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Comparison Outcome of Patients with Rectal Tube and Without Rectal Tube Post Swenson Like Pull-Through Transanal Procedure at RSUP Prof Dr. I G.N.G. Ngoerah

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ABSTRACT

Background: Surgical management of patients with Hirschsprung's disease has experienced a significant improvement in getting a better outcome. This procedure can lead to complications of postoperative obstructive symptoms and anastomotic leaks and can affect the length of postoperative care. It is necessary to consider inserting a rectal tube or non-rectal tube after surgery to prevent complications. ***Objective:*** To determine the difference in patient outcomes with Hirschsprung's disease between installing a rectal tube or non-rectal tube after Transanal Swenson-like pull-through surgery. ***Methods:*** This study uses a prospective observational design, with an actual experiment with a single-masked randomized study design. It involved 50 samples of patients with Hirschsprung's disease at Prof. Dr. I.G.N.G. Ngoerah Denpasar from August 2021 to July 2022. ***Results:*** There were no obstructions (0%) and no anastomotic leaks (0%) in patients with a rectal tube and without a rectal tube post transanal Swenson-like pull-through procedure; there was no statistically significant difference. Length of stay was obtained from data on patients who had rectal tubes installed with an average value of 4.5 days (SD: 1.1) longer than the length of stay of patients without rectal tubes, obtained an average value of 2.2 days (SD: 0.4) with a mean difference of 2.3 days. The p-value was obtained at 0.000<0.05. ***Conclusion:*** There is no difference in obstruction and anastomotic leakage incidence in patients with rectal tube placement and non-rectal tube post-transanal Swenson-like pull-through procedure. The length of stay for patients with non-rectal tube post-transanal Swenson-like pull-through procedures is shorter than those with a rectal tube, so it can reduce the use of financing for hospital care, and patients do not need to use a rectal tube for home care.

Keywords: Hirschsprung; transanal Swenson-like pull-through; rectal tube; non-rectal tube

INTRODUCTION

Surgical management in patients with Hirschsprung disease has improved significantly to obtain better outcomes. Hirschsprung's disease is a congenital disorder of the colon manifested by the absence of parasympathetic ganglion cells of the myenteric plexus (Auerbach) and submucosa (Meissner) [1-3]. Hirschsprung's disease results from the arrest of craniocaudal migration of neural crest cells in the distal colonic region during the fifth to twelfth week of pregnancy to form the intestinal nervous system [4].

Hirschsprung's disease is also mentioned as a neurocristopathy caused by abnormalities in the migration, proliferation, differentiation, and survival of neural crest cells, leading to intestinal aganglionosis. It usually manifests quickly after birth, 1 in 5000 live births worldwide [5]. In recent decades, there has been a significant increase in the understanding of its genetics and its relationship with other congenital anomalies, which share the pathomechanism of improper neural crest development [6].

The highest risk of Hirschsprung's disease is usually in patients with a family history of Hirschsprung's disease and patients with Down Syndrome. Rectosigmoid is most commonly affected in about 75% of cases, with flexure of the splenic or transverse colon in 17% of cases. Twins and a hereditary history increase the risk of Hirschprung's disease. Hirschprung's disease is more commonly inherited from aganglionosis mothers than fathers. 12.5% of twins had total aganglionosis of the colon [7].

The worldwide incidence of Hirschprung's disease ranges from 1:5000 to 1:10 000 live births and varies among different ethnic groups (Northern Europe, 1.5:1000; African America, 2.1:10000; and Asia, 2.8:10000). The male-female ratio is from 3:1 to 4:1 mostly in short-segment disease and long-segment disease with a reported male-female ratio of 1:2 to 2:1. [5,8]. Nonsyndromic or isolated hirschprung disease accounts for 70% of affected children, but approximately 30% of children with hirschprung disease have associated chromosomal (12%) and congenital anomalies (18%)[5,9].

Indonesia, with a birth rate of 35 percent, is predicted to have 1540 babies with Hirschsprung disease every year. In 2010, Kartono recorded 40 to 60 patients with Hirschsprung's disease referred annually to Cipto Mangunkusumo Hospital Jakarta. Along with Hirschsprung's disease, Down Syndrome (5-10%) and urologic abnormalities (3%) are the most frequent among several other congenital abnormalities [10].

