ORIGINAL ARTICLE

# Early feeding vs 5-day fasting after elective distal bowel stoma closure surgery in children

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**Abstract:**

**Objective: To determine the safety of enhanced recovery (ERAS) in children following Distal Elective Bowel Stoma Closure (DEBA)**

**Material and Methods: A prospective randomized controlled trial done over a period of 2-years between January 2018 to June 2020, in Pediatric Surgery Department, Liaquat National Hospital, Karachi. All the patients with Hirshsprung disease (HD) and Anorectal malformatin (ARM), with a covering colostomy were included in the study. Patient were managed by pre-set performa and results were filled prospectively. Early feeding post distal bowel stoma closure was compared with 5 day conventional fasting group and safety of early enteral feed initiation was assessed. Primary outcome measures were hospital stay and time to reach full enteral feed while secondary outcome measures included immediate post-operative complications.**

**Results: There were total 31 patients who underwent distal elective bowel anastomosis. Primary disease spectrum included 21 cases of Anorectal malformatin, 10 cases of Hirshsprung disease. Mean age in CASE group was 10.9 months and of CONTROL group 12.6 months. Patients in CASE group started feed on 1st post-operative day and mean time to reach complete enteral feed was 4th post-operative day. In CONTROL group enteral feed was started on 5th post-operative day and mean time to reach full enteral feed was 7.5th day post-surgery (p value 0.02). CASE group children were discharged home early as compare to CONTROL group (p value 0.05).**

**Conclusion: We conclude that it is safe to start feed early after elective distal bowel anastomosis for patient with Hirshsprung disease and Anorectal malformatin as it allows early discharge from the hospital.**

***Received***
*date: 3rd May, 2021*
***Accepted***
*date: 10th June, 2022*

**Keywords: Hirshsprung disease (HD), anorectal malformation (ARM), colostomy, distal elective bowel anastomosis, enhance recovery protocol after surgery (ERAS)**

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**Introduction:**

Patients with Anorectal malformation and Hirshprung disease due to delay in diagnosis or to prevent complication end up with a diversion colostomy. At present emphasis is on single stage corrective procedure but significant number of children with high Anorectal malformation and Hirshsprung's disease undergo staged repair with a colostomy as preliminary procedure. Enhanced recovery after surgery (ERAS) pathways has been implemented across a variety of surgical procedures in adults. These have demonstrated decreased length of stay (LOS) without increasing complication rates.[1,2] In pediatric population implementation of a pediatric-specific Enhanced recovery protocol in children undergoing colorectal surgery is feasible, safe and may lead to improved outcomes.[3]

Stewart et al and Han-Geurts et al reported that electrolytic, glucose and nutrient absorption ability of the bowel is not affected after colonic anastomosis and that the mucosal epithelium of the bowel is perfectly sealed after the first

24 hours of the post-operative period.[4,5] Early feeding accelerates the wound and anastomosis healing in the animal model.[5] There is clear evidence that early feeding is associated with fewer incidences of noso-comial infections, liver dysfunction, bacterial trans-location, secondary malnutrition, and promotes peristalsis, bowel movements and ambulation in surgical adult patients with resultant reduced hospital stay.[4,6-11] Phillips et al demonstrates that opioid utilization and time to feeding can be positively impacted using ERAS pathways without negatively impacting outcomes.[12] Roberto et al reported that early feeding after distal bowel anastomosis is safe and well tolerated in children.[15] Problems like, vomiting, abdominal distension, aspiration and risk of anastomotic dehiscence still feared with early feeding, hence still conventional practice is to keep the child NPO till 5th day post-surgery before starting enteral feed.

Implementation of early feeding post-surgery in pediatric patients still remains debatable with sparse data available in our population, hence our aim was to assess the tolerability and safety of EF in pediatric patients with Anorectal malformation and Hirshsprung disease who underwent distal bowel anastomosis.

