

Effectiveness of Early Feeding *versus* Conventional Protocol after Stoma Reversal in Adult Surgical Practices

Sajid Ali¹, Faheem Khan², Saman Hafeez¹, Zaka Ullah Jan³ and Mian Tauseef Uddin¹

¹Department of General Surgery, DHQ Hospital, Mardan, Pakistan

²Department of General Surgery, Category D Hospital, Rustam, Mardan, Pakistan

³Department of General Surgery, Khyber Teaching Hospital, Peshawar, Pakistan

ABSTRACT

Objective: To compare the effectiveness of early feeding and conventional feeding protocol after stoma reversal in adult surgical practices.

Study Design: Randomised controlled trial.

Place and Duration of the Study: Department of General Surgery, District Headquarters Hospital Mardan, Pakistan, from January 2020 to July 2022.

Methodology: A total of 72 patients enrolled in the surgical unit for stoma reversal were included in this study. After applying the exclusion criteria, 68 patients were randomised in two equal groups of 34 patients each. In Group A, patients were allowed oral liquid feed within 24 hours after surgery while in Group B oral liquid feed was allowed after 72 to 96 hours when the nasogastric tube was removed and bowel functions were returned. Efficacy, safety, and tolerability were evaluated from outcomes such as postoperative ileus, anastomosis leakage, infection of the wound, and length of hospital stay.

Results: The age range in this study was from 18 to 43 years with mean \pm SD of 31.602 ± 6.75 years. There were 41 (60.29%) males while 27 (39.71%) females in this study and the male population was dominant in both groups. The results were significantly in favour of Group A, where 28 (82.35%) patients did not have postoperative ileus compared to 17 (50%) patients in Group B ($p = 0.004$). Wound healing was also significantly better in Group A compared to Group B, where 30 (88.23%) patients had no wound infection compared to 21 (61.76%), respectively ($p = 0.001$). There was no difference between both groups regarding anastomotic leakage. Length of hospital stay was significantly shorter in Group A (3.117 ± 0.87 days) compared to Group B (5.617 ± 1.43 days) ($p = 0.001$).

Conclusion: Early feeding after stoma reversal is effective, minimises the postoperative complications, and leads to shortening of hospital stay in adult surgical practices.

Key Words: Anastomosis leakage, Early feeding, Length of hospital stay, Stoma reversal.

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INTRODUCTION

Ileostomy is a life-saving procedure for patients undergoing gastrointestinal (GI) surgeries. The process of ileostomy is the exteriorisation of part of the ileum through the wall of the abdomen in order to empty the enteric contents externally, thus bypassing the remaining GI tract. This diversion of bowel contents helps to avoid anastomosis of the bowel until it is safe.^{1,2}

Loop stomas are temporary and reversed mostly within 2-3 months, depending upon the patient's conditions at the time when stoma was fashioned and their post-procedure recovery.³

These patients tend to have poor wound healing and increased hospital stays as they are prone to infections secondary to malnourishment. With this state of malnutrition, the reversal of ileostomy is yet another challenge. Conventionally, after the reversal of stoma, patients are kept nil by mouth to allow some time for the healing of anastomosis. Nasogastric (NG) tube is used for stomach drainage and patient is allowed per orally when there is evidence of return of bowel motility^{4,5} hence, postoperative paralytic ileus is still common. After loop ileostomy closure, postoperative ileus is among the leading causes of readmission within one month.⁶

The belief that oral feeding will increase the risk of disruption of anastomosis had in fact no evidence from any study. The daily secretions from the stomach and pancreas are about 2 litres, so patient is still having this good amount of fluid despite the restriction of oral feed. The peristaltic activity is restored within 24 hours in the small intestine and after 48-72 hours in the large bowel, there are updated recommendations for early feeding after stoma reversal.^{7,8} Early feeding improves nutritional status of the patient, thus healing of the anastomosis

Correspondence to: Dr. Zaka Ullah Jan, Department of General Surgery, Khyber Teaching Hospital, Peshawar, Pakistan

E-mail: zuj_cck@yahoo.com

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and helps in resolving paralytic ileus. These benefits thus minimise the length of hospital stay (LHS).⁹

Studies did not reveal any benefit of using an NG tube and avoiding oral feeding for 5 days as it does not help in preventing anastomotic leakage and other complications related to surgery.¹⁰ Early enteral feeding (within 24 hours) is said to help in stabilising the enterocytes, increasing the mucosal barrier function, restoring intestinal peristalsis, and minimising the stress response.¹¹ Ottaviano *et al.* in his study discussed the implementation of enhanced recovery after surgery (ERAS) protocol in loop ileostomy closure which included early liquid diet after surgery. This helped in early recovery of the patient resulting in shortening the LHS.¹² Hence, the ERAS and the French guidelines also favour the early feeding after stoma reversal.¹³

METHODOLOGY

This study was conducted at the department of General Surgery, District Headquarter Hospital Mardan, Pakistan, over a period of 30 months from 10th of January 2020 to 10th of July 2022.

