels, retain physiological functioning, and expedite the postoperative recovery[1]. Early oral feeding (EOF) is one of its indispensable elements, and this dogma is a challenge to traditional dogma of extended post-surgical fasting in the abdomen. Traditionally, surgeons did not give postoperative nutrition until bowel movements were observed or the patient passed flatus because of the risk of nausea, vomiting, aspiration as well as anastomotic leakage. Nonetheless, the clinical experience gained in the last two decades refuted this conservative practice and proved that early feeding proves to be safe and helpful in the majority of patients undergoing surgery[2].

Given that gastrointestinal tract is critical in preservation of immune competence and metabolic

stability post-surgery, it is important. Long-term starvation causes atrophy of the mucosa, translocation of bacteria, and disruption of intestinal barrier activation, which can be the cause of postoperative infections and slow recovery. On the other hand, early feeding activates enteric hormones and peristaltic, decreases insulin resistance, and maintains gut mucosa structural and functional integrity. It helps also to improve patient comfort through decreasing thirst and hunger, increasing patient satisfaction, and early mobilization, which are all in line with ERAS principles of holistic patient-centered care[3].

Substantial evidence of safety of oral feeding during the early stages after the completion of numerous abdominal operations such as colorectal resections, cholecystectomies, and gastric surgeries has been confirmed by numerous randomized controlled trials and meta-analyses. Such studies have consistently found that early feeding is correlated with the earlier bowel functional restoration, shorter hospitalization, and lower postoperative ileus, but no higher risk of anastomotic leakage and aspiration. Moreover, preoperative nutrition benefits protein synthesis and catabolic response to surgery which ameliorates wound healing and immune defense systems[4].

Illustrating the above proven benefits, the implementation of early oral feeding in most developing countries, especially Pakistan, is not optimum. Conventional procedures and issues about the risks of post surgeries are still a barrier to the adoption of ERAS-based nutrition systems[5]. Also, the inconsistency in the postoperative nutritional management is due to the differences in surgical procedures, the lack of resources, and the insufficient awareness of the healthcare providers[6].

Hence, this research was developed to determine the importance of early oral feeding in improving post-operative recovery in abdominal surgery in an ERAS context[7]. The aim was to match early and late feeding schedules based on postoperative bowel operation, complication, and hospitalization, and, in the process, present the data that will justify the implementation of early feeding programs in the routine surgery practice at the tertiary hospitals in Pakistan[8].

MATERIALS AND METHODS

This cross-sectional observational study was done in order to test the importance of early oral feeding (EOF) in improving postoperative recovery after abdominal surgery under Enhanced Recovery After Surgery (ERAS) protocol. The research was conducted in some tertiary care facilities in Punjab, Pakistan, in the Departments of General Surgery, a span of time that went between January 2023 and February 2025. Before starting, both the Institute Review Board (IRB) of the respective centers and a written informed consent were acquired by all the patients who participated. The research followed all the ethical principles and confidentiality requirements provided in the Declaration of Helsinki (2013).

The study involved 100 adult patients who were recruited through non-probability consecutive sampling method. All the respondents were between the ages of 18 and 65 and had gone through elective open or laparoscopic surgery of the abdomen including cholecystectomy, hernia repair, appendectomy and bowel resection. The patients are deemed fit when they were hemodynamically stable after their operations and able to withstand oral intake within the period of 6-24 hours. Patients who had emergency surgeries, bowel perforation, peritonitis, or intestinal obstruction were excluded. In the same manner, patients that needed mechanical ventilation longer than 24 hours after surgery, with severe uncontrolled comorbidities such as renal or hepatic failure, and those who did not want to take part were not included in the study as well.

The patients were separated into two equal groups of fifty patients each after the surgery. Group A (Early Oral Feeding Group): consisted of the administration of clear liquids in the first six hours of surgery, and progressive transfer to soft and regular diets as tolerated. Group B (Delayed Oral Feeding Group) remained nil per os (NPO) at least 24 hours after surgery and was not allowed to resume oral intake until they had bowel activity (publication of flatus or audible bowel sounds), according to conventional care guidelines. Both the groups were provided with standardized postoperative attention that was compatible with ERAS guidelines such as multimodal analgesia, antiemetic prophylaxis, or early ambulation, as well as the limited use of drains and nasogastric tubes.

The data were gathered in a predetermined proforma as clinical data. The variables measured were patients demographics (age, gender, and BMI) type of surgery performed and postoperative outcomes including time to first flatus, time to first bowel movement, length of stay and complications such as postoperative nausea and vomiting (PONV), ileus, or wound infection. All patients were monitored closely in the first week of postoperation to record the milestones of recovery and complications.

All of the gathered data used SPSS 26.0 (IBM Corp., Armonk, NY, USA) to analyze them. The quantitative variables such as age, time to first flatus, bowel movement and hospital stay were represented as mean standard deviation (SD), whereas the categorical variables were represented by frequencies and percentages (gender and complications). Continuous variables were compared using the Independent Sample t-test and the Chi-square test was applied to compare categories. A p-value of below 0.05 was regarded as statistically significant. The results were analyzed to identify the difference in recovery patterns and complication of early and delayed oral feeding.

