

**Original Article****A Clinical Study of Early Removal of Nasogastric Tube and Early Oral Feeding In Patients Undergoing Surgery on Small Intestine**

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Place of Work: The study was conducted in Shri B M Patil Medical College, Bijapur, Karnataka

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Email: rohankhairatkar@yahoo.com**Abstract**

The study was conducted over a period of 18 months on 64 patients admitted in a tertiary care hospital in India with complaints of pain abdomen who underwent surgery on small intestine. Patients getting admitted were taken as 'alternate' case and control. In study group the nasogastric tube was removed 24 to 48 hours after operation and started oral feeding. In control group, nasogastric tube was maintained until the passage of flatus per rectum. The Study and Control group included 32 patients each. Postoperatively both group of patients were compared in terms of acceptance of first feed, duration of hospital stay and occurrence of complications.

Keywords: nil by mouth, nasogastric tube, ileus.**Introduction**

Patients undergoing surgery on small intestine form a large part of general surgery cases. They are unnecessarily kept nil by mouth post-operatively in the fear of ileus and post-operative fistula. This study helps to remove these fears and gives a scientific background regarding starting oral feeds in early postoperative period.

Materials and Methods**Source of Data**

Patients presenting to surgical department with complaints of pain abdomen who underwent surgery on small bowel.

Method of Collection of Data**Inclusion Criteria**

Patients of all ages and both sexes with clinical features suggestive of 'Gastrointestinal disorder' who underwent surgery on the small bowel.

Exclusion Criteria

1. Unconscious, sedated patients
2. Surgeries on abdomen other than those on small intestine.
3. Terminally ill patients.

Informed consent of patients was taken and Ethical Committee Clearance obtained.

Sampling

The patients attending surgical OPD and admitted in Tertiary care Hospital who underwent surgery on small intestine were included in the study. The study was conducted over a period of 18 months. Details of cases were recorded including history, clinical examination and investigations done.

Patients getting admitted were taken as 'alternate' case and control. Patients undergoing operation on the small intestine were randomized into two groups. In experimental group (Group A) the nasogastric tube was removed 24 to 48 hrs after

the operation and started oral feeding. In control group (Group B) the nasogastric tube was maintained until the passage of flatus per rectum, return of bowel sounds by auscultation, decreasing nasogastric output, absence of emesis and no increasing abdominal discomfort.

Observation and Analysis

The observations made in the conducted study and the inferences drawn are highlighted in the following pages.

Table 1 Distribution of Patients According to Age (In Years)

Age Group	1 to 10	11 to 20	21 to 30	31 to 40	41 to 50	51 to 60	61 to 70	71 to 80
Study Group	1	5	6	6	2	5	7	0
Control Group	0	2	7	1	8	7	6	1

The distribution of patients in both groups was mainly in the age group 21-70 years

Table 2 Distribution of Patients According to Sex

Group Type	Total	Male	Female
Study Group	32	19	13
Control Group	32	27	5

The number of male patients was higher in both the study and control groups

Table 3 Duration of Nasogastric Decompression/ Day of First Feed Postoperatively

Group Type	Range (days)	Mean
Study Group	1-1.58	1.43
Control Group	3-7	4.5

In the study group the nasogastric tube was kept for a mean of 1.43 days while in control group it was kept for a mean of 4.5 days. In both groups oral feeding was started after removal of nasogastric tube.

Table 4 Hospital Stay (In Days)

Group Type	Range (days)	Mean (days)
Study Group	5-13	9
Control Group	8-25	12.59

The mean duration of hospital stay in study group was 9 days while it was 12.59 days in control group.

Table 5 Complications

Complications	Study Group	Control Group
Number of patients	2	7

Study group: 2 patients developed vomiting

Control group: 2- Upper respiratory tract infection

2- Surgical site infection

1-Pneumonia

1-Pleural effusion

1-Pneumonitis

Table 6 Distribution of Cases

Diagnosis	Study Group	Control Group
Perforation		
1. Duodenal	13	17
2. Jejunal	1	2
3. Ileal	2	5
Obstruction		
1. Adhesions	6	4
2. Intussusception	2	1
3. Obstructed Hernia	4	1
4. Mesenteric band	2	0
5. Obstruction with bowel gangrene	2	2
Total	32	32

The incidence of duodenal perforation and postoperative adhesions was high both in study and control group.

