

Role of Gum Chewing After Small Gut Anastomosis

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¹ Conception of study

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Abstract

Background: This study was performed to assess the effectiveness of gum chewing on gut motility in early postoperative period after small gut anastomosis in patients operated for reversal of ileostomy or ileocolostomy.

Methods: This prospective, randomized trial was undertaken at Surgical Unit-I, Holy Family Hospital, Rawalpindi Medical University, Rawalpindi from March 2016 to March 2018. 90 patients were randomly divided into two equal groups. All patients underwent small gut anastomosis after reversal of ileostomy or ileocolostomy. In group A (gum chewing group), patients were advised to chew gum, whereas group B (control group) patients did not receive any gum for chewing and continued standard post-operative care. Both groups were kept NPO till 2nd post-operative day. After surgery, all patients were observed for onset of bowel sounds, time after surgery when flatus and stool were passed, time required for return of appetite and discharge from hospital. Patient satisfaction with postoperative course, incidence of anastomotic leak, wound infection and mortality was also recorded in both groups.

Results : Statistically, group A and group B were similar in age, gender and type of procedure. There was significant difference between both groups for onset of bowel sounds, passage of first flatus, complaints of nausea and vomiting, appetite, duration of hospital stay and patient's satisfaction level ($P < 0.05$). In Group A, 35 patients were satisfied whereas in group B, only 5 patients were happy with their postoperative course ($P < 0.05$). There was no statistically significant difference between groups for incidence of anastomotic leak, wound infection and mortality.

Conclusion: It is safe and cost effective to advise gum chewing in patients undergoing small gut anastomosis for reducing duration of postoperative ileus and improving level of patient satisfaction about their postoperative course.

Keywords: Postoperative ileus, Ileostomy, Anastomotic leak, Surgical site Infection.

Introduction

Post-operative ileus is a transient absence of normal intestinal function, caused by a loss of peristaltic

action of the intestine mostly after abdominal surgery. Patients with ileus have decreased bowel sounds, abdominal distention, and inability to eat.^{1,2}

It has a multifocal etiology. Major contributors are sympathetic hyperactivity, an increased concentration of catecholamines, vasoactive peptides and substance P in blood, which are mostly released in response to pain and inflammation caused by surgical manipulation. Electrolyte imbalance, peritoneal irritation, and intra-peritoneal infection are also important precipitating factors. It is common observation that usage of opioid analgesics slows down the intestinal motility.^{3,4}

Most of the time, ileus settles spontaneously with standard postoperative care. Gastric function usually normalizes first (24-48 hours) followed by return of motility in small intestine. Colon is last part of intestine to recover after abdominal surgery (48 to 72 hours).^{5,6}

It is observed that if ileus after the abdominal surgery lasts more than 3 days, it may be termed as postoperative paralytic ileus.⁷ Ileus leads to retention of gastrointestinal secretions and gas. It also results in absent bowel sounds, reduce passage of flatus, delayed defecation, abdominal distension along with nausea and vomiting.⁸ This delays postoperative enteral feeding and recovery, slows wound healing and postoperative mobilization. Delayed discharge from the hospital results in increased cost of treatment for patients and healthcare system. According to literature, prevalence of POI after surgery on large intestine is 15%.⁴

Postoperative ileus is mostly managed by conventional methods, which include nasogastric intubation, not allowing oral intake, replacement of fluid and electrolytes till the condition improves.⁷ Despite these standard postoperative measures, POI is still a major concern. Up till now no definite treatment for POI is in practice.

It is not always feasible to start early oral feeding for stimulation of normal function of gut. Sham feeding is any procedure that mimics normal food consumption, but these are not actually digested or absorbed. Chewing of gum may be used for reducing postoperative ileus. It causes the activation of both cephalic-vagal pathway and hormonal release, which in turn stimulate the bowel motility. Chewing of gum causes enhanced gut motility without the consequences of actual oral intake.^{9,10}

Literature showed the effectiveness of gum chewing after surgery on large gut but specific data regarding its benefits after anastomosis of small gut is not available. We have large number of patients with ileostomy constructed after enteric or tuberculous perforation of small intestine. So, the burden for reversal of these stomas is also very high. We conducted a randomized research to assess the effect of gum chewing in early postoperative period after small gut anastomosis in patients operated for ileostomy & ileocolostomy reversal. It was assumed that gum chewing will result in early return of normal bowel activity after small gut anastomosis in patients with reversal of ileostomy & ileocolostomy.

