



Initial experience with Soave's transabdominal pull-through: An observational study

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ABSTRACT

Purpose: The purpose of this study was to evaluate the clinical profile and outcome of patients with Hirschsprung's disease undergoing Soave's transabdominal pull-through.

Methods: The study is a prospective study in neonates, infants and children presenting to Surgery Department of B. P. Koirala Institute of Health Sciences, Dharan, Nepal with a diagnosis of Hirschsprung's disease who underwent a Soave's transabdominal pull-through from 2006 to 2008.

Results: There were 20 patients, including 10 neonates (50%), 8 infants (40%) and 2 children (10%). There were 18 males and 2 females. Mean age at presentation was 9.2 months (range 7 days–7 years). Mean time of passing stool postoperatively was 49.5 h (range 15–72 h). Mean time to orally allowing was 97.2 h postoperatively (range 36–120 h). Mean hospital stay was 14.4 days (range 11–19 days). One patient died due to uncontrollable hyperthermia (5% mortality). Other complications noted were 1(5.2%) anastomotic leak, 1(5.2%) cuff abscess and 1(5.8%) anastomotic stricture. Mean stool frequency at 1st month of follow-up was 6.8 per day, which later decreased to 4.5 per day at 3rd month, 3.1 per day at 6th month and 1.7 at 1 year. Two patients (11.7%) have constipation at 1 year follow-up.

Conclusion: The rate of complications like mortality, cuff abscess, anastomotic leak and constipation are comparable to other series. The short-term results of Soave's transabdominal pull-through have been satisfactory; however long-term results are still awaited.

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1. Introduction

Hirschsprung's disease is a congenital disorder characterized by absence of ganglion cells in the myenteric (Auerbach's) and submucosal (Meissner's) plexus. Over the last decade, there has been a significant evolution in surgical strategies to treat Hirschsprung's disease. A three-stage procedure involves a proximal defunctioning colostomy followed by a definitive pull-through and later closure of colostomy. The staged procedures has always faced challenges inherently associated with problems of repeated hospital stays, morbidity of colostomy, cosmetic disfigurement of abdomen and financial burden to the family.^{1–3} Keeping the above-mentioned problems of staged procedures into consideration, there has recently been an increasing trend in performing a single-stage pull-through procedure.^{4–6} However, the staged procedure definitely has its own merits of saving the child from enterocolitis, neonatal sepsis, metabolic abnormalities and possible mortality and in cases with massively dilated colons.⁵ The pull-through procedures most widely used are Swenson's, Martin's modification of Duhamel and

Soave's endorectal pull-through. The definitive management of Hirschsprung's disease has been recently introduced to our institute. The purpose of this study was to evaluate the clinical profile and outcome of patients with Hirschsprung's disease who underwent Soave's transabdominal pull-through in our institute.

2. Materials and methods

This study is a prospective study in neonates, infants and children presenting to Surgery Department of B. P. Koirala Institute of Health Sciences, Dharan, Nepal with a diagnosis of Hirschsprung's disease who underwent Soave's transabdominal pull-through in the period 1st January 2006 to 30th December 2008. Ethical approval was taken from the hospital (Reference no. 2063–056). The criteria of diagnosis for Hirschsprung's diseases were the following: 1) vomiting, abdominal distension and/or not passing stool and/or chronic constipation, 2) plain radiograph of the abdomen – which showed dilated bowel loops with absent air in the rectum, which was confirmed by 3) barium enema – showing a transition zone, and 4) absence of ganglion cells in the rectum on histopathology. We do not have the facility of anorectal manometry. After initial investigations, the children were subjected to a 3-staged pull-through

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procedure. During colostomy, degree of colonic dilatation and the location of transition zone were noted, full-thickness colonic biopsies were taken from four sites: at the peritoneal reflection, just above the transition zone, splenic flexure and the stoma. The biopsy material was preserved in formalin for identification of ganglion cells and sent for histopathological examination. The biopsy sites were closed using a non-absorbable suture material to facilitate subsequent identification of level for colonic transection. Finally, a right transverse loop colostomy was fashioned. Subsequent transabdominal endorectal (Soave's) pull-through of the distalmost ganglionated segment of the large bowel and coloanal anastomosis was done 6 weeks after colostomy. Colostomy closure was done 6 weeks following the pull-through. The patients were followed up at 1 month, 3 months, 6 months and 1 year after the last surgery. The study analyzed the following parameters: sex, gestational age at birth, age at presentation, clinical features, radiological findings, level of transition zone, operative findings, intra-operative complications, hospital stay, early and late post-operative complication and follow-up data, including stool frequency, stool consistency, and functional outcome (like anal strictures, perianal excoriations, constipation, need for laxatives and soiling of clothes). Data was collected and entered in the SPSS (Chicago, Illinois) software. Results are presented as mean \pm SD and range.

