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Comparative Study Between Open Soave Operation and Trans Anal Pull-Through for Hirschsprung's Disease Regarding the State of Continence: A Retrospective Study

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ORIGINAL ARTICLE

Comparative Study Between Open Soave Operation and Trans Anal Pull-Through for Hirschsprung's Disease Regarding the State of Continence: A Retrospective Study

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Abstract

Background: ***Hirschsprung's disease (HD) is ganglion cell deficiency within the colon's submucosal and myenteric plexuses. The deficient ganglion cells in this portion lead to ineffective movement of intestinal contents, causing stagnation or lack of peristaltic movement in that segment.***

Objective: ***Our study aims to evaluate and compareaims to evaluate and compare the continence state of patients suffering from Hirschsprung's disease (HD) after two of the most used surgeries for HD: the Soave technique versus the Trans-anal pull-through operations (Retrospectively).***

Patients and Methods: ***Our study included 60 post-pull-through cases for HD recruited from Al Azhar University (Al-Hussein and Sayed Galal University Hospitals) from 2012-2023. The patients were divided into two groups: (A) 30 underwent post-Soave's Operation. (B) Group: 30 patients underwent post-Trans-anal Pull-through Operation.***

Results: ***Open Soave's Operation and trans-anal Pull-through procedure for Hirschsprung's Disease have close functional outcomes concerning continence. Both groups showed satisfactory continence results with no statistically significant variation.***

Conclusion: ***Based on our study's findings, we conclude that open Soave's operation and trans-anal Pull-through for HD have close functional outcomes concerning the state of continence.***

Keywords: Hirschsprung's disease; Continence; PICS; Soave's; comparison; Trans-anal pull-through

1. Introduction

Hirschsprung's disease (HD) with a prevalence of about 1/5000, is considered among the most prevalent congenital digestive tract anomalies. [1]

The ganglion cell deficiency in the submucosal and myenteric plexuses in the distal part of the colon is a characteristic of HD, which is a developmental condition affecting the inner constituents of the enteric nervous system. Even though HD mostly affects the rectum and distal colon, 2–13% of individuals have complete colonic aganglionosis at time of presentation.[2]

It has been known that HD is caused by multiple factors, and genetic factors play the main role in its pathology. Symptoms of HD include constipation as a main symptom, vomiting, abdominal distension, and growth failure.[3]

The complex mechanism of continence relies on the interaction of several factors, including rectal compliance, anal sphincter function, stool consistency, as well as neurologic function.[4]

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El Halaby5 stated that complete anorectal continence after trans-anal pull-through was noted in (83.3%) children older than years.

However, in the meta-analysis held by Yan6, It was found that although Soave was similar to Trans-anal endorectal pull-through (TERPT), the TERPT operation could still significantly reduce incontinence/soiling compared to Soave. Related studies have shown that postoperative sphincter function does not decrease in patients undergoing TERPT. It may be that the risk of autonomic nerve damage is greatly reduced by avoiding pelvic dissection during TERPT operations.

our study is aiming for evaluation and comparison of the continence state for patients suffering from Hirschsprung's disease (HD) after two of the most used surgeries for HD The Soave's technique Versus the Trans-anal pull-through operations (Retrospectively).

2. Patients and methods

The study included 60 cases of patients who underwent surgery at Al-Azhar University hospitals, Pediatric Surgery Department from 2012 to 2023, with Open Soave's Operation and Trans-anal Pull-Through for Hirschsprung's Disease.

Patients will be divided into two groups: (A) Group 30 patients underwent post-Soave's Operation. (B) Group 30 patients underwent a Trans-anal Pull-through Operation,

We included patients between 4-14 years old who were diagnosed with HD confined to the rectosigmoid portion by barium enema and rectal biopsy.

We excluded all patients aged below four years (the age of toilet training) and patients with total colonic aganglionosis (TCA). These patients still had a colostomy at the time of evaluation, patients with evidence of inflammatory bowel disease, and pseudo-incontinence.

The evaluation was done by taking history, stressing disease duration, and significant complaints, and post-operative evaluation was done using the Pediatric Incontinence Constipation Score (PICS)(7) Table 1. Thorough clinical examination and radiological assessment of complaining patients (X-ray abdomen, MRI pelvic floor muscles, and EMG)

