Original Article

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Outcome of Chewing Gum versus Intravenous Fluids in Prevention of Postoperative Ileus after Stoma Reversal

Mohibah Khaliq[1], S H Waqar[2], Fahad Akhtar[3], Kanza Farukh[4], Muhammad Fahad Ali[5]

[1] Postgraduate Resident,[2] Professor, [3] Senior Registrar, [4] Medical Officer, [5] Postgraduate Resident,
Department of General Surgery, Pakistan Institute of Medical Sciences (PIMS), Islamabad, Pakistan

Author`s Contribution

[1,3]Substantial contributions to the conception or design of the work; or the acquisition, Drafting the work or revising it critically for important intellectual content [2]Supervision and Final approval. [4,5]Active participation in active methodology, analysis, or interpretation of data for the work,

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Address of Correspondent
Dr. Mohibah Khaliq
Postgraduate Resident,
Department of General Surgery
Pakistan Institute of Medical Sciences (PIMS), Islamabad
mohibakhaliq@gmail.com

ABSTRACT

Objective: This study compared the effectiveness of postoperative chewing gum with standard IV-fluid-based care in preventing POI after stoma reversal.

Methodology: This randomized controlled trial study was conducted in Department of General Surgery, PIMS, Islamabad from 01/03/25 to 30/09/2025 on 60 patients who were in a condition to undergo stoma reversal and randomly divided into two groups: Group A received three times of sugar-free chewing gum three days after surgery and Group B received only IV-fluid as a postoperative treatment. The time to first flatus and hospital stay were the primary outcomes. The secondary outcomes were the incidence of POI, the scores of postoperative pain, and patient satisfaction. Data was analyzed on SPSS version 27 and the p value of less than 0.05 was regarded as statistically significant.

Results: First flatus occurred before patients in the chewing-gum group (54.3 ± 7.9 hours) than in the control group (78.6 ± 10.4 hours). Group A also had shorter hospital stay (6.8 ± 1.1 days) as compared to Group B (9.1 ± 1.4 days). The chewing-gum group had less POI incidence, lower pain scores and increased satisfaction.

Conclusion: Chewing gum is a safe, inexpensive, and effective adjunct that enhances postoperative bowel recovery after stoma reversal. Incorporating it into routine postoperative care may help reduce POI and improve patient outcomes.

Keywords: Postoperative ileus, stoma reversal, chewing gum, sham feeding, bowel function, randomized controlled trial.

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Introduction

One of the most common and problematic complications of any laparoscopy or laparotomy, regardless of elective or emergency, is postoperative ileus.[1] The possible complications of the prolonged ileus postoperative may be severe postoperative pain, excessive nausea and vomiting, pulmonary complications, poor wound healing, delay of postoperative oral intake, delay of postoperative movement, prolonged hospitalization, and high cost of health care.[2] This problem is particularly common after stoma reversal, where the bowel is handled extensively, and adhesions are frequently divided.

One of the well-known and relatively safe options that can be performed to manage patients with peritonitis is ileostomy, i.e., the opening of the small gut on the abdominal wall.[3] There are several indications for emergency temporary loop ileostomies and colostomies that include enteric perforation, intestinal obstruction with gangrenous bowel, traumatic (firearm injury), and fecal peritonitis.[3] Of all these, enteric perforation accounts for about 20% to 40% stoma formation.[4, 5] The use of a protective ileostomy is especially indicated in a very low rectal resection, coloanal anastomosis, and pouches.[5] In the majority of cases, ileostomy is performed temporarily; the goal of which is reversal within three months. Real time can be highly variable among institutions because of patients and operating considerations.

The reversal of stoma has frequently involved adhesions dissection and bowel mobilization.[7] GI disturbance such as postoperative ileus may cause severe discomfort and augment post-operative morbidity.[6] In most cases, this

gastrointestinal dysfunction post operation is generally resolved through decompression of the stomach and cessation of the oral diet and IV fluids until the conditions are relieved. Recently, several gum chewing researches during the postoperative period have expressed positive results in postoperative gastrointestinal dysfunction. Sham-feeding, which is gum chewing, is an activity that activates the gut motility via cephalic-vagal stimulation releasing greater gastrointestinal secretions and enhances the bowel movements. It has also been indicated that the hexitol found in sugarless chewing gum helps in the alleviation of postoperative ileus.[7]

Loop ileostomy closure (LIC), although considered a relatively simple procedure, carries notable morbidity. Reported complication rates may reach 45%, with reoperation rates up to 7%. Recent work has suggested that LIC can be performed as a same-day procedure in selected patients, but only a small proportion are eligible for accelerated pathways. Postoperative ileus (POI) remains a major cause of delayed recovery, occurring in roughly 20% of cases. Enhanced recovery protocols highlight strict fluid management to reduce ileus rates after colorectal surgery. [8]

