

# Tolerability and Outcome of Early Oral Feeding in Elective Open and Laparoscopic Abdominal Surgery.

Y. Tej Kumar<sup>1</sup>, Narendranath Swain<sup>1</sup>, Nembian Raja Rajan<sup>2</sup>, Manindra Nayak<sup>2</sup>, Arabinda Puhan<sup>2</sup>

<sup>1</sup>Associate Professor, Department of Surgery, SCB Medical College, Cuttack, Odisha, India.

<sup>2</sup>Junior Resident, Department of Surgery, SCB Medical College, Cuttack, Odisha, India.

Received: July 2018

Accepted: July 2018

**Copyright:** © the author(s), publisher. It is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

## ABSTRACT

**Background:** To study the effects of early enteral feeding in postoperative patients who have undergone elective abdominal surgeries by both open and laparoscopic method. **Methods:** Nasogastric tube was removed after patients recovered from anesthesia. Patients were started on a clear fluid diet, 30ml/hour at 24th hour, then 60ml/hour in the next 12 hours and full fluid diet within 48 hours, then semi-solid diet over next 24 hours. Patient who don't tolerate oral diet, nasogastric tube was reinserted and managed with nil by mouth till the ileus was resolved. Patients were discharged only after they tolerated solid diet for at least 24 hours in intestinal groups and 12 hours in non-intestinal groups. Length of hospitalization or hospital stay was measured in terms of post-operative stay. **Results:** A total of 100 patients were selected for the study. Under both open (n=56) and laparoscopic surgery group (n=44), patients were categorized into those who underwent intestinal surgeries and those who underwent non-intestinal surgeries. Among open intestinal surgery group, total number of patients were (n=27) and among open non-intestinal surgery group, total number of patients were (n=29). Similarly, among laparoscopic intestinal surgery group, total number of patients were (n=10) and non-intestinal group, total number of patients were (n=34). The most common complication among all the groups was vomiting, 23% in open surgery group and 20% in laparoscopic surgery group. The incidence of nasogastric tube reinsertion among open surgery group was more (29%), among laparoscopic group was 25%. Among open surgery group, 71% patients who had complications, passed first stools within 5 days after operation whereas among laparoscopic surgery group, 73% patients with complications passed first stools within 3 days after surgery, signifying reduced duration of postoperative ileus with early oral feeding. 62% and 66% patients tolerated early oral feeding among open surgery group and laparoscopic surgery group respectively. The rate of early discharges were 77% for open intestinal surgery group patients and 83% for open non-intestinal surgery group patients. Similarly, the rate of early discharges were 80% among laparoscopic intestinal surgery group patients and 85% for laparoscopic non-intestinal surgery group patients. **Conclusion:** The result of this study suggests that early oral feeding is well tolerated and there is no merit in continuing to keep patients nil by mouth until bowel function is resumed. This study also shows that early oral feeding reduces the length of hospitalization. Significant percentage of patients in both groups had early resolution of bowel function and time to discharge was early. Furthermore, the duration of postoperative ileus was reduced in patients of both groups which led to early discharge. Thus in patients undergoing elective abdominal surgeries, both open and laparoscopic method, early postoperative feeding is well tolerated and reduces the length of hospitalization.

**Keywords:** Laparoscopy, Oral Feeding.

## INTRODUCTION

Adequate nutrition has always been a major problem of postoperative care. However, because of ileus, early oral feeding after abdominal surgery is usually avoided and routine nasogastric decompression has been used. More recent studies showed that the routine use of nasogastric tube after elective abdominal surgery may not be necessary. Regardless of the use of a nasogastric tube, oral feeding has

popularity of laparoscopic surgery, several authors showed that early feeding after laparoscopic colectomy is safe and tolerated by the majority of patients. Other studies clearly showed the advantages of early enteral nutrition in surgical patients in reducing septic complications and overall morbidity when compared with parenteral nutrition. Starting oral feeding within 24 hours has also been shown to increase patient compliance to decrease septic postoperative complication and to reduce septic hospital stay.

A clear rationale for withholding oral diet after elective bowel surgeries is lacking and contrary to widespread belief, evidence from clinical studies and animal experiments suggests that initial early feeding is advantageous, hence evaluation of tolerability and outcomes of early enteral feeding was planned.

### Name & Address of Corresponding Author

Dr. Narendranath Swain,  
Associate Professor,  
Department of Surgery,  
SCB Medical College,  
Cuttack, Odisha, India.

been delayed until after the resolution of postoperative ileus. Recently, with the increased

**Aim of the Study**

The aim of this study was to compare and evaluate the tolerability and outcome of early oral feeding in patients undergoing elective abdominal surgeries, both open and laparoscopic method. A total of 100 patients were selected for the study. Under both open (n=56) and laparoscopic surgery group (n=44).

