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Undergoing Small Bowel Surgery**

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## Early vs Traditional Postoperative Feeding in Patients Undergoing Small Bowel Surgery

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### Abstract

**Purpose:** The postoperative management of patients undergoing gastrointestinal (GI) surgery was followed by keeping them 'nil by mouth' and provide gastric decompression via a nasogastric tube (NGT) until the postoperative ileus resolves and bowel function resumes. Early feeding and recovery are being portrayed as the new solution for these problems. To compare the outcomes in early vs traditional postoperative feeding in patients undergoing small bowel surgery.

**Methodology:** Study design: Randomized controlled trial. Setting: Department of General Surgery, Services Hospital Lahore. Data collection: The sample size is calculated as 60 (30 in each group), by using WHO sample size calculator by keeping the confidence interval equal to 95%, power equal to 80%, and hospital stay as  $4 \pm 0.64$  days vs.  $6.1 \pm 0.84$  days in early vs late feeding group respectively.

**Findings:** In group A, the mean age of was  $33.59 \pm 9.34$  years and in group B, the mean age of was  $34.76 \pm 9.87$  years. In group A, there were 14 (46.7%) males and 16 (53.3%)

females. In group B, there were 14 (46.7%) males and 16 (53.3%) females. In group A, the mean duration of surgery was  $59.17 \pm 17.28$  min. In group B, the mean duration of surgery was  $57.17 \pm 16.54$  min. In group A, there were 4 (13.3%) patients who had postoperative vomiting. In group B, there were 13 (43.3%) patients who had postoperative vomiting ( $p < 0.05$ ). In group A, there were 3 (10%) patients who had postoperative anatomic leak. In group B, there were 5 (16.7%) patients who had postoperative anatomic leak ( $p > 0.05$ ). In group A, the mean time to pass first stool was  $4.14 \pm 0.90$  days. In group B, the mean time to pass first stool was  $6.42 \pm 1.09$  days ( $p < 0.05$ ). In group A, the mean hospital stay was  $4.76 \pm 0.73$  days. In group B, the mean hospital stay was  $6.83 \pm 1.34$  days ( $p < 0.05$ ).

**Recommendations:** The conclusion of the study that early feeding cases are beneficial as compare to conventional (delayed) feeding. It reduces infection complications and length of hospital stay.

**Keywords:** *Early vs Traditional Postoperative Feeding, Anastomosis, Surgery, Small Bowel, Gastrointestinal*

## 1.0 INTRODUCTION

Postoperative treatment of gastrointestinal (GI) surgery in patients was followed by keeping them 'nil by mouth' to provide a nasogastric tube (NGT) for gastric decompression before the postoperative ileus recovers and bowel function returns. Over the years, this management has been introduced with the concept that oral feeding restriction allows the GI tract more time to heal and recover, thus minimizing postoperative complications.(1)

There was always a concern that unnecessary delay in feeding also reduces the overall recovery and poses a greater risk of infection due to prolonged stay and the risk of other complications like deep vein thrombosis due to immobilization. Early feeding and recovery are being portrayed as the new solution for these problems.(2)

In one study, seven trials, this included a total of 587 patients. Compared with traditional oral feeding, early oral feeding reduced the length of hospital stay (weighted mean difference -1.58 days; 95% CI -2.77 to -0.39;  $p = 0.009$ ) and the total postoperative complications (relative risk 0.70; 95% CI 0.50-0.98;  $p = 0.04$ ). There were no significant differences in the risk of anastomotic dehiscence, pneumonia, and wound infection, rate of nasogastric tube reinsertion, vomiting, or mortality.(3) There is increasing supportive data regarding the effectiveness of early feeding in recent studies, revealing that early feeding is safe & effective in patients undergoing elective GI surgery. Furthermore, study showed that early feeding is acceptable and advantageous for the patient.(4, 5)

However, oral and enteral tubes are two different methods of feeding, the latter could result in a number of issues, such as tube malposition, patient pain, aspiration pneumonia, epistaxis, sinusitis, and tube occlusion. For example, with a frequency as high as 23-35%, tube blockage is a very prevalent problem with enteral feeding tubes.

