

Early Enteral Feeding Versus nil by Mouth after Intestinal Resection and Anastomosis: A Study of 60 Cases

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Abstract

Background: As per routine protocol, patients operated for resection and anastomosis of intestine, are kept nil by mouth till intestine starts functioning. But evidence from clinical studies and animal experiments suggests that initiating enteral feeding early is beneficial to patient. The study was performed to compare standard nil by mouth versus early start of enteral feeding following intestinal resection and anastomosis.

Objectives: This study was conducted to compare the feasibility, safety and efficacy of early enteral feeding versus nil by mouth (delayed enteral feeding) after elective intestinal resection and anastomosis and emergency traumatic intestinal perforation repair with resection and anastomosis.

Methods: The comparative study includes 60 cases of intestinal resection and anastomosis, operated at tertiary care hospital, during year 2010 to 2012, from which randomly 30 patients were selected for conventional nil by mouth approach and rest of 30 patients were given early enteral feeding within 1st 24 hours post operatively.

Results: In the study most common age group, who undergone surgery in both case and control groups was between 21-30 years with male predominance in both groups. Most common surgery performed was ileostomy closure in both groups. Case group had statistically significant low rate of wound infection, paralytic ileus and post operative pain with less hospital stay. No significant difference in incidence of anastomotic dehiscence, intra abdominal abscess or pneumonia was found.

Conclusion: Compare to conventional nil by mouth approach, early enteral feeding significantly reduces the incidence of wound infection, paralytic ileus and pain in post operative patients of resection and anastomosis of intestine, thereby reducing length of hospital stay, which suggest that early enteral feeding is safe, effective and feasible in post operative patients of resection and anastomosis of intestine.

Key words: Enteral feeding, Ileostomy, Intestines, Paralytic Ileus, Postoperative Pain, Surgical Anastomosis, Wound Infection

INTRODUCTION

Resection and anastomosis is often done in malnourished patients¹⁻³ and in severe cases, is known to increase the post operative morbidity.⁴ Additionally these surgical patients are subjected to post operative stress and hypercatabolic state;

hence these patients require some form of early nutrition, enteral or TPN. Routinely after intestinal resection and anastomosis for various reasons nil by mouth is advised and oral/enteral feeding is started after the passage of flatus and appearance of bowel sounds. Idea behind nil by mouth is to prevent post operative nausea and vomiting and to protect the anastomosis.

Post operative dysmotility mainly affects stomach and colon but small intestine recovers within 4-8 hours after surgery.⁵ Hence feeding within first 24 hours after surgery is very well tolerated.^{6,7} Contrary to widespread opinion, evidence from clinical studies and animal experiments suggests that initiating feeding early is advantageous. In animals,

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starvation reduces the collagen content in anastomotic scar tissue^{8,9} and diminishes the quality of healing,^{9,10} whereas feeding reverses mucosal atrophy induced by starvation¹¹ and increases anastomotic collagen deposition and strength.¹² Experimental data in both animals and humans suggest that enteral nutrition is associated with an improvement in wound healing¹³ Finally, early enteral feeding may reduce septic morbidity. Based on these findings present study is designed.

METHODOLOGY

This prospective randomized comparative study was carried out at tertiary care hospital for a duration of 2 years ranging from 2010 till 2012. A total of 60 patients of intestinal resection & anastomosis were included in the study. From these, 30 patients were randomly offered conventional nil by mouth approach and other 30 patients were selected randomly for early enteral feeding within 1st 24 hours postoperatively after taking their written informed consent. Approval from the local ethical committee was obtained regarding the study.

Inclusion and Exclusion Criteria

Patients were selected preoperatively from age group between 1-70 years. Patients of both sex were included in both group randomly. All elective small and large intestinal resection and anastomosis were included. All ileostomy or colostomy closure, in which more than half of the circumferential luminal defect present, were included in our study. Emergency traumatic intestinal perforation presented within 1st 24 hrs were included. Preoperatively blood transfusion was given to patients of both case and control groups before elective resection and anastomosis of intestine, if Hb was <10 gm%. Blood sugar and blood pressure level were kept within normal limit with the help of insulin and antihypertensive drugs before operation and continue in post op period. Preoperative prophylactic antibiotic, injection ceftriaxone (dose according to weight) was given 45 minutes before surgery.

Post operatively 30 patients were offered Ryle's tube blockade and enteral feeding within first 24 hours, starting with sips of water as decided pre operatively in randomly selected patients. Ryle's tube was taken out as patients tolerate liquids in first 24 hours. Other 30 patients were kept nil by mouth until the passage of flatus and appearance of active bowel sounds. The outcomes were compared in the terms of post operative pain, paralytic ileus, anastomotic dehiscence, wound infection, pneumonia and intra abdominal abscess, length of hospital stay after operation.

