Modified Transanal Rectosigmoidectomy for Hirschsprung's Disease: Clinical and Manometric Results in the Initial 20 Cases

By Fabio Luis Peterlini and Jose Luiz Martins
Sao Paulo, Brazil

Purpose: The authors describe a modified technique of primary transanal rectosigmoidectomy for Hirschsprung's disease (HD), using a Swenson like procedure to perform the anastomosis between the colon and the rectum, and the preliminary results from this in children.

Methods: Twenty children, of whom, 90% were boys and 10% girls, 50% white and 50% nonwhite, aged 15 days to 10 years and with HD proven via biopsy, underwent a transanal pull-through procedure over a 29-month period. Postoperative follow-up ranged from 29 to 5 months. The proximal cut edge of the mucosal and submucosal cuff was tagged with multiple polypropylene 4-0 sutures, which were used for traction of the intestinal layers outside. The rectal mucosa was incised circumferentially using cautery, to perform rectal dissection approximately 1.5 cm from the dentate line, except in newborn case, in which the proximal cut edge was 0.5 cm from the dentate line. The dissection extended in an upward direction around the entire rectal circumference as far as the opening of the peritoneal reflection. The full thickness of rectum and sigmoid were mobilized outside through the anus, with division and coagulation of the rectal and sigmoid vessels using cautery or ligatures with cotton 4-0. The dissected colon then was divided above the transition zone, which was confirmed via full-thickness biopsy sections and with frozen section confirmation of ganglion cell presence. The authors performed a modified Swenson anastomosis technique, using a seromuscular polyglactin 4-0 separate-stitch suture. No drains were used.

Results: Normal bowel movements were displayed by all patients at the follow-up. All patients underwent a defecogram and anorectal computerized manometry at 3 months after surgery that showed an absence of stenosis and good anorectal sphincter muscle complex function. The incidence of complications in our series was 10%.

Conclusions: During the follow-up period of 29 months, all patients had normal bowel movements and normal anorectal manometric pressure profiles.

INDEX WORDS: Hirschsprung's disease, transanal pull-through, pull-through.

SINCE DE LA TORRE and Ortega published their report in 1998,[1] many centers have been performing one-stage pull-through procedures for Hirschsprung's disease (HD) in children recently.[2-5]

The authors have modified the technique developed by De la Torre and Ortega,[1] maintaining the pull-through procedure using the same transanal approach that eliminated the need for colostomy and colostomy closure but using a Swenson like procedure to perform the anastomosis between the colon ganglion and the distal rectum.

MATERIALS AND METHODS

From November 1999 to April 2002, 20 children, of whom, 90% (18) were boys and 10% (2) girls, 50% white and 50% nonwhite, aged 15 days to 10 years and with HD proven via biopsy, underwent a transanal pull-through procedure under general anesthesia and caudal block. The bowel was prepared with warm saline solution irrigation, and intravenous antibiotics (amikacin and metronidazole) were used, beginning 24 hours before the surgery and continuing until the seventh postoperative day.

After a full anal dilatation, the anorectal cavity was prepared using povidone-iodine, and an anal retractor (Lone Star Medical Products Inc) was placed in the anus. The proximal cut edge of the mucosal and submucosal cuff was tagged with multiple polypropylene 4-0 sutures, which were used for traction of the intestinal layers outside. We did not perform any epinephrine or saline solution injection into the submucous plane.

The rectal mucosa and submucosa was incised circumferentially using cautery to perform muscular rectal dissection approximately 1.5 cm from the dentate line (Fig 1). The exception to this was for the newborn case in which the incision was made 0.5 cm from the dentate line. The dissection extended in an upward direction around the entire rectal circumference as far as the opening of the peritoneal reflection. The full thickness of rectum and sigmoid was mobilized outside through the anus, with division and coagulation of the rectal and sigmoid vessels using cautery or ligatures with cotton 4-0. The dissected colon then was divided above the transition zone, which was confirmed via full-thickness biopsy sections and with frozen section confirmation of ganglion cell presence.

We performed a modified Swenson anastomosis technique, using a seromuscular polyglactin 4-0 separate-stitch suture (Fig 2). No drains were used. At the end of the surgery, we used electric muscle stimulator EM (BGE) to visualize the anorectal sphincter contraction function in all patients.

The patients were discharged on the fifth or sixth day after surgery as is customary.

From the Federal University of São Paulo (UNIFESP-EPM), São Paulo, Brazil.

Address reprint requests to Jose Luiz Martins, MD, Rua dos Otonis 131, V. Clementino, São Paulo, SP Brazil, CEP: 04025-000.

