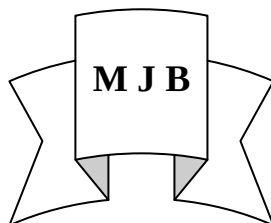


Anatomical Aspects of the Technique of Trans Anal One Stage Endorectal Pull-Through Procedure in Children with Hirschsprung's Disease

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Abstract

Purpose: this prospective study presents the technique and results of transanal one-stage endorectal pull-through procedure in children with rectosigmoid lesions from Hirschsprung's disease at Pediatric Central Teaching Hospital – Baghdad – Iraq from (jan.2007-may.2009).

Methods: twenty children aged one month to 6 years with section biopsy-proven Hirschsprung's disease underwent transanal one-stage endorectal pull-through procedures during a 12-month period. A rectosigmoid transitional zone was suggested by contrast enema in 16 patients. Preoperative colonic irrigation to evacuate feces out of the dilated colon was done in the hospital. Bowel preparation was the same as conventional colorectal surgery. Full – thickness rectal biopsy at 1 to 2 cm above the dentate line was submitted for pathologic diagnosis. A rectal mucosectomy dissection was started 0.5 cm proximal to the dentate lines and was extended into the intraperitoneal rectum. The muscular sleeve was divided circumferentially at 3 to 4 cm proximal to the dentate line, exposing the Intraperitoneal rectum and allowing full-thickness mobilization of the rectosigmoid colon was pull down to anastomose with the distal end of anorectal mucosa.

Results: operating time, ranged from 110 to 180 minutes. The length of bowel resections ranged from 9 to 25 cm . the length of hospital stay depended on the amount of fecal impaction in the colon. Older children with substantial fecal impaction required 2 weeks of preoperative saline enema. One infant needed 3 days for bowel preparation, the same as for conventional colorectal surgery. The hospital stay ranged from 6 to 7 days in children younger than 2 years and 10 to 28 days in older children. There were no intraoperative or postoperative complication related to the pull-through procedure. One case of colitis occurred in the 6 years old child, which required rectal tube decompression one week after the operation. Seven patients passed stool within 24 hours after surgery. All patients had normal bowel movements within 3 weeks. There was no rectal cuff stricture or enterocolitis during one year of follow-up.

Conclusion: transanal one-stage endorectal pull-through operations for rectosigmoid lesions from Hirschsprung's disease can be performed successfully in all ages of children with good results, avoiding transabdominal exploration. The early postoperative enterocolitis in the older children might occur and should be treated urgently. The partial coloanal anastomosis obstruction found in older children could be treated by placing a rectal tube into the anus to decompress the dilated pull-through colon. The limitation of this approach is that retroperitoneal fixation of the descending colon could not be dissected by transanal route.

الجوانب التشريحية لعملية سحب القولون من خلال فتحة الشرج لمرضى شلل القولون الولادي

الخلاصة

دراسة مستقبلية تضمنت (٢٠ حالة) من المرضى المصابين بشلل القولون الولادي تراوحت اعمار المرضى من (١ شهر) الى (٦ سنوات).

أجريت الدراسة في قسم جراحة الأطفال في مستشفى الطفل المركزي ببغداد للفترة (٢٠٠٧-٢٠٠٩). كانت الطريقة السابقة للعملية تعتمد ثلاث مراحل يتم خلال المرحلة الأولى فغر القولون وفي المرحلة الثانية استئصال الجزء المتأثر من القولون عن طريق فتح البطن

والمرحلة الثالثة عملية غلق فغر القولون. الطريقة المعتمدة بالدراسة هي إجراء العملية بمرحلة واحدة عن طريق استئصال الجزء المتأثر بعد سحبه من خلال فتحة الشرج. وكانت النتائج جيدة حيث تم إجراء العملية بوقت اقل وبمضاعفات اقل وبفترة رقاد اقصر بعد العملية وبمختلف الأعمار دون الحاجة إلى إجراء أكثر من مرحلة من خلال فتح تجويف البطن.

Introduction

Primary megacolon (Hirschsprung Disease) shows a familial tendency and is more common in male than in females. symptoms usually appear during the first few week after birth. The sigmoid colon is greatly distended and hypertrophied while the rectum and anal canal are constricted. histological examination reveals a complete failure of development of the parasympathetic ganglion cells in this region. the treatment is operative excision of the a ganglionic segment of the bowel.[1] Hirschsprung 's disease is the most common cause of intestinal obstruction in newborn [2,3].Colostomy followed by a transabdomino-perineal pull through procedure is the standard treatment for the disease [4]. Using laxative or rectal tube and saline irrigation can successfully treat functional obstruction avoiding colostomy during newborn period [5]. Seventy percent to 80% of patient have an a ganglionic segment at the level of recto sigmoid colon [6,7]. One stage repair, even in the newborn period, either by laparotomy or by combined laparoscopy and trans anal dissection, has been advocated[8].The result of the one stage approach in small infants appears to be at least as procedure with a colostomy was used.Recently, the use of one stage definitive procedure for small infants with Hirschsprung's disease has increased [9]. One stage trans anal approach is associated with a significantly shorter hospital stay and lower cost without increase risk of complications, based on the reported success of the one stage trans anal endorectal pull-through technique[10].

