Effects of Chewing Gum on Recovery of Bowel Motility among patients after laparoscopic colorectal surgery

JiWoo Hong¹, Hee Jung Jang², Soon-Ok Ju³

¹Hallym University Sacred heart hospital, 431-796, Korea  
²Division of Nursing, Hallym University, Chuncheon 200-702, Korea  
³Corresponding author email: hjjang@hallym.ac.kr

Abstract. In the present study, we aimed to assess whether gum chewing affects bowel motility, including time to first passage of flatus, time to first feces, and time to tolerance of oral fluid after laparoscopic colorectal surgery. The current study had a non-equivalent control group and non-synchronized design. Sixty-four patients who underwent laparoscopic colorectal surgery were assigned to either a gum chewing group (n = 32; experimental group) or a control group (n = 32). The patients in the experimental group chewed gum for 1 hour, 3 times a day, until they passed gas. Chewing gum lead to significant differences in the first passage of flatus (t = 7.716, p = .000) and feces (t = 2.216, p = .030), and time to tolerance of oral fluid (t = 4.40, p < .001) between groups. This research concluded that chewing gum can be a useful intervention to shorten the time to the first passage of flatus and feces as well as to reduce the time to tolerance of oral fluid.

Keywords: Chewing gum, Laparoscopy, Colorectal surgery, flatus, feces

1 Introduction

Colorectal cancer is the third most-common cancer in Korea (National Cancer Information Center, 2013). Laparoscopic surgery was recently introduced for surgical removal, and its advantages compared to open surgery include reduced postoperative pain, faster recovery, reduced analgesic use, shorter length of hospital stay, quicker rehabilitation, and cosmetic benefit; hence, laparoscopic surgery is recommend for colorectal cancer (Korean Academy of Medical Sciences, 2012).

In particular, chewing gum is a type of sham feeding that is convenient, inexpensive, and easy to implement. It is recommended as a safe intervention for patients undergoing colorectal surgery because there have been no reported adverse effects of gum chewing in these patients (Leier, 2007).
Most of the studies on the effects of chewing gum have included patients undergoing abdominal surgery, and the studies on the effects of chewing gum in patients undergoing laparoscopic colorectal surgery are rare.

1.1 Purpose

In the present study, we aimed to assess whether chewing gum can be an effective intervention to help postoperative recovery after laparoscopic colorectal surgery by reducing the time to first passage of flatus and time to first feces in patients undergoing laparoscopic colorectal surgery.

1.2 Hypotheses

1) The first hypothesis: The time to the first passage of flatus will be shorter in the gum chewing experimental group than in the non-gum chewing control group.
2) The second hypothesis: The time to first feces will be shorter in the experimental group than in the control group.
3) The third hypothesis: The time to first meal (including beverage) will be shorter in the experimental group than in the control group.

2 Methods

2.1 Research design

In the present quasi-experimental study, using a non-equivalent control group and non-synchronized design, we aimed to investigate the effect of chewing gum on the recovery of bowel motility in patients undergoing laparoscopic colorectal surgery.

2.2 Participants

The 64 subjects were adult patients who underwent laparoscopic surgeries under general anesthesia such as hemicolectomy (Lt, Rt), anterior resection (AR), low anterior resection (LAR), or abdominoperineal resection (APR); who were hospitalized at the surgical ward in H University Hospital; and who met the following criteria:

1) Subjects who had clear consciousness and were capable of communicating
2) Subjects who agreed to participate in this study
2.3 Data collection

Data collection for this study was conducted in patients undergoing laparoscopic colorectal surgery who were either assigned to the experimental group (n=32) comprising patients hospitalized from May 2013 to September 2013, or the control group (n=32) comprising of patients hospitalized from January 2013 to April 2013.

2.4 Experimental procedure

Sugarless Xylitol gum of L Company was used for gum chewing as the experimental treatment in this study. The gum was supplied to patients 3 times a day at 8:00 am, 1:00 pm, and 6:00 pm, starting from the day of admission to the ward after surgery. The duration of gum chewing was 1 hour, which was based on the studies by Schuster et al (2006) and Bang et al (2008). Gum chewing was discontinued following the self-reporting of the first passage of flatus from the bowel, wherein oral intake was initiated after the passage of flatus, after which gum chewing was discontinued.

3 Results

3.1 Homogeneity of general and clinical characteristics between the 2 groups

The homogeneity test for the general characteristics of the experimental and control group was performed using the $\chi^2$ test and t-test. No significant differences were noted between the groups, hence, it was found to be a homogenous population.

3.2 Hypothetic verifications

1) The first hypothesis: When the first hypothesis—the time to the first passage of flatus will be shorter in the gum chewing experimental group than in the non-gum chewing control group—was verified by using the t-test, the time to the first passage of flatus was 2.96 ± 1.25 days in the experimental group and 5.37 ± 1.23 days in the control group; the difference in these values was statistically significant ($t = 7.716$, $p < .001$), and hence, the first hypothesis is supported.

2) The second hypothesis: When the second hypothesis—the time to first feces is shorter in the experimental group than in the control group—was verified by using the t-test, the time to first feces was found to be 4.53 ± 1.81 days in the experimental group and 5.53 ± 1.79 days in the control group; the difference in these values was statistically significant ($t = 2.216$, $p = .030$), and hence, the second hypothesis is supported.
3) The third hypothesis: When the third hypothesis—the time to the first meal (including beverage) will be shorter in the experimental group than in the control group—was verified by using the t-test, the time to sipping water was found to be 4.4 ± 2.04 days in the experimental group and 5.59 ± 1.24 days in the control group (t = 2.658, p = .010) and time to liquid diet intake was found to be 5.25 ± 0.91 days in the experimental group and 6.46 ± 1.26 days in the control group; the differences in these values were found to be statistically significant (t = 4.404, p < .001) and hence, the third hypothesis is also supported.

4 Conclusions

This study was a quasi-experimental study, using a non-equivalent control group and non-synchronized design, to investigate the effect of chewing gum on recovery of bowel motility in 64 patients undergoing laparoscopic colorectal surgery at general surgery ward in H University Hospital located in A City.

In conclusion, this study found that gum-chewing in patients undergoing laparoscopic colorectal surgery can be an effective intervention to facilitate the passage of flatus and feces, and shorten the time to dietary intake by promoting bowel motility.

References