0022-3468/03/3807-0012$30.00/0
doi:10.1016/S0022-3468(03)00189-1

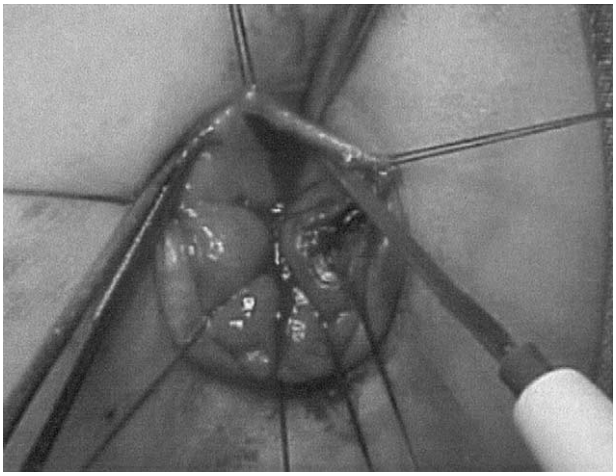

Fig 1. Mucosal incision with cautery to perform the rectal dissection approximately 1.5 cm from the dentate line.

RESULTS

Normal bowel movements were displayed by all patients at the follow-up. The longest aganglionic segment in our series involved rectum, sigmoid, and distal descending colon, with a length of 40 cm (Fig 3). All patients underwent a defecogram and anorectal computerized manometry 3 months after surgery that showed an absence of stenosis and good anorectal sphincter muscle complex function (Fig 4). The incidence of complications in our series was 10%, corresponding to the 2 initial cases in which we observed a great difference between the diameters of the rectum and colon to be anastomosed, with leakage and anastomosis fistula occurring, causing peritonitis. These 2 patients underwent laparotomy, cavity washing, reconstruction of the colorectal anastomosis, and laminar drains. Both patients had good postoperative evolution. During the postoperative follow-up period, which ranged from five to twenty nine months, we did not observe any anal excoriation or enterocolitis.

Fig 2. The longest aganglionic segment in our series.

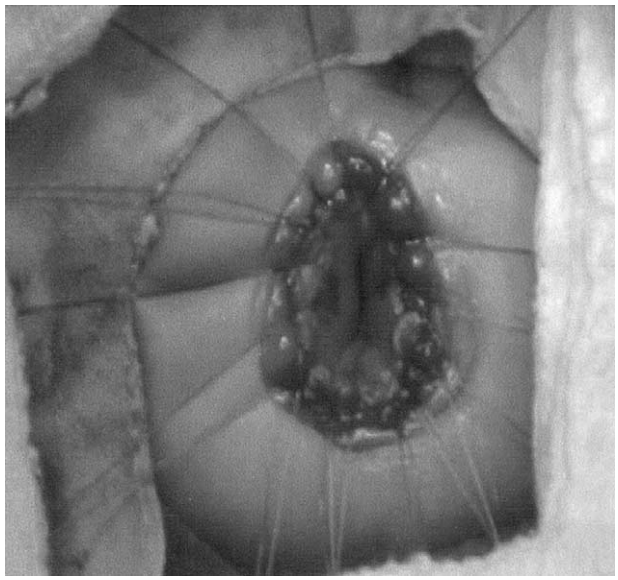

Fig 3. Colorectal anastomosis performed using a Swenson like procedure.

DISCUSSION

Swenson and Bill[6] first described a transanal pull-through procedure for the treatment of HD in 1948.[6] Endorectal pull-through, as described by Soave in 1964[7] and later modified by Boley[8] is one of the standard surgical procedures. However, the intraabdominal rectal mucosal dissection is sometimes technically difficult, and the remaining long rectal muscular cuff may cause functional problems, including organ stenosis.

We performed a modified Swenson anastomosis technique, using a seromuscular polypropylene 4-0 separate-stitch suture. The circumferential anastomosis was wide, thus, avoiding the chance of stenosis. We did not use the Soave or Soave-Boley techniques because we wanted to avoid the possibility of stenosis in the anastomosis region.

When colorectal vessels are being dissected and tied to free the colon, extreme care should be taken to obtain hemostasis, thereby avoiding vessel retraction into the abdominal cavity. No mortality was observed in our series.

