

*Research Article***Benefits of lap assisted transanal pull through operation in treatment of hirschsprungs disease****Abdelhalem Shawkat***, **Mohamed Elbarbary***, **Gamal S. Saleh****, **Tohamy Abdallah**** and **Ragab Askalany****

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Abstract

Abstract: Aim of the Study: The aim of this study is to compare outcomes for infants with Hirschsprung's disease undergoing a TERPT procedure with those undergoing a laparoscopically assisted transanal pull-through (LAPT). **Methods:** Forty patients with Hirschsprung Disease were operated between January 2016 and January 2019 was reviewed. Twenty patients underwent transanal endorectal pullthrough TERPT while the other 20 patients underwent laparoscopic assisted pull through LAPT. Age at operation, presenting symptoms, operative time complications and degree of continence were evaluated. Bowel functions were assessed using the Cleveland Clinic Incontinence Score. Ethical procedures including obtaining informed consent were conducted in accordance with the ethical standards of the Committee on Human Experimentation of Minia University. **Results:** The mean age of the patients at the time of operation were 18.9 month for the transanal group versus 21.3 months for the laparoscopic group. The mean follow-up period was 6 month, ranging from 3 to 12 month. The rate of enterocolitis occurred in 15% of cases in transanal group versus 30% of cases in the laparoscopic group. Constipation was found in 25% of cases of TERPT group versus 10% of cases in the LAPT group. The rates of normal continence (score 0:4) was 60% vs 50% for TERPT vs LAPT respectively while the rate of severe incontinence (score 15:20) was 20% vs 5% for TERPT vs LAPT respectively. **Conclusion:** The functional outcomes after LAPT was satisfactory in term of fecal soiling compared to trans anal approach this may be due to less pelvic dissection compared to trans anal pull through.

Keywords: TERPT, LAPT, Hirschsprung disease, Incontinence**Introduction**

Since, the first description of Harald Hirschsprung's in 1889¹. The choice of rectal dissection technique is controversial, although the three primary options remain full-thickness dissection with end-to-end anastomosis as described by Swenson in 1948,² and Duhamel's retro-rectal anastomosis or Soave's extramucosal dissection which were developed later.^{3,4} During the 1980s, one-stage (primary) procedures were proposed for uncomplicated cases, thereby avoiding the morbidity associated with stoma formation.⁵ In 1995, Georgeson et al.,⁶ described a minimally invasive approach using laparoscopy for colonic biopsies and mobilisation, followed by transanal endorectal dissection of the

rectum and coloanal anastomosis. Subsequently, laparoscopic Swenson and Duhamel-type procedures have been described.^{7,8} In 1998, De La Torre et al., reported the first entirely transanal primary endorectal pull-through without laparoscopic assistance.⁹ The transanal Swenson-type procedure has been reported but no case-controlled data have been published; a purely transanal Duhamel is not feasible technically.¹⁰

Benefits of this approach include utilisation of a single incision and the avoidance of abdominal wall scarring, with the potential for better cosmesis and reduced post-operative pain, a shorter operating time and the suitability of this technique for use in

resource-poor settings which may lack equipment for laparoscopy.¹¹⁻¹³ Potential disadvantages regarding a totally transanal approach include the possible impact of prolonged dilation of the sphincter muscles on faecal continence,^{14,15} the risk of colonic torsion and the inability to confirm the histological transition zone prior to starting mobilisation of the colon as many surgeons would change their operative approach when faced with longer segment aganglionosis.¹⁶

Aim of the study:

The aim of this study is to compare outcomes for Patients with Hirschsprung's disease undergoing a TERPT procedure with those undergoing a laparoscopically assisted transanal pull-through (LAPT).

Patients and Methods

The study included Forty patients with HD disease operated on from January 2016 to January 2019 in the department of Pediatric Surgery Minia University. Twenty patients were operated upon using (TERPT) and Twenty patients were operated using (LAPT).

Preoperative evaluation:

Table 1: Presenting symptoms of patients

Presenting symptoms	Total (n=40)	TA (n=20)	LA (n=20)	P-value
Chronic Constipation	30 (75%)	17 (85%)	13 (65%)	0.14
Delayed meconium passage	28 (70%)	12 (60%)	16 (80%)	0.16
Abdominal distension	15 (37.5%)	9 (45%)	6 (30%)	0.32
Preoperative enterocolitis	17 (42.5%)	8 (40%)	9 (45%)	0.74
Neonatal bilious vomiting	4 (10%)	2 (10%)	2 (10%)	1

Rectal examination for empty collapsed rectum with absent rectal ampulla, tight anal sphincter and impacted stools. Also, to exclude signs of enterocolitis.

Investigations was done in the form of full laboratory investigations and radiological imaging in the form of Plain abdominal X-ray films erect and supine and unprepared (unprepared to prevent transient dilatation of the aganglionic segment) single contrast enema were done to confirm the diagnosis by revealing the "transition zone" or the funnel shaped area between the narrowed aganglionic distal segment and the dilated ganglionic proximal segment, with special attention to the lateral views in contrast study for accurate assessment of the distal colorectal segment. Delayed X-ray film after 24 hours if transition zone is not identified. If significant barium is still present in the colon, it increases the suspicion of Hirschsprung's disease.