Material and Methods

This prospective, randomized trial was undertaken at Surgical Unit-I, Holy Family Hospital, Rawalpindi Medical University, Rawalpindi from March 2016 to March 2018. After approval of the study by the Institution's Research Ethics Committee, the patients meeting selection criteria were enrolled in the study using consecutive non-probability sampling technique. Randomization was performed by drawing sealed envelopes (lottery method) into group A and group B (45 patients each). They underwent small gut anastomosis after reversal of ileostomy or ileocolostomy. Group A (gum chewing group) patients were advised to chew gum, three times a day for one hour, starting 6 hours after surgery. In group B (control group), patients did not receive gum chewing and continued standard postoperative care. Both groups were kept NPO till 2nd post-operative day. Electrolyte imbalance, if any, was corrected, and any comorbid illness optimized prior to surgery. A broad-spectrum antibiotic, Ceftriaxone 1 gm, was administered 1 hour before surgery. All patients were operated under general anaesthesia. Intestinal anastomosis was done in an interrupted single-layer extra-mucosal fashion. Operative procedures including any per-operative adhesiolysis (if any), type of anastomosis, blood loss, and duration of surgery were recorded.

In the postoperative period, injections of Ceftriaxone (1 gm), and Metronidazole (400 mg) were given for 3 days. All cases were monitored for the appearance of bowel sounds, time of passage of first flatus and stool and return of appetite. Patients were also enquired about their satisfaction level with the post-operative course. Incidence of anastomotic leak, surgical site

infection and mortality was also recorded in both group of patients. An injection of ketorolac (30 mg) was given every 8 hours for the initial 3 days after surgery as analgesic and then it was prescribed as per demand. Narcotic analgesics were avoided. Early ambulation was encouraged. Oral liquids were started on 2nd and solid diet on 3rd postoperative days. Patients were discharged from the hospital after they passed stool, started taking regular meals, and had no complications. The duration of postoperative hospital stay and mortality (if any) were recorded. Patients were followed in OPD for one month.

Data was analyzed on IBM ® SPSS® version 20.0. Categorical variables like gender were expressed as frequencies. Continuous variables such as age, and operating time were expressed as mean. Independent sample T-test was used to compare return of bowel sounds, passage of flatus and stool, feel of hunger and duration of hospital stay between two groups. P value ≤ 0.05 was considered significant.

Result

90 consecutive patients meeting inclusion criteria were enrolled on a randomized sampling basis. The mean age for group A and B was 37.5 and 42.2 years respectively. In group A (gum chewing group), 25 patients were male and 20 were females while in group B (control group), 23 patients were male, and 22 patients were female.

The average time duration between formation of stoma and its closure was 155 days for group A and 113 days for group B ($P = 0.116$). Average duration of surgical procedure was 86.86 minutes in group A and 89.48 minutes in group B ($P = 0.113$). In group A, 35 patients were operated for reversal of ileostomy and 10 patients for reversal of ileocolostomy, whereas in group B, 39 patients were operated for reversal of ileostomy and 6 patients for reversal of ileocolostomy. ($P > 0.05$).

There was statistically significant difference between both groups for onset of bowel sounds, passage of first flatus, appetite, duration of hospital stay and patient's satisfaction level with the postoperative course. Early passage of stool was noted in group A as compared to group B (46 vs 63 hours on average) but this difference was not statistically significant. (Table-1)

There was no statistically significant difference for complications like incidence of anastomotic leak, surgical site infection and mortality. This is shown in table 2.