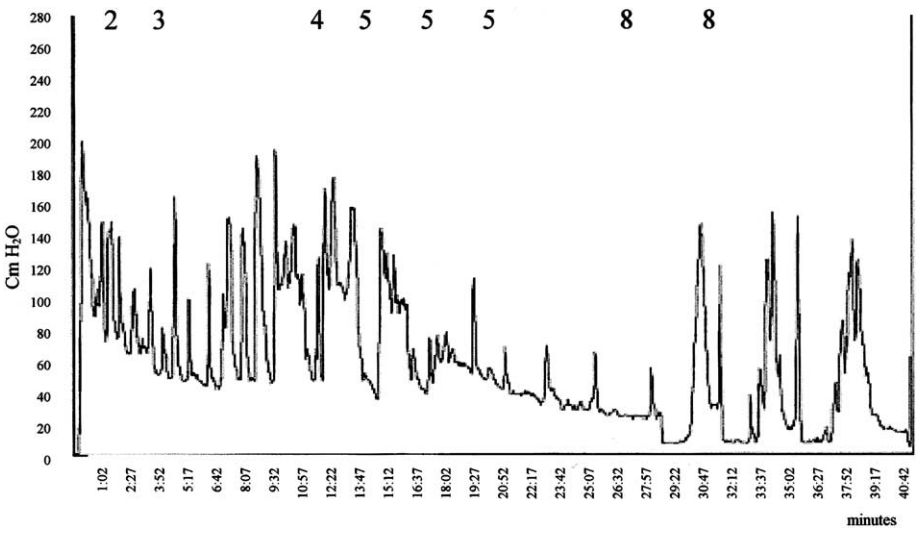

Fig 4. Anorectal computerized manometry shows good anorectal sphincter muscle complex function (graph compressed so as to present the whole examination). 2, Pressure responses to coughing; 3, Voluntary contraction; 4, Perianal stimulation; 5, Investigation of the rectal sphincter reflex; 8, Pressure curves for the anal canal, obtained by removing the balloon one centimeter at a time.

It must be remembered that the radiologic and anatomopathologic locations of the transition zone cannot always be correlated in cases of congenital megacolon. In a previous case series,[9] we observed that 21% of the patients with classical long-segment congenital megacolon presented a radiologic transition zone that was lower than the anatomopathologic transition zone. The ganglion cell presence must be confirmed via full-thickness biopsy sections and with frozen section confirmation.

The transanal approach provides the same advantages as seen in laparoscopic surgery, but without the risks of the laparoscopic technique.[10] Longer follow-up is necessary to document whether other complications appear.

This technique has the advantage that neither abdominal nor intraperitoneal bowel opening is necessary. This decreases the risk of forming adhesions, and there is a reduced need for postoperative analgesia. It offers the best cosmetic results in the correction of HD, preserves the sphincters, and does not affect fecal and urinary continence.

We believe that this procedure can fulfill the purpose of pull-through for the treatment of HD, removing the aganglionic colon and pulling through normally innervated bowel to the anus with preservation of anal sphincter function. The transanal approach provides the same advantages as seen in laparoscopic surgery but without the risks of the laparoscopic technique. Longer follow-up is needed to document whether other complications appear.

REFERENCES

1. De la Torre-Mondragón L, Ortega-Salgado JA: Transanal endorectal pull-through for Hirschsprung's disease. J Pediatr Surg 33:1283-1286, 1998

2. Langer JC, Minkes RK, Mazziotti MV, et al: Transanal one-stage Soave procedure for infants with Hirschsprung's disease. J Pediatr Surg 34:148-152, 1999

3. Albanese CT, Jennings RW, Smith B, et al: Perineal one-stage pull-through for Hirschsprung's disease. J Pediatr Surg 34:377-380, 1999

4. Shankar KR, Losty PD, Tumoch RR, et al: Transanal endorectal coloanal surgery for Hirschsprung's disease; Experience in two centers. J Pediatr Surg 35:1209-1203, 2000

5. Gao Ya, Li Gongcai, Zhang X, et al: Primary transanal rectosigmoidectomy for Hirschsprung's disease: Preliminary results in the initial 33 cases. J Pediatr Surg 36:1816-1819, 2001

6. Swenson O, Bill AH: Resection of rectum and rectosigmoid with preservation of the sphincter for benign spastic lesions producing megacolon: An experimental study. Surgery 24:212-220, 1948

7. Soave F: Hirschsprung's disease: A new surgical technique. Arch Dis Child 39:116-124, 1964

8. Boley SJ: New modification of the surgical treatment of Hirschsprung's disease. Surgery 56:1015-1017, 1964

9. Peterlini FL, Martins JL, Cury EK: Surgical management of Hirschsprung's disease using original Duhamel's technique or modified Duhamel's procedure with gastrointestinal autosuture. A Folha Medica 4:235-239, 2001

10. Georgeson KE, Fuenfer NM, Hardin WD: Primary laparoscopic pull-through for Hirschsprung's disease in infants and children. J Pediatr Surg 30:1017-1022, 1995