

Safety of early oral feeding after gastrointestinal anastomosis: a randomized clinical trial

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ABSTRACT

Background: Different abdominal surgeries could benefit from early feeding. **Aims:** To compare early feeding with traditional postoperative dietary management for development of postoperative gastrointestinal (GI) symptoms. **Settings and Design:** A prospective randomized controlled study. **Methods and Materials:** This was a study of 110 patients who were randomly allocated to early feeding beginning with liquid diet, 8 h postoperatively; whereas those in the traditional feeding group were given a regular diet with normal bowel sounds. **Statistical analysis used:** Fisher exact test, P value less than 0.05 was significant. **Results:** There were no differences in patients' demographics, surgical procedure, and anesthesia used. Complete data were available for 110 patients; 55 were allocated to the early feeding group and 55 to the late feeding group. The incidence of postoperative ileus did not differ between the two groups [early 1 (1%) vs late (1) 1%, $P > 0.05$ NS]. However, there was no significant difference in the rate of intraoperative complication such as, leakage of anastomosis, mesenteric embolus, wound infection, and wound dehiscence between groups [7.2% (4) vs 16.36% (9), respectively, P value = 0.093 NS]. Also, there were no significant differences in mortality between the two groups. **Conclusion:** Early feeding in GI anastomosis seems to be safe, well tolerated, and was not associated with increased postoperative GI complaints including ileus and postoperative complications such as wound dehiscence, infection, leakage, anastomosis, and mortality.

Key words: Early feeding, Gastrointestinal anastomosis

How to cite this article:

Ahamd FS, Ali ZS. Safety of early oral feeding after gastrointestinal anastomosis: a randomized clinical trial. *Indian J Surg* 2005;67:185-8.

INTRODUCTION

Traditionally, after abdominal surgery, the passage of flatus, or bowel movement was the clinical evidence for starting an oral diet. The resolution of postoperative ileus defined by the passage of flatus usually occurred within 5 days.^[1] Studies were undertaken to evaluate whether different abdominal surgeries could benefit from early feeding. Early feeding improves the outcome of patients with trauma and burns,^[2] although few studies have

examined its use after gastrointestinal (GI) anastomosis. A randomized controlled trial that compared an early regular diet to conventional postoperative dietary management to determine GI complications and mortality after major GI anastomosis was conducted. The secondary purpose of this trial was to evaluate the incidence of postoperative ileus after major GI anastomosis with early feeding in comparison with conventional diet.

MATERIALS AND METHODS

Between August 2003 and November 2004, after the study was approved by the Human Research Review Committee, patients at the referral hospital who had

Paper Received: May 2005. **Paper Accepted:** July 2005. **Source of Support:** Nil.

GI anastomosis were offered participation, and those who agreed gave informed consent. Patients with histories of acute obstruction, perforation, intra-abdominal infection and who were aged lesser than 16 years were excluded. All patients underwent general anesthesia. However, epidural catheter was not used for pain relief postoperatively. Only those patients who had laparoscopic procedures were not included because they were discharged from the recovery room and not admitted to the hospital.

