

ORIGINAL ARTICLE

Comparison of Early and Delayed Feeding after Elective Gut Anastomosis

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ABSTRACT

Objective: To compare the effects of early and delayed feeding after elective gut anastomosis in relation to a mean number of days of audible bowel sounds.

Study Design: A cross-sectional study.

Place and Duration of Study: The study was conducted at the Department of Surgery, Combined Military Hospital (CMH), Rawalpindi, Pakistan, from 11th May 2019 to 10th November 2019.

Methods: A total of 60 individuals undergoing gut anastomosis were divided into two groups. In group A, the NG tube was removed within 6 to 24 hours of surgery, and clear oral liquids (30ml/hour) were started. Oral fluids, including juices and soups on the other day after surgery, tailed by semisolid food at 3rd day, then regular food at 4th day and finally discharge at the 5th day. In group B, the NG tube was detached three to five days after the procedure, observing NG tube output <30-50cc daily. Then, patients were followed up in post-surgical wards for 48 hours. Patients were noted and informed of the time when bowel sounds were audible, the first flatus passed, and the first stool passed.

Results: The mean age in group A was 40.23 ± 15.66 years, and in group B was 37.93 ± 15.23 years. Most of the patients, 31 (51.67%), were between 16 to 30 years of age. Out of 60 patients, 36 (60.0%) were males and 24 (40.0%) were females, with male to female ratio of 1.5:1. The mean number of days of audible bowel sounds in Group A (early feeding) was 1.57 ± 0.63 days while in Group B (delayed feeding) was 3.90 ± 0.76 days (*p*-value = 0.0001).

Conclusion: This research established that the outcome of early feeding is better than the outcome of delayed feeding after elective gut anastomosis.

Keywords: Audible Bowel Sounds, Early and Delayed Feeding, Elective Gut Anastomosis.

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Introduction

Bowel anastomosis is routine surgery in both planned and unplanned situations. The technique

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was used according to the site of anastomosis, gut caliber/condition, and background etiology. Anastomosis is mostly performed because of traumatic rupture, intestinal obstruction, and cancerous or non-cancerous perforation. Anastomosis is also performed in some planned situations, such as resection of malignancy of the gastrointestinal system. Usually after bowel surgery, patients are "NIL BY MOUTH" until recovery of gut movements.²

Persistent interruption in gut function (ileus) may lead to prolonged hospital admission, which in turn may result in increased hospital-acquired infections and respiratory complications.³ Cases with ileus after operation complain of pain, distention, and

vomiting. Subsequently, the extent of hospital stay is increased, leading to high costs.⁴ Postoperative ileus happens commonly after gut surgeries and is a major cause of preventing timely hospital release.² The aggravating causes comprise the nature of anesthetics, usage of narcotics, gut surgeries the nature of anesthetics, usage of narcotics, gut surgeries, and limit of gut handling.¹

Customary routines, including extended duration of time without taking any oral fluids before surgery, gut preparation, and start of intake by mouth 72 to 120 hours postoperatively is now discontinued. All customary practices have now been replaced by new guidelines labeled the Enhanced Recovery After Surgery pathway.³ Oral intake should be initiated on the same day of the procedure when permitted after the removal of the Nasogastric (NG) tube. With the start of enteral medications, the requirement of injectables longer than twelve to twenty-four hours is hardly required in an uncomplicated surgery. Patients can take sips of water immediately after surgery.⁴

Early vs late enteral nutrition is accompanied by reduced admission duration and is the reason for decreased complications.⁵ One study found that the mean duration required for audible bowel sound was significantly less with early feeding (1.08 ± 0.27 vs. 3.01 ± 0.6 days, $p=0.000$), passage of first flatus (1.32 ± 0.55 vs. 2.76 ± 0.87 days, $p=0.000$) and passage of first stool (2.28 ± 0.89 vs. 3.92 ± 0.90 , $p=0.000$) when compared to delayed feeding.⁶

The rationale of this clinical trial is to compare the consequences of timely feeding versus late feeding after planned gut anastomosis after elective surgery. Literature review showed that early feeding has a better outcome than delayed feeding outcomes than delayed feeding, which results in early healing and early discharge from the hospital. However, varied data has been retrieved from literature, which shows delayed feeding is associated with fewer complications. Moreover, there is very little local data available in the literature, which could help us to determine the beneficial role of early feeding. The rationale of this reading is to compare the consequences of timely feeding versus late feeding after planned gut anastomosis after elective surgery.

