

Study of the Effect of Early Feeding, Chewing Gums, and Laxative on Ileus in Patients Who Underwent Open Cholecystectomy

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Abstract

Objective: The Latin word ileus originated from the Greek term Eileos—intestinal colic, which is derived from the verb eilein—to squeeze or roll up tight. Postoperative ileus is common after abdominal operations, including colectomy. The aim of this study was to compare the effect of chewing gum, initiation of early feeding, nasogastric decompression, and NPO condition on postoperative ileus after cholecystectomy. **Design:** This study was carried out as clinical trial. **Place and duration of study:** During a 19-month period of study from July 2006 to February 2007, 97 patients who underwent uncomplicated open cholecystectomy in Golestan, Razi, and Imam Khomeini Hospital were included in this study. **Patients and methods:** These patients underwent surgery due to acute cholecystitis or gall stones. Patients with gangrene, empyema, or peritonitis were not included in this study. Patients were “NPO” one night before surgery. Cholecystitis was diagnosed based on history, physical examination, and sonographic findings. After surgery, patients were randomly divided in 4 groups (laxative, NPO, early feeding, and chewing gums). Data were analyzed with ANOVA and variance analysis method by SPSS version 13.0 software. Patients with gall bladder empyema or gangrene, associated cholangitis, history of chronic constipation or history of drugs affecting gastrointestinal motility were excluded from this study. All patients underwent general anesthesia with one of the following drugs: midazolam, fentanyl, thiopental sodium, atropine, neostigmine, and atracurium. All of these drugs are short-acting and have a half-life of less than 2hrs. Bowel sounds were checked by a single experienced physician with a Littmann stethoscope. **Results:** Patients were 29-72 years old (M=32% and F=68%). There were significant differences for the NPO group versus the feeding and gum group ($P=0.01$). BS recovery time was significantly different between laxative group and gum group (0.008) and laxative group versus feeding group (0.012). There was no significant difference for feeding versus gum group ($P=0.9$) and laxative versus NPO group ($P=0.38$). The average times of hospital stay were shortest for the feeding and the gum group with 1.20 and 1.21 days, respectively. All patients in the gum group were discharged in 2 days; 84% of patients in the feeding group were only 24 hrs in hospital before discharge. This percentage was 25% and 79.2% for the NPO and the gum group, respectively. There was a significant difference for the feeding and the gum group compared to the other groups for duration of hospital stay. **Conclusion:** As mentioned above, the gum chewing method is a safe and effective method in reducing postoperative ileus.

INTRODUCTION AND AIM

The Latin word ileus originated from the Greek term Eileos—intestinal colic, which is derived from the verb eilein—to squeeze or roll up tight. ¹ This term, obviously, is not an accurate description of postoperative ileus, since it is a functional rather than a mechanical disorder. Postoperative ileus is common after abdominal operations, including colectomy. ² For lack of a commonly accepted standard definition, postoperative ileus is usually regarded as the transient impairment of intestinal motility occurring after operation ³ which is clinically characterized by abdominal

distention, delayed passage of gas and stool, lack of bowel sounds, and accumulation of gas and fluid in the bowel that may result in nausea and vomiting. Madsen et al. indicated that clinical parameters other than bowel sounds, such as the return of flatus and the first postoperative bowel movement, are appropriate for assessing GI motility after abdominal surgery. ⁴ For a long time, NG tube was a treatment of choice in ileus. Recent studies have questioned the role of the NG tube ⁵. Some of the adverse effects of postoperative ileus are as following: increased incidence of nausea and vomiting, delayed resumption of oral feeding, increased postoperative pain, delayed wound healing, and increased

risk of postoperative complications. ⁶ Because of significant implications of ileus after colectomy, surgeons have devised strategies in an attempt to minimize postoperative ileus. A study by Stewart et al. showed that early feeding after colectomy hastened hospital stay. ⁷ Choi et al. showed that early feeding after open colon resection was safe and resulted in early hospital discharge. ⁸ The aim of this study was to compare the effect of chewing gum, initiation of early feeding, nasogastric decompression, and NPO condition on postoperative ileus after cholecystectomy.

PATIENTS AND METHODS

During the 19-month period of study from July 2006 to February 2007, 97 patients who underwent uncomplicated open cholecystectomy in Golestan, Razi, and Imam Khomeini Hospital were included in this study. These patients underwent surgery due to acute cholecystitis or gall stones. Patients with gangrene, empyema, or peritonitis were not included in this study. Patients were NPO one night before surgery. Cholecystitis was diagnosed based on history, physical examination, and sonographic findings. Patients with gall bladder empyema or gangrene, associated cholangitis, history of chronic constipation or history of drugs affecting gastrointestinal motility were excluded from this study. All patients underwent general anesthesia with the one of the following drugs: midazolam, fentanyl, thiopental sodium, atropine, neostigmin, and atracurium. All of these drugs are short-acting and have a half-life of less than 2 hrs. After surgery, patients were randomly divided in 4 groups (laxative, NPO, early feeding, and chewing gums). For patients in the laxative group, 6 hours after surgery, the laxative was initiated (15cc q8hrs). For patients which chewing gums, chewing was initiated 6hrs after surgery with 3 times a day lasting 30 minutes each. In the early feeding group, peroral feeding was initiated 6hrs after surgery with liquid and then regular diet. After extubation, bowel sounds were examined q6hrs by an experienced physician with a Littmann stethoscope. Data were analyzed with ANOVA and Variance analysis method by SPSS version 13.0 software.