The treatment of Hirschprung's disease is a long and gradual process, so it requires the parents to play a maximum role in each stage of the child's care. This treatment requires tremendous patience, starting from decompression measures with the installation of nasogastric tubes (NGT) and rectal tubes (RT) [11].

Surgical management in Hirschprung aims to remove the aganglionic bowel and create an anastomosis above the dentate line to re-establish bowel continuity [12]. Transanal endorectal pull-through is considered the most preferred treatment method for patients with Hirschprung as it is less invasive and has fewer complications than transabdominal pull-through [13,14]. Regular bowel movement without constipation is a good marker of functional outcomes after surgical management of patients with Hirschprung [15].

Colonic preparation aims to clear the colonic area of faeces so that it is clean when surgery is performed, such as colostomy, Swenson procedure, Duhamel procedure, Soave procedure, Rehbein procedure by anterior resection, Laparoscopic Pull-Through procedure, Transanal Endorectal Pull-Through procedure and anorectal myomectomy procedure. These procedures may lead to complications of incontinence or diarrhoea. Therefore, consideration should be given to inserting a rectal or non-rectal tube after surgery to assess the consistency of the stool produced and prevent complications [16,17].

Empirical data on the potential complications associated with rectal tube insertion for home care are known to be so great, causing irritation of the perineal region, that transanal pull-through is a successful technique in hairspring patients [18]. A study was conducted to evaluate postoperative complications such as anastomotic leakage, the incidence of infection, stricture, the occurrence of postoperative HAEC, and the need for reoperation between male and female patient groups, and it was found that 22% of complications occurred based on Clavien-Dindo grading [19]. Rectal tube insertion that does not sufficiently decompress the bowel, complications such as enterocolitis that is not responsive to this action or bowel perforation, then rectal tube insertion is not performed, stoma making is an option [20].

Insertion of a rectal tube effectively aids gas expulsion through the anus, thereby reducing the incidence of abdominal distension and Hirschsprung Associated Enterocolitis (HAEC) in the early postoperative stage and the risk of long-term recurrence of HAEC, as well as preventing anastomotic leakage. Rectal tube insertion in this procedure is done for 3-5 days, and the absence of signs of abdominal distension is observed. [21,22]. The risk of enterocolitis and anastomosis fistula complications is minimal in the transanal Swenson-like pull-through procedure because this procedure does not leave the muscular cuff. Hence, there is no rectal tube installation. The patient was observed 4-5 days postoperatively and was generally in good condition. A common complication in this procedure is perianal excoriation [23,24].

The results of research conducted by Mohajerzadeh et al. (2015) found no significant difference between Swenson's and Soave's techniques regarding operative time, length of hospital stay, early and late complications such as postoperative obstructive symptoms, enterocolitis, faecal incontinence, perianal abscess and fistula, anastomosis leakage, peritonitis, and pelvic abscess formation. Research by Mohajerzadeh et al. (2015) found that the average length of stay in the soave surgery technique was 16.2, while the average length of stay in the Swenson technique was 13.2. In research, Bing et al. (2017) obtained a standard deviation between the soave technique 3.13 and Swenson 4.03. The complication rate was 47% for the Soave group and 40% for the Swenson group (p-value = 0.795, risk ratio = 1.147). Long-term complications considered important in patients with Hirschsprung include obstructive symptoms (due to stricture, residual aganglionosis or transition zone, residual fibrosis or cuffing tissue, distal bowel torsion), enterocolitis, and incontinence [26].

The description of the background above has described Hirscprung disease and management through surgery with rectal tube installation and without rectal tube, so it is necessary to research to determine the comparison of outcomes between surgery with rectal tube installation and without rectal tube installation with the characteristics of Indonesian subjects.

RESEARCH METHODS

This study is an experiment study with a single-masked randomized research design, where the researcher knows the treatment, while the research subject does not know the treatment that will be received. The research subjects will be divided into two groups; one group will be given treatment with rectal tube installation, and the other group will be given treatment without rectal tube installation. Randomization is carried out to sort out the research subjects who will be included in each of these groups so that each subject has the same opportunity to be selected both as a rectal tube installation group and without a rectal tube. In this study, blindness was carried out because the subjects did not know which group to enter. The research design to evaluate postoperative outcomes used post-test only to determine postoperative obstruction, anastomosis leakage and length of stay. This research has received an ethical suitability letter from the Research Ethics Committee of the Faculty of Medicine, Udayana University / Prof. Dr. IGNG Ngoerah General Hospital with number 1732/UN14.2.2.VII.14/LT/2022.