**MATERIALS AND METHODS**

The method of early enteral or oral feeding was started as elaborated below. Nasogastric tube was removed after patients recovered from anesthesia.

Patients were started on a clear fluid diet 30ml/hour at 24thhour, this was advanced to 60ml/hour in the next 12 hours and to full fluid diet within 48 hours, to semi-solid diet over next 24 hours. Inpatients who did not tolerate early oral feeds, nasogastric tube was reinserted and managed subsequently with nil by mouth till the ileus was resolved.

Post-operative analgesia was maintained using nonopioids.

Resolution of post-operative ileus was defined as having normal bowel sounds along with passing of flatus or stools.

Sepsis was classified as patients having fever, surgical site infection, anastomotic leak, peritoneal contamination, respiratory infection and urinary tract infection.

Patients were discharged only after they tolerated solid diet for at least 24 hours in intestinal groups and 12 hours in non-intestinal groups in the absence of other factors prohibiting discharge eg: fever, wound infection, anastomotic leak etc.

Tolerability was defined as absence of vomiting and abdominal distension after oral feeds.

Length of hospitalization or hospital stay was measured in terms of post-operative stay.

**Criteria for early and delayed discharge**

Among open surgery group, less than 5 to 10 days of hospital stay (depending on surgery) were categorized early discharge and those more than 10 days, delayed discharge.

Among laparoscopic group, less than 5 days of hospital stay was categorized early discharge and those more than 5 days, delayed discharge.

Time to first stool passage was said to be early if, less than 5 days for open surgery group and less than 3 days for laparoscopic surgery group.

**RESULTS****Table 1: Method of surgery among the study group**

Open	56 (56%)
Laparoscopic	44 (44%)

Above table and chart shows 56% patients underwent elective open abdominal surgery and 44% patients underwent elective laparoscopic abdominal method of surgery.

Patients were categorized into those who underwent intestinal surgeries and those who underwent non-intestinal surgeries. Among open intestinal surgery group, total number of patients were (n=27) and among open non-intestinal surgery group, total number of patients were (n=29). Similarly, among laparoscopic intestinal surgery group, total number of patients were (n=10) and non-intestinal group, total number of patients were (n=34).

**Table 2: Nature of surgery among the study group**

	Non-intestinal	Intestinal
Open	29 (52%)	27 (48%)
Laparoscopy	34 (77%)	10 (23%)

Above tables and charts show, 52% patients underwent non-intestinal surgeries and 48% patients underwent intestinal surgeries.

Among laparoscopic group, 77% patients underwent non-intestinal surgeries and 23% patients underwent intestinal surgeries.

All patients had their nasogastric tube removed after recovering from anesthesia and started on a clear fluid diet 30ml/hour at 24thhour, this was advanced to 60ml/hour in the next 12 hours and to full fluid diet within 48 hours, to semi-solid diet over next 24 hours. In patients who did not tolerate early oral feeding, nasogastric tube was reinserted and managed subsequently with nil by mouth

**Table 3: Distribution of outcomes in open surgery group (Intestinal and Non-intestinal)**

	Intestinal	Non-Intestinal
Vomiting	6 (22%)	7 (24%)
Abdomen distension	4 (15%)	2 (7%)
Re-insertion of nasogastric tube	5 (19%)	3 (10%)
Sepsis	4 (15%)	2 (7%)
Death	1 (4%)	0

[Table 3] describes the complications in open surgery group, among intestinal and non-intestinal surgeries respectively. Among both intestinal and non-intestinal surgery group, the most common complication was vomiting (22% & 24% respectively). Abdomen distension was 15% and 7% respectively in intestinal and non-intestinal group. Incidence of nasogastric tube reinsertion among intestinal and non-intestinal group were 19% and 10% respectively.

[Table 4] shows the complication rates in laparoscopic surgery group, among intestinal and non-intestinal surgeries respectively. Vomiting was the most common complication among both intestinal and non-intestinal group (30% and 18% respectively). Abdomen distension was 10% and 15% respectively in intestinal and non-intestinal group. Incidence of nasogastric tube reinsertion was also 10% and 15% respectively.

**Table 4: Distribution of outcomes in laparoscopic group (Intestinal & Non-intestinal)**

	Intestinal	Non-Intestinal
Vomiting	3 (30%)	6 (18%)
Abdomen distension	1 (10%)	5 (15%)
Nasogastric tube re-insertion	1 (10%)	5 (15%)
Sepsis	0	0
Death	0	0

The rate of early discharges were 77% for open intestinal surgery group patients and 83% for open non-intestinal surgery group patients. Similarly, the rate of early discharges were 80% among laparoscopic intestinal surgery group patients and 85% for laparoscopic non-intestinal surgery group patients.