OBSERVATION AND RESULTS

- Case group was designed as patients kept in early enteral feeding group and control group was designed as patients kept in nil by mouth group.
- In this study of 60 patients, most common age group in case and control group was 21-30 years and there were 9(30%) in case group and 10(33.3%) in control group(Table 1).
- In this study of 60 patients, there were 17(56.7%) male in case group and 25(83.3%) male in control group. There were 13(43.3%) female in case group and 05(16.7%) females in control group(Table 2).
- In this study of 60 patients, most commonly performed procedure in case (14 patients) group and control (13 patients) group was Ileostomy closure(Table 3).
- In this study of 60 patients, only 1 patient had intra abdominal abscess, 1 patient had wound infection, 1 patient had vomiting and 2 patients had paralytic ileus in case group. While in control group, 2 patients had anastomotic dehiscence, 7 had wound infection, 2 had pneumonia, 2 had intra abdominal abscess, 2 had vomiting and 8 had paralytic ileus(Table 4).

Table 1: Age distribution

Category	Number		Percentage	
	Case	Control	Case	Control
Age (years)				
0-10	01	00	3.3	00
11-20	03	05	10	16.6
21-30	09	10	30	33.3
31-40	06	05	20	16.7
41-50	05	06	16.7	20
51-60	02	02	6.7	6.7
61-70	04	02	13.3	6.7
Total	30	30	100	100

Table 2: Sex distribution

Category	Number		Percentage	
	Case	Control	Case	Control
Sex				
Male	17	25	56.7	83.3
Female	13	05	43.3	16.7
Total	30	30	100	100

Table 3: Procedures

Category	Number		Percentage	
	Case	Control	Case	Control
Procedures				
Right hemicolectomy	05	01	16.7	3.3
Left hemicolectomy	00	01	00	3.3
IA anastomosis	02	02	6.7	6.7
DJ anastomosis	00	01	00	3.3
JJ anastomosis	03	01	10	3.3
II anastomosis	01	02	3.3	6.7
Ileostomy closure	14	13	46.7	43.3
Colostomy closure	05	09	16.7	30

- Visual analogue score was 3 in most of the patients of case group and 5 in most of the patients of control group on 2nd post operative day. VAS was 1 and 2 in case and control group, respectively in most of the patients on 4th post operative day. VAS was 1 in both case and control groups in most of the patients on 6th post operative day. VAS was 0 in both case and control groups in most of the patients on 7th post operative day (Table 5).
- In this study of 60 patients, most of the patients (28 patients) discharged on 7th post op day in case group. While 17 patients discharged on 7th post op day, 6 on 10th post op day, 2 on 12th post op day, 5 on 14th post op day (Table 6).

Table 4: Complications

Category	Number		Percentage	
	Case	Control	Case	Control
Anastomotic dehiscence	00	02	03.3	06.7
Wound infection	01	07	03.3	23.3
Pneumonia	00	02	00	06.7
Intra-abdominal abscess	01	02	00	06.6
Vomiting	01	02	03.3	06.7
Paralytic ileus	02	08	06.7	26.6

Table 5: Post-operative pain

Visual analogue pain score	Post-operative day													
	Case							Control						
Days→	1	2	3	4	5	6	7	1	2	3	4	5	6	7
Score↓														
0	00	00	00	00	02	08	28	00	00	00	00	00	03	20
1	00	00	02	18	23	19	02	00	00	00	03	16	17	03
2	00	01	15	06	03	02	00	00	00	00	04	14	05	08
3	00	14	10	04	02	01	00	00	07	16	06	09	02	00
4	08	12	03	02	00	00	00	01	09	07	07	00	00	00
5	20	02	00	00	00	00	00	13	14	03	00	00	00	00
6	02	01	00	00	00	00	00	16	00	00	00	00	00	00
7	00	00	00	00	00	00	00	00	00	00	00	00	00	00
8	00	00	00	00	00	00	00	00	00	00	00	00	00	00
9	00	00	00	00	00	00	00	00	00	00	00	00	00	00
10	00	00	00	00	00	00	00	00	00	00	00	00	00	00

Table 6: Length of hospital stay

Category	Numbers		Percentage	
	Case	Control	Case	Control
Length of hospital stay (days)				
7	28	17	93.3	56.7
8	00	00	00	00
9	00	00	00	00
10	01	06	3.3	20
11	00	00	00	00
12	00	02	00	6.7
13	00	00	00	00
14	01	05	00	16.7

DISCUSSION

In this study, we included benign and malignant etiologies for resection and anastomosis of small and large intestines. And the most common procedure done was ileostomy closure. Ileostomies were done primarily after ileal perforation, which were common in young aged male patients. Reported animal experiments indicated that tissue defenses against infection were established within 1 to 3 hours after bacterial inoculation and that factors influencing the wound response to such a challenge were virtually inoperative after that time. This information laid the groundwork for use of systemic agents during the perioperative time.^{14,15}