After completion of surgery, surgeons called a research physician who assigned patients to early or late feeding groups using a random number table with pseudo randomization and disguised block length of five with 1 : 1 ratio. Surgeons were not masked to feeding groups after surgery. Patients in the early feeding group were offered simply a liquid diet within 6 h of arrival on the ward. If they tolerated 1 liter within 24 h, they were started on free liquid on the second day, and regular diet on the third day. In both groups, the nasogastric tube was removed immediately after surgery. Patients with normal postoperative course were discharged when they could tolerate a regular diet. In our study, we did not compare the length of hospital stay to evaluate all postoperative complications equally in both groups. Demographic information collected included the age, sex, medical, and surgical histories of the patients and indications for anastomosis. The subjects had different types of major anastomosis and were randomly allocated to feeding groups irrespective of anastomotic type to eliminate bias [Table 1]. The length of time until bowel movement was first passed was also noted. Given the common clinical practice of morning and evening patient assessment, bowel function variables, including normal bowel sounds and passage of flatus and bowel movement, were treated as ordinal not continuous variables and recorded as occurring on a specific postoperative day. Patients were not given oral or rectal bowel stimulants after surgery. Whether early oral feeding increased the postoperative complications or was it safe and well tolerated was not very clear. In the early feeding group, the rate of postoperative complications, even ileus did not differ from the conventional diet. The main outcome was to evaluate postoperative complications that included wound infection, leakage of anastomosis, obstruction, mesenteric emboli, upper GI bleeding, wound dehiscence, prolonged ileus, and mortality. Ileus was defined as hypoactive bowel sounds, abdominal distention, and no passage of flatus or bowel movement with or without nausea or vomiting after the first postoperative day.^[3]

The patients had to meet all the criteria in both groups to be considered as an ileus.

Same as other studies,^{[4]-[7]} evaluating the ileus, after

starting the diet, was performed after the first postoperative day in the early feeding group. Postoperative ileus was managed by IV Hydration, no oral intake antiemetic, and radiological evaluation of the abdomen. If vomiting was unresponsive to antiemetic, a nasogastric tube was placed and removed after symptoms resolved. On the day of discharge, they answered questions about nausea, vomiting, cramping, distention, desire for oral feeding, and first day of flatus passage or bowel movement. A power analysis was done based on an average incidence of postoperative ileus reported in the literature of approximately 25%,^[8] with a doubling of that rate considered clinically significant. With 80% power and $\alpha = 0.05$, 110 patients were needed to show a twofold greater incidence of postoperative ileus in the early feeding group.

Fisher exact test was used to analyze discrete variables such as postoperative ileus. Continuous variables were analyzed using student's *t*-test.

RESULTS

Between August 2003 and November 2004, 110 patients who had major abdominal surgery for anastomosis indications agreed to participate. Complete data were available for 110 patients, with 55 (31 men and 24 women) patients with 66.45 mean years old to early feeding, and 55 (38 men, 17 women) with 63.44 mean years old to late feeding. No patient was excluded. There were no significant demographic differences between groups, including age, medical, and surgical history.

Indications for anastomosis approximately were similar between groups [Table 1], with biliary tract anastomosis common in the early feeding group [14.54% (8) vs 12.72% (7), $P > 0.05$] and small intestine anastomosis was common in traditional feeding [20% (11) vs 16.36% (9), $P > 0.05$]. General endo tracheal anesthesia was used in all cases. Preoperative complications did not differ between the groups. Interestingly, postoperative complications did not differ significantly between the groups [Table 2]. However, the incidence of postoperative ileus did not differ between the groups (one patient in the early feeding group and one patient in the traditional group, P value = 0.8 NS). Among the 110 participants, the overall incidence of complication was 9.09% for the early feeding group and 16.36 for the traditional feeding group.

Most patients had active bowel sounds on the day of surgery or the first postoperative day, flatus by the first or second postoperative day, and bowel movement by the second or third postoperative day. The mean \pm standard deviation postoperative day when normal bowel sounds are auscultated (0.5 ± 0.6 vs 0.5 ± 0.5 days, $P = 0.65$), flatus was passed (1.7 ± 0.7 vs

1.6 ± 0.8 days, $P = 0.7$), and first bowel movement reported (3.9 ± 0.7 vs 4.46 ± 1.2 days, $P = 0.07$), early vs late feeding groups, respectively. The subjects received similar amounts of pain medication, including oral ibuprofen (2427 ± 1665 vs 2535 ± 1737 mg, $P = 0.77$) early vs late feeding group, respectively. When data were stratified within feeding groups to compare type of anastomosis, no significant differences in any of the outcomes were noted including postoperative complications.

