

Stricture after Assisted and Non-Assisted Transanal Pull-through for Classic Hirschsprung's Disease

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ABSTRACT

Background: Transanal endorectal pull-through (TEPT), and abdominally assisted TEPT for Hirschsprung's disease (HSD) have been reported as established methods of treatment. However, the difference between the 2 procedures in the development of stricture has been scarcely reported. The purpose of this study was to compare the stricture formation after the assisted and non assisted TEPT.

Methods: In the period between June 2009 and January 2012, 20 cases of classic HSD underwent abdominal assisted (group 1), (either by mini-laparotomy (group 1A, 14 cases) or laparoscopy (group 1B, 6 cases)) TEPT, and another 20 cases underwent Pure TEPT (group 2). There was no difference in age (<2years) and weight distribution between the 2 groups at the time of operation. Postoperative (PO) stricture development was assessed by the occurrence of buttocks excoriations and its duration, calibration by Hegar dilators at 2 weeks postoperative. A score from 0-2 were given for all the patients after 2 weeks (no stricture: 0, stricture: 1; tight stricture: 2). All patients were minimally followed up for 1 year. **Results:** No stricture developed in (55.56%) of group 1, and (45%) in group 2. Mild stricture occurred in (44.44%) of group 1 while it was (45%) in group 2. No patient (0%) of group 1 developed tight strictures, but (10%) of group 2 had tight stricture. None of our patients required surgical intervention for the stricture management. **Conclusions:** Assisted TEPT has clinically significant less incidence of post-operative development of stricture than non assisted TEPT.

Key Words: Transanal endorectal pull-through, Hirschsprung's disease, minilaparotomy, laparoscopy, stricture, obstructive score.

INTRODUCTION

Although many types of pull-through procedures have been described, a transanal one stage pull through procedure (TEPT) for the rectosigmoid form of HSD has become widely used and has been enthusiastically welcomed by pediatric surgeons¹. Many surgeons have used this procedure for the last 10 years, and the time has come to evaluate its original technical aspects. The first consequence of an exclusive transanal approach is conceptual. With a pure transanal approach, difficulties during dissection and anastomosis have already been reported, with risk of twisted pull-through or peritonitis and pelvic abscess¹. In fact, various authors described a higher than expected incidence of problems in the long-term follow-up².

The incidence of stricture is 8–24% historically, and is more common after Soave and Swenson repairs³. Two multicenter reviews of endorectal procedures noted a 4.2–4.8% incidence of stricture³. The etiology of anastomotic stricture can be multifactorial, including a narrow

muscular cuff, technical complications, compromised blood supply, sequelae following an anastomotic leak, or failure to adhere to a dilation program³. Circular rather than oblique anastomosis may also be a cause⁴. Constipation will usually result. Identification is facilitated by digital rectal or proctoscopic examination³. Strictures may be classified into two basic types. Simple strictures result in moderate narrowing at the anastomotic site, and typically present within a few weeks after the pull-through procedure⁴.

In general, these can be addressed readily with serial dilations and usually do not require subsequent surgical correction. More persistent strictures, particularly those associated with a history of an anastomotic leak, may be more difficult to address. Strictures associated with an ischemic segment of bowel also tend to be persistent and may not respond to dilation⁴. Strictures not responding to conservative management may require stricturoplasty or a redo pull-through procedure. In severe cases, formation of a colostomy and mucous fistula with antegrade dilation enema may be a solution³.

PATIENTS AND METHODS

During the period from June 2009 to January 2012, this prospective randomized (by sealed envelope technique) study was conducted on 40 pediatric patients with classic HSD responding to nursing at Pediatric Surgery Unit of General Surgery Department, Ain Shams University hospitals. Patients were divided into 2 equal groups (Group 1 assisted TEPT [Group 1A mini-laparotomy, Group 1B laparoscopy], Group 2 Pure TEPT). Inclusion criteria were: histopathologically documented HSD, transitional zone in the rectosegmoid colon (classic type of HSD) diagnosed by Contrast enema, and age below 2 years. Exclusion criteria were: previous colortectal surgery for HSD other than rectal biopsy including colostomy. Associated congenital syndromes (e.g., Down syndrome), and neurological impairment (e.g., Menengiomyelocoele).