A previous study evaluating gum chewing after ileostomy reversal reported significantly earlier return of bowel function and shorter hospitalization in patients who chewed gum compared with those receiving routine IV-fluid management. Their findings showed earlier passage of first flatus (49.97 ± 1.69 vs 89.17 ± 2.07 hours) and shorter hospital stay (7.73 ± 0.74 vs 10.27 ± 0.87 day. [9]

Since POI has a significant impact on postoperative recovery and healthcare expenditures, it is crucial to find easy and efficient interventions. Chewing gum, as a form of sham-feeding, may offer a low-cost method to stimulate bowel activity and improve outcomes after stoma reversal. This forms the rationale for comparing chewing gum with standard IV-fluid-based postoperative care in the present study. The objective of the study was to compare the outcome of chewing gum vs. I/V fluid in the prevention of post-operative ileus after stoma reversal.

Methodology

The study design was a randomized Control Trial (RCT) conducted at the Department of General Surgery, PIMS, Islamabad. The duration of study was six months from the 01/03/25 to 30/09/2025. This study was conducted after obtaining ethical approval from the Institutional Review Board of the Pakistan Institute of Medical Sciences (PIMS), Islamabad.

By using the WHO size calculator sample size is 60 (n=30 in the chewing gum group and n=30 in the control group), with a level of significance 5%. Power of test 90%, test value of population mean 7.73, anticipated population mean 10.27, population standard deviation 0.805.[9]

A Non-probability consecutive sampling technique. The inclusion criteria were patients aged 18 to 75 years, both genders, undergoing stoma reversal. And the exclusion criteria were patients. in case of inflammatory bowel disease, patients who undergo any form of 'abdominal radiation. cancers, pregnant mothers' and patients under ICU who spend over 24 hrs. after surgery.

After the research ethics committee issues an ethical approval, postoperative ileus is characterized as the temporary inhibition of normal gastrointestinal motility occurring after abdominal surgery and is usually temporal (3-5 days). Reduction in POI: This will be defined by patient in the chewing gum group having a lower POI incidence than the IV fluid group, which will mean that chewing gum has a better outcome in preventing POI and will be referred to as reduction in POI. And the results of the research will be characterized by the following: The period of passage of first flatus will be the period of time that passes since the completion of surgery to the passing of intestinal gas after surgery to the patient. The time of the patient in hospital was recorded as the duration of time he or she is in the hospital since his or her admission.

A detailed history and clinical examination will be performed in all cases. Patients will be divided into two groups: Group A, receiving chewing gum postoperatively thrice daily starting 6 hours postoperatively along with standard postoperative care, and Group B, receiving IV fluid (routine aftercare). The incidence of POI was compared in the study together with the time of first flatus passage. number of hours, and hospital stay in days in the two groups. Pain scores, patient satisfaction, and overall quality of life were also evaluated. The researcher recorded all the findings on a specially designed proforma.

Data analysis was carried out in SPSS version 27. Variables such as age, length of stay and time of passage of first flatus will be analyzed by use of descriptive statistics like mean and standard deviation. Qualitative variables such as gender, the reasons behind formation of the stoma, the procedure performed at the time of stoma formation and the history of past operations in the abdomen will be counted as frequency. The length of hospital stay and time of first flatus were compared using

an independent sample t -test that was used to compare the two groups. The p-value under 0.05 is significant.

Results

The research study included 60 participants who were having their stomas reversed, and each group had comparable baseline statistics. The average ages of the participants were comparable, 42 years for the chewing gum group and 45 years for the IV fluid group. The gender distribution exhibited a particular male predominance across both groups. Comorbidities, history of smoking, and previous abdominal surgery were also equally distributed. Such similarities suggest that randomization was successful and that there were no pre-existing imbalances that would affect outcomes in the postoperative period. (Table I)

Both groups most frequently cited enteric perforation as their main reason for stoma formation, as well as stating other causes such as intestinal obstruction, gangrenous bowel, trauma, and fecal peritonitis in similar proportions. When analyzing first procedures, Loop ileostomy was most common, with loop colostomy and resection with anastomosis being performed with similar frequency. Because of these equal distributions, it can be concluded that baseline surgical pathology and stoma type were equally distributed in the groups, limiting any confounding effects on the postoperative outcomes. (Table II)

Participants of the chewing-gum group had a remarkably shorter time interval to first flatus and an earlier return of bowel function compared to the IV-fluid group. 'The intervention group had earlier discharge as compared to the control group' by almost two days, which also led to a reduction in the length of hospital stay. These differences were statistically significant. (Table III)