The other outcomes of interest are early gut motility and passage of stool and lowering the time to discharge from the hospitals.(6, 7) According to a study done by Nematihonar B et al, they compared traditional (delayed) vs early feeding and it was seen that the first stool passage was seen in  $3.9 \pm 0.92$  days vs.  $5.4 \pm 0.77$  days and hospital stay was  $4 \pm 0.64$  days vs.  $6.1 \pm 0.84$  days in early vs late group respectively.(8)

According to another study done by El-Nakeeb A et al, they compared early vs conventional feeding and it was seen that vomiting was seen in 25% vs 16.67%, time to pass first stool was  $4.1 \pm 1.2$  vs  $4.9 \pm 1.2$  days, hospital stay was  $6.2 \pm 0.2$  vs  $6.9 \pm 0.5$  days and anastomosis leak was seen in 0% vs 1.66% in early vs conventional feeding respectively.(9) In another study anastomosis leakage was seen in 2 (2.02%) cases with early vs 6 (6%) in cases with traditional postoperative feeding.(10)

The majority of the studies done in the past are delayed or conventional feeding and it is still being practiced in underdeveloped countries like Pakistan where the data regarding this early feeding is lacking for which this study was planned to collect the local data and look for the better modality in our population.

## 2.0 METHODOLOGY

This randomized controlled trial was conducted General surgery Department, Services Hospital, Lahore. Sample size is calculated as 60 (30 in each group), by using WHO sample size calculator by keeping the confidence interval equal to 95%, power equal to 80%, and hospital stay as  $4 \pm 0.64$  days vs.  $6.1 \pm 0.84$  days in early vs late feeding group respectively.

Patients with age 18 to 50 years with both genders undergoing elective small bowel surgery needing end to end anastomosis due to intestinal obstruction were included. The cases requiring ileostomy (assessed by history and medical record), sepsis (assessed by history and medical record) and documented cases of end-stage renal failure, diabetes, and hypertension were excluded.

After the acceptance of the synopsis from CPSP and the local ethical review committee of the same hospital, the subject was selected according to inclusion criteria. Informed written consent was taken from each subject. Demographic data was collected in the form of gender (Male/ female), age (years), weight (kg), type of surgery (emergency/elective where an emergency was labeled if the symptoms lead to surgery within 24 hours and elective if otherwise) and duration of surgery and recorded on a predesigned proforma.

Then these cases were divided into two equal groups by a simple lottery method labeled as A or B. The cases in group A was undergone early feeding and those in group B with conventional (delayed) as per operational definition. Then there were assessed for vomiting, time is taken to pass the 1<sup>st</sup> stool, hospital stay, and anastomosis leak.

Data was entered in SPSS version 25.0V. Age, weight, duration of surgery, and outcome i.e. time is taken to pass 1<sup>st</sup> stool and duration of hospital stay were presented as mean & SD while frequency and percentages were calculated for gender, type of surgery, vomiting, and anastomosis leak. Both the groups were compared. Effect modifiers controlled through stratification of gender, age, weight, duration of surgery and type of surgery to seeing their effect on outcome variables and post-stratification chi-square test was applied for qualitative variable and independent-sample t-test for quantitative variable and post-stratification p-value equal or less than 0.05 is taken as significant.

### 3.0 FINDINGS

In group A, the mean age was  $33.59 \pm 9.34$  years and in group B, the mean age was  $34.76 \pm 9.87$  years. Table 1 In group A, there were 14 (46.7%) males and 16 (53.3%) females and in group B, there were 14 (46.7%) males and 16 (53.3%) females. In group A, the mean duration of surgery, time for first stool and hospital stay in days was  $59.17 \pm 17.28$  min,  $4.14 \pm 0.90$  and  $4.76 \pm 0.73$ . In group B, the mean duration of surgery, time for first stool and hospital stay in days was  $57.17 \pm 16.54$  min,  $6.42 \pm 1.09$  and  $6.83 \pm 1.34$  days. Table 1

