



Early Enteral Feeding in Gastrointestinal Surgery

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Abstract

Traditionally, after abdominal surgery, the passage of flatus, or bowel movement was the clinical evidence for starting an oral diet. Studies were undertaken to evaluate whether different abdominal surgeries could benefit from early feeding. So a study was carried out prospectively to analyze the benefits and clinical outcome of 46 patients who received early enteral feeding following GI surgery. A nasogastric feeding tube placed by the surgeon beyond the pylorus through which continuous infusion of peptide-based diet was administered. NG feeds were started 4 to 6 hours following surgery and increased at a rate of 50 mL/hour on the postoperative day - Three. Feeds were given either distal or proximal to their anastomosis. 46 patients met the exclusion and inclusion criteria were included in the study. Enteral feeding was well tolerated by the patients with less side effects, in some case nausea and vomiting is present which is being the most frequent. 48 hours after surgery oral feeding was started. There is faster recovery of bowel function due to early enteral feeding. Enteral feeding also leads to a decreased hospital stay.

Keywords: feeding tube, elemental diet, gastrointestinal surgery, enteral nutrition.

Introduction

Early enteral feeding is superior than total parenteral nutrition (TPN) for various reasons such as preserves gut immunity, motility, TPN catheter associated infections, route for access is very easy. Between 30% and 50% of hospitalized patients are malnourished because of lack of good

nutritious feed. Lack of feeding result in diminished wound healing, predisposition to infection, and increased postoperative morbidity. Although most healthy individuals can tolerate up to 7 days of starvation (with adequate glucose and fluid replacement), those subjected to major trauma, and the physiologic stress of surgery,

sepsis, or cancer-related. cachexia require nutritional intervention much sooner.¹⁻² In this study we evaluated the benefits and role of early enteral feeding in gastrointestinal (GI) surgery patients.

Materials and Methods

A study was carried out in a prospective manner in patients following GI surgery with intestinal anastomoses, from July 2018 to August 2020 in Rajah Muthiah Medical College and Hospital, Chidambaram. Patients without purulent peritonitis, with pathology of non-traumatic etiology and who maintained at least 1.5 metre of small bowel were included. After the surgery the operating surgeon inserted a 10-Fr nasointestinal feeding tube distal to the pylorus. After 4 to 6 hours of surgery, continuous infusion of an elemental peptide-based diet at a rate of 20 ml/hour for the first 24 hours, then increased to 40 ml/h during the second day, and 60 ml/h during the third day and following days as needed for a total volume of 1500 ml/day. If audible bowel sounds were present oral feeding was started and there was no evidence of nausea, vomiting or abdominal distention. The patients were given intravenous fluids upto 2500 ml/d. Additional losses through tubes and drains were replaced as needed.

The antibiotics were given to all the patients prophylactically and therapeutically. A written informed consent form was obtained. The parameters studied were nausea, vomiting, abdominal distention, diarrhea and complications like intra-abdominal abscess, wound infection, intestinal suture leak, peritonitis and pneumonia. Also day of nasointestinal feeding tube removal, length of hospital stay, and mortality were studied.

Results

Forty-six patients were included in the study. Displacement of the feeding tube back into the stomach in 6 patients, and 24 h infusion given to 3 patients after the postoperative period. 46 patients formed the study group. Enteral feeding

was started 4 to 6 hours after surgery. The average volume of diet given per patient was 500 ml, and the highest consumption was 6500 ml in a patient following pancreaticoduodenectomy who presented with a high-output pancreatic fistula (660 ml/24 hour) on the postoperative day - 4. On the third postoperative day nasogastric tube removed and oral feeding was started initially as clear liquids then progressed to a soft diet the same day if there was good tolerance. The average length of postoperative stay in hospital was 4 days.

Nine patients (19.56%) developed nausea so infusion in feeding tube was stopped for 6 hours. Side effects are summarized in Table III. In one patient (2.2%) it was necessary to stop EN permanently due to prolonged ileus, vomiting, and abdominal distention and a NG tube was placed for 3 days.

TABLE I.

PATIENT DIAGNOSES	
Diagnoses	n (%)
Peptic ulcer disease	11 (25)
Gastric carcinoma	10 (22)
Cholelithiasis	10 (22)
Colon cancer	2 (4)
Pancreatic carcinoma	2 (4)
Chronic pancreatitis	2 (4)
Colostomy	2 (4)
Other pathologies	7 (15)

TABLE II.