Table III: Comparison of Primary Outcomes Between Groups. (n = 60)

Outcome Variable	Group A (Chewing Gum) Mean ± SD	Group B (IV Fluids) Mean ± SD	p-value
Time to First Flatus (hours)	54.3 ± 7.9	78.6 ± 10.4	<0.001
Length of Hospital Stay (days)	6.8 ± 1.1	9.1 ± 1.4	<0.001

Table I: Sociodemographic and presenting clinical features of study subjects (n = 60)

'Variable'	Category	'Group A (Chewing Gum) (n=30)'	'Group B (IV Fluids) (n=30)'	Total (n=60)
'Age (years)'	Mean ± SD	42.7 ± 11.3	44.9 ± 10.8	43.8 ± 11.0
'Gender'	Male	'18 (60.0%)'	'17 (56.7%)'	'35 (58.3%)'
	Female	'12 (40.0%)'	'13 (43.3%)'	'25 (41.7%)'
Co-morbidities	Present	9 (30.0%)	11 (36.7%)	20 (33.3%)
	Absent	21 (70.0%)	19 (63.3%)	40 (66.7%)
Smoking Status	Smoker	7 (23.3%)	8 (26.7%)	15 (25.0%)
	Non-smoker	23 (76.7%)	22 (73.3%)	45 (75.0%)
Previous abdominal surgery	Yes	10 (33.3%)	12 (40.0%)	22 (36.7%)
	No	20 (66.7%)	18 (60.0%)	38 (63.3%)

Table II: Operative and stoma-related characteristics of the study cohort. (n = 60)

'Variable'	Category	'Group A (n=30)'	'Group B (n=30)'	'Total (n=60)'
Reason for stoma formation	Enteric perforation	14 (46.7%)	13 (43.3%)	27 (45.0%)
	Intestinal obstruction	5 (16.7%)	6 (20.0%)	11 (18.3%)
	Gangrenous bowel	4 (13.3%)	3 (10.0%)	7 (11.7%)
	Trauma/firearm injury	3 (10.0%)	2 (6.7%)	5 (8.3%)
	Fecal peritonitis	2 (6.7%)	3 (10.0%)	5 (8.3%)
	Protective ileostomy	2 (6.7%)	3 (10.0%)	5 (8.3%)
Procedure at the time of stoma formation	Loop ileostomy	22 (73.3%)	21 (70.0%)	43 (71.7%)
	Loop colostomy	5 (16.7%)	6 (20.0%)	11 (18.3%)
	Resection + anastomosis	3 (10.0%)	3 (10.0%)	6 (10.0%)

Table IV: Secondary Postoperative Outcomes. (n = 60)

Variable	Category / Mean ± SD	Group A (n=30)	Group B (n=30)	p-value
Postoperative Ileus (POI)	Yes	3 (10.0%)	8 (26.7%)	0.04
	No	27 (90.0%)	22 (73.3%)	—
Pain Score (VAS)	Mean ± SD	3.9 ± 1.2	5.1 ± 1.4	0.002
Patient Satisfaction	Satisfied	22 (73.3%)	15 (50.0%)	—
	Neutral	6 (20.0%)	8 (26.7%)	—
	Dissatisfied	2 (6.7%)	7 (23.3%)	—

The chewing gum group demonstrated a clinically significant decrease in the prevalence of delayed bowel recovery compared with the control group. In addition, patients who received chewing gum reported significantly less pain, indicating a higher level of comfort in the postoperative period. Furthermore, higher satisfaction levels in the intervention group indicated a more complete recovery and greater ease in coping with the postoperative period.

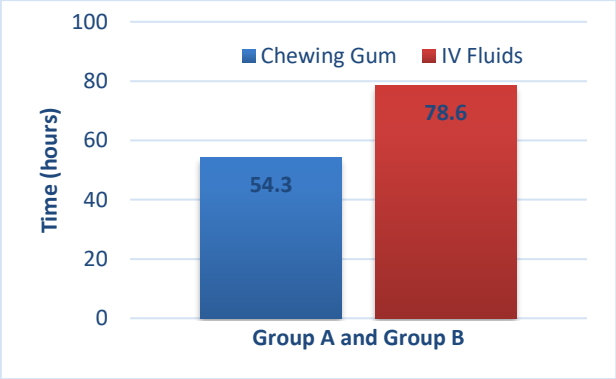

Figure 1. Comparison of Time to First Flatus Between Study Groups.

Figure 1: Bar chart demonstrating the average time to first flatus in patients with chewing gum versus the usual IV fluid care, following a stoma reversal. There was a significantly earlier restoration of bowel activity in the chewing-gum group (54.3 hours) compared with the IV-fluid group (78.6 hours), indicating faster postoperative gastrointestinal recovery.