Operative Technique for Pure transanal Soave pull-through group (group 2) was the same as published by Langer et al in 1999⁶. Minilaparotomy assisted group (group 1A), used an additional left iliac fossa oblique incision, while laparoscopic assisted Transanal Soave pull-through technique was done for group 1B as described by Georgeson and Muensterer in 2008⁷. Frozen control was used in all cases.

Two weeks postoperatively, careful rectal examination was performed, with calibration by adequate sized Hegar dilator according to the patient age⁸. Patients were considered as having mild stricture if the stricture can be released (given way) at ease by one size Hegar dilator less than the age matched size. If ≥ 2 Hegar dilator sizes are needed less than the age matched size to release the stricture; it was considered to be tight stricture. Patients with strictures, either mild or tight were subjected after 2 weeks from the operation to twice daily rectal dilatation regimen at home, with regular outpatient clinic visit and reassessment every 2 weeks after the start of dilatation. Routine dilatations were not done unless there was felt to be a stricture. For further evaluation of the obstructive symptoms caused by the stricture, all patients were submitted to an Obstructive Score Questionnaire "ranging from 0 to 7"; adopted from the questionnaire published by El-Sawaf et al in 2007⁵ and was designed specifically to address the complications of

surgeries after HSD; at 1month, 6 months and 1 year postoperative (Table 1). Statistical presentation and analysis of the present study was conducted, using the mean, standard error, unpaired student t-test, linear correlation coefficient and chi-square.

Table 1: Obstructive score questionnaire

1: Sense of fullness and evacuation after defecation:	
Fullness and full evacuation	0
Fullness but partial evacuation	1
Absent sense of fullness	2
2: Need for medical therapy to control stooling:	
No	0
Long period but finally weaned off 1	
Occasionally	2
Always	3
3: Distension:	
No	0
Mild	1
Moderate to severe	2

RESULTS

Each group had 16 males and 4 females. Group 1A included 12 patients, while group 1B included 8 patients. There was 2 Mortalities in group 1A (one patient from severe post-operative HSD associated Entero-colitis attack, and the other patient from anastmotic leakage and septic shock), while no mortality in group 1B or group 2. Anastmotic leakage occurred in 3 patients of group 1 (1 from subgroup 1A, and 2 from subgroup 1B) all was managed by redopull-through and covering right transverse loop colostomy; and no patient of group 2 had anastmotic leakage. Pathological processing of the resected colon revealed adequate proximal margin in all the patients, except for one patient of group 1A who had a transitional zone Pull-through, as proved by paraffin sections and had a redo operation. No stricture developed in (55.56%) of group 1, and (45%) in group 2. Mild stricture occurred in (44.44%) of group 1 while it was (45%) in group 2. No patient (0%) of group 1 developed tight strictures, but (10%) of group 2 had tight stricture. The duration of Hegar dilatation ranged from 3 weeks to 6 months (mean 2.9 months) in group 1, while it ranged from 6 weeks to 7 months (mean 3.4 months) in group 2 (Table 2). None of our patients required surgical intervention for the stricture management. There

was no statistically significant difference between the 2 group as regard: Buttock excoriation duration, Stricture score (Figure 1); Hegar Dilatation and duration of dilatation (Figure 2). The obstructive score (0-7) of group 1 was 0.87 at 1 month, 0.93 at 6 months, and 0.4 at 1 year. For the 3 patients with closed colostomy it was 0.33 after 1 year follow up from the initial procedure.

Subgroup 1A and 1B analysis revealed that obstructive score was 0.45 at 1 month, 0.73 at 6 months, 0.18 at 1year following the procedure in subgroup 1A, while it was 2 at 1 month, 1.5 at 6 months, 1 at 1year following the procedure in subgroup 1B. The obstructive score of group 2 was 1.15 at 1 month, 0.7 at 6 months, and 0.45 at 1 year (Figure 3).

Table 2: Follow up data in group1 and 2.