3. Results

There were 20 patients enrolled in our study. Mean age at presentation in our study was 9.2 ± 18.62 months (range 7 days–7 years) in which there were 10 neonates (50%), 8 infants (40%) and 2 children (10%) (Table 1). There were 18 males (90%) and 2 females (10%). Mean gestational age was 40^{+6} weeks (range 38^{+3} –41 weeks). We also tried to correlate with weight at birth, however as most of children were born at home, we could not get the results. 5(25%) of patients needed rectal stimulation to pass first meconium. Abdominal distention was found to be the most consistent symptom (90%), whereas vomiting was found in smaller fraction of the group (16, i.e. 80%). A history of passing meconium within 24 h was found in 10(50%) patients, within 24–48 h in 2(10%) patients, and after 48 h in 8(40%) patients. On physical examination, gripping sensation (grip sign) was found in 14(70%) patients on rectal examination. After investigations and assessment on initial laparotomy, the transition zone was found in rectosigmoid region in 16

Table 1
Characteristics of the patients.

Characteristics	n/mean \pm S.D.	%/range
Sex		
Male	18	90
Female	2	20
Age at presentation	9.2 ± 18.62 months	(range 7 days–7 years)
Age groups		
Neonates (0–30 d)	10	50
Infants (1–12 mo)	8	40
Children (>1 yr)	2	10
Gestational age at presentation	40^{+6} weeks	(range 38^{+3} –41 weeks)
Symptoms		
Abdominal distension	18	90
Vomiting	16	80
Passage of meconium		
Within 48 h	12	60
After 48 h	8	40
Grip sign	14	70
Level of aganglionosis		
Rectum	12	60
Sigmoid	4	20
Descending colon	2	10
Splenic flexure	2	10
Total colon	0	0

(80%) of patients, at the descending colon in 2 (10%) and at the splenic flexure in 2 (10%) of patients. We did not get any cases of involvement of right-sided colon or total colonic aganglionosis. Two patients were suspected of Hirschsprung's disease due to their presentation and investigations but had ganglion cells in their rectum and sigmoid colon, so they were not subjected to pull-through and not included.

Regarding the operative characteristics, mean time of diagnosis to first surgery was 22.2 ± 10.39 h (range 10–48 h), the duration of pull-through was 133 ± 14.18 min, the length of bowel mobilized was 45 ± 10 cm (range 30–58 cm), mean blood loss was 31 ± 13 mL (range 20–100 mL) (Table 2). Two patients required blood transfusion. No significant intra-operative complications were noted. Mean time of passing stool postoperatively was 49.5 ± 19.35 h (range 15–72 h) following colostomy closure. Mean time to orally allowing was 97.2 ± 24.3 h (range 36–120 h) following colostomy closure. Mean hospital stay was 14.4 ± 2.5 days (range 11–19 days).

There was one perioperative mortality (5%) (Table 2). The child died of uncontrollable hyperthermia 1 day after the pull-through. One patient (5.2%) had an anastomotic leak due to devascularisation of the pull-through bowel with development of peritonitis; resection of the diseased bowel and a redo pull-through was done later. In another patient (5.2%), there was development of cuff abscess 4 days after the pull-through which was drained laparoscopically.

Two patients were lost to follow-up at 6 months and 1 year (follow-up rate of 89.5%). Mean follow-up was 9.3 months. Some patients were still on longer follow up. Mean stool frequency at 1st month of follow-up was 6.8 per day, which later decreased to 4.5 per day at 3rd month, 3.1 per day at 6th month and 1.7 at 1 year (range 1–once every 3rd day) (Table 3). The mean period of anal dilatation was 1.27 months postoperatively. At the end of 6 months and 1 year, 2 patients (11.7%) have constipation; they pass stool once every 3rd day and need laxatives daily. One child has a palpable anastomotic stricture (incidence 5.8%). They underwent a rectal biopsy, the ganglion cells were present. The child with anastomotic stricture had recurrent episodes of enterocolitis, which were managed with rectal tube decompression, bowel rest and intravenous antibiotics. He underwent a stricturoplasty recently; results are yet to be observed. Stool consistency was formed in 5(26.3%) of patients at 1st month of follow up, which increased to 13(68.4%) at 3rd month and 100% at 6th month and at 1 year. Soiling of clothes was present in 8(42.1%) of patients at 1st month of follow-up, which decreased to 3(15.8%) at 3rd month and was absent at 6th month and 1 year. Perianal excoriation was present in 7(36.8%) of patients at 1st month of follow up, which

Table 2
Operative characteristics and complications.

Operative characteristics	Mean	Standard deviation	Range
1 Duration between diagnosis and surgery (in hours)	22.2	10.39	10–48
2 Operating time (in minutes)	133	14.18	120–150
3 Blood loss (in ml)	31	13	20–100
4 Length of bowel mobilized (in cm)	45	10	30–58
5 Time of passing of stools postoperatively (in hours)	49.5	19.35	15–72
6 Time of orally allowing (in hours)	97.2	24.3	36–120
7 Total hospital stay (in days)	14.4	2.5	11–19
Complications	n	%	
1 Mortality	1	5	
2 Cuff abscess	1	5.2	
3 Anastomotic leak	1	5.2	
4 Constipation	2	11.7	
5 Post-operative enterocolitis	1	5.8	
6 Anastomotic stricture	1	5.8	

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