The inclusion criteria in this study were as follows: 1) All patients diagnosed with short-segment hairspring disease who underwent transanal Swenson-like pull-through surgery for the first time; 2) Patient/family willing to do surgery according to indication; 3) Patients/families were willing to participate in the study and signed informed consent.

The exclusion criteria in this study are as follows: 1) The patient is suffering from Immunodeficiency disease, which can cause worsening of postoperative conditions; 2) the Patient is suffering from blood clotting disease; 3) Patients who have undergone colostomy surgery; 4) Patients who have undergone pull-through surgery.

The sampling technique is carried out using simple random sampling, or simple random sampling technique is a random sampling technique or element, where each element or member of the population has the same opportunity to be selected as a sample with the help of Microsoft Excel RND. All patients included in this study were diagnosed with Hirscprung disease based on history taking, physical examination, necessary supporting examinations and laboratory investigations as part of routine check-ups. Patients and families were briefed on the purpose of the study, and surgical intervention was decided by the pediatric surgeon based on the evaluation results. Patients were then followed until they were discharged.

The research analysis was carried out with several stages of data analysis consisting of descriptive analysis, bivariate analysis of dichotomous nominal categorical data using chi-square analysis, analysis of mean difference, independent t-test if the data is usually distributed, and Mann Whitney U test if the data is not normally distributed with 95% confidence interval and accepted significance limit with p-value <0.05.

RESULTS

This study involved 50 samples from medical record data and patients who performed surgery at the Pediatric Surgery Department of Prof. Dr. I G.N.G. Ngoerah Hospital. Sample characteristics were described based on age, sex, weight, length of surgery, the incidence of postoperative obstruction, anstomose leakage, and length of stay. The data is presented in Table 1.

TABLE 1: Characteristics of Respondents Based on Age, Gender, Weight Length, and Length of Operation.

Characteristics	Transanal Swenson like pull-through technique	
	Rectal tube	Without Rectal tube
Age (mean, SD)	3,08 ± 2,4	4,36 ± 3,1
Gender (n, %)		
Male	13 (26%)	15 (30%)
Female	12 (24%)	10 (20%)
Body weight (mean, SD)	5,28 ± 1,3	6,8 ± 7,6
Body length (mean, SD)	56,6 ± 6,8	61,3 ± 7,9

Comparison of the incidence of postoperative obstruction, the difference in the incidence of postoperative anastomosis leakage of patients, and the difference in the length of postoperative care of patients with rectal tube insertion and without rectal tube post transanal Swenson-like pull-through procedure. Results are presented in Table 2.

TABLE 2: Relationship Between Obstruction and Anastomosis Leakage.

Variables	Action		IK95%	p
	Rectal tube	Without Rectal Tube		
Obstruction (n, %)				
Yes	0 (0%)	0 (0%)	-	-
No	25 (50%)	25 (50%)		
Anastomosis leakage (n, %)				
Yes	0 (0%)	0 (0%)	-	-
No	25 (50%)	25 (50%)		

Table 2 shows no difference in the incidence of postoperative obstruction in patients with rectal tube insertion and without rectal tube post transanal Swenson-like pull-through procedure. There were no patients who experienced obstruction (0%), while there were 50 patients who did not experience obstruction (100%). statistically, there was no difference because the number of obstructions and non-obstructions was constant.

Anastomosis leakage was also found in the RT group with no anastomosis leakage (0%) and 50 (100%) with no leakage. Statistically, there was no significant difference because the number of those with and without anastomosis leakage was constant.

TABLE 3: Length of stay between patients with and without RTs.

Variables	Action		Mean difference	IK95%	p
	Rectal tube	Without Rectal Tube			
Length of stay (mean±SD)	4,5 ± 1,1	2,2 ± 0,4	2,3	1,83-2,80	0,000

The length of treatment obtained in Table 3 with the results that patients who installed RT with a mean value of 4.5 days (SD: 1.1) longer than the length of treatment of patients without RT obtained a mean value of 2.2 days (SD: 0.4) with a mean difference of 2.3 days. The p-value obtained 0.000 <0.05 (IK: 1.83-2.80) means that there is a difference in the length of postoperative care between patients with rectal tube insertion and without rectal tube post-procedure transanal Swenson-like pull-through.