Test of Significance Between Days of 'Hospital Stay'

Group Type	Mean(days)	Standard Deviation	Z-Value	P-Value
Control Group	12.59	3.73	4.79	<0.0001
Study Group	9.0	2.22		
Sample Size	32	32		

Discussion

Several animal models have been established to investigate mechanisms of ileus, and the descriptions are consistent.^[1-4] Stomach emptying is impaired for about 24 hours after laparotomy. In contrast, the motility and the capacity of absorption of the small intestine is normal within a few hours after surgery. However, the colon remains inert for a long time, with differences in times needed for return of activity in caecum (48 hours) and sigmoid colon (72 hours), with the passage of flatus or stool as a marker. Evidently, the profound change in colon motility is a major feature of the postoperative abdomen. It results from differences between the mobility of the ileum and the inertia of the rectosigmoid.^[5]

A period of starvation ("nil by mouth") is common practice after gastrointestinal surgery in which an intestinal anastomosis has been formed. The stomach is decompressed with a nasogastric tube and intravenous fluids are given, with oral feeding being introduced as gastric dysmotility resolves. The rationale of nil by mouth is to prevent postoperative nausea and vomiting and to protect the anastomosis, allowing time to heal before being stressed by food. It is, however, unclear whether deferral of enteral feeding is beneficial.

Contrary to widespread opinion, evidence from clinical studies and animal experiments suggest that initiating feeding early is advantageous. Postoperative dysmotility predominantly affects the stomach and colon, with the small bowel recovering normal function 4-8 hours after laparotomy. Feeding within 24 hours after laparotomy is tolerated and the feed absorbed. Gastrointestinal surgery is often undertaken in patients who are malnourished, which in severe

cases is known to increase morbidity. In animals, starvation reduces the collagen content in anastomotic scar tissue and diminishes the quality of healing, whereas feeding reverses mucosal atrophy induced by starvation and increases anastomotic collagen deposition and strength. Experimental data in both animals and humans suggest that enteral nutrition is associated with an improvement in wound healing. Finally, early enteral feeding may reduce septic morbidity after abdominal trauma and pancreatitis.

In our study group nasogastric tube was removed 1-2 days after surgery with a mean of 1.43 days, irrespective of the presence or absence of bowel sounds. The rationale behind early removal of nasogastric tube and early oral feeding was that small amount of feed itself will have trophic effect on GI tract and will stimulate bowel recovery. After removal of nasogastric tube all patients significantly felt better and were allowed orally clear fluids followed by liquid diet and then soft diet. All patients tolerated oral feed except two patients, one of whom developed vomiting and distension of abdomen where nasogastric tube was reinserted and other patient in which the vomiting subsided spontaneously. In the control group nasogastric tube decompression was continued until the return of bowel sounds and passage of flatus per rectum. The duration of nasogastric decompression ranged from 3-7 days postoperatively with a mean of 4.5 days. The patients were allowed oral feed in manner similar to study group. Similar results were found in the study conducted by Kristoffer Lassen, Jorn Kjaeve, et al^[6] in 2008, University Hospital Northern Norway, Tromso, Norway; who conducted a randomised multicentre trial to investigate whether a routine of allowing normal food at will increases morbidity after major gastrointestinal (GI) surgery. Time to resume bowel function was significantly in favour of allowing normal food at will ($P = 0.01$), as were the total number of major complications, length of stay, and rate of complications after discharge from hospital.

The length of hospital stay in study group ranged from 5-13 with a mean of 9 days while that in control group ranged from 8-25 with a mean of 12.59 days. The difference in hospital stay between the two groups was statistically significant ($p<0.0001$). The hospital stay in control group was prolonged due to wound infection and pulmonary complications adding to the total cost of treatment. Study group was found to have benefitted in terms of less cost for the treatment.

Most of the patients in control group complained of discomfort and unpleasant sensation due to the tube. They also had difficulty in coughing and bringing out the sputum due to the tube in situ. In control group 2 patients developed upper respiratory tract infection, 1 patient had pneumonia, 1 patient developed pneumonitis and another patient developed pleural effusion. There was no incidence of pulmonary complications in study group. In a study conducted by Alfred Cusher et al^[7], University of Dundee, Dundee, Scotland in 1985 with similar group of patients, 5 patients in no tube group and 11 patients in tube group had pneumonia.

