

## ORIGINAL ARTICLE

## OUTCOME OF EARLY INITIATION OF POST-SURGERY FEEDING AFTER COLOSTOMY REVERSAL IN CHILDREN

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**Background:** Children undergoing colostomy reversal surgery often face uncertainties regarding the optimal timing for reintroducing feeding postoperatively. Early initiation of post-surgery feeding is of interest due to its potential to hasten recovery and reduce hospital stay. The impact of early feeding initiation is unclear. Objective of this study was to find out the outcome in terms of hospital stay and post-surgery complications of early initiation of post-surgery feeding after elective colostomy reversal in children. **Methods:** From 6 Jun 2022 to 10 Oct 2023, a non-randomized controlled trial was conducted at Bahawalpur, analyzing 93 children under 15 years with status colostomy following elective reversal. Patients were allocated to Group-A (traditional oral feeding) or Group-B (early oral feeding) at the surgeon's discretion, with outcomes including post-surgery hospital stay duration and complications. **Results:** Out of a total of 93 patients, 49 (52.7%) were boys and 44 (47.3%) girls. Overall, mean age was  $4.86 \pm 3.27$  years. Anastomotic shock was noted among 6 (6.5%) patients while 9 (9.7%) patients had superficial surgical site infection. None of the patients needed repeat surgery for any post-surgery complications. No significant difference in terms of anastomotic leak ( $p=0.3983$ ), and superficial surgical site infection ( $p=0.4980$ ) were observed. Significantly shorter duration of post-surgery hospital stay was recorded among patients of Group-B when compared to Groups-A ( $6.49 \pm 1.14$  vs  $8.90 \pm 1.27$ ,  $p < 0.0001$ ). **Conclusion:** Early initiation of enteral feeding post elective colostomy reversal in children resulted in significantly reduced duration of post-surgery hospital stay.

**Keywords:** Colostomy, complications, outcome, oral feeding

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## INTRODUCTION

In patients having elective colostomy reversal, bowel rest is commonly preferred adopting nasogastric (NG) decompression and subsequent wait till bowel movement turns normal allowing passage of flatus/faeces on post-surgery day 3 or more.<sup>1,2</sup> Till that time patients are not allowed to have enteral feeding while NG tube is kept *in situ* until the content is reduced and turned clear. There are many causes of anastomosis leakage and it is often presumed that fasting protects the anastomosis from any possible complications allowing hermetic closure of anastomosis prior to the start of enteral feeding.<sup>3,4</sup>

In the recent past, some researchers have challenged these traditional approaches as not much scientific evidence exists about these ideas while it is also true that effects of prolonged fasting among children undergoing elective colostomy reversal has not yet been evaluated properly.<sup>5</sup> Some researchers have pointed out resumption of early feeding on post-surgery day 1 as it seems functionally possible.<sup>6</sup> Even in the absence of oral feeding, around 1.5 to 2 litres of gastrointestinal and pancreatic sections enter and pass through the distal bowel and are absorbed.<sup>7</sup>

Following surgery, return to bowel function and motility usually happens between 6 to 12 hours in small bowel, 12 to 24 hours in stomach while large bowel usually takes 48 to 72 hours.<sup>8</sup> Dag A *et al*

analyzing early versus traditional oral feeding among patients following colostomy reversal found early feeding to be beneficial.<sup>9</sup> Lewis SJ *et al* in their systemic review and meta-analysis found feeding within 24 hours following laparotomy to be well tolerated.<sup>10</sup>

GI blood flow is reduced in cases following different kinds of critical medical conditions while manipulations in the intestine might initiate pathogenesis of intestinal oedema that can alter GI blood flow and enhance inflammatory response through activation of macrophages and invasion of neutrophils.<sup>11</sup> Early oral feeding may improve the nutritional status and help improvement in wound healing which in turn can reduce post-surgery complications. Some international data exists regarding use of early feeding in patients following colostomy reversal but no local study exists. Majority of the studies conducted in the past have been retrospective analyses which have its own limitations.