Material and Method

In a cadaveric newborn, we could mobilize and pull out the lower one third of the descending colon without difficulty . the tension was faced when the colon beyond the lower one third was pulled out of the anal canal.Fifteen infants and five children with rectosigmoid lesions from Hirschsprung's disease were operated on with a one-stage transanal endorectal pull-through technique. The patients ranged from 1 month to 6 years of age. They had chronic constipation and occasional colonic obstruction. A rectosigmoid transitional zone was suggested by contrast barium enema in 16 of the children. A 12- month-old boy had an equivocal barium enema, the patients needed a period to irrigate feces from their colons. Two days before the operations, we gave the patients a low-fiber diet, erythromycin (30 to 50 mg/kg/d) were used to reduce bacteria in the colon for 2 days before the operation. Gentamycin and metronidazole of cefoxitin were given the night before surgery and were continued for 5 days after the procedures. A solution of 0.25% lidocaine with 1:200,000 epinephrine was injected around the submucosal area to promote hemostasis and facilitate easy mucosal dissection. A full-thickness rectal biopsy was done at 0.5 cm above the dentate line, extending upward for 1.5 to 2 cm submucosal dissection was performed. The prolapsed rectal cuff was cut at 3 to 4 cm above the starting point of the submucosal dissection the rectum and sigmoid colon were dissected to above the transitional zone, sometimes requiring division of rectal and

sigmoid vessels the colon was anastomosed to the lower anorectal mucosa additional stitches fixing the seromuscular layer of the pull-through colon to the inner cuff was done to prevent internal organ herniation. We left as short a rectal cuff as possible to prevent its stricture.

Results

The cadaveric dissection correlated with our clinical experience in that the lower one third of the

descending colon could be dissected and pulled out of the anus because it was loosely fixed to the retroperitoneum. Twenty patients aged (one month to 6 years) with Hirschsprung's disease proven by biopsy underwent one-stage transanal endorectal pull-through procedures during a one-year period . characteristics of the patients and results of the surgery are shown in table 1.

Table 1 patient's data

Characteristics	No of pts	3	2	5	1	4	2	1	2
Age		1-3 mo.	4-5mo.	6-8 mo.	9 mo.	10-12mo.	1-2yrs.	3yrs	4-6yrs.
Sex		M	1F\1 M	3M\2F	M	3M\1 F	2M	M	1M\1 F
symptoms		Constipation(CO N) Abd.distension(AD)	CO N AD	CON AD	CON AD	CON AD	CON AD	CO N AD	CON AD
Previous RX		Anal Suppository(SP)	SP	SP Laxative(LX)	SP LX	SP LX	SP LX	SP LX	SP LX
Preoperative Dx.		Barium enema(BE)	BE	BE	BE	BE	BE	BE	BE
Bowel resection length(cm)		9-10	10-11	10-13	14	12-16	15-18	25	17-20
Blood loss(cc)		few	few	few	few	few	few	300	200-220

The rectal biopsies all showed aganglionic cells and thick nerve fibers in their muscular layers. Submucosal dissection was easier in the younger patients, especially in the infant. The 2 oldest patients needed one and 2 weeks in the hospital to irrigate impacted feces from their colon. There were minimal residual colon contents found during surgery because we gave enough time for rectal irrigation. The operating time ranged from 110 to 220 minutes, with a mean of 140 minutes. No patients required conversion to an open procedure. In all cases the bowel had active movement the day after

surgery. The patient tolerated oral feeding within one or 2 days after the procedure. There was no other complication related to the procedure during 3 to 12 months of follow-up. All patients had good appetites and normal weight gain. The frequency of bowel movements was decreased to the normal range within 3 to 4 weeks after the operation. The color and stool content was improved from gray and black semisolid to yellow and more solid after surgery.

Discussion

The treatment of Hirschsprung's disease is to respect the ganglionic segment of the rectum and colon, pull down normally innervated bowel, and anastomose this bowel at the anorectal region, while preserving the sphincter muscle. Previously, a one-stage transabdominoperineal pull-through procedure was performed in patients who had a late presentation of Hirschsprung's disease in our institution. Recently, the one-stage approach was found to be technically feasible with low morbidity in newborns. All of the common operative techniques described by Duhamel, Soave-Boley, and Swenson were performed previously by transabdominal exploration combined with the perineum approach. The latest one-stage transanal endorectal pull-through procedure during the neonatal period abdominal wall incision is a unique technique. It is also can eliminate the possibility of pelvic nerve injury. Postoperative pain was minimal, and cosmetic results were better than with the transabdominal approach. Transanal endorectal pull-through in 8 children with different ages and conditions showed that transanal rectal dissection was easy in infants but difficult in older children. The problems encountered were thickness of the mesentery in older patients, inflamed mucosa, longstanding dilated colon, and previous rectal biopsy.

Postoperative enterocolitis occurring in a 6-year-old boy might be associated with long time intestinal obstruction and inflammation. It was treated with rectal tube decompression and antibiotics. The colostomy must be done if the patient did not improved with conservative treatment. The patients stayed in the hospital 5 to 7 days after operation for observation if complications occurred. However, the

patients were be discharged earlier if the postoperative outcome was good. Barium enema effectively showed the transitional zone in infants and children but had a significant false negative rate in correctly identifying the transitional zone during the newborn period. The barium enema must show the exact location of the transitional zone before starting anal dissection, otherwise, there would be problems in the case of total aganglionic colon. Fullthickness biopsy of the rectum at 0.5 cm extended upward to 2 cm above the dentate line should be done to confirm the diagnosis. The pulled through colon must show a normal amount of ganglion cells before anastomosis to the lower end of the anorectal mucosa. the rectosigmoid lesions, which occur in 70% of Hirschsprung's cases can be treated with the transanal with endorectal pull-through technique if they were diagnosed during infancy and childhood.

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