The wound infection rate was higher in control group. Two patients in the control group developed surgical site infection while there was no any incidence of surgical site infection in the study group. Patients undergoing resection and anastomosis of bowel for gangrene were also allowed early oral feed and there was no incidence of anastomotic leak, intra-abdominal abscess or wound infection. Similar results were found in meta-analysis conducted by Stephen J Lewis, Matthias Egger et al^[8]. Early feeding reduced the risk of any type of infection (relative risk 0.72, 95% confidence interval 0.54 to 0.98, $P = 0.036$).

Risk reductions were also seen for anastomotic dehiscence ($P = 0.080$), wound infection, pneumonia, intra-abdominal abscess, and mortality, but these failed to reach significance ($P > 0.10$).

Another study conducted by Singh et al^[9] Department of Surgery, Postgraduate Institute of Medical Education and Research (PGIMER),

Chandigarh, India in 1997 concluded that immediate postoperative feeding is feasible in patients with perforative peritonitis and reduces septic morbidity.

The other complications because of prolonged immobility like DVT and MODS would also add to morbidity in control group but could not be evaluated because of non occurrence of these in either group. Given the commonly observed phenomenon of infection as a precipitating factor of multiple organ failure (MOF), early enteral feeding also lowers the risk of MOF. The theory that appropriate nutritional support might be able to prevent the process of MOF is biologically plausible, since response to injury is hallmarked by hyperdynamic metabolic processes involving the reordering of substrate priorities, by increased energy demands and by clinical malnutrition. The benefits of early enteral feeding are contributed by the trophic support of gut mucosa as well as by the improved maintenance of gut metabolic and immunologic function during the hypercatabolic phase.

Conclusion

At the end of study conclusion drawn is that it is safe to remove nasogastric tube early (24 to 48 hours) in patients undergoing surgery on small intestine. Patients, tolerated oral feeds early and had shorter duration of hospital stay and better wound healing as compared to control group. In addition to that there is less incidence of overall postoperative complications. There is also less burden on nursing team in managing nasogastric tube and IV fluids, leading to less financial onus on the patient and hospital.

Reference

- Smith J, Kelly KA, Weinshilboum RM: Pathophysiology of postoperative ileus. Arch Surg 1977, 112:203-209.
- Woods JH, Erickson LW, Condon RE, Schulte WJ, Sillin LF: Postoperative ileus: a colonic problem? Surgery 1978, 84:527-533.

3. Livingston EH, Passaro EP Jr: Postoperative ileus. *Dig Dis Sci* 1990, 35:121-132.
4. Hotokezaka M, Mentis EP, Patel SP, Combs MJ, Teates CD, Schirmer BD: Recovery of gastrointestinal tract motility and myoelectric activity change after abdominal surgery. *Arch Surg* 1997, 132: 410-417.
5. Resnick J, Greenwald DA, Brandt LJ: Delayed gastric emptying and postoperative ileus after nongastric abdominal surgery: part I. *Am J Gastroenterol* 1997, 92:751-762.
6. Kristoffer Lassen, Jørn Kjæve et al Allowing Normal Food at Will After Major Upper Gastrointestinal Surgery Does Not Increase Morbidity *Ann Surg* 2008;247: 721–729
7. Alfred Cuschieri, Gary C. Vitale, Colin R. Mackie, William G. Cheadle, Prophylactic Postoperative Nasogastric Decompression *Ann Surg* 1985 Vol. 202 No. 3: 361-365
8. Stephen J Lewis, Matthias Egger, Paul A Sylvester, Steven Thomas Early enteral feeding versus “nil by mouth” after gastrointestinal surgery: systematic review and meta-analysis of controlled trials *BMJ* 2001;323:1–5
9. Gurpreet Singh, R Prashanth Ram and Satish K Khanna, Early Postoperative Enteral Feeding in Patients with Nontraumatic Intestinal Perforation and Peritonitis. *J Am Coll Surg* Vol. 187, No. 2, August 1998 142-146