**Table 5: Early and delayed discharge distribution among open surgery group**

	Early	Delayed
Intestinal	20 (77%)	6 (23%)
Non-intestinal	24 (83%)	5 (17%)

Above table and chart show the distribution of early and delayed discharge among open surgery group, both intestinal and non-intestinal group. Among intestinal group, 77% patients had early discharge and only 23% patients had delayed discharge. Among non-intestinal group, 83% patients had early discharge and only 17% patients had delayed discharge.

**Table 6: Early and delayed discharge among laparoscopic group**

	Early	Delayed
Intestinal	8 (80%)	2 (20%)
Non-intestinal	29 (85%)	5 (15%)

Above table and charts show early and delayed discharge among laparoscopic group, both intestinal and non-intestinal group. Among intestinal group, 80% patients had early discharge and only 20% patients discharge was delayed. Among non-intestinal group, 85% patients had early discharge and only 15% patients had delayed discharge.

This study had shown that early oral feeding was well tolerated and also reduced the length of hospitalization.

## DISCUSSION

Historically, the postoperative management of patients undergoing bowel surgery has involved the use of nasogastric tube and avoidance of oral intake of nutrients until resolution of postoperative ileus. Recently this approach has been increasingly questioned and intensive efforts have been made to obtain relevant clinical evidence. Today studies have shown that nasogastric tube insertion has a limited role in postoperative care for abdominal surgery.<sup>[1-4]</sup> Recent evidences suggest that adequate oral intake has a strengthening effect on intestinal anastomoses and does not lead to anastomotic complications.<sup>[5]</sup>

Systematic review and meta-analysis of randomized controlled trials comparing early oral feeding with nil by mouth after gastrointestinal surgeries has shown that vomiting ( $p=0.046$ ) has been more in patients who were fed early but other complications like anastomotic leak, wound infection, pneumonia and mortality were comparable between the groups.<sup>[6]</sup> In the present study also, vomiting had been the most common complication in the open surgery group, among both intestinal and non-intestinal groups (22% & 24%) respectively. Incidence of abdomen distension was 15% and 7% in the open surgery group, intestinal and non-intestinal group. Incidence of sepsis was only 15% and 7% among intestinal and non-intestinal group respectively. There was mortality of 4% among intestinal group and non-intestinal group having no incidence of mortality in the study.

The reasons for which surgeons use nasogastric intubation is to prevent gastric dilatation, to treat postoperative paralytic ileus and to decrease tension on intestinal anastomosis. Han-Guerts et al reported the removal of nasogastric tubes directly after elective abdominal surgery in all cases, they concluded that patients were able to judge their own food tolerance adequately. In the present study, the incidence of nasogastric tube reinsertion in patients who underwent open surgery was 19% and 10% among intestinal and non-intestinal group respectively. 62% patients in the open surgery group tolerated early oral feeding and only 38% did not tolerate and had above mentioned complications.

It was suggested that early resumption of an oral diet diminishes the duration of ileus.<sup>[7]</sup> In the present study among open surgery group, early enteral feeding was started on the day after the operation without the evidence of bowel motility and most of the patients tolerated (62%) the early feeding schedule. 71% patients with complications passed first stool within 5 days after the operation and only 29% patients passed first stools after 5 days. This signified that duration of ileus was reduced by early feeding schedule in the present study.

Early oral feeding has been shown to shorten the postoperative hospital stay in some trials following gastrointestinal surgery.<sup>[8]</sup> However, in some studies following colorectal operations, the elimination of nasogastric tubes and early oral feeding have failed to show any association with a shorter length of hospital stay.<sup>[9]</sup> A shorter hospital stay is a potential advantage of early postoperative feeding and this feature was demonstrated in the present study. Because early feeding significantly shortens the length of ileus, it also significantly shortens the length of hospitalization. In the present study, among open surgery group, 77% patients who underwent intestinal surgery had early discharge and only 13% had delayed discharge from the hospital. Similarly, in patients who underwent open non-intestinal

surgery, 83% patients had early discharge and only 17% patients had delayed discharge.