Discussion

In this RCT trial of 60 patients undergoing stoma reversal, use of postoperative chewing gum significantly shortened the time to first flatus and reduced the length of hospital stay compared with standard postoperative care (IV fluids only). Specifically, the chewing-gum group had 1st flatus that was shorter in a mean of 54.3 +- 7.9 hours compared to 78.6 +- 10.4 hours in the control group ($p < 0.001$), shorter hospital stay (6.8 +- 1.1 vs 9.1 +- 1.4 days; $p < 0.001$). Secondary outcomes, also preferred including the incidence of postoperative ileus, pain score, and patient satisfaction. the chewing-gum group.

These findings were in accordance with the supporting sham-feeding (chewing gum) as a low-cost, low-risk intervention to accelerate postoperative gastrointestinal recovery. A recent umbrella review pooling data from 17 reviews (representing 26,672 participants) concluded that chewing gum significantly reduces time to first flatus (by 12.3 hours), time to first bowel movement (by 19.3 hours), and length of hospital stay (by 0.85 days). [10] Similarly, a 2025 RCT of 84 colorectal-cancer patients reported that gum chewing significantly shortened time to return of bowel sounds, first flatus, and defecation versus standard care. [11] Additionally, a 2025 multicenter RCT in patients undergoing laparotomy for gastroduodenal perforations demonstrated that chewing gum shortened the duration of postoperative ileus by a median of 21.5 hours and reduced hospital stay by 2.5 days. [12]

A 2022 randomized trial after colorectal resection also reported significantly earlier first flatus and defecation with gum chewing (39.1 ± 15.7 vs. 52.9 ± 22.0 hours for flatus). [13] These up-to-date findings support our results and suggest that gum chewing remains effective across different types of abdominal surgeries, elective or emergency.

The mechanism underlying this benefit is thought to be cephalic-vagal stimulation via sham-feeding, which promotes gastrointestinal motility and reduces sympathetic inhibition of gut peristalsis after surgical stress. [14, 15]

Given that delayed return of bowel function a typical cause of extended hospitalization, patient suffering and higher expenses to health-care may be post-operative ileus, POI), but incorporation of chewing gum as a part of postoperative care can provide a cost-effective remedy [8,16], widely-available adjunct to standard postoperative protocols[17], especially in resource-limited settings[18] similar to ours.

Additionally, the positive effects on secondary outcomes in our study (lower POI incidence, lower pain scores, higher patient satisfaction) suggest that chewing gum may confer not only objective recovery benefits[19] but also improve patient experience and comfort, an often underreported dimension in surgical recovery research.

However, some limitations deserve acknowledgement. Although the sample size was calculated appropriately (n = 60), our study remains modest in scale and was conducted at a single center. Larger multi-center trials are needed to confirm generalizability. While our study recorded flatus time, hospital stay, POI, pain, and satisfaction, we did not assess longer-term outcomes such as readmission rates, long-term gastrointestinal complications, or quality-of-life (QoL) beyond discharge. Although our original plan considered QoL, we did not have a validated instrument so our study omitted it. Future

studies should include standard QoL scales to allow better assessment of patient-centered outcomes.

Our control group received conventional IV-fluid-based care, but other aspects of postoperative management (e.g., mobilization, feeding protocol) were not strictly standardized and may have varied between patients, potentially influencing bowel recovery.

Although some recent trials support gum-chewing (2022–2025), the overall body of high-quality, large-scale RCTs remains small. Many of the foundational studies and meta-analyses are older, and there is still debate about the consistency of effect across different types of abdominal surgery, especially when enhanced recovery after surgery (ERAS) protocols are used. [20]

As noted in the umbrella review, many included studies were of low quality with inconsistent methodology. [10] In addition, some negative studies (e.g., pre-ERAS era trials) reported minimal or no benefit, raising the possibility that positive findings may be overrepresented.[19]

In our trial, blinding of patients was not possible (they knew if they chewed gum), which may introduce performance or reporting bias; for example, patients in the chewing-gum group may have reported flatus sooner or been more motivated. Because of these limitations, while our results are encouraging, they should be interpreted with cautious optimism.

Conclusion

In conclusion, this randomized controlled trial demonstrates that adding postoperative chewing gum to standard care in patients undergoing stoma reversal significantly accelerates the return of bowel function (first flatus), reduces the duration of hospital stay, lowers the incidence of postoperative ileus, decreases pain scores, and improves patient satisfaction. Given its simplicity, low cost, and safety profile, chewing gum represents a practical, non-pharmacological intervention that can be incorporated into postoperative care protocols, particularly in resource-constrained surgical settings.

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