

Staged Laparoscopic-Assisted Pull-Through for Hirschsprung's Disease

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The authors report 3 cases of Hirschsprung's disease that were treated by laparoscopic-assisted transanal pull-through after a colostomy already had been performed. Two of these patients presented with severe enterocolitis, and a primary laparoscopic-assisted single-stage transanal pull through was not feasible. The third patient had a colostomy performed and was referred to us for a definitive procedure. Many centers over the world now perform laparoscopic-assisted single-stage pull-through as a primary modality of management for Hirschsprung's disease. But for a country like India, where patients with Hirschsprung's disease present or are referred late and frequently with enterocolitis,

performing a primary procedure is not possible in all cases. However, this has been used as the definitive procedure after performing a diverting colostomy and histopathologic determination of the length of the aganglionic bowel. The procedure gives excellent results and permits early postoperative feeding, early hospital discharge, and good cosmetic results. *J Pediatr Surg* 38:1667-1669. © 2003 Elsevier Inc. All rights reserved.

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THE USES OF laparoscopic surgery to perform a colonic pull-through for Hirschsprung's disease has been growing in popularity in recent years. We have used this procedure in patients who were not fit to undergo this procedure as a primary modality of management and in whom a colostomy had to be performed previously. We report our experience of 3 cases treated by this procedure successfully with an uneventful follow-up.

MATERIALS AND METHODS

This procedure has been performed on 3 patients aged 9 months, 2 years, and 5 years, respectively. Two of them were girls. Barium enema and histology proved Hirschsprung's disease. We used 5-mm instruments and 3 ports, one of which was used for the 0° scope and the remaining 2 for instruments. The ports were placed below the colostomy as shown in Fig 1. CO₂ pneumoperitoneum was created, and the procedure was performed, maintaining a pressure of 7 to 12 mm Hg.

RESULTS

Three children with biopsy-proven Hirschsprung's disease who had been operated on for diverting colostomy underwent laparoscopic-assisted pull-through as a definitive management for Hirschsprung's disease. All the children had a transition zone that was distal to the descending colon, and none had significant associated abnormalities. Two of the patients had presented with severe enterocolitis a month before and had been operated on for a diverting colostomy with multiple colonic biopsies for determining the length of the aganglionic segment. The third patient had already operated on for a colostomy and staging biopsies at another pediatric surgical center and was referred to us for a definitive procedure. The patients were admitted 1 day before the

procedure, and mechanical preparation of the distal bowel was done with normal saline.

General endotracheal anesthesia and preinduction broad-spectrum intravenous antibiotics were given to all the children. The patients were placed in a supine position with the head end lowered by about 20°. An indwelling urinary catheter was placed. The abdomen was insufflated with carbon dioxide through a Veress needle placed through the abdominal wall. The pneumoperitoneum was maintained at 7 to 12 mm Hg. The bowel is inspected for the presence of marking sutures placed at the time of the first surgery to mark the transition zone. The mesocolon was divided up to a point that allowed adequate mobilization of the colon for the pull-through procedure. (We use an L-shaped hook and a Maryland dissecting forceps for dissection.) Grasping the colon at the transition zone and pushing it down into the pelvis checked the adequacy of length. The aganglionic segment was dissected down up to the peritoneal reflection, staying as close to the bowel as possible.

The perineal part of the procedure was done in lithotomy position. After placing stay sutures to expose the dentate line, the rectal mucosa is circumferentially in-

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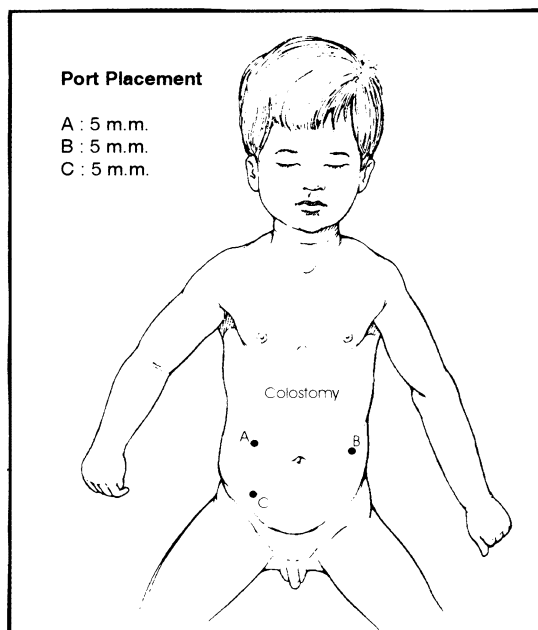