L. Burden et al, in their study 'Rapid rehabilitation in elderly patients after laparoscopic colonic resection demonstrated considerable improved recovery after combining laparoscopic surgery with a multimodal rehabilitation protocol of pain relief, early mobilization and oral nutrition.<sup>[11]</sup> Studies have shown that early oral feeding after laparoscopic bowel surgery was safe and tolerated by majority of patients.<sup>[10]</sup> Basse et al in their study analysed that patients who received multimodal treatment had significantly earlier defecation and shorter hospital stay than who received conventional care.<sup>[12]</sup> In the present study, 66% patients who underwent laparoscopic surgery tolerated early oral feeding and only 34% patients did not tolerate early oral feeding. Vomiting was the most common complication among both intestinal and non-intestinal group (30% and 18% respectively). The incidence of abdomen distension was 10% and 15% respectively in intestinal and non-intestinal group. Only 10% and 15% required nasogastric tube reinsertion among intestinal and non-intestinal group respectively. There was no sepsis or death in both groups. 73% patients with complications passed first stool within 3 days after operation and only 27% patients passed first stools after 3 days. 80% Patients who underwent laparoscopic intestinal surgery had early discharge and only 20% had delayed discharge. Similarly, 85% patients who underwent non-intestinal surgery had early discharge and only 15% patients had delayed discharge.

Although the components of ERAS (Enhanced Recovery after Surgery) protocol and preoperative nutrition were not implemented in our study, reduction in the postoperative stay was demonstrated. In the present study, patients undergoing resection anastomosis as well as those having stoma closure were included. This might bias the results as complications differ in those undergoing anastomosis and those undergoing stoma closure. Similarly the complications differ among the various laparoscopic surgical procedures involving bowel and those involving non-intestinal surgery. Trials including only respective patients eg: patients with only anastomosis or patients with only laparoscopic bowel surgery can overcome the limitation of this study.

## CONCLUSION

The goal of this study was to evaluate the tolerability and outcome of early enteral feeding after elective abdominal surgeries. The result of this study suggests that early oral feeding is well tolerated and there is no merit in continuing to keep patients nil by mouth until bowel function is resumed. This study also shows that early oral feeding reduces the length of hospitalization. Significant percentage of patients

in both groups had early resolution of bowel function and time to discharge was early. Furthermore, the duration of postoperative ileus was reduced in patients of both groups which led to early discharge. Thus in patients undergoing elective abdominal surgeries, both open and laparoscopic method, early postoperative feeding is well tolerated and reduces the length of hospitalization.

## REFERENCES

1. Ganong's review of physiology, chapter 28, Gastrointestinal physiology, clinical box 28-3.
2. Schwartz principle of surgery, Ileus and related disorders, 2368-2380.
3. Charoenkwan K, Phillipson G, Vutyavanich T: Early versus delayed oral fluids and food for reducing complication after major abdominal gynecological surgery. Cochrane Database Syst Rev 4:CD004508, 2007.
4. Gendall KA, Kennedy RR, Watson AJ, et al: The effect of epidural analgesia on postoperative outcome after colorectal surgery. *Colorectal Dis* 9:584, 2007. [PMID: 17506795]
5. Nelson R, Tse B, Edwards S. Systematic review of prophylactic nasogastric decompression after abdominal operations. *Br. J. Surg.* 2005 Jun; 92 (6):673-80.
6. Hoover HC, Ryan JA, Anderson EJ, et al. Nutritional benefits of immediate postoperative jejunal feeding of an elemental diet. *Am J Surg* 1980; 139:153-159.
7. Article on early enteral feeding after upper digestive tract surgeries and clinical assessment of post-operative ileus, *Biosci. J., Uberlândia, v. 24, n. 4, p. 100-107 Oct./Dec. 200*
8. DiFronzo La, Yamin N, Patel K, O'Connell TYX. Benefits of early feeding and early hospital discharge in elderly patients undergoing open colon resection. *J. Am. Coll. Surg.* 2003 Nov; 197(5):747-52.
9. Sagar S, Harland P, Shields R. Early postoperative feeding with elemental diet. *British Medical Journal* 1979 (3); 1:293-5.
10. Basse L, Raskov HH, Hjort Jakobsen D, Sonne E, Billesbole P et al. Accelerated postoperative recovery programme after colonic resection improves physical performance, pulmonary function and body composition. *Br. J. Surg.* 2002 Apr; 89(4):446-53.
11. Burden S et al. Pre-operative nutrition support in patients undergoing gastrointestinal surgery. *Cochrane Database Syst. Rev.* 2012 Nov 14.
12. Rohatiner T, Wend J, Rhodes S, Murrell Z, Berel D, Fleshner P. A prospective single-institution evaluation of current practices of early postoperative feeding after elective intestinal surgery. *Am. Surg.* 2012 Oct; 78(10):1147-50.

**How to cite this article:** Kumar YT, Swain N, Rajan NR, Nayak M, Puhan A. Tolerability and Outcome of Early Oral Feeding in Elective Open and Laparoscopic Abdominal Surgery. *Ann. Int. Med. Den. Res.* 2018; 4(5):SG09-SG12.

**Source of Support:** Nil, **Conflict of Interest:** None declared