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Primary Swenson Pull-Through in Infants Less Than 4-Months: A Preliminary Report

La traction Swenson primaire chez des enfants âgés de moins de 4 mois: Un rapport préliminaire

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Abstract

Background: In our center, our approach has been to practice the traditional staged procedure for the treatment of Hirschsprung's disease. This prospective study was to determine the feasibility of early neonatal pull through and in infants less than 4 months.

Methods: 5 consecutive patients with Hirschsprung's disease under 4 months of age were recruited in to the study. Full thickness rectal biopsy confirmed the diagnosis in all the patients. A primary definitive Swenson's pull through was using standard technique with intraoperative frozen section when available. Perioperative Ceftriaxone and metronidazole was administered preoperatively. A rectal tube made from a 2cc syringe was left in situ for 5-7 days after the operation

Results: Four of the patients were seen within the neonatal period and a patient presented at 13 weeks, the male to female ratio is 4:1. The mean weight at admission is 3.20kg while the mean weight at surgery was 3.75kg. Intra-operative frozen section revealed that two patients had aganglionosis up to the proximal sigmoid colon while 2 other patients had an aganglionosis up to the proximal descending colon and the distal transverse colon respectively. All the patients were commenced with oral intake on or before 4th post-operative day. Wound infection and paralytic ileus occurred in the immediate post operative period in one patient each while another developed an incisional hernia. None of these complications was life threatening and were all managed as required. Bowel opening in the patients range from 2-5 times daily.

Conclusions: Based on this preliminary study it can be concluded that primary neonatal and early infancy pull through is feasible and advantageous to the patients. Further prospective works in this area are needed coupled with improvement in the neonatal care facilities.

Keywords: Hirschsprung's disease, Primary Swenson pullthrough, infants

Résumé

Arrière-plan: Dans notre centre, nous avons toujours adopté la méthode traditionnelle pour le traitement de la maladie de Hirschsprung. Cette étude prospective avait pour objectif de déterminer la faisabilité de la traction primaire néo-natale chez des enfants âgés de moins de 4 mois. ***Méthodes:*** Nous avons recruté, pour l'étude, cinq malades consécutifs âgés de moins de 4 mois atteints de la maladie de Hirschsprung confirmée histologique ment. Au moyen de la technique habituelle, nous avons entrepris la traction primaire Swenson en utilisant, quand disponible, le sectionnement gelé au cours de l'opération. ***Résultats:*** Sur les cinq malades, il y avait quatre garçons et une fille. Quatre des malades se sont présentés dans la période néo-natale et le cinquième à 13 semaines. Le poids moyen était de 3,20kg à l'hospitalisation et de 3,75kg pendant la chirurgie. Deux des malades avaient l'aganglionose jusqu'au plus proche côlon sigmoïde alors que chez 2 autres l'aganglionose allait jusqu'au côlon proximal et chez l'un jusqu'au côlon distal transversal, respectivement. Tous les malades ont été mis à l'allaitement dans les quatre jours après l'opération.. L' évacuation de l'intestin chez les malades varie quotidiennement de 2 à 5 fois. Les complications étaient non mortelles et comprenaient la blessure et la paralysie de l'iléon chez chaque malade peu après la chirurgie, alors qu'un autre malade a contracté l'hernie l'incisionnelle. ***Conclusions:*** Cette étude préliminaire a montré que la traction dans l'enfance néo-natale et au début de l'enfance est faisable et comporte des avantages. Pour de plus amples éclaircissements, il faudrait d'autres études prospectives dans ce domaine. ***Mots-clés:*** la maladie de Hirschsprung, la traction primaire Swenson, enfants.

Introduction

Hirschsprung's disease is the commonest cause of functional intestinal obstruction in the newborn[1] and in some series is the second commonest cause of intestinal obstruction in neonates following anorectal malformations.[2] The management of this

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condition had been, in the past, to create a colostomy to relief the intestinal obstruction while allowing for nutritional rehabilitation of the patient and then a formal pull through before the closure of the stoma.[3,4] This modality of management is froth with many problems including prolonged hospital stay; morbidity and mortality associated with colostomy in the neonate and infant, multiple exposures to anesthesia as well as increased cost of the management.[4] In the last few decades, attempts have been made by several workers to achieve a pull through without creating a stoma.[5-7]

In our center, our approach has been to practice the traditional staged procedure for the treatment of Hirschsprung's disease. A previous study from our institution and other parts of Nigeria has shown that majority of the patients do not return after colostomy. This prospective study was to determine the feasibility of early neonatal pull through and in infants less than 4 months.

Methods

This study was carried out at the Pediatric Surgical Unit of the Obafemi Awolowo University Teaching Hospitals Complex, Ile Ife, and Osun state. 5 consecutive patients with Hirschsprung's disease under 4 months of age were recruited in to the study. All the patients were fully resuscitated, had their anemia corrected and had preoperative bowel preparation to decompress the bowel using twice daily warm saline enema as well as bisacodyl suppositories. The patients thereafter had full thickness rectal biopsy to confirm absence of ganglion cells in both myenteric and sub mucous plexuses. The result usually comes out within a week or two of taking the biopsy. The patients are advised to remain on the ward during this period. Bowel decompression was continued during this time. A primary definitive Swenson's pull through was thereafter performed on these patients. A rectal tube made from a 2cc syringe was left in situ after the operation. (Figure 1).

