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Role of Chewing Gum in Reducing Post-Operative Ileus and Enhancing Recovery Following Colorectal Surgery – A Study at CMH Lahore

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ABSTRACT

Objectives: To determine impact of chewing gum in immediate postoperative period on the outcomes of colorectal surgery. **Study Design:** Comparative cross-sectional study. **Place and Duration of Study:** Combined Military Hospital, Lahore from February 07, 2025 to May 07, 2025. **Methodology:** In this study, 62 patients who underwent elective colorectal surgery were included. They were divided into Group-G (advised to chew gum in addition to standard post-operative care) and Group-S (managed through standard post-operative care). Patients in both the groups were assessed for outcomes including duration to recover from physiologic postoperative ileus and the occurrence of pathologic postoperative ileus and their comparison was performed between groups. Data was analyzed using SPSS version 22.00. **Results:** In this study, 62 patients divided into two groups were included. Median age was 68.00 (7.00) years. There were 33 (53.20%) male and 29 (46.80%) female patients. In Group-G, median duration to pass first postoperative flatus was 37.00 (5.00) hours while in Group-S it was 58.00 (19.00) hours, ($p < 0.001$). In Group-G, median duration to pass first postoperative feces was 58.00 (5.00) hours while in Group-S it was 78.00 (5.00) hours, ($p < 0.001$). In Group-G ($n = 31$), pathological postoperative ileus occurred only in 1 (3.23%) patient while in Group-S ($n = 31$), it occurred in 8 (25.81%) patients, ($p = 0.012$). **Conclusion:** Addition of gum chewing to standard postoperative care after colorectal surgery can effectively reduce postoperative ileus rate and recovery time.

INTRODUCTION

Postoperative ileus is a medical terminology used to describe the inability of a patient to pass feces after undergoing a surgical procedure.[1] Major mechanism which has been hypothesized to drive the occurrence of this complication is the desynchronization of the naturally synchronized propulsion movement of the intestinal tract secondary to the abnormality in the normal flow of the intestinal electrical impulses.[2] Particularly, in the cases of colorectal surgery, there are three potential pathophysiological processes that have the potential to result in this complication including the activation of neural reflex which physiologically functions as an inhibitory reflex, inflammation and disorganized activity of the sympathetic system.[3]

Traditionally, in these surgeries, patient were kept in nothing per oral status along with the passage of nasogastric tube till the re-establishment normal gut movements to prevent postoperative vomiting, abdominal pain and nausea.[4] Current evidence, however, state that time to begin feeding after major procedures is an important factor that determines the chances of ileus development and its recovery. [5] One such method of early introduction of feeding that has been hypothesized to promote gut motility stimulation and improving the operative outcomes by early recovery of the postoperative ileus, without giving the actual food, is advising the patient to chew chewing gum, a practice famously known in surgical fraternity as sham feeding.[6]

When it comes to the role of this practice of bubble gum chewing in addition to the provision standard postoperative care package to the patient in their postoperative period to achieve early recovery from ileus, it is still controversial. At one end, there are studies that exhibit significant benefit of this clinical practice while on the other end, literature also exist demonstrating the contradictory evidence in this regard.[7, 8] Owing to such non-availability of concrete evidence, particularly due to

the lack of local and regional studies regarding this clinical practice, present study was conducted with the aim to determine the impact of chewing gum in immediate postoperative period on the outcomes of colorectal surgery.

METHODOLOGY

This comparative cross-sectional study was conducted at Combined Military Hospital, Lahore from February 07, 2025 to May 07, 2025, after taking approval from research evaluation board of institution. Sample size was calculated using WHO
Sample size calculator by using following formula:

This was done by assuming level of significance of 5%, power of 80%, anticipated mean duration of passage of first postoperative flatus in patients with versus without practice of postoperative gum chewing of 35.93 ± 15.66 hours and 52.92 ± 21.97 days, respectively. [9] This gave a sample size of 62 (31 in each group) which was selected using non-probability consecutive sampling technique.

Inclusion criteria: Adult male and female patients who had age more than eighteen years and American Society of Anesthesiologist (ASA) status I-III who underwent elective laparoscopic colorectal surgery were included.

Exclusion criteria: Patients who had previous history of colorectal surgery, who required emergency surgery, in which laparoscopic procedure was converted to open procedure or those unfit for surgery were excluded.