In group A, there were 13 (43.3%) patients who underwent emergency surgery and 17 (56.7%) who underwent elective surgery. In group B, there were 11 (36.7%) patients who underwent emergency surgery and 19 (63.3%) who underwent elective surgery. In group A, there were 4 (13.3%) patients who had postoperative vomiting. In group B, there were 13 (43.3%) patients who had postoperative vomiting. The difference was significant ( $p < 0.05$ ). In group A, there were 3 (10%) patients who had postoperative anatomic leak. In group B, there were 5 (16.7%) patients who had postoperative anatomic leak. The difference was insignificant ( $p > 0.05$ ).

In group A, the mean time to pass first stool was  $4.14 \pm 0.90$  days. In group B, the mean time to pass first stool was  $6.42 \pm 1.09$  days. The difference was significant ( $p < 0.05$ ). In group A, the mean hospital stay was  $4.76 \pm 0.73$  days. In group B, the mean hospital stay was  $6.83 \pm 1.34$  days. The difference was significant ( $p < 0.05$ ).

Data was stratified for gender of patients. In males, postoperative vomiting was observed in 1 (7.1%) cases in group A while in 7 (50%) cases in group B. The difference was significant ( $p < 0.05$ ). In females, postoperative vomiting was observed in 3 (18.8%) cases in group A while in 6 (37.5%) cases in group B. The difference was insignificant ( $p > 0.05$ ). Data was stratified for age in years, type of surgery and duration of surgery was shown in Table 2.

Data was stratified for gender of patients. In males, postoperative anatomic leak was observed in 2 (14.3%) cases in group A while in 1 (7.1%) cases in group B. The difference was insignificant ( $p > 0.05$ ). In females, postoperative anatomic leak was observed in 1 (6.3%) cases in group A while in 4 (25%) cases in group B. The difference was insignificant ( $p > 0.05$ ). Data was stratified for age in years, type of surgery duration of surgery and duration of surgery in (min) was shown in Table 3.

**Table 1: Descriptive of Age Duration of surgery time to first stool and hospital stay in days within groups**

		<b>Group A N=30</b>	<b>Group B N=30</b>
Age	Mean± SD	33.59± 9.34	34.76± 9.87
Duration of Surgery	Mean± SD	59.17± 17.28	57.17± 16.54
Surgery	Emergency	13(43.3%)	11(36.7%)
	Elective	17(56.7%)	19(63.3%)
Time to first stool (days)	Mean± SD	4.14± 0.90	6.42± 1.09
Hospital stay (days)	Mean± SD	4.76± 0.73	6.83± 1.34

**Table 2: Comparison of Vomiting in Both Groups with Age Groups, Surgery and Duration of Surgery (Min)**

		<b>Vomiting</b>	<b>Group A</b>	<b>Group B</b>	<b>P value</b>
Age in years	18-30	Yes	1(8.3%)	4(36.4%)	0.10
		No	11(91.7%)	7(63.6%)	
	31-50	Yes	3(16.7%)	9(47.4%)	0.04
		No	15(83.3%)	10(52.6%)	
Surgery	Emergency	Yes	3(23.1%)	5(45.5%)	0.24
		No	10(76.9%)	6(54.5%)	
	Elective	Yes	1(5.9%)	8(42.1%)	0.012
		No	16(94.1%)	11(57.9%)	
Duration of Surgery (min)	30-60	Yes	2(13.3%)	9(47.4%)	0.03
		No	13(86.7%)	10(52.6%)	
	60-90	Yes	2(13.3%)	4(36.4%)	0.16
		No	13(96.7%)	7(63.6%)	