Table 1. Pediatric incontinence constipation score

PEDIATRIC INCONTINENCE CONSTIPATION SCORE			INCONTINENCE			CONSTIPATION		
DOES YOUR CHILD WEAR DIAPERS/NAPPIES DURING THE DAY?			0	2.5	5			
ALWAYS	Sometimes	No						
DOES YOUR CHILD WEAR DIAPERS/NAPPIES DURING THE NIGHT?			0	2.5	5			
ALWAYS	Sometimes	No						
HOW OFTEN DOES YOUR CHILD OPEN ITS BOWELS?			0	2.5	5	4	2	0
SEVERAL	Once daily	Less often						
WHAT DOES THE STOOL USUALLY LOOK LIKE?			0	2	4	1	0.5	0
WATERY	variable	Thick						
CAN YOUR CHILD CONTROL THE URGE TO OPEN ITS BOWELS?			5	2.5	0			
YES ALWAYS	Sometimes	No						
CAN YOUR CHILD TELL THE DIFFERENCE BETWEEN STOOL AND AIR IN THE BOWELS?			4	2	0	1	0.5	0
YES ALWAYS	Sometimes	No						
DOES YOUR CHILD REGULARLY SOIL ITS UNDERCLOTHES BY INVOLUNTARILY PASSING SMALL AMOUNTS OF STOOL?						0	1	2
YES ALWAYS	Sometimes	No						
DOES YOUR CHILD HAVE TROUBLE OPENING ITS BOWELS COMPLETELY (INCOMPLETE EMPTYING)?						0	1.5	3
YES ALWAYS	Sometimes	No						
DOES YOUR CHILD FEEL PAIN WHEN OPENING HIS BOWEL?			2	1	0	0	2	4
YES ALWAYS	Sometimes	No						
DOES YOUR CHILD HAVE TO PRESS HARD TO EMPTY HIS BOWELS?			2	1	0	0	2	4

YES	Normal	No			
DOES YOUR CHILD HAVE A LOT OF WIND?			0	1	2
YES ALWAYS	Sometimes	Never			
DOES YOUR CHILD SUFFER FROM CONSTIPATION?			0	2	4
YES ALWAYS	Sometimes	Never			
DOES YOUR CHILD HAVE PAIN IN THE TUMMY?			0	2	4
YES ALWAYS	Sometimes	Never			
TOTAL					

Ethical consideration:

The Faculty of Medicine, Al-Azhar University's ethical committee obtained approval for the research protocol.

3. Results

Concerning demographic information, the (A) Group had a mean age of 6.08± 2.31 years, with most of them (73.3%) being males, while the (B) Group had a mean age of 6.91± 2.10 years with most of them (70%) being males. Table 2

Table 2. Comparing two groups regarding demographic data.

		(A) Group post Soave's Operation (N= 30)		(B) Group Post Trans-anal Pull-through Operation (N= 30)		Test value	P-value
		No.	%	No.	%		
Gender	Male	22	73.3%	21	70.0%	X^2= 0.082	0.774 (NS)
	Female	8	26.7%	9	30.0%		
Age (years)	Mean± SD	6.08± 2.31		6.91± 2.10		Z_{MWU}= 1.838	0.066 (NS)
	Median (IQR)	6 (4.6- 6.3)		6.75 (5.7- 8)			
	Range	2- 12		3 – 12.0			

No significant difference between the groups regarding gender and age (p>0.05).

The present study demonstrated that chronic constipation was the frequent complaint found in cases of both (A) Group and (B) Group. All cases in both groups had the disease since birth.

Table 3. Comparing two groups regarding time of evaluation after operation.

		(A) Group post Soave's Operation (N= 30)	(B) Group Post Trans-anal Pull-through Operation (N= 30)	Test value	P-value
Time post-operative in years	Mean± SD	3.61± 1.20	2.80± 1.29	Z_{MWU}= 5.153	0.031 (S)
	Median (IQR)	3.84 (2.58- 4.5)	2.48 (2- 4)		
	Range	1.58- 6.75	1 – 5.08		

Time post-operative was significantly longer in (A) Group compared to (B) Group (p=0.031).

The current study showed that (A) Group had a mean time of evaluation after operation 3.61± 1.20 years while (B) Group had a mean time of evaluation after operation 2.80± 1.29 years. The time of evaluation post-operative was longer in a significant way in the (A) Group than in the (B) Group (p=0.031). (Table 3)

Our results showed no statistically significant variation between the two examined groups concerning PICS at our follow-up. Table 4

Table 4: Comparing two groups regarding pediatric incontinence constipation score (PICS) at our follow up.

		(A) Group post Soave's Operation (N= 30)	(B) Group Post Trans-anal Pull-through Operation (N= 30)	Test value	P-value
PICS (Incontinence)	Mean± SD	22.62± 2.38	22.48± 2.73	Z_{MWU}= 0.382	0.702 (NS)
	Median (IQR)	22 (22- 24.5)	24 (19.5- 24.5)		
	Range	18- 26	17 – 26		
PICS (Constipation)	Mean± SD	21.18± 3.11	21.93± 1.52	Z_{MWU}= 0.713	0.478 (NS)
	Median (IQR)	22.5 (18.5- 23.5)	22.5 (21.5- 22.5)		
	Range	15- 24.5	15 – 23.5		

No significant difference between the groups regarding PICS at our follow up.