RESULTS

Patients were 29-72 years old (M=32% and F=68%). The results of the four groups are listed in Table 1.

Figure 1

Table I: Features of the four groups

Group	Age (yrs)	Duration of Surgery (minutes)	Duration of hospital stay (days)	Length of recovery of bowel sounds (hrs)
NPO	46.03±10.6	71.67±16.26	2.04±0.75	39.75±16.29
Early feeding	50.8±9.69	69.20±15.20	1.20±0.5	22.08±12.92
Laxative	48.03±10.01	64.79±14.77	1.79±0.5	33.75±11.97
Gums	46.54±7.66	64.38±15.41	1.21±0.4	21.5±9.99

As shown in table II, there were significant differences for the NPO group versus the feeding and gum group (P=0.01). BS recovery time was significantly different between laxative group and gum group (0.008) and laxative group versus feeding group (0.012). There was no significant difference between feeding versus gum group (P=0.9) and laxative versus NPO group (P=0.38).

Figure 2

Table II: Statistical differences of bowel sound recovery time between the groups.

Group 1 vs Group 2		P-value
NPO	Feeding	0
	Laxative	0.38
	Gum	0
Feeding	Laxative	0.012
	Gum	0.99
Laxative	Gum	0.008

Figure 3

Table III: Length of hospital stays in different groups

Group	Length of Hospital Stay	No	Percent
NPO	1	6	25%
	2	11	45.8%
	3	17	29.2%
Feeding	1	21	84%
	2	3	12%
	3	1	4%
Laxative	1	6	25%
	2	17	70.8%
	3	1	4.2%
Gum	1	19	79.2%
	2	5	20.8%

The average time of hospital stay was shortest for the feeding and the gum group with 1.20 and 1.21 days, respectively. All of the patients in the gum group were discharged in 2 days; 84% of patients in the feeding group were only 24hrs in hospital before discharge. This percentage was 25% and 79.2% for the NPO and the gum group, respectively. There was a significant difference for the feeding and the gum group compared to the other groups for duration of hospital stay (P<0.05) (Table III).

During the first 24hrs, only 4.2% of patients in the NPO group had vomiting; 12% of patients in the feeding group had vomiting. No patients in gum and laxative group had vomiting. Defecation in the 1st 24hrs of surgery was seen in

12.5% of NPO, 56% of feeding, 50% of laxative, and 41.7% of chewing gum group. Nausea in the first 24hrs after surgery was seen in 12.5% of NPO, 28% of feeding, 25% of laxative, and 0% gum chewing group.

DISCUSSION

As mentioned earlier, one of the most important problems for the surgeon to discharge a patient is the return of bowel movements. Bowel sounds are likely related to small bowel movement. Bowel movement and flatus are likely related to large bowel activity. In the study of Fanning et al.⁹, the mean time for discharge was 4 days after laxative administration. In our study, the above time was 1.7 days. A study showed that early feeding was effective in resolution of post-colectomy ileus.¹⁰ Seventy-two percent of all patients who underwent early feeding were able to tolerate that. This finding was comparable to Petrelli et al.¹¹ According to Petrelli et al. early oral feeding is safe and feasible for post-colectomy patients with history of endorectal neoplasm.¹⁵ In most of the studies the criteria for discharge from hospital were defecation, passage of gas, or feeding tolerance.¹² In our study, bowel sounds were the criteria for hospital discharge. In the study of Schuster et al., mean time of first bowel movement, mean time of first flatus, and mean length of hospital stay were significantly lower in the gum chewing group than in the control group.¹³ In the study of Asao et al., the first passage of flatus was seen, on average, on postoperative day 2.1 in the gum-chewing group and on day 3.2 in the control group ($P < 0.01$). The first defecation was 2.7 days sooner in the gum-chewing group (postoperative day 3.1) than in the control group (5.8 days; $P < 0.01$). All patients tolerated gum chewing on the first operative day. The postoperative hospital stay for the gum-chewing and control group was 13.5 ± 3.0 days and 14.5 ± 6.1 days, respectively. Gum chewing aids early recovery from postoperative ileus and is an inexpensive and physiologic method for stimulating bowel motility.¹⁷ Chewing gum is postulated to activate the cephalic-vagal reflex, which is usually enhanced by food, and to increase the production of the gastrointestinal hormones associated with bowel motility.¹⁷ A meta-analysis carried out by Purkayasthia et al. showed that chewing gum may enhance intestinal recovery following colostomy and reduce the

length of hospital stay.¹⁴ Some difference between our findings and other published papers may be due to the fact that our work was carried out in cholecystectomy patients in contrast to colectomy patients.

Conclusion: As showed above and in some of the published papers, gum-chewing is a safe and effective method in reducing ileus.

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