Contrast injection was done under screen to inject a moderate amount of barium. Antero-posterior and lateral views usually taken immediately and delayed films were taken 24 hours later. Anorectal manometry was not routinely indicated, but rather obtained based on the patient's medical history and underlying illness. Partial thickness rectal biopsy was done for all patients to confirm the diagnosis by the absence of ganglion cells in the diseased segment.

These biopsies were taken under general anesthesia before the definitive procedure. Consent for surgery was conducted with the parents or guardians in attendance of the surgeons and anaesthesiologist and the whole procedure, regarding preoperative preparation, medications, anaesthesia, and pre-operative and postoperative events and complications are explained and discussed.



Fig 1: Transanal pullthrough of the colon



Fig 2: Inspection of the narrow and dilated segments

Results

The mean age of the patients at the time of operation were 18.9 month for the trans anal group versus 21.3 months for the laparoscopic group. Patients were reviewed retrospectively. The mean follow-up period was 6 month, ranging from 3 to 12 month.

The mean operative time was less in the trans anal group in contrast to laparoscopic group 90min vs 120 min respectively. The postoperative hospital stay was more in transanal group compared to the laparoscopic group 5.3 days vs 3.3 days respectively. Intraoperative bleeding occurred in only one case of LAPT group vs no cases in the trans anal group. This case was controlled laparoscopically without need to convert to open surgery. Two cases of the transanal group required laparotomy due to inadequate colon mobilization.

Discussion

Since the first reports in the late 1990s the transanal pull-through has become a popular procedure worldwide for Hirschsprung's disease management and the role of laparoscopy remains controversial^{12,17}. Five eligible studies comparing TERPT to LAPT. In general, these studies were of low quality, featuring heterogeneity with respect to outcome assessment, limited adjustment for potential confounders and inadequate long-term follow-up. The only outcome assessed, where there was a significant difference, was duration of surgery with two studies demonstrating a significantly shorter duration of operation time for

TERPT compared with LAPT similar to our study. This may be due to avoidance of time spent accessing the abdomen with a laparoscopically assisted procedure and concurs with results from studies comparing open abdominal procedures with transanal pull-through.¹⁸ It may be likely to be subject to a degree of case selection, it is possible that cases with shorter, less-complicated disease segments were preferentially chosen for TERPT.

The other relevant outcomes assessed were the incidence of Hirschsprung's associated enterocolitis (HAEC), and functional gastrointestinal outcomes. We found no evidence to suggest any difference in rates of postoperative HAEC between TERPT and LAPT procedures in our study 15% versus 25% respectively while incidence of HAEC ranged from 10% to 45% across studies; this compares to a reported incidence of 5–35% from previous studies.^{19,20} The variable rates of HAEC reported may relate to inconsistent definitions between studies. Kim et al.,²¹ used a previously validated scoring system to assess severity and utilised a Delphi score to 'further secure uniformity' of the diagnosis of HAEC. Van de Ven et al.,²² also used a Delphi score to diagnose HAEC. Neither Ishikawa et al.,²³ or Dahal et al.,²⁴ included definitions for the diagnosis of HAEC. In our study we found that there is significant difference between both groups in terms of faecal continence. The laparoscopic group had better outcomes regarding the degree of inconti-

nence 70% of cases had normal bowel control compared to 50% in the transanal group while in the other studies there was no difference in rates of faecal incontinence or constipation between TTERPT and LAPT groups.

Of crucial importance in the assessment of incontinence and constipation is an adequate period of follow-up to allow assessment of children at an age when continence should be expected, and they have gained the necessary level of maturity and communication skills to report these outcomes. Follow-up durations were variable in the four studies that assessed these outcomes. In our study we reviewed only cases that was more than 3 years similar to Kim et al.,²¹ who restricted their analysis to infants over 3 years of age and Ishikawa et al.,²³ included only infants with three or more years of postoperative follow-up. Van de Ven et al.,²² included all infants with follow-up longer than 3 months. Dahal et al.,²⁴ did not set a minimum follow-up period, with an age range from 6 to 171 months. In all studies, the methods used to assess faecal incontinence include an element of subjectivity. In our study we used the Cleveland Clinic Incontinence (CCI) score while Kim et al.,²¹ employed a previously published parental telephone interview survey of bowel function with investigators blinded to the patient's operative arm. Ishikawa et al.,²³ did not detail how follow-up data were obtained.

There is some evidence that bowel function following definitive surgery for Hirschsprung's disease continues to improve until adolescence.²⁵ In addition, Dahal et al.,²⁴ acknowledge that the decision to utilise TTERPT or LAPT depended on results of barium enema, with longer segment disease more likely to be treated with a LAPT procedure. Reliance on a contrast enema to select patients for TTERPT introduces another potential difficulty for the surgeon, as recent reports suggest that 10–31% of infants have no radiologically identifiable TZ and a further 8–38% of reported TZs are discordant with the confirmed pathological length of aganglionosis.²⁶

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