

Original Article

Early and Late Complications Following Surgical Repair of Hirschsprung's Disease in Pediatric Patients: Single-staged Versus Multiple-Staged Pull through

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ABSTRACT

Background: Early diagnosis and repair make a better prognosis in Hirschsprung's disease (HD) patients. Two basic approaches, namely single staged and multiple staged pull through are commonly applied to treat such patients. In this study we tried to compare short-term and long-term complications of the two procedures to provide a guide for choosing the safer and more effective approach.

Methods: The study involved all the HD cases treated via either of the two common approaches during a seven-year period from 1995 to 2002 in Isfahan, Iran. Fourteen patients underwent single-staged repair (SS) but the remaining 48 were treated via a multiple-staged approach (MS). Short-term and long-term complications together with patients' defecation patterns were compared between the two groups.

Results: Early wound infection was significantly more prevalent among MS group (9 (19%) in MS groups vs. 1 (7%) in SS group; $P < 0.05$). Intestinal obstruction, severe enterocolitis, and anastomotic stricture were considerably lower in SS repair than in MS procedure. Defecation patterns in both groups were comparable. Compared with the MS approach, the number of hospital admissions and total length of stay were significantly lower in the SS group.

Conclusions: Although restoration of normal function is achieved with both procedures, early and late complications, number of admissions and the total length of hospital stay are considerably lower with the SS pull through. Therefore, with an earlier diagnosis, SS repair can be an improved strategy, which will bring a better prognosis for HD patients.

Keywords: Hirschsprung's disease, Intestinal aganglionosis, Congenital megacolon, Primary endorectal pull through

Hirschsprung's disease (HD) is often a difficult clinical diagnosis¹. The main cause of morbidity and mortality in these patients is enterocolitis¹. The mortality rate of Enterocolitis in HD varies between 6% and 30%¹. Of course during the last few decades the age of HD diagnosis has declined to 3 to 6 months. A recently conducted Study showed that up to 90% of cases are diagnosed during the neonatal period¹. Few cases of HD detected in adults have also been reported¹.

As a whole, the main purpose of treatment in HD is to restore anorectal

function as much as possible². Studies in this regard have all confirmed the better outcome of repair when HD was diagnosed and treated early in life especially during the first four months³. In the year 1960 multiple-staged (MS) pull through procedure was introduced to treat the HD patients for the first time. Since then the procedure techniques have changed and nowadays the single staged (SS) approach, which does not need colostomy, is preferably used in neonates with HD⁴.

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Lower rate of early and late complications besides better outcome especially in neonates have discriminated single staged approach^{5,6}. Of course, if the patient's colon is dilated due to a prolonged course of disease, the single-staged therapy will not definitely be a good modality⁷.

To offer a more accurate judgment, we compared early and late complications of the two approaches.

Materials and Methods

This was a cross sectional analysis which involved 62 HD patients who underwent surgical repair at Al-Zahra and Kashani University hospitals, Isfahan, Iran, between 1995 and 2002.

Forty eight of the patients were treated via a multiple staged approach. The remaining 14 children underwent single staged procedure.

Early and late complications were extracted from the patients' medical files, parents' interviews, and at the subsequent follow-up visits by a pediatric surgeon. Complications were followed from shortly after the operation until three months later.

The early complications listed, were anastomosis failure, anal superficial wounds, pelvic infection, prolonged ileus, wound infection, and bowel obstruction. Late complications included anastomotic stricture, rectal prolapse, bowel obstruction and retraction of pull through.

Defecation pattern was scored by a ten item questionnaire, each scoring 0 to 2 (Table 1). Total score on defecation pattern was obtained by summing the questions scores. Score 10 rated excellent, 6 to 9 were good, 3 to 5 were relatively good and scores 0 to 2 were considered weak.

Data were presented as count (%) and were compared between the two groups using Pearson Chi square or Fisher exact test where appropriate. A P value less than 0.05 was considered as statistically significant. Statistical analysis was performed on a computer using SPSS 9.0.

Results

In this study 14 cases of single-staged and 48 patients of multiple-staged therapy were

included. Although early complications were more frequent in MS group, the difference was only significant for the frequency of wound infection (9 (19%) in MS groups vs. 1 (7%) in SS group, $P < 0.05$; Table 2). Regarding late complications, the results also revealed that anastomotic stricture, severe enterocolitis, and bowel obstruction happened more frequently with MS procedure (Table 3).

Comparison of defecation pattern in both groups showed that 6 (42.8%) patients in SS group as well as 20 (41.60%) in MS group had excellent scores (Table 4).

Thirty-one (64.5%) patients of MS group stayed at the hospital for more than 20 days.

However, patients in the SS group had a hospital stay of 11 to 20 days. In the SS group 42.8% of patients were hospitalized twice, while 71% of patients in the other group had more than two admissions.

Discussion

Early restoration of normal sphincter function is the cornerstone of all the therapeutic strategies in Hirschsprung's disease. Besides advanced diagnostic means, the SS pull through approach has enabled surgeons to treat HD patients during their early months of life^{1,2,5,6}.

In our study early and late complications of SS and MS procedures were compared. The number of hospital admissions was higher with MS procedure. Complications such as wound infection, anastomotic stricture and bowel obstruction also occurred more significantly with MS repair.

In a study conducted by Swenson⁴, a master of pull through Procedure, anastomosis leak, wound infection, enterocolitis and the mean length of stay at the hospital were considerably higher in MS therapy.

The major sign of a successful operation is gaining a normal defecation pattern. Defecation pattern in both groups was satisfactory and did not significantly differ between the groups. Though SS therapy has always been introduced as preferable for its being done in early ages, yet lower rate of

complications associated with SS procedure has been overlooked in previous studies.

However, when HD is diagnosed late or whenever the patient suffers enterocolitis, MS approach seems to be the only choice.

Regarding sphincter function, the results in both groups were more satisfactory than in similar studies. In the SS group about 43% of patients were hospitalized only twice, while more than 70% of patients in the other group had more than two admissions.

As a whole, it seems that an early diagnosis can give the chance of performing SS pull through procedure which causes fewer complications, imposes fewer expenses and gives a better prognosis in HD patients.

Table 1. Defecation pattern scoring used in this study

Item	Range	Score
Number of defecations per day	1 – 2	0
	3 – 5	1
	≥ 6	2
Daily need for diapers	Always	0
	Often	1
	None	2
Stool consistency	Watery	0
	Formed	1
	Soft	2
	None	0
Control over rectal urgency	Seconds	1
	Minutes	2
	Everyday	0
Soiling	Off and On	1
	Never	2

Total score was obtained by adding individual item's score.

Table 2. Comparison between the two groups with respect to early and late complications and defecation pattern.

	Multiple-staged (n = 48)	Single-staged (n = 14)	P value
Early Complications			
Anastomosis failure	4	1	0.66
Anal superficial wound	5	3	0.33
Pelvic infection	3	0	0.5
Prolonged ileus	4	1	0.66
Wound infection	9	1	0.008
Bowel obstruction	2	0	0.11
Late Complications			
Anastomotic stricture	4	0	0.001
Enterocolitis Overall	13	5	0.44
Mild	3	2	0.05
Moderate	7	3	0.66
Severe	3	0	0.008
Pull through retraction	1	0	0.42
Rectal prolapse	1	0	0.44
Bowel obstruction	8	0	0.001
Defecation Pattern			
Excellent	20	6	0.44
Good	24	7	0.84
Relatively good	4	1	0.77
Weak	0	0	-

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