**Material and Methods**:

All patients admitted at Liaquat National Hospital electively for distal stoma closure between January 2018 and June 2020 with age up to 13 years of age with primary disease of anorectal malformation and hirshsprung disease were included in the study. All children who had undergone distal bowel anastomosis for any other cause, children who underwent emergency surgery, children with upper gastrointestinal tract anastomosis (esophagus, gastric, duodenal or jejunal), bilious digestive anastomosis, immuno-suppressed patients, gastrostomy or any pre-anastomotic derivation, multiple anastomosis, chronic intestinal obstruction and patients who did not complete the minimum post-operative follow up of one month were excluded from the study. Patients were divided into 2 cohorts by means of non-probability consecutive sampling. CASE group consisted of patients in whom there was early initiation of enteral feed post operatively; while CONTROL group had patients in whom 5 day fasting was done post-operatively. The CASE group was kept NPO for 24 hours and was started feed on 1st post-operative day. CONTROL group was kept NPO for 5 days post-operatively and started on parenteral nutrition, enteral feed started on 5th day post-surgery. Pre-operative preparations were identical in form of 2 day prior admission, mechanical bowel preparation by 8 or 10 FR feeding tube and saline irrigation at 15ml/kg and pre-operative empirical metronidazole, amikacin and coamoxiclav in appropriate doses. Post-operatively patients in both group had a nasogastric tube in place. Child was discharged home if demand enteral feed was tolerated for 24 hours.

Surgical closure of stoma was done by a single layer, interrupted, seromuscular closure using monofilament synthetic absorbable sutures.

Time to achieve demand enteral feed and duration of hospital stay was primary outcome measure and post-operative complications; SSI, anastomotic leak and adhesive obstruction, within 30 days post-surgery, were secondary outcome measure.

Ethical approval was taken by the ethical review board of the hospital. Descriptive statistics measurements for global description. Student's t test for quantitative and Chi square test for qualitative variables were used, considering statistically significant a p-value less than 0.05.

Operational definition:

Distal elective bowel anastomosis: Elective closure of colostomy.

Early feeding: Start of enteral feed on first post-operative day.

Enteral feeding: Giving 10% dextrose water, mother feed or top feed diet according to age of patient

Case group: Early feeding group, in whom feeding was started on 1st operative day.

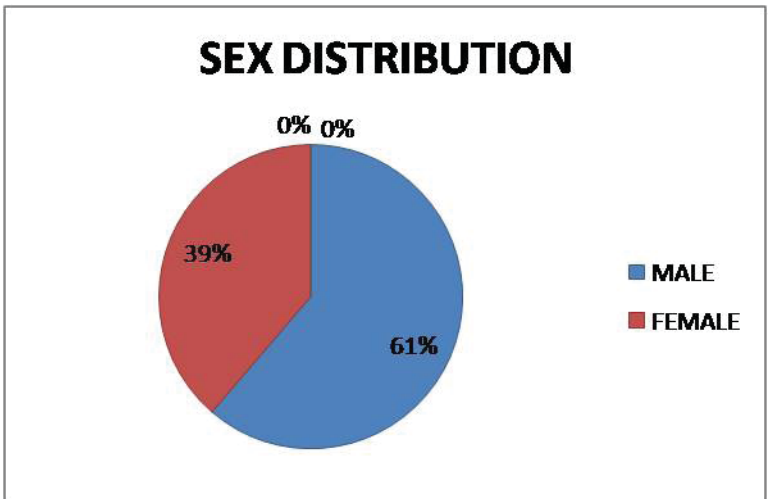


Table 1: Patient demographics

| Characteristics | Case | Control | p value |
|---|---|---|---|
| Age (Mean) | 11.3 months | 14.6 months | **0.045** |
| Sex: | | | 0.65 |
| Male | 11 | *09* | |
| Female | 05 | *06* | |
| Primary disease | *ARM 12* | ARM 9 | 0.05 |
| Etiology | HD 4 | HD 6 | |
| Total number | 16 | 15 | |

Table 2: Primary outcome variables

| | Case | Control | p value |
|---|---|---|---|
| Mean time to full enteral feed | 4th post-operative day | 7.5th post-operative day | 0.02 |
| Mean total hospital stay | 7.0 days | *8.5 days* | 0.05 |