Methods

The study was conducted at the Department of Surgery, Combined Military Hospital (CMH), Rawalpindi, Pakistan from 11th May 2019 to 10th November 2019 after approval from the hospitals ethical review committee held on 15th April 2019 vide letter no: 408. Size of sample was taken having confidence level= 95% and alpha= 5% (two-sided) with power = 80%, power of test taking population mean as 1.084, test value of population means as 3.014 and pooled standard deviation as 0.435. Non-probability consecutive technique was used for sampling. Patients included all patients undergoing gut anastomosis. Age group 16 to 70 years. While patients with Chronic liver disease (ALT & AST>40IU, hepatitis C or B), Renal disease (creatinine>1.2mg/dl) or heart diseases (abnormal ECG), Diabetes mellitus (BSR>200mg/dl), Anemia (Hb<10g/dl), Using steroids and with previous history of gut obstruction. 60 cases were selected from wards of Department of Surgery, PEMH Hospital Rawalpindi. Documentations was also done. All surgeries were done by same surgical team with help of researcher under general anesthesia. Then cases were randomly divided in two groups by using lottery method. The reason of using lottery method is to blind the observers resulting in better outcomes of results. Furthermore, to enhance the reliability of effects of early feeding after gut anastomosis surgery study was conducted with randomized controlled trial. In group A, NG tube was removed within 6 to 24 hours of surgery and oral liquids (30ml/hr) was started, then fluids at the 2nd day tailed by semisolid food at 3rd day, then routine food at 4th day and finally discharge at the 5th day. In group B, NG tube was detached 3-5 days after the surgery when the NG tube output was <30-50cc daily. Then patients were followed-up in post-surgical wards for 48 hours. To elaborate the effect of age on gut motility patients were divided in two age groups. 16 – 40 years old patients and the ages between 41 – 70 years were analyzed separately. Patients were noted and inform the time when bowel sound audible, first flatus passed and first stool passed.

Statistical analysis of the data were performed using SPSS version 21. Mean and SD were analyzed for

continuous variable like age, duration required to bowel sound audible. Frequency and percentage were analyzed for gender and cause of anastomosis. Both groups were compared for outcome by using independent samples t-test. Data were stratified for age, gender and cause of anastomosis. *P*-value ≤ 0.05 was taken as significant.

Results

Age range in this research was from 16 to 70 years with mean age of 39.08 ± 15.36 years. The mean age of patients in group A was 40.23 ± 15.66 years and in group B was 37.93 ± 15.23 years. Most of the patients 31 (51.67%) were between 16 to 30 years of age as shown in Table 1.

Table 1: Age distribution for both groups (n=60)

Age (years)	Group A (n=30)		Group B (n=30)		Total (n=60)	
	No of patients	%	No of patients	%	No of patients	%age
16-40	15	50.0	16	53.33	31	51.67
41-70	15	50.0	14	46.67	29	48.33
Mean ± SD	40.23 ± 15.66		37.93 ± 15.23		39.08 ± 15.36	

Amongst the 60 patients, 36 (60.0%) were males, and 24 (40.0%) were females, with male to female ratio of 1.5:1. Percentage of patients for both groups

according to the cause of anastomosis is shown in Table 2.

The mean number of days of audible bowel sounds in

Table 2: Percentage of patients for both groups according to anastomosis (n=60)

Cause	Group A (n=30)		Group B (n=30)		Total (n=60)	
	No of patients	%	No of patients	%	No of patients	%
Ileostomy Reversal	19	63.33	19	63.33	38	63.33
Colostomy Reversal	09	30.0	08	26.67	17	28.33
Ileo - colostomy Reversal	02	6.67	03	10.0	05	8.33

Group A (early feeding) was 1.57 ± 0.63 days, while in Group B (delayed feeding) was 3.90 ± 0.76 days. Stratification of a number of days of audible bowel sounds in relation to age groups and gender are

displayed in Tables 3 and 4, respectively. Stratification of a number of days of audible bowel sounds with respect to the cause of anastomosis is shown in Table 5.

Table 3: Stratification of the number of days of audible bowel sounds age groups

Age of patients (years)	Group A (n=30)		Group B (n=30)	
	number of days of audible bowel sounds		number of days of audible bowel sounds	
	Mean	SD	Mean	SD
16-40	1.60	0.74	3.63	0.62
41-70	1.53	0.52	4.21	0.80

Table 4: Stratification of the number of days of audible bowel sounds gender

Gender	Group A (n=30)		Group B (n=30)	
	number of days of audible bowel sounds		number of days of audible bowel sounds	
	Mean	SD	Mean	SD
Male	1.56	0.62	3.78	0.73
Female	1.58	0.67	4.08	0.79

SD: Standard Deviation

Table 5: Duration of postoperative gut sounds to cause of anastomosis

Cause	Group A (n=30) number of days of audible bowel sounds		Group B (n=30) number of days of audible bowel sounds		P-value
	Mean	SD	Mean	SD	
Ileostomy Reversal	1.53	0.51	3.58	0.69	0.001
Colostomy Reversal	1.67	0.87	4.63	0.52	0.001
Ileo -colostomy Reversal	1.50	0.71	4.00	0.0	0.001