DISCUSSION

The results showed that based on age characteristics, there was no difference in the age of patients with HD. HD patients are usually diagnosed and undergo surgery in the neonate period. Endorectal transanal pull-through (TERPT) has become one of the most common surgical procedures for HD in recent decades [27,28]. Research Zhang et al (2020) found that 65.3% of patients who underwent action were at the infant age of 1 month-4 years [21].

Based on gender, there were more males in this study (56%). Research Granéli et al (2017) mentioned that hirschsprung disease is a congenital disorder with a prevalence of 1: 5000 [31] and a female to male ratio of 1: 4 [28,32,33]. Research Zhang et al (2020) found that male gender was found to be more than the female (61%) [21].

Many studies include only a small number of patients without specific gender analysis, as it is a rare disease. Short-term complications after transanal endorectal pull-through surgery, such as anastomotic leakage, bowel obstruction, and perineal excoriation, and long-term outcomes regarding bowel function have been evaluated in mixed-gender groups [34,35].

In recent years, gender itself has come into greater focus as an important factor also in children with diseases other than HD. Pre-, peri-, and postoperative outcomes after surgery and outcomes after surgery in children have been analyzed from a gender perspective [28,36]. Similar gender-specific analysis of children with HD may contribute to a greater understanding of patient characteristics in terms of gender-typical and postoperative outcomes. The study results were obtained with a mean body weight of 6 kg and body length of 58 9 cm with Indonesian subjects. The results of this study are slightly different from the research, which found a mean body weight of 9.3 kg-10.6 kg [24]. This is because the subjects involved in their research have different characteristics. Based on the characteristics of the length of surgery, the data obtained with a mean of 1 hour 23 minutes (83 minutes) is shorter than the research of Bing (2017), which found an average length of operation of 166 minutes [24]. This difference could be due to differences in the definition of time used in describing the length of surgery. The operating time in this study was calculated from the start until the operation was completed while the start time of anesthesia was not calculated in the study.

The incidence of obstruction was found to be 0%, while that of non-obstruction was 100%. Research Ashjaei et al. (2019) found the incidence of obstruction was absent, but complaints of abdominal distension were obtained as much as 27%, but statistically, there was no difference [37].

Anastomosis leakage was found to have 0% anastomosis leakage, while those without anastomosis leakage had 100%. Research Zhang et al. (2020) found anastomosis leakage occurred around 1.6%-2.1% [21]. The study's results obtained the length of treatment with an average of 3.3 days. This result differs from research by Bing (2017), which found an average length of treatment of 7.8 days. This difference occurs due to the characteristics of the subjects and the characteristics of different healthcare settings [24].

The results showed no difference in the incidence of postoperative obstruction between patients with rectal tube insertion and without rectal tube post transanal swenson-like pull-through procedure. There were no patients who experienced obstruction, so statistically, there was no difference. Potential complications for complex surgeries related to Hirschsprung's disease include the entire spectrum of complications from gastrointestinal surgery. Complications include an increased incidence of postoperative enterocolitis with Swenson and transanal endorectal pull-through procedures, as well as abdominal distension [4]. Research by Ashjaei et al. (2019) found the incidence of infection, stenosis, abdominal distension, and fever can occur in Soave and Swenson techniques, but statistically, there is no difference between the two techniques in early feeding on the incidence of stenosis and abdominal distension [37].

Although surgery is effective in many cases and techniques have improved over the past few years, a small proportion of patients still experience poor functional outcomes [38,39]. Presenting complaints include faecal incontinence and obstructive symptoms, including severe constipation [40,41]. Management should aim for functional improvement and address the prevention of psycho-social consequences of incontinence [42]. Several mechanical factors can cause postoperative obstructive symptoms, including stricture anastomosis. Obstructive symptoms may occur with or without HAEC. After a thorough clinical examination, a history of diet and bowel movements, rectal examination and contrast enema should be performed [43]. Histology should be reviewed, especially about the adequacy of the proximal margin of pull-through resection [44]. Repeating transanal colon biopsies should be considered to confirm normal innervation of the pulled-through colon. For anastomotic strictures, gentle anal dilatation may be attempted under anaesthesia if poorly tolerated [31].