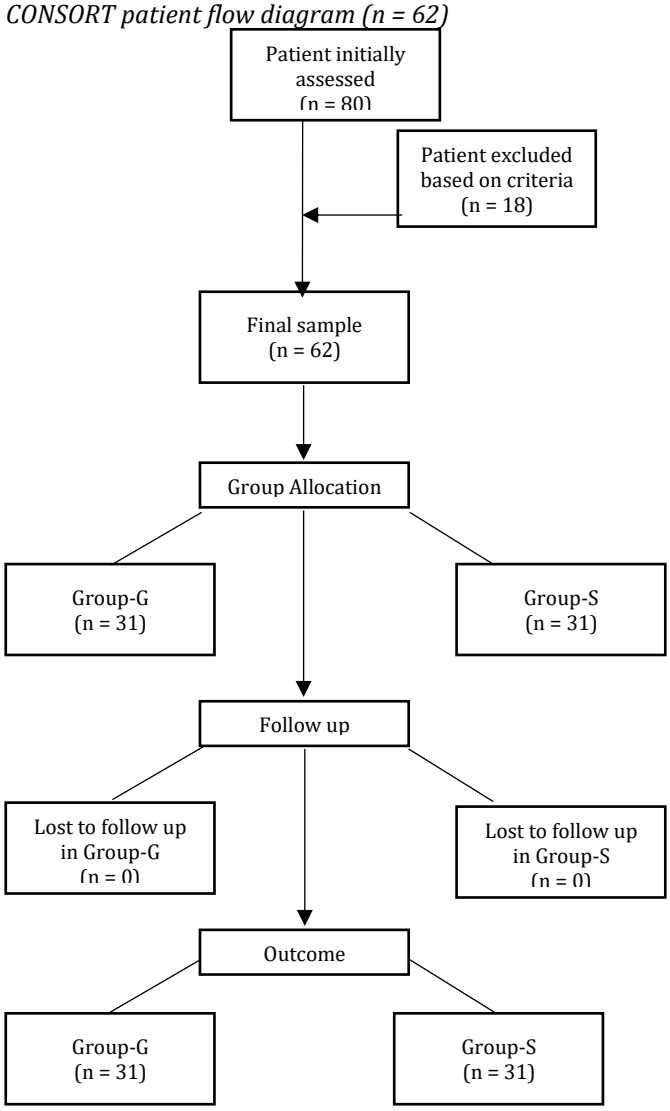
A written consent which was signed by the study participants, was made an essential pre-requisite. Baseline characteristics of all patients including age, gender and ASA status were documented. All the patients, depending upon indication underwent laparoscopic colorectal surgery as per standard protocol.

Once procedure was completed, all patients were provided post-operative care as per Enhanced recovery after surgery (ERAS) protocol (including early mobilization, earlier drain removal and effective pain/nausea/vomiting/blood sugar control), with addition of chewing bubble gum in the postoperative management protocol in Group-G (n = 31) while in Group-S (n = 31), postoperative management was provided as per standard ERAS protocol without the addition of chewing bubble gum.

During the post-operative period, patients were kept admitted till the passage of flatus as well as feces after the surgery or seven days, whichever was earlier, and the time taken to pass first flatus and feces was documented. These times defined the duration of recovery from physiologic postoperative ileus. Occurrence of pathological postoperative ileus was determined by observing the presence of the visible distention of the abdomen along with the inability to listen to the bowel sounds through stethoscope aided auscultation, presence of gas/liquid on the abdominal x-rays and inability to pass flatus or stool after more than three days of surgery. In case of developing this pathological ileus, appropriate individualized plan of management was followed for each case.

Process of patient selection till the final outcome assessment is given in CONSORT patient flow diagram given in Figure-1:

Figure 1
CONSORT patient flow diagram (n = 62)



Statistical analysis of the collected data was performed by inputting the data into Statistical Package for Social Sciences (SPSS) software version 22.00. Normality of data was checked by Shapiro-Wilk test which exhibited that age, duration to pass first postoperative flatus and duration to pass first postoperative feces were not distributed normally. These were thus presented as median inter-quartile range (IQR) and their comparison between groups was performed using Mann Whittney U-test. Qualitative data (gender, ASA status and occurrence of pathological postoperative ileus was represented by using percentage and frequency and their comparison between groups was performed using Chi square test. A p-value of ≤ 0.05 was considered as statistically significant.

RESULTS

In present study, a total of 62 patients (31 in each group) were included. Median age was 68.00 (7.00) years. There were 33 (53.20%) male and 29 (46.80%) female patients. In terms of ASA status, 24 (38.70%) patients had ASA status I, 23 (37.10%) patients had ASA status II and 15

(24.20%) patients had ASA status III. Baseline patient demographics are compared in Table-I:

Table I
Comparison of baseline patient demographics between groups (n = 62)

Parameter	Study Groups		p-value
	Group-G (n = 31)	Group-S (n = 31)	
Median age	68.00 (4.00) years	68.00 (8.00) years	0.966
Gender			
Male	17 (54.84%)	16 (51.61%)	0.799
Female	14 (45.16%)	15 (48.38%)	
ASA status			
I	12 (38.71%)	12 (38.71%)	
II	11 (35.48%)	12 (38.71%)	0.946
III	8 (25.81%)	7 (22.58%)	