SD: Standard Deviation

Discussion

A suitable and satisfactory diet is the most demanding parameter after surgery. Though two major parameters are still to avoid after surgery, which are the frequent start of NG feed and avoidance of enteral diet, 7 latest guidelines suggest that an NG tube is not required after surgery.⁸⁻¹³ Besides that, enteral feed in. A large gut anastomosis is always preferable to avoid bloating and the start of early gut mobility, as a result of which ileus is avoided. A soft diet in small quantity is started. Afterwards, the nutrition is converted from liquid to semisolid, and ultimately, normal food is started. It has been followed in many hospitals. Usually natural diet is avoided until fourth to fifth day after surgery.¹⁴ In this regard, the very first research was done in 1979. In that research, Sagar started the normal diet right after the next day of surgery. He observed the requirement of less duration of admission in the medical centers and improvement of the digestive system.¹⁶ Afterwards, the introduction of video-assisted surgeries enforced the concept of the earlier start of enteral nutrition. This practice results in enteral feed to start early, in cases which were done with laparoscope specially the large gut surgeries and also results in improvement of digestive system. Later on, this concept was shifted to open gut surgeries, which also included large gut anastomosis surgeries. A lot of research has been under process, which will provide additional benefits, including a low rate of infection and fewer disease rates after gut surgeries.

Research done by Ng and Neill showed the effects of early feeding after surgeries, including open large gut surgery. In all these research works start of

enteral nutrition right after the first postoperative day showed better outcomes. Percentage of adverse effects was average 12.5%, which included leakage at the site of anastomosis, chest infection due to gut blockage resulting in regurgitation and aspiration of gastric contents. The percentage of satisfied enteral feeding was average 86%. Research also declared a decrease in the percentage of postoperative ileus due to the start of an enteral diet at an appropriate time and a reduction of the duration of hospital admission. All these researches changed the idea of delayed enteral feed postoperatively.¹⁷

In our research, the average extent of the duration of noticeable gut sounds in Group A (early feeding) was 1.57 ± 0.63 days, while in Group B (delayed feeding) was 3.90 ± 0.76 days (p -value = 0.0001). Another research showed average interval essential for noticeable gut sound was considerably fewer through timely start of diet (1.08 ± 0.27 vs. 3.01 ± 0.6 days, $p=0.000$), noticeable bloating after surgery (1.32 ± 0.55 vs. 2.76 ± 0.87 days, $p=0.000$) and noticeable stool after surgery (2.28 ± 0.89 vs. 3.92 ± 0.90 , $p=0.000$) in patients with early vs delayed start of oral intake.⁶

The results of a study conducted by Charoenkwan show the first noticeable bowel sound with the timely start enteral diet starts 12 hours earlier on average.¹⁸ Outcomes of a study by Ng and Neill showed benefits to bowel movements with the start of the timely enteral diet.¹⁹ Another research done by Ortiz showed the initial noticeable gut sound observed at an average of 4.3 days postoperatively as a result of timely initiation of enteral feed and 4.7 days postoperatively as a result of delayed oral intake. Contrarily, the outcomes of Sekhvat showed

fewer bowel sounds observed with the start of timely enteral nutrition.²⁰ Another study conducted by Seenu and Goel showed almost similar results with different percentages of the average number of days the bowel sounds were observed postoperatively with timely start of oral feed vs delayed initiation of enteral nutrition.²¹

In research done, Fanaie,²² showed no noticeable variance in the presence of gut sounds amongst two groups (0.5±0.6 vs. 0.5±0.5) days ($p=0.65$). The average duration of bloating in group A was (1.32±0.55) days, and in group B was (2.76±0.87) days, correspondingly, with the value of $p=0.000$. The average duration of the passageway of stool was (2.28±0.89) days in group A and (3.92±0.90) days in group B ($p=0.000$). A research by Tito et al. revealed a noticeably reduced average duration of admission in timely initiation of enteral diet (2.5+1.7) days vs. average admission duration in late initiation of the enteral diet of (9.93+2.60) days (p -value=0.001).²³

The main purpose of conducting this study is to avoid prolonged NG tube placement after gut anastomosis surgery. Early removal of the NG tube and the start of oral feeding can not only reduce the patient's discomfort but also increase the chances of early recovery and discharge from the hospital.

Timely initiation of the enteral diet reduces the chances of decreased gut mobility by activating the nervous pathway, which results in the production and excretion of digestive chemicals and movements of the bowel, thus decreasing the incidence of bowel movement abnormality; 24 timely initiation of enteral diet also affects general condition and stability of the patient.²⁵ it also results in a shorter duration of hospital stay, which ultimately reduces the chances of hospital-acquired infections.

Conclusion

This research concluded that the outcome of early feeding is better than the outcome of delayed feeding after elective gut anastomosis. So, we recommend that early feeding be preferred after elective gut anastomosis because it might contribute to the early return of gut motility.

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Authors Contribution

GJ: Idea conception, study designing, data analysis, results and interpretation, manuscript writing and proof reading

MSA: Data collection, data analysis, results and interpretation, manuscript writing and proof reading

ASM: Idea conception, study designing, data analysis, results and interpretation

SA: Study designing, data collection

FSM: Data collection, manuscript writing and proof reading

MTK: Data collection, data analysis, results and interpretation, manuscript writing and proof reading

ZS: Data collection, data analysis, results and interpretation, manuscript writing and proof reading