DISCUSSION

The key finding in our study was that postoperative complications did not differ significantly between the two groups [Table 2]. Similarly, oral feeding was tolerated with low morbidity following small or large bowel resections^[9] and not associated with the occurrence of anastomotic dehiscence.^[10] However, patients undergoing elective colorectal resection can be managed without postoperative NG catheter, starting oral feeding on the first postoperative day.^[11] Interestingly, in older patients undergoing elective open-colon resection, early feeding results in a short hospital stay and low postoperative morbidity. The results are comparable to those reported for laparoscopy-assisted colectomy.^[12] Some review literatures support safety of early feeding after surgery.^{[13],[14]}

The secondary outcome of our study was the incidence of postoperative ileus in early feeding groups that was similar to conventional diet. Postoperative ileus does not have a standard definition. Livingston and Passaro^[3] define ileus as the functional inhibition of propulsive bowel activity, irrespective of the pathologic mechanism. The exact etiology of ileus is unknown, but it is believed to be more common after laparotomy and procedures that enter the peritoneal cavity.^[3] Many factors are believed to contribute to it, including intraoperative, bowel manipulation, anesthetic agent, peri operation narcotics, and postoperative sympathetic hyperactivity.^{[3],[15]} Postoperative ileus can result in accumulation of gas and secretions leading to distention, emesis, pain, and longer hospital stay. Currently available therapies are supportive and include intravenous hydration and nasogastric suctioning.^[3] Tradition dictates advancement of postoperative diet based on physical signs of bowel function and not on postoperative GI physiology. Animal and human radiological and physiologic studies do not support the traditional practice of oral feeding based on auscultation of normal bowel sound and passage of flatus and bowel movement.^{[3],[15],[16]} After surgery, return of bowel function and motility usually occurs within 6–12 h in the small bowel, 12–24 h in the stomach, and 48–72 h in the colon.^[17] Physiologic studies have found that myoelectric and motor activity in the stomach is not affected after abdominal surgery.^[15] Schilder et al.^[16]

showed bowel activity before flatus was passed, which illustrates that patients tolerate fluid secretions of 1–2 l from the stomach and pancreas immediately after surgery. Studies also have shown tolerance to clear liquids on postoperative day 1 after GI surgeries.^{[15],[16],[18]} Marik and Zaloga conducted meta-analysis of prospective, randomized studies comparing early vs late enteral feeding demonstrating the benefits of early nutrition.^[4] However, the preferred feeding site for enteral nutrition remains controversial.^[5] Despite this fact, Seenu and Goel^[6] showed that early oral feeding after elective colorectal surgery is safe and can be tolerated by most patients. Similarly,^[7] Difronzo et al.^[12] demonstrated a high tolerability (86.5%) to early postoperative oral feeding after elective open colon resection. These studies were not exclusive to colorectal surgery. Suehiro et al.^[19] showed that early oral feeding after gastrectomy is safe and the incidence of complications including anastomosis leak and wound infection occurred equally in both groups. Our study documents a further advance in postoperative treatment of patients who have major abdominal anastomosis. It was found that by offering liquid 6 h after surgery, increased incidence of ileus, rather than following a rigid protocol. That finding is supported by Resnick et al.'s review of postoperative ileus and documentation of normal bowel physiology.^[20] Also, there were no differences in postoperative complications, including, wound infection, wound dehiscence, leakage of anastomosis, mesenteric embolus, obstruction, upper GI bleeding, and mortality.

Nausea and vomiting, however, occur more commonly after upper GI surgery than after resection of the small intestine and colon. However, there is no evidence that bowel rest and a period of starvation are beneficial for healing of wounds and anastomotic integrity.^{[21],[22]}

In our clinical experiment, there were no differences in postoperative complications.

It is therefore concluded that early feeding is safe and well tolerated by patients undergoing bowel resection. In addition, it is not associated with increased postoperative GI complications including postoperative complications and ileus.

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