**Table 3: Comparison of Anatomic Leak in Both Groups with Age Groups, Surgery and Duration of Surgery (Min)**

	<b>Anatomic Leak</b>	<b>Anatomic leak</b>	<b>Group A</b>	<b>Group B</b>	<b>P value</b>
Age in years	18-30	Yes	1(8.3%)	2(18.2%)	0.48
		No	11(91.7%)	9(81.8%)	
	31-50	Yes	2(11.1%)	3(15.8%)	0.67
		No	16(88.9%)	16(84.2%)	
Surgery	Emergency	Yes	0	3(27.3%)	0.044
		No	13(100%)	8(72.7%)	
	Elective	Yes	3(17.6%)	2(10.5%)	0.53
		No	14(82.4%)	17(89.5%)	
Duration of Surgery (min)	30-60	Yes	2(13.3%)	2(10.5%)	0.80
		No	13(86.7%)	17(89.5%)	
	60-90	Yes	1(6.7%)	3(27.3%)	0.15
		No	14(93.3%)	8(72.7%)	

## Discussion

In this study, we compared early and conventional (delayed) feeding, which demonstrates the benefits of early feeding as compared to conventional. It shows that early feeding does not cause anastomotic

leakage. It demonstrates that the mucosal epithelium of the bowel is perfectly sealed within the first 24 hours of the postoperative period.(11) During our study, we started the feeding at 14-24 hours and no leakage is observed, which clearly shows leakage is not true for anastomosis of small and large intestines.(12) Additionally, it indicates that early feeding accelerates the process of anastomosis and wound healing.

In our study, in group A, the mean age was  $33.59 \pm 9.34$  and in group B was  $34.76 \pm 9.87$  years. In group A, the mean duration of surgery was  $59.17 \pm 17.28$  min and in group B, the mean duration of surgery was  $57.17 \pm 16.54$  min. In group A, there were 4 (13.3%) patients who had postoperative vomiting. In group B, there were 13 (43.3%) patients who had postoperative vomiting ( $p < 0.05$ ). In group A, there were 3 (10%) patients who had postoperative anastomotic leak. In group B, there were 5 (16.7%) patients who had postoperative anastomotic leak ( $p > 0.05$ ). In group A, the mean time to pass first stool, and hospital stay was  $4.14 \pm 0.90$  days &  $4.76 \pm 0.73$  days. In group B, was  $6.42 \pm 1.09$  days and  $6.83 \pm 1.34$  days ( $p < 0.05$ ).

Hunger has been shown to induce mucosal atrophy, and early feeding reverses this process and improves the deposition of anastomotic collagen. (13, 14) Patients also undergo gastrointestinal surgery. Who are malnourished, recognized in extreme instances, to raise morbidity.(15)

In the Reissman et al report, 17.5 percent of patients in the case community had anastomotic dehiscence and 3.75 percent had anastomotic dehiscence.(16, 17) Dehiscence inside a control group. The P-value was  $> 0.05$ , which is also negligible. Wound infection after resection & resection is a common complication. Bowel anastomosis, but its incidence has decreased as a result. To discover novel antibiotics.(12)

Data for the postoperatively early enteral feeding is well tolerated in the presence of co-morbid conditions also and may also be beneficial. Early enteral feeding significantly reduces the length of hospital stay in the post-operative patients of resection and anastomosis of the intestine due to less postoperative pain, fewer complications, and improvement in general wellbeing.(18)

Most patients (93%) were able to tolerate the early feeding. The early feeding group had considerably shorter periods to the first passage of flatus ( $2.66 \pm 0.71$  days vs.  $3.9 \pm 0.071$  days) and stool ( $3.9 \pm 0.92$  days vs.  $5.4 \pm 0.77$  days). The early feeding group's hospital stay was also significantly reduced ( $4 \pm 0.64$  days vs.  $6.1 \pm 0.84$  days). In the early feeding group, anastomosis leakage and abscess formation were not observed. Early feeding groups' patient satisfaction (measured using a visual analog scale) was higher than delayed feeding groups' ( $8.56 \pm 1.16$  vs.  $7.06 \pm 1.59$ ,  $P = 0.001$ ). (8)

#### 4.0 CONCLUSION

The present study concluded that early feeding *are* beneficial as compared to conventional (delayed) feeding in small bowel surgery. *It* enhances recovery and reduces infections, complications and length of hospital stay.

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