RESULTS

This study has involved 100 patients who underwent elective abdominal surgery including 60 men (60) and 40

women (40). The average age of the respondents was 45.6 -12.4 years and the majority of the patients were between the ages of 30 and 60 years. The early oral feeding and the delayed feeding group were similar in terms of age, genders, body mass index (BMI) and type of surgery performed, which made the groups homogenous. The procedures involved cholecystectomy, appendectomy, hernia repair, and bowel resection surgeries under the standard procedures of the perioperative care based on the ERAS principles.

The study population is gender balanced as shown in table 1. Males constituted most of the participants which are representative of the higher number of male patients that undergo elective abdominal surgeries in all the sampled tertiary care hospitals located in Punjab. The gender ratio was slightly skewed towards the males but statistical analysis revealed no significant difference between the two feeding groups in the terms of baseline demographic variables hence showing a balanced comparison on which outcomes evaluation could be done.

Table 1: Gender Distribution of Patients

Gender	Frequency (n)	Percentage (%)
Male	60	60%
Female	40	40%
Total	**100**	**100%**

The two groups were compared in terms of postoperative recovery (in terms of bowel functions recovery, length of stay and postoperative complications). Early oral feeding was associated with a significantly quicker recovery of bowel movement in patients in comparison to those on delayed feeding schedules. The oral feeding early group had a mean first flatus of 1.3 + 0.4 days, which was much lower as compared to the delayed group of 2.8 + 0.9 days ($p = 0.001$). Likewise, early-fed patients had a shorter time to first bowel movement (1.8 ± 0.6 days) compared to late-fed patients (3.2 ± 1.1 days) ($p < 0.001$). These results indicate that oral feeding should be undertaken within six hours of the surgery and it significantly helps to recover gastrointestinal motility, which is one of the most imperative signs of post-surgical recovery according to the ERAS guidelines.

A comparative study of the key postoperative outcomes of the two study groups is taken up in Table 2. The average number of days stayed in hospital was substantially lower in patients who were started on early oral feeding (4.2 +/-1.5 days) than in those patients who were started on delayed feeding (6.1 +/-2.0 days, $p < 0.01$). Such a decrease in hospital stay not only indicates a quicker physiological healing but also carries over to the resource usage and enhanced turnover in the surgical units. The rate of postoperative ileus was significantly reduced in the early oral feeding group (8%) in accordance with the delayed group (24, $p = 0.02$). Moreover, nausea and vomiting were less common among the early-fed patients (10% vs. 28% with delayed feeding, $p = 0.03$), which points to the notion that early feeding does not cause gastrointestinal distress but, in fact, may alleviate the condition with the help of a more rapid recovery of the gut motility.

Wound infection in the early oral feeding group (6% vs. 14% in the delayed feeding group) was not found to be statistically significant ($p = 0.18$). Nevertheless, the general tendency was towards early oral feeding as a measure enhancing improved outcomes after operation with reduced complications.

Table 2: Comparison of Postoperative Outcomes Between Early and Delayed Feeding Groups

Parameter	Early Oral Feeding (n = 50)	Delayed Oral Feeding (n = 50)	p-value
Time to first flatus (days)	1.3 ± 0.4	2.8 ± 0.9	<0.001
Time to first bowel movement (days)	1.8 ± 0.6	3.2 ± 1.1	<0.001
Hospital stay (days)	4.2 ± 1.5	6.1 ± 2.0	<0.01
Postoperative ileus (%)	4 (8%)	12 (24%)	0.02
Nausea and vomiting (%)	5 (10%)	14 (28%)	0.03
Wound infection (%)	3 (6%)	7 (14%)	0.18

A close examination of the pattern of recovery showed that the patients in the initial stages of oral feeding group showed earlier mobilization and tolerance to oral intake with a few adverse events. No patients in this group had any need to recommence nasogastric tubes or parenteral nutrition after the first post operative period and three patients in the delayed feeding group had to undergo nasogastric decomposition as a result of delayed ileus. Further, the subjective ratings showed that subjects fed early had higher scores in the comfort, thirst and fatigue postoperative, which led to the more satisfactory recovery process.

Findings of this paper can therefore conclusively prove that early oral feeding is an important factor in promoting postoperative outcomes through increasing bowel motility, decreasing the number of gastrointestinal complications, and reducing the length of stay in the hospital. The regular patterns of various recovery indicators are a good indication that the concept of early oral feeding as part of the routine postoperative practice in abdominal surgery under ERAS should be integrated even in elective cases. The findings correlate with the existing body of international literature which indicates that reintroduction of oral nutrition in the early stages is not

only safe, but physiologically beneficial and results in better outcome of the patients and cost-effective surgery.

DISCUSSION

The current research approached the importance of early oral feeding (EOF) in improving post surgery recovery in patients undergoing an elective abdominal surgery using the Enhanced Recovery After surgery (ERAS) protocol to guide all operations. The results of this research are very effective in presenting the advantages of early introduction of oral intake following surgery as they demonstrate that it is effective in reducing the turnaround time of the bowel, a reduction in hospital stay, and a drop in postoperative complications (ileus and nausea) as compared to the traditional late approach with regard to feeding[9].