Concerning the first question, it was shown that four patients (13.3%) in group A suffered from episodes of unintended defecation during the day (wearing Diapers/Nappies), 3 cases had sometimes, and 23 cases had no unintended defecation during the day. While in group B, one patient suffered from episodes of unintended defecation during the day (wearing Diapers/Nappies), 20 cases had no unintended defecation during the day, and 9 cases had sometimes. Concerning the second question, none of the patients in the (A) group suffered from episodes of unintended defecation during the night (wearing Diapers/Nappies). At the same time, two patients in group B sometimes had unintended defecation during the day. Concerning the number of stool passages postoperatively, 8 (26.7%) patients in group A had a history of passing less than once daily. Ten patients passed once daily, and 12 patients passed several times a day. Meanwhile, in group B, 4 (13.3%) patients had a history of passing less than once daily, seven patients passed once daily, and 19 patients passed several times a day.

In group A, the stool consistency was thick in 4 patients (13.3%), 26 patients (86.7%) were variable, and no cases had watery stool. Meanwhile, in group B, the stool consistency was thick in one patient (3.3%), 29 patients (96.7%)

were variable, and no cases had watery stool. In group A, 6 cases (20%) had some control of their urge to defecate postoperatively, while 24 cases (80%) could always control their urge.

Meanwhile, in group B, 3 cases (10%) had some control of their urge to defecate postoperatively, while 27 cases (90%) could always control their urge. In group A, 24 patients (80%) can always discriminate between air and stool postoperatively, and six patients (20%) can sometimes discriminate. In group B, 29 patients (96.7%) can always distinguish between air and stool postoperatively, and one patient (3.3%) can sometimes discriminate.

There was a statistically significant variation between the two groups concerning painful defecation postoperatively (p=018), as it was significantly increased in group B. In group A, 6 cases (20%) had no problems in excretion, and 24 cases had normal defecation. Meanwhile, in group B, 6 cases (20%) had no issues with defecation, and 24 cases had normal defecation. In group A, 19 cases (63.3%) didn't suffer from constipation after operation, 9 cases sometimes did, and two instances always had constipation. Meanwhile, in group B, 28 cases (93.3%) didn't suffer from constipation after the operation, 2 cases sometimes did, and none always had constipation with statistically significant variation between them.

There was no statistically significant variation between the two examined groups concerning defecography and MRI, respectively .Table 5,6

Table 5. Comparing two groups regarding defecography.

		(A) GROUP POST SOAVE'S OPERATION (N= 30)		(B) GROUP POST TRANS-ANAL PULL-THROUGH OPERATION (N= 30)		*CHI- SQUARE TEST*	
		No.	%	No.	%	Test value (X^2)	P-value
DEFECOGRAPHY	Not done	28	93.3%	30	100.0%	2.07	0.355 (NS)
	Large anterior rectocele	1	3.3%	0	0.0%		
	Rectal intussusception	1	3.3%	0	0.0%		

No significant difference between the groups.

Table 6. Comparing two groups regarding MRI pelvic floor and anal complex muscles

		(A) GROUP POST SOAVE'S OPERATION (N= 30)		(B) GROUP POST TRANS-ANAL PULL-THROUGH OPERATION (N= 30)		*CHI- SQUARE TEST*	
		No.	%	No.	%	Test value (X^2)	P-value
MRI	Not done	29	96.7%	29	96.7%	2.00	0.368 (NS)
	Normal MRI study	1	3.3%	0	0.0%		
	Huge rectal, sigmoid dilatation, megacolon	0	0.0%	1	3.3%		

There was no statistically significant difference between the groups.

4. Discussion

Symptoms and presentation of HD are variable, ranging from neonatal intestinal obstruction to progressive chronic constipation in elderly patients. About 80% of patients complain of intestinal dysmotility, malnutrition, and progressive distension of the abdomen early in their life. Manifestations of HD occur in only 20% to 40% of newborns in Africa, while the rate is up to 90% in developed countries. [8]

Our results were in line with the study of Elrouby[9], which included two groups: group A underwent trans-anal Soave's pull-through, and group B underwent transabdominal Soave's pull-through. There wasn't a significant variation between the two approaches in the functional outcome postoperatively, which included postoperative constipation and continence.

Mini laparotomy is not essential during the trans-anal approach; However, it should be applied to patients with a higher risk of long aganglionic segments or if there are any issues with the procedure. Keeping in mind that the trans-anal pull-through procedure is mainly limited to the aganglionic segment involving only the rectosigmoid portion of the colon due to the

challenge of achieving adequate colonic mobilization.[10]

Thomson[11] carried out a meta-analysis discussing outcomes after totally trans-anal endorectal pull-through (TERPT) versus TERPT with a laparoscopic aid in infants with uncomplicated HD, and there were no significant variations concerning postoperative complications (enterocolitis, fecal incontinence, or constipation).