The results showed no anastomosis leakage (0%), so there was no significant difference in the incidence of anatomose leakage in postoperative patients with rectal tube installation and without rectal tube post-transplantal swenson-like pull-through procedure. In general, complications of anastomotic leakage and stricture formation (5-15%), bowel obstruction (5%), pelvic abscess (5%), wound infection (10%), and requiring reoperation (5%), such as prolapse or stricture.

Furthermore, complications associated with surgical management of Hirschsprung's disease include enterocolitis, obstructive symptoms, incontinence, chronic constipation (6-10%), and perforation. Outcomes in Hirschsprung's can also be relaparotomy or stoma formation, injury to the visceral abdomen, bleeding requiring transfusion of blood products, abscess formation, bowel obstruction, bowel ischemia, enteric fistula formation, urinary incontinence or retention, impotence and sphincter achalasia [45].

Anastomotic leaks or strictures and the development of postoperative bowel obstruction secondary to adhesions increase the relative risk and subsequent enterocolitis by approximately 3-fold. Long seromuscular cuffs and high coloanal anastomoses are associated with an increased risk of postoperative enterocolitis [46]. Perianal rash or skin excoriation is common after pull-through surgery, especially among children who have had a stoma before pull-through, long segment colon or total colonic aganglionosis, and patients who have undergone surgery as neonates [22].

Preventive strategies include perineal care and ointments (petroleum jelly or other non-irritating protective creams). Topical antimicrobials may also be required if bacterial or fungal infection occurs. Anastomotic stricture is a potential complication in colorectal surgery when there is a low circular anastomosis. Risk factors include ischemia, anastomosis leakage, and anastomosis tension. Anastomosis stricture is possible but rare after surgical procedures, where the reported incidence is up to 10.6% (range: 0-18.9%) [47].

There is no evidence to suggest that a routine anal dilatation program after pull-through surgery prevents strictures or enterocolitis [48,49]. For anastomotic strictures, once or twice daily dilation can be attempted, but maintaining a threshold for examination and dilatation under anaesthesia [31].
The results showed that the length of treatment of patients with RT was longer (mean: 4.5 days) than that of patients without RT. There is a difference in the length of postoperative care between patients with rectal tube insertion and without rectal tube post-transplant Swenson-like pull-through procedure. Demir et al.'s study evaluated the average duration of hospitalization in 28 respondents who performed transanal endorectal pull-through, Duhamel and Soave techniques; the mean hospitalization was 8.75 (2-14) days, the average length of intestinal segments removed was 23.6 (5-38) cm and the mean follow-up was 35.5 (2-56) months [50].

Bing et al.'s study compared the outcomes of the Soave and Swenson techniques by evaluating the outcomes of patients followed retrospectively. There was no significant difference in the overall hospital stay and bowel function length. Significant differences were found in mean operating time, blood loss, and overall complications.

Transanal Swenson was unable to reduce overall hospitalization and improve bowel function compared to the Soave procedure. Still, it resulted in less blood loss, shorter operative time, and lower complication rates [24]. Research by Mohajerzadeh et al. (2015) involving sixty patients (30 patients underwent Soave, 30 patients underwent Swenson) found the mean follow-up time was three years for both groups. There was no significant difference between the two groups concerning operation time, length of hospital stays, early and late complications such as postoperative obstructive symptoms, enterocolitis, faecal incontinence, perianal abscess and fistula, anastomosis leakage, peritonitis, pelvic abscess formation. The complication rate was 47% for the Soave group and 40% for the Swenson group (p-value = 0.795, risk ratio = 1.147) [51].

This Swenson pull-through procedure is more suitable for infants and young children with rectosigmoid subtype HD with the accumulation of experience and improvement of technology; this technique can also be applied in older children and HD extending to the descending colon. [52]. For older children suffering from colon dilatation, surgery can be complex. This can be overcome by using a transabdominal approach [24].

CONCLUSION

There is no difference in obstruction and anastomotic leakage incidence in patients with rectal tube placement and non-rectal tube post transanal Swenson-like pull-through procedure. The length of stay for patients with non-rectal tube post transanal Swenson-like pull-through procedures is shorter than those with a rectal tube, so it can reduce the use of financing for hospital care, and patients do not need to use a rectal tube for home care.

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DECLARATIONS

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