Historically, surgical patients were maintained nil per os (NPO) until bowel movements returned or a flatus was discharged due to the assumption that premature feeding may develop into nausea, vomiting and anastomotic leakage[10]. These fears have however been disproven scientifically in the last few decades by numerous clinical trials and meta-analyses who have shown that early oral feeding is not only safe but also physiologically advantageous. The findings of the current research were consistent with the results of Lassen et al[11]. (2015) and Gustafsson et al. (2016), who found out that the early feeding reduces the length of stay and assists in accelerating the gastrointestinal recovery without complicating its outcomes. On the same note, Tanaka et al. (2018) ascertained that early oral nutrition reintroduction induces peristalsis, maintenance of mucosal integrity, and alleviates catabolic effects after surgery, which are critical in accelerating recovery[12].

The patients under the early oral feeding group showed a much faster recovery of bowel motility as evidenced by earlier passage of flatus and bowel movement in this study (Table 2). This can be explained by the fact that the gastrointestinal tract is stimulated by luminal exposure of food stuff to nutrients thus leading to the release of intestinal hormones like gastrin, motilin and cholecystokinin[13]. These hormones increase the smooth muscle contraction and peristaltic motions thereby restoring bowel functions earlier than in the patients under fasting. Early feeding also encourages secretion of digestive enzymes and bile which also helps in healing the intestines. Furthermore, it inhibits the mucosal atrophy and decreases the bacterial translocation of the gut lumen to blood, thus, lowering the risk of postoperative infection and sepsis[14].

The other interesting result of this study was the decrease in the length of hospital stay by a significant margin in patients treated with early feeding. This finding is in line with the study by Ljungqvist et al. (2017), who noted that the reduction of postoperative fasting minimizes the stress levels associated with surgery, enhances energy balance, and shortens the discharge[15]. A reduced hospital stay has both clinical and economic direct effects, especially in a resource-constrained environment such as Pakistan, in which bed availability maximization and cost minimization are key healthcare concerns. The outcomes are also confirmed by Joshi et al. (2021) who emphasized that the implementation of ERAS-based nutritional protocols lead to the acceleration of the mobilization process, the reduction of the complication rate, and patient satisfaction[16].

Even though the rate of wound infection was not very different in the two groups, it was found that the early fed patient had a lower rate of infection, which indicated the presence of better immunity and wound healing owing to the event of early nutritional support[16]. Kaibori et al. (2020) and Arumainayagam et al. (2022) have also reported similar results and have determined that early oral nutrition provides nitrogen balance, protein synthesis, and faster tissue repair. Moreover, the reduced cases of nausea and vomiting in the early feeding group did not follow the traditional belief that oral feeding soon after surgery aggravates these conditions. Rather, the early consumption assists in balancing gastric motility and avoiding stagnant gastric motility as discussed by Wainwright et al. (2019)[17].

Early feeding is an ERAS paradigm shift in the traditional restrictive perioperative care to the evidence-based patient-centered practice. Nonetheless, with all the evidence, it is not a popular thing in Pakistan[18]. Some of the barriers to complete ERAS implementation include out moded surgical practices, ignorance or lack of awareness and enlightenment among health care professionals and postoperative surveillance facilities. Hence, there is a definite need to sensitize surgical teams and nursing personnel on the safety and advantages of early feeding so that there is a proper adherence to the protocols[19].

Local data is also provided in the present study to the expanding amount of international evidence on the use of ERAS principles in South Asian clinical practice. The results reflect that early oral feeding is not only practicable in tertiary care hospitals in Punjab but also leads to much better postoperative outcomes, despite the limited resources setting. Nevertheless, more multicentric, randomized controlled trials involving larger sample sizes should be conducted to confirm these findings in respect to different kinds of abdominal operations and study population[20].

CONCLUSION

To sum up, this paper shows that early oral feeding (EOF), being a part of Enhanced Recovery After Surgery (ERAS) protocol, is a very strong aspect of the postoperative recovery rates of patients undergoing abdominal operations. The patients who started to eat in six hours after the surgery recovered bowel movement earlier, experienced less postoperative ileus, stayed at the hospital less, and fewer complications than those who practiced traditional delayed feeding. The findings confirm the

safety and physiologic advantage of early oral feeding, which promotes the gastrointestinal motility and minimizes the metabolic burden of surgical operations. The results underline the necessity of incorporating early feeding practices in the routine surgical care pathways in the tertiary hospitals in Pakistan. ERAS-based nutritional strategies can be adopted by hospitals to deliver better patient outcomes, increase hospital efficiency, and decrease healthcare costs. To eliminate the traditional barriers to early feeding and standardize the practices of postoperative care, surgeons, anesthetists, and nursing teams are expected to collaborate and break the traditional barriers. There is a need to do future research using bigger cohort and procedure specific in order to increase the evidence base in favor of early oral feeding in abdominal surgery as well as to facilitate its use regularly in all surgical fields.

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