While in the study of Kabbash[12], 32 patients were included and divided into two groups. Group A: 16 patients underwent trans-abdominal one-stage pull-through procedures, and Group B: 16 patients underwent trans-anal one-stage pull-through procedures). Postoperative incontinence did not significantly differ between the two groups (p =0.723). It was reported by 50 and 56.2% of cases in groups A and B, respectively.

The meta-analysis of Yan[6] in the 87 studies included 1 Randomized control and nine observational clinical studies. Including 392 cases of trans-anal endo rectal pull-through (TERPT) and 332 cases of Trans abdominal (TAB) group. TERPT has a lower postoperative complication, including incontinence and constipation

Moreover, in a meta-analysis, Gosemann[13] claimed that there was a wide range in the functional results of HD surgery techniques. They could show a significant advantage of Laparoscopic assisted Trans-anal endorectal pull-through more than Open surgery concerning the frequency of constipation and soiling/incontinence. No significant variations were found between anastomotic stricture and enterocolitis.

We can achieve a 95% success rate in patients complaining of fecal incontinence by classifying patients suffering from fecal incontinence with a systematic rationale with selective, personalized management.[14]

5. *Conclusion*

We aimed to assess and compare the state of continence after surgical management of HD; from the findings of our study, we concluded that open Soave's operation and trans-anal Pull-through procedure for Hirschsprung's Disease have a close functional outcome concerning continence and constipation rates.

Disclosure

The authors have no financial interest to declare in relation to the content of this article.

Authorship

All authors have a substantial contribution to the article

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Conflicts of interest

There are no conflicts of interest.

References

1. Verkuijl SJ, Friedmacher F, Harter PN, Rolle U, Broens PM. Persistent bowel dysfunction after surgery for Hirschsprung's disease: A neuropathological perspective. World J Gastrointest Surg. 2021;13(8):822-833.
2. Oh C, Youn JK, Han JW, Yang HB, Kim HY, Jung SE. The Patients with Hirschsprung's Disease Who Underwent Pull-Through at Age Less than 1 Year: Longitudinal Bowel Function. World J Surg. 2020;44(7):2426-2439.
3. Bahrami A, Joodi M, Moetamani-Ahmadi M, et al. Genetic Background of Hirschsprung Disease: A Bridge Between Basic Science and Clinical Application. J Cell Biochem. 2018;119(1):28-33.
4. Yamataka A, Miyano G, Takeda M. Minimally Invasive Neonatal Surgery: Hirschsprung Disease. Clin Perinatol. 2017;44(4):851-864.
5. Elhalaby EA, Hashish A, Elbarbary MM, et al. Transanal one-stage endorectal pull-through for Hirschsprung's disease: a multicenter study. J Pediatr Surg. 2004;39(3):345-351.
6. Yan BL, Bi LW, Yang QY, Wu XS, Cui HL. Transanal endorectal pull-through procedure versus transabdominal surgery for Hirschsprung disease: A systematic review and meta-analysis. Medicine (Baltimore). 2019;98(32):e16777.
7. Fichtner-Feigl S, Sailer M, Höcht B, Thiede A. Development of a New Scoring System for the Evaluation of Incontinence and Constipation in Children. Colo-Proctology. 2003;25(1):10-5.
8. Ghorbanpour M, Seyfrabie MA, Yousefi B. Early and long-term complications following transanal pull through Soave technique in infants with Hirschsprung's disease. Med Pharm Rep. 2019;92(4):382-386.
9. Elrouby A, Waheeb S, Khairi A, Abouheba M, Badr K. One Stage Pull-Through Procedure for Hirschsprung's Disease: Trans-Anal or Trans-Abdominal? A Comparative Study. Acta Scientific Paediatrics. 2019;2(6):19-24.
10. Green HL, Rizzolo D, Austin M. Surgical management for Hirschsprung disease: A review for primary care providers. JAAPA. 2016;29(4):24-29.
11. Thomson D, Allin B, Long AM, Bradnock T, Walker G, Knight M. Laparoscopic assistance for primary transanal pull-through in Hirschsprung's disease: a systematic review and meta-analysis. BMJ Open. 2015;5(3):e006063.
12. Kabbash MM, Osman MA-A, Ahmed MY, Rabie M, Ibrahim MKJTEJoHM. Comparison between Tran abdominal and trans anal one stage pull through in Hirschsprung disease. 2021;84(1).
13. Gosemann JH, Friedmacher F, Ure B, Lacher M. Open versus transanal pull-through for Hirschsprung disease: a systematic review of long-term outcome. Eur J Pediatr Surg. 2013;23(2):94-102.
14. Bischoff A, Tovilla M. A practical approach to the management of pediatric fecal incontinence. Semin Pediatr Surg. 2010;19(2):154-159