Data from the patients including the age, sex, age and weight at admission, age and weight at pull-through, the pathological report of the rectal biopsy confirming the diagnosis, the level of aganglionosis as confirmed by intraoperative frozen section, days to commencing oral intake, the length of hospital stay and the complications were all collated. The data was analyzed using the SPSS 11.0 version.

Table 1: Patients' Data

Serial No.	Age at Admission	Sex	Wt at Admission	Age at Biopsy	Age at p/thru	Wt at p/thru	Rectal biopsy (full-thickness)	Path of frozen section specimen	Days to oral intake	Compli-cation	Duration from biopsy to discharge (days)	Duration from pull through to discharge (days)
1.	3 days	M	2.9kg	5 days	15 days	3.25kg	Confirms HD	Ganglion cells at prox. Sigmoid	3	Incisional hernia	19	8
2.	13 weeks	F	4.1kg	14 wks	16 wks	4.70kg	Confirms HD	Ganglion cells at prox. Sigmoid	3	Intestinal obstruction (ileus) Hyponatremia (125 mmol/L)	38	24
3.	27 days	M	2.9kg	33 days	47 days	3.25kg	Confirms HD	Ganglion cells at prox. desc. Colon	4	Nil	24	10
4.	11 days	M	2.2kg	15 days	26 days	3.00kg	Confirms HD	Equivocal	2	Wound infection	25	11
5.	4 days	M	3.1kg	10 days	11 wks*	4.95kg	Confirms HD	Not Done	4	Nil	1*	8

* Patients was discharged a day after biopsy on the request of patient's parents and re-presented at 11 weeks.

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Results

Four of the patients were seen within the neonatal period and a patient presented at 13 weeks, the male to female ratio is 4:1. The mean weight at admission is 3.20kg while the mean weight at surgery was 3.75kg. All the patients had confirmed Hirschsprung's disease on rectal biopsy. One of the neonates also had a barium enema, which shows dilated sigmoid colon with a funnel shaped transitional zone tapering towards a contracted segment of the rectum.

Intra-operative frozen section revealed that two patients had aganglionosis up to the proximal sigmoid colon while 2 other patients had an aganglionosis up to the proximal descending colon and the distal transverse colon respectively. The last patient did not have the benefit of the intraoperative frozen section due to breakdown of the cryostat at the time of his surgery. However all had adequate resection margin on final histopathology report.

All the patients were commenced with oral intake on or before 4th post-operative day.

Wound infection and paralytic ileus occurred in the immediate post operative period in one patient each while another developed an incisional hernia. None of these complications was life threatening and were all managed as required. Bowel opening in the patients range from 2-5 times daily.

Discussion

Hirschsprung's disease (congenital aganglionosis megacolon) is the commonest cause of functional intestinal obstruction in neonates in our environ-ment.[1,2] The principle of management is the removal of the aganglionic portion and a "pull-through" of the proximal ganglionated bowel first described by Swenson and Bill in 1948.[4] Later, Duhamel[9] and Soave[10] described the retrorectal pull-through and endorectal pull-through respectively. These 3 procedures have been widely used in the surgical management of the condition and the outcome and prognosis has been very good and comparable among the 3 procedures.[11-13]

Traditionally, these procedures have been done in 3 stages with the first stage being the creation of a diverting colostomy above the transition zone usually confirmed by intraoperative frozen section "leveling" the site to ganglionated portion of the bowel. The second stage performed much later when the nutritional status of the patient is improved (often between 6 and 12 months of the first surgery) involves the definitive pull-through while the final stage is the closure of the stoma.[4] Early experience of Swenson with definitive surgery done within 4 months of the first colostomy show very high morbidity and mortality associated with the procedure and informed the decision to wait for longer period before the pull through is done.[11] With better supportive care of the neonate and more potent antibiotics, survival in this category of patients have tremendously improved.[4]

The first report of primary pull through without a stoma was by So and coworkers in 1980 and since then other workers have reported primary pull through using the 3 traditional techniques of Swenson, Duhamel and Soave.[5,6] Many authors have compared primary pull through procedures with the staged ones and they found consistently advantages in the primary pull through including reduction in the number of hospitalizations and total hospital days, avoidance of stoma-related complications such as skin breakdown, prolapse, and scar formation as well as reduction in the number of exposure to general anesthetics.[14,15] We have also shown in a previous study that colostomy is associated with high morbidity and a significant mortality in our children therefore a primary pull through where feasible would be ideal for our environment. This will also translate to less financial burden as cost of hospitalization would be reduced. However the diagnosis of Hirschsprung's disease is confirmed on rectal biopsy. This could be achieved either by a suction biopsy or a full thickness biopsy.[3] The suction biopsy is advantageous because it needs no anesthesia,[16] can be done as a clinic procedure and in good hands has a low false positive rate; however, it is not available in our center hence the need for two general anaesthesia in our patients as the full thickness biopsy can only be done under general anaesthesia.

All our patients were able commence oral intake within 4 days of surgery and they all did well. The mean hospital stay was 21 days i.e. from the time of rectal biopsy to final discharge.

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However, the duration of stay following pull through was 12 days on the average.

The immediate postoperative complications seen were not life threatening and were managed conservatively while the third patient was noticed during follow up in the clinic to have incisional hernia. The patient with incisional hernia has been counseled for the need for operative repair later. All the patients had acceptable bowel motion with no incontinence observed.

Based on this preliminary study it can be concluded that primary neonatal and early infancy pull through is feasible and advantageous to the patients. Further prospective works in this area are needed coupled with improvement in the neonatal care facilities.

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