SURGICAL PROCEDURES	
Type of Procedure	n (%)
Partial gastrectomy-Billroth II	10 (21.7)
Truncal vagotomy-pyloroplasty	8 (17.4)
Cholecystectomy-sphincterotomy and sphincteroplasty	6 (13)
Cholecystectomy-choledochoduodenostomy	4 (8.7)
Colostomy/ileostomy closure	4 (8.7)
Hemicolectomy	3 (6.5)
Truncal vagotomy-gastrojejunostomy	3 (6.5)
Partial pancreatectomy	2 (4.3)
Choledochojejunostomy	2 (4.3)
Pancreaticoduodenectomy	1 (2.2)
Total gastrectomy	1 (2.2)
Other	2 (4.3)

There were postoperative complications in six patients. The most common complication was surgical site infection (4 patients, 8.7%). Complications are listed in Table IV. Two patients presented with an intra-abdominal abscess. One patient who underwent gastrectomy presented later to the hospital, 30 days after surgery with a localized abscess. The other patient undergone a laparotomy procedure for the closure of an ileostomy and mucous fistula a jejunal diverticulum was found incidentally and removed during the same operation. The more distal ileostomy closure was intact.

Antibiotic therapy was used in all the patients (for more than 72 hours). Serum albumin levels obtained in 27 patients preoperatively (3.05 ± 0.89 g/dL) indicated mild malnutrition.

Discussion

Early enteral feeding helps to maintain integrity of intestine. It can also decrease the risk of postoperative ileus.^{3,13-15} "Sagar et al. and others"¹⁶⁻¹⁹ have shown that intestinal absorptive capacity is not inhibited in the immediate postoperative period.⁴⁻⁶

TABLE III.

THE INCIDENCE OF SIDE EFFECTS	
Side Effects	n (%)
Nausea	7 (15)
Vomiting	6 (13)
Abdominal distention	5 (10)
Diarrhea	1 (2.2)

TABLE IV.

OBSERVED COMPLICATIONS	
Morbidity	n (%)
Wound infection	4 (8.7)
Intra-abdominal abscess	2 (4.4)
Suture leakage	1 (2.2)
Pancreatic fistula	1 (2.2)

The elemental diet is particularly useful in transition period while patient recovers bowel function post surgically. The use of NG tube for decompression is important to avoid abdominal distention during first few hours of post surgical period. Some authors considered diarrhoea as frequent complication in early enteral feeding may be due to the high osmotic load directly into the jejunum.⁷⁻¹²

Radiologically we confirmed the position of nasogastric tube postoperatively. If there is a proximal displacement of the feeding tube, infusion was either stopped or not started. Nausea and vomiting were found to be the most frequent side effects. Aspiration pneumonia was the most lethal potential complication described in previous studies. In this present study, there is no aspiration pneumonia.²⁰

Intestinal suture leakage due to early administration of early enteral feeding has not been reported. Hypermetabolic response to injury starts immediately after surgery affecting the immune response and visceral protein mass creating the complications.

Some clinical studies shows that with early nutritional support this chain of events may be altered to some extent. Previous studies have shown a reduction in the incidence of septic events and a shorter hospital stay in patients who were receiving early enteral nutrition. Patients on EN developed less pneumonia and sepsis.

Observed wound infection in 4 patients (8.7%), which is not significant. But In a old study of Moore et al,²¹ he conducted the study with 230 patients out of which 112 patients got TPN and 118 got early enteral feeding in post operative period which concludes reduction in septic complication in enteral group. In this study early EN improve bowel function earlier which lead to a shorter hospital stay.

Compared with intermittent infusion, continuous infusion is better tolerated, with a lower incidence of side effects such as diarrhea and abdominal pain and the possibility of achieving nutritional goals faster.

Summary

Early enteral feeding is tolerated well by patients after elective Gastrointestinal surgery, with a low complications. The NG tube feeding is a cost effective and safe method for administering nutrition during the postoperative period. Early Enteral feeding favours faster return of bowel function after Gastrointestinal surgery, which leads to shorter hospital stay.

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