Group type	Assisted transanal Group (Group 1)	Pure transanal Group (Group 2)	P-value
Prolonged Buttock Excoriation > 1month	Yes: 4 patients No: 11 patients Unknown: 5 (2 died, 3 with colostomy)	Yes: 2 patients No: 18 patients	0.190
Stricture Formation	Score 0: 10 patients Score 1: 8 patients Score 2: 0 patients Unknown: 2 (Died) patients	Score 0: 9 patients Score 1: 9 patients Score 2: 2 patients	0.299
Duration of Dilatation	<2 months: 3 patients >2 months: 5 patients Unknown: 2 patients	<2 months: 3 patients >2 months: 8 patients	0.608

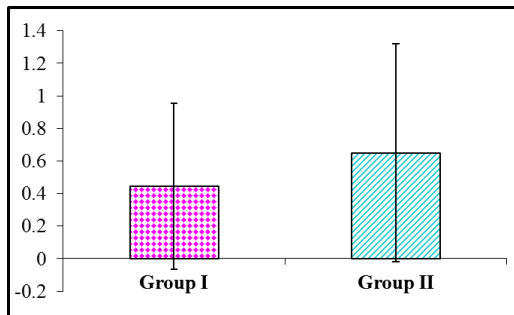


Fig. 1: Comparison between group 1 and 2 as regard the Stricture score.

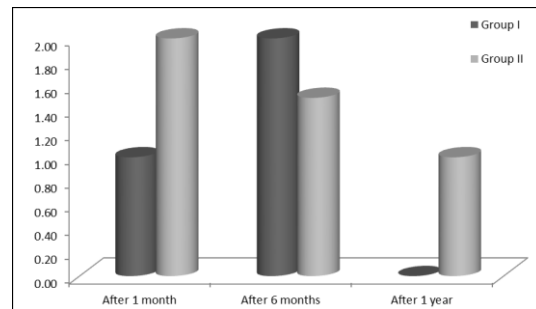


Fig. 3: Obstructive Score of group 1 and 2 after 1 month, 6 months, and 1 year.

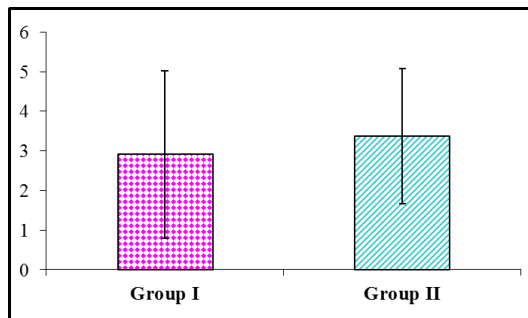


Fig. 2: Comparison between group 1 and 2 as regard the Stricture dilatation time in months

DISCUSSION

Although we did not find a statistically significant difference between the 2 studied groups as regard the incidence of stricture formation, the grade of the formed stricture, the duration of Hegar dilatation, and obstructive score (at 1 month, 6 months, and at 1 year PO); the confidence interval analysis showed that assisted group (group 1) has a clinically significant positive trend of improvement of all these parameters than non assisted group (group 2). Obstructive score was used to add more

distinction between the stooling disturbance and the obstructive attacks commonly occurs in the HSD patients post TAPT. This improvement in stricture score could be explained by less sphincter damage, with less anal manipulation with the avoidance of overstretching the anal sphincters in pure TAPT procedure⁹. This is consistent with 2 studies done in adults, which documented changes in manometric findings after similar transanal procedures⁵. The improvement in Obstructive score can be attributed to better management of seromuscular cuff in the assisted group. This study groups' demographic data were comparable, and there was no statistically significant difference between the 2 groups as regard pre-operative data. Upon processing the operative data, there was no statistically significant difference between the 2 groups except in the operative time (longer in the assisted group); which can be explained by the time used to shift the surgical field position from the abdominal assistance position to the perineal position, and the time needed for instillation of laparoscopic ports. Return of bowel function (earlier in the pure trans-anal group) was also statistically significant, and explained by less bowel manipulation with less PO ileus.

CONCLUSION

One of the highly debatable modifications of the Transanal endorectal pull-through in classic HSD is the addition of abdominal assistance either by minilaparotomy or laparoscopy. In our study abdominal assistance, revealed to have positive trend of improving stricture formation. The outcome has been favorable, but long-term follow-up is necessary for full assessment of those patients.

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