Sample size was calculated as $n_1 = 34$, $n_2 = 34$, with power = 80% and $\alpha = 5\%$ (one sided), $p_1 = 10.25\%$, and $p_2 = 35.89\%$, calculated by OpenEpi software.

A total of 72 patients above the age of 18 years, who were admitted to the surgical unit for stoma reversal after temporary ileostomy or colostomy, were included in this study. Two patients with comorbid condition (uncontrolled hypertension) and two patients with immunosuppression were excluded from the study. Remaining 68 patients were randomised in two equal groups of 34 patients each using computer generated randomisation table. In Group A, no NG tube was passed and patients were allowed oral clear liquid diet within 24 hours after surgery without waiting for the signs of return of bowel function (audible bowel sounds / opening of bowels). At the initial stage, clear liquids (30 ml/hr) were given orally. Oral feeding gradually progressed to a full liquid diet and then regular diet on postoperative day 1 and 2, respectively if no nausea / vomiting was reported by the patient. In Group B, oral liquid diet was allowed 72 to 96 hours postoperatively when the NG tube was removed and bowel functions were returned.

Discharge criteria included, patients tolerating a regular diet, having at least one bowel motion, and reported clinically fit. Efficacy, safety, and tolerability were evaluated from outcomes such as postoperative ileus (vomiting / abdominal distension), anastomotic leakage (signs and symptoms of peritonitis), postoperative wound healing, and LHS.

Anastomosis was performed in both groups by hand-sewn interrupted single-layer technique. All surgical procedures were performed under general anaesthesia by consultant general surgeons. Broad spectrum 3rd generation cephalosporins were administered prophylactically prior to anaesthesia.

Data was analysed using SPSS version 25. Quantitative variables were expressed in form of mean and standard deviation. Qualitative variables were expressed in form of frequency and percentages. Study outcomes were compared between the two groups by applying Chi-square test and independent t-test. $p < 0.05$ was considered statistically significant.

Ethical approval was taken for conducting the study from the Ethical Committee of the Hospital. The study purpose was explained and written consent was obtained from the participants.

RESULTS

The age range in this study was from 18 to 43 years with a mean age of 31.602 ± 6.75 years. The mean age in Group A and Group B are shown in Table I.

Male gender was dominant (60.29%) in the overall study population. There was also a higher percentage of males compared to females in both study groups as shown in Table I.

The majority of these patients had undergone loop ileostomy (66.17%) followed by colostomy (33.82%). The group-wise details are given in Table II. Details of postoperative outcomes were calculated for both groups and significance of the difference was calculated by applying Chi-square as shown in Table II.

The overall mean of LHS was 4.367 ± 1.72 days. The LHS was significantly less for Group A (3.117 ± 0.87 days) compared to Group B (5.617 ± 1.43 days, $p < 0.001$).

Table I: Patient demographics and Frequency and percentage of patients as per gender in both groups (n = 68).

Demographics	Group A Mean \pm SD (n = 34)	Group B Mean \pm SD (n = 34)
Age (years)	30.852 \pm 6.01	32.352 \pm 7.43
Gender	n (%)	n (%)
Male	19 (55.88%)	22 (64.70%)
Female	15 (44.11%)	12 (35.29%)
Total	34 (100%)	34 (100%)

DISCUSSION

For the stoma reversal procedure, it was conventionally recommended to use a NG tube and patients were kept NPO for 4-5 days until the return of bowel functions. This was due to the fear that oral intake may lead to paralytic ileus causing nausea, vomiting, and abdominal distension, and thus causing anastomotic leakage. Patients were kept initially under intensive care, and the length of hospital stay was expected to be more than one week.

Enteral nutrition on the other hand was suggested to help in early healing due to enhancing the immune response and resulting in shortening the LHS. The factors suggested to support early recovery are epidural anaesthesia, early oral feed, use of NSAIDs, and mobilisation, while the factors that are mentioned to be avoided are the NG tube and the use of opiates.¹⁴

Table II: Details regarding stoma formation and comparison of postoperative outcomes in both groups (n = 68).

Surgical procedure	Group A (n = 34)		Group B (n = 34)		Total (n = 68)	
	Ileostomy	Colostomy	Ileostomy	Colostomy	Ileostomy	Colostomy
	21 (61.76%)	13 (38.23%)	24 (70.58%)	10 (29.41%)	45 (66.17%)	23 (33.82%)
Outcomes	n (%)		n (%)		p-value*	
Postoperative ileus	No	28 (82.35)	No	17 (50)	0.004	
	Yes	6 (17.64)	Yes	17 (50)		
Anastomotic leakage	No	33 (97.05)	No	31 (91.17)	0.302	
	Yes	1 (2.94)	Yes	3 (8.23)		
Wound infection	No	30 (88.23)	No	21 (61.76)	0.011	
	Yes	4 (11.76)	Yes	13 (38.23)		

*Chi-square test.