The present study was aimed to find out outcome in terms of post-surgery complications of early initiation of post-surgery feeding after elective colostomy reversal, and duration of hospital stay in children.

## MATERIAL AND METHODS

This non-randomized controlled trial was conducted at the Department of Paediatric Surgery, Bahawal Victoria Hospital, Quaid-e-Azam Medical College, Bahawalpur, from 6 Jun 2022 to 10 Oct 2023 after approval from

Institutional Ethical Committee. Written consent was sought from parents/guardians of all study participants.

A total of 93 children aged up to 15 years were enrolled. Indications for elective colostomy were peritonitis following enteric fever, anorectal malformation, or rectal atresia (as per medical history, clinical examination, radiological and laboratory investigations). All patients had elective colostomy after adequate proximal mechanical bowel washing with polyethylene glycol and non-residue diet for 2 days while clear water and oral rehydration salt for 1-day prior to surgery with distal mechanical bowel wash using normal saline till the visibility of clear effluent. Children having seizures, cardiovascular defects, complications of past surgeries, more than 2 past abdominal surgeries, adhesions, or those with gross luminal disparity between proximal and distal colon during surgery were excluded.

Demographic data were recorded and patients were non-randomly distributed into 2 groups. A total of 93 patients underwent colostomy reversal. Group-A had 63 patients who were kept *nil-per-os* until documentation of bowel functioning showing passage of flatus or faeces, normally on 3<sup>rd</sup> post-surgery day. The NG tube was kept *in situ* until the content reduced and turned clear. Group-B had 30 patients who started enteral diet the next morning within 16 to 24 hours of 1<sup>st</sup> post-surgery day. Feeding was initiated with clear water which was followed by breast milk and other liquid diet after 3–4 hours. The NG tube was removed in the morning of the 1<sup>st</sup> post-surgery day. Reinsertion of NG tube was done if a patient had 2 episodes of vomiting, having more than 100 mL within 24 hours in absence of bowel movements.

All patients were observed for post-surgery complications like anastomotic leak or superficial surgical site infections which were handled as per institutional protocols. Patients were discharged when they did not have any post-surgery complication and had established full-enteral feeding. Duration of post-surgery hospital stay and post-surgery complications were noted among all patients.

Data were recorded on a special proforma, and analysed using SPSS-26. Qualitative variables like gender, area of residence and post-surgery complications were presented as frequency and percentages. Quantitative variables like age and duration of hospital stay were shown as Mean±SD. Chi-square test was applied to compare qualitative variables and independent sample *t*-test was used to compare quantitative variables between study groups considering  $p \leq 0.05$  as statistically significant.

## RESULTS

A total of 93 patients fulfilled the inclusion and exclusion criteria. Out of the total, 49 (52.7%) were

boys and 44 (47.3%) were girls. Overall, mean age was  $4.86 \pm 3.27$  years (Range: 1–15 years). There were 50 (53.8%) patients from rural areas 43 (46.2%) were from urban areas (Table-1).

Anastomotic shock was noted in 6 (6.5%) patients while 9 (9.7%) patients had superficial surgical site infection. None of the patients needed repeat surgery for post-surgery complications and were managed conservatively (Table-2).

Overall, mean duration of post-surgery hospital stay was  $7.92 \pm 1.38$  days (Range: 4–14 days). Significantly shorter duration of post-surgery hospital stay was recorded among patients of Group-B compared to Groups-A ( $6.49 \pm 1.14$  vs  $8.90 \pm 1.27$ ,  $p < 0.0001$ ) (Table-3). Following post-surgery initiation of the feeding, none of the patients needed reinsertion of NG tube. No mortality was reported in the present study.

