Early Oral Feeding in Pediatric Intestinal Anastomosis

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Abstract A prospective nonrandomized study of 31 children aged <16 years over a period of 14 months was conducted to evaluate the effects of early oral feeding (EOF) in children with intestinal anastomosis. Patients undergoing elective or emergency intestinal anastomosis below the ligament of Trietz with no contamination were included while contaminated cases and neonatal atresias were excluded. First feed was the direct oral feed started within 24 h, usually the morning after surgery. Liquid feeds were started initially and increased at 4 hourly increments to appropriate feed for age. Time to full feeds was recorded. Patients were monitored for vomiting, abdominal distension, and signs of leak. Time to first stool and length of hospital stay were recorded. Median age of patient was 12 months. Mean time to first feed was 16 h, and mean time to full feeds was 36 h. Four of the 31 patients had delayed tolerance to feed, either due to vomiting or distension, which was transient and resolved spontaneously in three patients and due to prolonged ileus in the fourth patient. None of the patients had leaks. Most of the patients were discharged by postoperative day 3 (83 %). Early enteral feeding in pediatric intestinal anastomosis can be safely started without looking for traditional markers of return of bowel activity. It lowers hospital stay with no adverse effects. Generalization of this concept to selected emergency and neonatal surgeries can be considered, but needs further randomized control trial to validate.

Keywords Early oral feeds • Intestinal anastomosis • Bowel activity

Introduction

It is a common practice to keep a child nil by mouth after intestinal anastomosis until the return of bowel movements and many times as per the personal preference of the surgeon. Little scientific evidence supports this practice. Possible factors contributing to postoperative ileus are bowel manipulation, anesthesia, inflammatory response to surgery, and perioperative narcotics [1, 2]. Withholding enteral feeds does not eliminate the 1–2 l of endogenous fluids which go past the anastomosis. Schilder et al. have demonstrated that bowel activity occurs before the passage of flatus [3]. Bowel sounds may or may not be present with normal bowel activity [4]. Studies have shown quicker return of bowel function with feeding [5–7]. ESPEN guidelines recommend early initiation of enteral feeding within 24 h after gastrointestinal surgery, but also state that it needs to be adapted according to the individual tolerance and type of surgery [8]. There are many studies and meta-analyses supporting early feeding in adults [9–11], but few in children [12–15]. Hence, this prospective study was conducted to evaluate the effects of early oral feeding (EOF) in children with intestinal anastomosis without waiting for evidence of return of bowel activity.

Material and Methods

This was a prospective study of 31 children aged <16 years over a period of 14 months (September 2011 to October 2012). Patients undergoing elective or emergency intestinal anastomosis below the ligament of Trietz with no contamination were included while contaminated cases and neonatal atresias were excluded. All children undergoing colostomy closure had bowel preparation with polyethylene glycol (PEGLEC®). The nasogastric tube used for preoperative bowel preparation was removed after completion of surgery. All elective patients received a single

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Table 1 Diagnosis and complications encountered

Type of surgery	Diagnosis	No:	Delayed tolerance to feed	Cause for delayed tolerance
Elective	Colostomy closure for ARM or other	26	2	1 vomiting, 1 vomiting + distension
	Chronic pancreatitis for Peustow's	1	1	vomiting
Emergency	Patent vitello intestinal duct	2	1	Vomiting + distension
	Meckel's diverticulitis	1		
	Intestinal duplication	1		
Total		31	4	

prophylactic dose of cefotaxime, amikacin, and metronidazole. Discrepancy in luminal diameter between the proximal and distal bowel, if any, was noted. First feed was started within 24 h, usually the morning after surgery, without observing bowel sounds. Feeds were started with liquid diet initially and increased at 4 hourly increments onto appropriate feed for age. Older children were advised liquids initially and later soft and normal diet as the patient desired. Passage of first stool and time to full feeds were recorded. Patients were monitored for vomiting, abdominal distension, and evidence of anastomotic leak. Feeds were delayed for 6 h if vomiting or abdominal distension occurred. If intolerance continued, feeds were deferred for a further 24 h. Duration of postoperative hospital stay was recorded.