In Group-G, median duration to pass first postoperative flatus was 37.00 (5.00) hours while in Group-S it was 58.00 (19.00) hours, ($p < 0.001$). In Group-G, median duration to pass first postoperative feces was 58.00 (5.00) hours while in Group-S it was 78.00 (5.00) hours, ($p < 0.001$). This comparison of parameters that determine recovery from postoperative ileus between groups is demonstrated in Table-II:

Table II
Comparison of parameters that determine recovery from postoperative ileus between groups (n = 62)

Parameter	Study Groups		p-value
	Group-G (n = 31)	Group-S (n = 31)	
Median duration to pass first postoperative flatus	37.00 (5.00) hours	58.00 (19.00) hours	< 0.001
Median duration to pass first postoperative feces	58.00 (5.00) hours	78.00 (5.00) hours	< 0.001

In Group-G (n = 31), pathological postoperative ileus occurred only in 1 (3.23%) patient while in Group-S (n = 31), it occurred in 8 (25.81%) patients, ($p = 0.012$). Comparison of frequency of pathological postoperative ileus between groups is given in Table-III:

Table III
Comparison of frequency of pathological postoperative ileus between groups (n = 62)

	Group-G (n = 31)	Group-S (n = 31)	p-value
Pathological postoperative ileus	1 (3.23%)	8 (25.81%)	0.012

DISCUSSION

Present study focused on an important aspect of colorectal surgery, i.e., recovery from physiologic postoperative ileus and occurrence of pathological ileus which is a major concern for operating surgeons during the postoperative recovery period. [10, 11] In present study, operational definition which was set to label occurrence of postoperative ileus was the persistence of physiologic ileus for more than three days period. This was set as per the standardized definition of this common post-surgical complication which has been used by various previous studies. [12, 13] In addition to this, all the patients were provided with a postoperative care package based on the ERAS protocol which has been reported to significantly improve the post-procedural outcomes after the abdominal surgeries, particularly the colorectal surgeries, as compared to the conventional postoperative practices. [14, 15]

Regarding the age of the patients who underwent colorectal surgery, it was observed that the average age was sixty eight years. This may have occurred because in older age patients, chances of developing colorectal conditions that necessitate surgical intervention like malignancy and diverticular disease of colorectal region is much higher as compared to the younger population. [16, 17] Similarly, most patients who underwent colorectal surgery were male and the reason behind this trend could be similar to that of older age, i.e., higher chances of males to develop colorectal conditions that necessitate conductance of surgical intervention. [18]

Upon comparative analysis of the parameters that assessed recovery from postoperative ileus including duration taken after surgery for the passage of first stool and feces, it was observed that these durations were significantly shorter among patients who were given gum for chewing in addition to ERAS postoperative management as compared to ERAS postoperative management alone, ($p < 0.001$). Compared to this, a study was conducted by Ya-Chuan *et al.* [9] with the similar objective and they also found that these durations were significantly shortened in postoperative bubble gum chewers (p-values of 0.004 and 0.025). In another study, conducted by Kusika *et al.* [19] similar finding was observed with significantly shorter time span between surgery end and passage of flatus for the first time ($p < 0.001$) but the difference in the overall duration was due to the difference in the type of surgical procedure. Similar, observation of beneficial impact of gum chewing postoperatively on the parameters of postoperative ileus recovery were demonstrated in a study conducted by Muwel *et al.* [20] Contrarily, Atkinson *et al.* [21] found that there was no significant impact of addition of bubble gum chewing practice in the post-operative care package on the recovery of postoperative ileus. The exact reason behind this difference could not be determined but it may have occurred due to difference in the study setting and surgical technique. A unique perspective of this study was assessment of patients for occurrence of pathological postoperative ileus. It was observed that the frequency of this complication was also significantly reduced by addition of chewing gum to ERAS protocol ($p = 0.012$). In the similar vein, van den Heijkant *et al.* [22] also reported that this useful yet simple intervention of chewing bubble gum after surgery significantly reduced the rate of this complication ($p = 0.020$).

Based on results of present study, current hypothesis that addition of bubble gum chewing to the standard ERAS protocol based post-operative care significantly improves the operative outcomes of colorectal surgery as well as pathologic postoperative ileus frequency was proved. Owing to this, it is strongly recommend chewing gum should be made part of the standard postoperative ERAS

protocol in patients undergoing elective laparoscopic colorectal surgery.

CONCLUSION

In conclusion, addition of gum chewing to standard postoperative care after colorectal surgery can effectively reduce postoperative ileus rate and recovery time.

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