Table 3: Post-operative complications

| | Case n = 16 | Control n= 15 | p value |
|---|---|---|---|
| Surgical site infection N (%) | 2 (13.33%) | 2 (14.30%) | **0.89** |
| Anastamotic Leakage N (%) | 1 (6.67%) | *2 (14.30%)* | 0.68 |
| Adhesive Obstruction N (%) | 2 (6.67%) | *1 (7.71%)* | 0.69 |

Control group: 5-day fasting group, in who enteral feed was started on 5th post-operative day.

**Results**:

There were total 31 patients who underwent distal elective bowel anastomosis. Primary disease spectrum included 21 cases of Anorectal malformation, 10 cases of Hirshsprung disease, sex distribution of the groups shown in figure-1. Mean age of patient was 16 months with range between 3 months to 36 months. Means age in CASE group was 10.9 months and of CONTROL group 12.6 months. TABLE 1 shows the demographics of all the children included in the study, with groups having comparable figures.

In CASE group, there were 12 patients with Anorectal malformation and 4 cases of Hirshpsrung disease undergoing distal bowel anastamosis, while in CONTROL group 2, there were 9 patients of anorectal malformation and 6 patients of Hirshsprung disease. Patients in CASE group started feed on 1st post-operative day and mean time to reach complete enteral feed was 4th post-operative day. In CONTROL group enteral feed was started on 5th post-operative day and mean time to reach full enteral feed was 7.5th day post-surgery. This variable was statistically significant (p value 0.02). In CASE group children were discharged home early as compare to CONTROL group, however it was statistically insignificant (p value 0.05) as shown in table-2.

Table-3 shows the incidence of complications in both arms of study. Early post-operative complications including surgical site infection (SSI) anastomotic leak and adhesive obstruction were comparable in both groups and were not statistically significant.

**Discussion**:

31 total patients with Anorectal malformation and Hirshsprung disease underwent colostomy closure electively. Our results showed that both groups were comparable given the homogeneity in the distribution of the demographic, and therefore, the only difference was the early feeding in the CASE group. Our results also demonstrated that in CASE group, Children post-surgery were able to reach full enteral feed earlier than the CONTROL group which was statistically significant. There was reduced hospitals stay for children who received early enteral feed however it was not statistically significant. Post-operative complications in both groups were comparable. Although it was not a blinded study, our observations support early feeding in distal elective bowel anastomosis in children.

In our study, the 5-day fasting did not confer any preventive role to avoid post-operative complications given that the frequency of SSI, dehis-

cence of the intestinal anastomosis, and adhesive obstruction were similar in both groups. All this supports an early feeding policy among distal elective bowel anastomosis (DEBA) in pediatric patients. This is in concordance to a systematic review of randomized clinical trials concluding that even when the individual clinical complications failed to reach statistical significance, the trend is that early feeding may reduce the risk of post-operative complications in adult 48 patients.[13,16] similarly clinical trial by R. Davila-Perez et al on 60 children showed that the time to fulfil oral intake was earlier in the early feeder group and also the post-operative stay was shorter in the early feeding group than in the late feeder group.[15] The observed results in this study also demonstrated a shorter post-operative hospital stay in the CASE group. There were three limitations of the study: First it was not blinded for the personnel that recorded the follow up variables because it was impossible to hide the food in the control group second it only included colonic anastomosis, so there is a need of more studies to test the safety on other types of anastomosis and third confounding factors were not controlled for each primary disease that can have impact on the outcome.

**Conclusion**:
We conclude that it is safe to start enteral feed early after elective distal bowel anastomosis for patient with hirshsprung disease and anorectal malformation as it allows early discharge from the hospital.

**Conflict of interest**: None

**Funding source**: None

**Role and contribution of authors**:
Tahir Muhammad Yaseen, collected the data, references and did the initial writeup

Shabbir Hussain, critically review the article and advise final changes.

Taimoor, collected the data, references and heped in discussion writing.

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