Results

A total of 31 patients satisfied the inclusion criteria. The age group ranged from 2 days to 16 years. The median age was 12 months. Twenty-six of the patients underwent colostomy closure, in whom 23 were children with anorectal malformation and each of the remaining three had colonic perforation, stricture, and perineal trauma, respectively. Of the remaining five patients, four had ileal resection anastomosis for various reasons, and one child with chronic pancreatitis underwent jejunal anastomoses after formation of a draining Roux loop (Table 1). Twenty-six patients had planned surgeries while five underwent emergency surgery. The time to first feed ranged from 6 to 24 h

with a mean of 16 h. Time to reach full feeds ranged from 16 to 60 h with a median time of 30 h.

Postsurgery length of hospital stay ranged from 2 to 9 days, with a median of 3 days. Of the five patients with stay longer than 3 days, two were due to prolonged antibiotic usage as per personal preference of the operating surgeon and two due to wound infection related to inadequate bowel preparation. Only one patient, the child who underwent Peustow's surgery, had to actually stay longer due to delayed tolerance to feeds (Table 2).

Delayed tolerance to feeds was seen in four patients, in three of whom it was transient while in one it was prolonged. This was the patient with Peustow's operation for chronic pancreatitis. Of the former three, two had colonic anastomosis and one, ileal. The delayed tolerance was in the form of vomiting in all and abdominal distention in addition in two (Table 1).

Bowel luminal discrepancy was seen in seven of the children with colonic anastomosis, none of whom had any intolerance to early feeding.

Discussion

Traditionally after abdominal surgery, presence of bowel sounds or passage of flatus or stools has been the clinical evidence of restoration of bowel activity and indicators for starting oral diet. Our study questions the need to look or wait for signs of return of bowel activity in cases where there was no peritoneal contamination. Bowel sounds are poor markers of bowel function as

Table 2 Length of hospital stay

	No.	Postop stay (days)	Reason for increased stay (>3 days)—5 pts
Colonic anastomosis	5	2	
	20	3	
	1	5	Wound infection
	1	9	Wound infection
Others			
PVID	2	3	
Meckel's diverticulitis	1	4	Longer antibiotic usage
Peustow's	1	6	Reached full feeds—5th day
Ileal duplication	1	4	Longer antibiotic usage

uncoordinated and antegrade peristalsis can be heard as bowel sounds. Currently, there is no good marker for return of bowel sounds, and even in the presence of prolonged ileus, the bowel moves [4]. Reissman et al. reported that majority of patients tolerated solid diet before their first bowel movements [16].

It has been shown in animals that the period of fasting reduces the collagen content in anastomotic tissue and diminishes the quality of healing, and on the other hand, feeding reverses mucosal atrophy induced by starvation and increases collagen deposition and strength of the site of anastomosis [17, 18, 20]. An experiment on a rat peritonitis model which was fed early has shown a decrease in tumor necrosis factor- α and a higher anastomotic bursting strength [19].

Early oral feeding in intestinal anastomosis is well documented in adults [9–11]. Cochrane reviews have shown no advantage in keeping patients “nil by mouth” following gastrointestinal surgery and support early commencement of enteral feeding [9].

There are very few studies done in children related to early oral feeding postintestinal surgeries. A study by Surasak Sangkhathat et al. concluded that early enteral feeding in pediatric patients undergoing limited colonic anastomosis stimulated early bowel movements and reduced hospital stay [12]. In another study by Gulsen Ekingen et al. where early enteral feeding in newborn surgical patients (including atresias) was started within 8–20 h of surgery, irrespective of bowel movements and defecation, it was found that early small-volume feeds were well tolerated, and benefits were valuable regardless of type of abdominal surgery [15]. Another recent study by Sholadaye et al. in African children, which included elective and emergency cases with contamination, concluded that early feeds following intestinal anastomosis in children are safe, particularly in a setting of limited availability of parenteral nutrition [13, 14]. But the criterion for early feeds in this study was feed started before 72 h unlike most other studies where the criterion is taken as within 24 h.

In our study, majority of patients had colonic anastomosis (84 %), and very few cases were emergency and small-bowel anastomosis (15.6 %). Feed was started by morning of the first postop day. Only paracetamol infusion or suppository was used for postoperative analgesia. Regional anesthesia especially epidural anesthesia has shown to reduce the postoperative ileus [17].

The only patient who had prolonged feed intolerance was the child who underwent Puestow's surgery which could be attributed to the extensive dissection required for the procedure. On subset analyses, it was found that infants reached full feeds earlier than older children.

Conclusion

Early enteral feeding in pediatric intestinal anastomosis can be safely started without waiting for traditional markers of return of bowel activity. It decreases the hospital stay.

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