**Table-1: Characteristics of patients between both study groups (n=93)**

Characteristics		Group-A (n=63)	Group-B (n=30)	<i>p</i>
Gender	Boys	32 (50.8%)	17 (56.7%)	0.5959
	Girls	31 (49.2%)	13 (43.3%)	
Age in Years (Mean±SD)		$4.96 \pm 3.18$	$4.72 \pm 3.48$	0.7422
Area of Residence	Rural	35 (55.6%)	15 (50.0%)	0.6154
	Urban	28 (44.4%)	15 (50.0%)	

**Table-2: Distribution of post-surgery complications between both study groups (n=93)**

Post-Surgery Complications	Group-A (n=63)	Group-B (n=30)	<i>p</i>
Anastomotic leak	5 (7.9%)	1 (3.3%)	0.3983
Superficial surgical site infection	7 (11.1%)	2 (6.7%)	0.4980

**Table-3: Comparison of mean duration of post-surgery stay between both study groups (n=93)**

Mean duration of post-surgery stay (days)	Group-A (n=63)	Group-B (n=30)	<i>p</i>
	$8.90 \pm 1.27$	$6.49 \pm 1.14$	<0.0001

## DISCUSSION

Mucosal epithelium of the bowel is thought to completely seal following first 24 hours of post-surgery period.<sup>3</sup> Studies conducted in animals have found early feeding to accelerate wound and anastomosis healing.<sup>12</sup> Early feeding is thought to reserve mucosal atrophy induced by the starvation while increasing the anastomotic collagen deposition and strength.<sup>13</sup> Early feeding is known to delay post-surgery ileus helping wound healing and reducing sepsis.<sup>14</sup> Post-surgery ileus is described as a significant reason for patients being kept nothing *per os* in the post-surgery period. To assess post-surgery ileus, the first NG tube is removed on the morning of postoperative day 1, and subsequent monitoring is conducted closely. In the present study, following post-surgery initiation of the feeding, none of the patients needed reinsertion of NG tube. Post-surgery nutrition is considered to be an important factor influencing post-surgery complications and duration of

post-surgery hospital stay.<sup>11</sup> None of our patients received complete parenteral nutrition during the initial post-surgery period.

Although no statistically significant differences were observed in terms of post-surgery complications between both groups, patients in early feeding group had lesser rate of post-surgery complications. Ghosh A *et al*<sup>15</sup> found significantly low rates of post-surgery complication among children in early feeding group when compared to controls. Some researchers<sup>16</sup> have shown that early feeding might affect healing and may cause anastomotic leakage, but this was not evident in present study as 3.3% in early feeding group had anastomotic leak vs 7.9% in traditional feeding group.

We noted significantly low post-surgery duration of hospital stay among patients of early feeding group when compared to those in traditional feeding group. Duration of hospital stay is regarded as one of the major factor influencing patients' satisfaction with the treatment process. Nematihonar B *et al*<sup>17</sup> analysing early vs delayed post-surgery oral feeding among patient undergoing colostomy reversal found patients in early feeding group to have higher overall satisfaction in terms of treatment process as per visual analogue scale when compared to delayed post-surgery oral feeding. Paul SK *et al*<sup>2</sup> comparing early versus traditional oral feeding following colostomy closure in children found significantly less post-surgery duration of hospital stay in early oral feeding group which is quite similar to our study. Gosh A *et al*<sup>15</sup> also found post-surgery duration of hospital in early feeding groups among patients undergoing colostomy reversal to be significantly less when compared to traditional feeding group.

## CONCLUSION

In children following elective colostomy reversal, early initiation of enteral feeding was found having statistically better outcome in terms of duration of post-surgery hospital stay.

## LIMITATIONS AND RECOMMENDATIONS

Being a single centre study, conducted on a relatively small sample size with non-randomized sample allocation were some of the limitations of this study. Large scale studies will further verify our findings.

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## Contribution of Authors:

**MS:** Substantial contribution to concept of work

**TI:** Acquisition, analysis and interpretation of data

**FMA:** Critical revision for improving intellectual content

**FA:** Final approval of the manuscript

**TY:** Critical revision for improving intellectual content

**ABS:** Literature search and review of bibliography

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