Different studies have discussed the benefits of early enteral feeding after stoma reversal. Pirzada *et al.* studied the protocol of ERAS for 60 patients undergoing stoma reversal procedures. Male gender was 65% while female gender was 35% in this study. Postoperative paralytic ileus, wound infection, and LHS were studied between ERAS protocol and conventional feeding protocol. Patients were given oral sips (15 ml/hour) after surgery and this was continued for 24 hours. Patients tolerating the liquid diet were then progressed to semi-solid diet after 24 hours. The postoperative ileus was reported in 83% of the patients in the conventional protocol compared to 10.7% in the ERAS protocol with a statistically significant difference between the two groups ($p = 0.001$). There was no significant difference regarding wound healing; however, LHS was significantly decreased in early feeding protocol.¹⁵

Slieker *et al.* shared that after applying the ERAS, vomiting was decreased to 29% compared to the conventional protocol. Patients reported first bowel motion early (median 1 day) compared to control group (median 2 days) with a significant difference ($p < 0.01$). LHS was also significantly reduced to a median of 4 days compared to 5 days in the control group ($p < 0.01$).¹⁶

A study conducted on 100 Pakistani patients with the objective of comparing the efficacy of an enhanced recovery programme (ERP) after loop ileostomy reversal concluded that the group with early feeding had fewer postoperative complications. Only 9% patients were reported with wound infection, 3% had anastomotic leakage while the average hospital stay was 4 days.¹⁷

Soni *et al.*, in a recent study published in 2022 on early enteral feeding (EEF) after gastrointestinal surgery, shared the results in the shape of better outcomes with EEF. The mean age in this study was 37.11 ± 12.25 years with a male-to-female ratio of 2.69:1. There was an 11.4% complication rate in the EEF group which was less than the conventional feeding protocol group. There was no significant difference between the two groups regarding wound infection and anastomosis leakage, however, mean hospital stay was significantly lower in the EEF group compared to the conventional group.¹⁸

Ahmad *et al.* in a study with 156 patients compared the outcomes of early oral feeding *versus* late feeding after

stoma reversal. The mean age in this study was 34 ± 12.5 years with a male-to-female ratio of 1.5:1. In the early feeding group, 10.25% patients suffered from paralytic ileus compared to 34.61% patients in the conventional feeding protocol ($p < 0.001$). Wound infection was reported in 10.25% patients in the early feeding group while in 35.89% in conventional feeding group ($p < 0.001$). There was no difference in anastomotic leakage between the two groups; however, LHS was significantly less in early feeding where the majority of patients were discharged up to 3rd day *versus* conventional feeding where the majority of patients had to stay for 5-7 days ($p < 0.001$). They thus concluded that early feeding is safe, with significantly less postoperative complications as compared to the conventional feeding protocol.⁹

The mean age in this study was 31.602 ± 6.75 years with a dominant male percentage of 60.29% as also observed in previous studies.¹⁴ Ileostomy was performed in 66.17% of the patients while colostomy was performed in 33.82% of patients. As regards the primary objectives, the results of this study are also in line with the above studies conducted to compare the effectiveness of early feeding on outcomes after the stoma reversal procedure. Postoperative ileus was reported in only 6 patients (17.64%) in Group A which was significantly less than Group B with 17 (50%) patients ($p = 0.004$).

There was no significant difference in the two groups regarding anastomotic leakage. Wound infection was reported in only 4 (11.76%) patients in Group A while this number was 13 (38.23%) patients in Group B. As per the results discussed above in previous studies wound healing results were significantly better in the early feeding group compared to conventional protocol ($p = 0.011$).^{9,17}

An important outcome was the LHS which was reported to be significantly reduced in Group A with 3.117 ± 0.87 days while this was 5.617 ± 1.43 days in Group B (p -value = 0.0001). Similar results with a reduction in LHS were also reported in previous studies.^{9,12,15-18}

The findings of this study will help in designing future protocols regarding postoperative feeding in patients undergoing stoma reversal. A major limitation of this study was the smaller sample size, and further data will be needed to design clear protocols.

CONCLUSION

Early feeding after stoma reversal is effective, minimises the postoperative complications, and leads to a shortening of hospital stay in adult surgical practice, thereby decreasing the psychological stress and economic burden on patients and reducing the load on the already compromised healthcare system.

ETHICAL APPROVAL:

Ethical approval was obtained from the Ethical Committee of DHQ Hospital Mardan (ID No.: 271-41) prior to initiation of the research work.

PATIENTS' CONSENT:

Informed consent was obtained from patients to publish the data concerning this case.

COMPETING INTEREST:

The authors declared no conflict of interest.

AUTHORS' CONTRIBUTION:

SA: Concept and design.

FK: Data collection and analysis.

SH: Drafting and revision.

ZUJ: Final manuscript review.

MTU: Overall supervision and interpretation of data.

All authors approved the final version of the manuscript to be published.

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