Fig 1. Port sites.

cised using Cautery approximately 5 mm above the dentate line, and a submucosal plane is developed. The endorectal dissection then is carried proximally, staying in the submucosal plane to the level of the dissection performed laparoscopically. No sooner has the dissection extended proximal to that point, the full-thickness of rectum and sigmoid is easily mobilized through the anus (Fig 2). The colon is divided a few centimeters above the most proximal normal biopsy site, and anastomosis is performed in a single layer using 5-0 polyglactin sutures. We have not divided the rectal cuff in any of the patients and have not encountered any problems regarding cuff abscess or stenosis. Intraoperative blood was less than 15 mL. No blood transfusion was required in any case. No additional ports were required to be placed. A caudal block with bupivacaine, 0.25% at 0.8 to 1 mL/kg, and local bupivacaine infiltration at the port sites was given to all the patients at the end of the procedure to provide effective postoperative analgesia. Oral nonsteroidal analgesic agents were given postoperatively as and when required. However, they were seldom needed. Clear fluids were started from the first postoperative day, and the patients were discharged by the fifth postoperative day. The patients underwent a digital rectal examination 10 to 14 days postoperatively. The colostomy was closed 4 weeks after the definitive procedure. Patients were followed up on a monthly basis for the first 3 months and then every 3 months thereafter. We have followed up with the patients for a period of up to 6 months after the colostomy closure. We have not encountered any postoperative complications. The patients had a stool output



Fig 2. Full thickness of rectum and sigmoid is mobilized out through the anus.

ranging from 5 to 7 times per day. All 3 children were growing and developing normally. Cosmetic results were excellent (Fig 3), and the only scar over the abdomen was that of the colostomy closure.

DISCUSSION

The standard management of a patient with Hirschsprung's disease has been colostomy followed by one of the several pull-through procedures for the purpose of removing the aganglionic colon.¹ Over the past years, there has been growing enthusiasm for a single-stage approach for infants. The results from this approach also appear to be as favorable as those in which a staged procedure with stoma is used.²⁻⁴ The use of laparoscopy to perform pull-through surgery for Hirschsprung's disease is becoming popular in recent years. All of the 3 standard operations have adapted to the minimally invasive approach.⁵⁻⁷ However, the prerequisite for performing such a procedure is an early referral and no evidence



Fig 3. Postoperative picture of the child.

of enterocolitis. In a country like India, patients with Hirschsprung's disease are referred late after trials of laxatives and enemas. Many of these children often present with severe enterocolitis and signs of toxemia. In such cases, a diverting colostomy in the normal proximal bowel has to be done as a life saving procedure.

Later, after the child stabilizes, a definitive procedure can be performed. We have used laparoscopic-assisted pull-through as the definitive procedure in such cases. The stoma was closed 4 weeks after the definitive procedure. We also use laparoscopic assisted pull-through as a primary procedure without a diverting colostomy in selected patients with good results. The approach has the advantage of no postoperative ileus, less postoperative pain, and early hospital discharge with a good cosmetic result. The caudal block and local anesthetic infiltration at the port sites at the end of the procedure ensures a

painless postoperative recovery. We recommend the construction of a midline colostomy in patients with Hirschsprung's disease involving the rectum and sigmoid colon in whom a laparoscopic-assisted pull-through is planned as the definitive procedure. This would facilitate port placement during the second surgery.

Many researchers have used a purely transanal approach without laparoscopy for Hirschsprung's disease.⁸⁻¹⁰ This procedure also is claimed to be simple and relatively noninvasive. However, for our patients who have been referred late, we prefer a combined endoscopic and transanal dissection to facilitate removal of the dilated colon proximal to the aganglionic segment.

Laparoscopic-assisted pull-through for Hirschsprung's disease in patients who already have a colostomy is possible and safe. Long-term results are awaited.

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