Table 1: Comparison of postoperative patient recovery between the two groups

Variables	Group A (n=45)	Group B (n=45)	P - value
Return of bowel sounds (hours)	24	44	0.001
Passage of flatus (hours)	32	69	0.042
Passage of stool (hours)	46	63	0.476
Return of appetite (hours)	44.5	48	0.003
Duration of hospital stay (days)	4.08	6.71	0.006

Table 2: Comparison of postoperative complications between two groups

Variables	Group A (n=45)	Group B (n=45)	P - value
Anastomotic leak	03	02	0.363
Surgical site infection	03	04	0.437
Mortality	01	02	0.244

Discussion

Ileus after abdominal surgery is common in surgical practice. It is major contributors towards delayed recovery and prolonged hospital stay. The major complications after prolonged ileus include abdominal pain after surgery, high incidence of nausea and vomiting, pulmonary and wound related complications, more time required to start oral intake, immobilization after surgery, prolonged hospital stay, and direct impact on cost of surgery for patients as well as for hospitals.

Chewing of gum is a simple and cheap way to overcome prolonged POI, based on the concept of sham feeding. It has psychological as well as physiological roles. It is satisfying for a patient to chew gum in early postoperative time, when he/ she is not allowed oral diet and the patient has complaints of dry mouth and bad taste. There is limited data on the use of gum chewing after surgery with small gut anastomosis.

As already mentioned, most patients are operated for either enteric perforation or tuberculous abdomen. Most of the times, resection of diseased gut and

primary anastomosis is not feasible in such patients due to their delayed presentation. Ultimately, such patients present for reversal of stomas on an elective basis. We performed this study in our settings to see usefulness of gum chewing overcome POI and early recovery after abdominal surgery along with small gut anastomosis.

Three mechanisms of cephalic-vagal stimulation work during gum chewing. First one is chewing mechanism, the second is the perception of taste mechanism, and the third one is perception by olfactory mechanism.¹¹ Nerve impulses generated by these mechanisms are directed to the cerebral cortex and stimulate vagus nerve and GIT during the cephalic phase. Hormones including gastrin, neurotensin, pancreatic polypeptide and duodenal alkaline secretions stimulate the muscles in the gastrointestinal tract, resulting in bowel movement.^{12,13,14}

In our study, both groups were similar statistically. Patients in gum chewing group showed early onset of bowel sounds, early passage of flatus and early feel of hunger ($P < 0.05$). Postoperative nausea and vomiting was also less in gum chewing group with a p-value of less than 0.05. These observations were also in comparison with the results of three meta-analysis of randomized controlled trials.^{13,15,16} All of these trials reported beneficial effect of gum chewing after abdominal surgery.

A study from India reported insignificant results with the use of gum chewing. These findings were most likely due to different group of patients with more handling of gut.⁹

Use of gum chewing after small gut anastomosis has been extensively reviewed in recent years and it is found useful to overcome POI.^{17,18} These studies have also concluded that gum chewing is useful after intestinal surgery with respect to decreased time to first flatus and stool, bowel sounds, and postoperative hospital stay.^{17,18}

In our study, patients were more satisfied with gum chewing as compared to patients not having it. A trial done by Konno et al also concluded that gum-chewing reduces stress-related responses and might help to cope with stress.¹⁹

Statistically significant reduction in postoperative hospital stay ($P < 0.05$) was observed in our study. This is in comparison with the findings of a study, conducted by Van Den Heijkant et al, who found shorter hospital stay in patients having gum chewing in post-operative period (9.5 vs 14 days).³ Literature also reported similar findings in other systematic reviews and meta-analyses, whereas others depicted

insignificant results.²⁰ Another meta-analysis showed favorable results with the use of chewing gum. It reported early passage of flatus and stool, without statistically significant differences in duration of hospital stay.²¹ According to literature; keeping in view high cost of hospital stay, gum chewing is a cheap way to overcome post-operative ileus.^{22,23}

Conclusion

It is safe and cost effective to advise gum chewing after small gut anastomosis for reducing duration of postoperative ileus and improving level of patient satisfaction about their postoperative course.

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