Gastrointestinal surgery is often undertaken in patients who are malnourished⁴⁻⁶ which in severe cases is known to increase morbidity.⁷ As previously mentioned systemic and local factors may affect the outcomes after resection and anastomosis of intestine.¹⁶ In animals, starvation reduces the collagen content in anastomotic scar tissue^{8,9} and diminishes the quality of healing^{9,10}, whereas feeding reverses mucosal atrophy induced by starvation¹¹ and increases anastomotic collagen deposition and strength.¹² Experimental data in both animals and humans suggest that enteral nutrition is associated with an improvement in wound healing. Anastomotic dehiscence is the most dreadful complication after intestinal resection and anastomosis. In this study, no patient had anastomotic dehiscence in case group and 2 patients (6.7%) had anastomotic dehiscence in control group. P value was 0.150, which is insignificant. In Reissman et al study,¹⁷ 2.5% patients had anastomotic dehiscence in case group and 3.75% had anastomotic dehiscence in control group. P value was >0.05, which is also insignificant.

Wound infection is common complication after resection & anastomosis of bowel, but its incidence has decreased after invention of novel antibiotics. In this study, 1 patient (3.3%) had wound infection in case group, which was due to intra abdominal abscess after proximal perforation in meckel's diverticulum resection and anastomosis and no patient had wound infection in stoma closure and 7 patients (23.3%) had in control group, 6 patients had wound infection after stoma closure and 1 patient had wound infection after ileoileal anastomosis for koch's ileal stricture. P value was 0.023. Data of this study was suggestive that early enteral feeding decreased wound infection rate with statistical significance.

The incidence of post operative respiratory infection was found to be elevated in advanced age group, pre existing poor chest condition, immune-compromised patients or as a consequences of anastomotic dehiscence. No patient

had pneumonia in our case group and 2 patients had post operative respiratory infection in control group. Of these 2 patients, 1 patient had advanced age with pre existing respiratory infection which recovered with antibiotic and oxygen support and another patient developed pneumonia related to anastomotic dehiscence. P value was 0.150. No statistical significance found between case and control group.

Intra abdominal abscess occurs frequently as a consequence of anastomotic dehiscence, proximal perforation due to obstruction or inadequate peritoneal lavage. Only 1 patient (3.3%) had intra abdominal abscess, which was due to proximal perforation due to anastomotic obstruction and treated by re exploration and resection of ileal perforation and previous anastomosis with ileoileal anastomosis. 2 patients had intra abdominal abscess in control group, both due to anastomotic dehiscence and both died. P value was 0.554. No statistical significance was found between case and control group.

Livingston and Passaro¹⁸ define ileus as the functional inhibition of propulsive bowel activity, irrespective of pathologic mechanism. Many factors are believed to contribute to paralytic ileus, including intra operative bowel manipulation, anesthetic agents, peri operative use of narcotics and post operative sympathetic hyperactivity and electrolyte imbalance. Early enteral feeding induces bowel motility. In this study, 2 patients (6.7%) had paralytic ileus in case group and 8 patients (26.6%) had paralytic ileus in control group, all of which were managed conservatively. P value was 0.038. Data suggested that early enteral feeding was found to decrease incidence of paralytic ileus.

In this study, most of the patients (93.3%) were discharged on the 7th postoperative day in case group, as patients had increased well being and less post operative complications. While in control group, 17 patients (56.7%) were discharged on 7th postoperative day, 6 patients (20%) were discharged on 10th postoperative day, 2 patients (6.7%) were discharged on 12th postoperative day, 5 patients (16.7%) were discharged on 14th postoperative day, because of increased complication rate. P value was <0.05 (significant) according to Levene's T test, which indicates early enteral feeding significantly decreased length of hospital stay after operation. In this study, pain was scored according to "Visual Analogue Scale" from post op day 1 to 7. According to Mann Whitney test, P value was <0.05 from post op day 1 to 7, which indicates early enteral feeding also reduced patient's post operative pain level, which may be due to improved general well being of patients pain perception is less in case group compared to nil by mouth, control group.

CONCLUSION

From present study, it can be concluded that, early enteral feeding significantly reduces the incidence of wound infection, paralytic ileus and pain in post operative patients of resection and anastomosis of intestine. No significant increase the incidence of anastomotic dehiscence, intra abdominal abscess, or pneumonia was found in patients put on early enteral feeding after resection and anastomosis of intestine, as the sample size was small.

Post operatively 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 intestine due to less post operative pain, less complications and improvement in general well being.

No significant change in incidence of anastomotic dehiscence, intra abdominal abscess or pneumonia was found in patients put on early enteral feeding after resection and anastomosis of intestine, as the sample size was small.

So, early enteral feeding is safe, effective and feasible in post operative patients of resection and anastomosis of small and large intestine but further studies are needed with large sample size to support the above findings and to calculate frequency, type and amount of feed to be given early post-operatively.

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