Duodenal Derotation and Extent Tapering Jejunoplasty as Primary Repair for Neonates With High Jejunal Atresia

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Background: The dilated bowel segment usually involves the entire jejunum, as well as the duodenum in patients with high jejunal atresia. Classical approaches with a limited tapering enteroplasty and anastomosis frequently fail to restore intestinal function. A novel technique using duodenal derotation and extent tapering jejuno-plasty (DDETJ) is reported here.

Methods: Infants with high jejunal atresia within 10 cm of the ligament of Treitz treated with DDETJ over a 3-year period were reviewed. The entire dilated duodenum and jejunum were visualized after duodenal derotation. A longitudinal extensive tapering resection of dilated bowel with Endo GIA stapler was performed to fashion as a tube and anastomosed to the distal jejunum.

Results: Five female infants underwent this procedure over a 3-year period. Four infants underwent primary DDETJ, while one with associated multiple atresias had previously undergone limited tapering jejunoplasty, but was unable to tolerate oral feeding. DDETJ was performed 4 weeks later. There were no postoperative complications, and all patients tolerated feeding within 14 days. Follow-up lasted from 2 to 18 months.

Conclusion: In very proximal high atresia, the extent of tapering is limited by the proximity of the ligament of Treitz. Duodenal derotation provides better access to the high atresia. The results of this limited experience suggest that the DDETJ procedure could provide an alternative therapy in patients with high jejunal atresia.

1. Introduction

Jejunal atresias close to the ligament of Treitz (LOT) have been difficult to treat, because the dilated bowel segment usually involves the entire jejunum and duodenum. Thus, irrespective of the point at which the resection is performed, the discrepancy in diameter between the proximal and distal segments...
remains. Early and late nonfunctioning after-standard tapering enteroplasty for atresias near the LOT have frequently been reported and may be caused by dilated, atonic duodenum proximal to a patent duodenoojejunostomy.\(^1,2\) Duodenal derotation is a novel procedure first described by Weitzman and Brennan in 1974.\(^3\) Another modified procedure, lateral duodenectomy and duodenojejunostomy, was developed by Kling et al in 2000.\(^4\) Here we describe a surgical technique where longitudinal extensive tapering resection of dilated jejunum and duodenum with Endo GIA stapler was performed after derotation of the bowel.

2. Patients and Methods

Five patients with high jejunal atresia were treated with duodenal derotation and extent tapering jejunooplasty (DDETJ) at Chang Gung Children's Medical Center over a 3-year period between January 2005 and January 2008. Data were retrospectively collected from patients’ charts regarding sex, body weight, clinical features, imaging findings, associated anomalies, postoperative complications, time to feeding, and hospital discharge.

2.1. Surgical technique

Exploration was performed via a right transverse supraumbilical incision. The atretic segment was identified. In all cases, the atresia was very close to the LOT, thus limiting the length of the tapering enteroplasty. Duodenal derotation was performed as previously described by Kling et al.\(^4\) In brief, the hepatic flexure of the colon and the right colon attachments were lysed and the colon was rotated to the left abdomen. Superior attachments of the jejunum and duodenum to the inferior border of the pancreas and anterior attachments to the superior mesenteric vessels were divided; the bowel was mobilized at the LOT (derotation from “C” shape; Figure 1). A longitudinal line was drawn with a surgical marker on the antimesenteric surface of the proximal atretic dilated bowel, and a 30-mm Endo GIA stapler (USSC, Norwalk, CT, USA) was applied parallel to the long axis of the dilated bowel to create a tapered bowel with a caliber of 1.5 cm, which was anastomosed with the distal segment (Figure 2). The bowel was left in a corrected malrotation position with the cecum in the left upper quadrant. An appendectomy was also performed.

3. Results

There were five female patients. Four were full term infants with birth weights ranging from 1835 g to 2545 g. An antenatal ultrasound diagnosis of intestinal atresia was made in four infants. Preoperative radiology in all cases confirmed high jejunal atresia (Figure 3). All patients presented with bile-stained vomiting without abdominal distention. Four patients were treated with primary DDETJ, and postoperative radiologic studies showed no further dilatation of the proximal jejunum (Figure 4). These infants tolerated oral feeding within 14 days of operation, and were discharged home. There were no postoperative complications. One infant had associated multiple jejunoileal atresia and colon atresia, and underwent multiple resections with anastomosis, limited tapering jejunojejunostomy and end colostomy. A DDETJ was performed at 4 weeks because of feeding intolerance unresponsive to prokinetic...
agents. The patient tolerated oral feedings within 2 weeks of DDETJ. The clinical details of the patients are summarized in Table 1.

4. Discussion

In the management of patients with jejunoileal atresia, Benson, Low, and Nixon and Tawes observed functional bowel stasis in the dilated segment of the proximal bowel after bowel reconstruction. They all recommended excision of the dilated proximal bowel segment before anastomosis. In 1969, Thomas introduced tapering resection of the proximal dilated bowel to improve bowel motility. In the case of high jejunal atresia, the extent of tapering is limited by the proximity of the LOT, and dysmotility of the proximally dilated bowel is thus problematic after resection and anastomosis.

Weitzman and Brennan previously proposed an alternative treatment for very proximal jejunal atresia, which included derotation of the bowel without resection. This provided better access to high atresias and placed the anastomosis in a more dependent position. But, the treatment did not use extensive tapering and left dilated atonic duodenum residual at the LOT. The lateral duodenectomy and duodenojejunostomy procedure was developed by Kling et al to allow successful management of proximal jejunal atresias close to the LOT and that do not respond to simple tapering and anastomosis. The procedure exposes the ampulla of Vater; resection of all dilated duodenum and jejunum is performed. The novel modifications of the DDETJ procedure described in this study make the tapering of the dilated duodenum and jejunum with an Endo GIA stapler simple and safe, while also avoiding the
removal of dilated intestine. This approach appears to enhance enteral transit by tapering a proximal reservoir, allowing a better size match and providing dependent drainage. Results of the current series demonstrate the potential success of this technique when used as primary therapy in cases with high jejunal atresia.

In very proximal atresias, the extent of tapering is limited by the proximity of the LOT, and duodenal derotation provides better access to high atresias. The results of this limited experience suggest that the DDETJ procedure could provide an alternative therapy for high jejunal atresia.

References


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<th>Days to feeding post-DDETJ</th>
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LOT=ligament of Treitz; DDETJ=duodenal derotation and extent tapering jejunoplasty.