

Classical Swenson Abdomino-perineal Pull through Technique in the Treatment of Hirschsprung's disease-4 years experience

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ABSTRACT

Objective: Aim of this study was to analyze the results of classic Swenson abdomino-perineal pull through technique in the treatment of Hirschsprung's disease carried out at our hospital during four years.

Study Design: Prospective observational study

Settings: Pediatric surgery department, KMC Civil hospital Khairpur and GMMMC Civil Hospital Sukkur

Duration of Study: Four years from 1st July 2016 to 30th June 2020

Materials and methods: Total of 40 patients were selected and recruited for the study. Data of pre-operative symptoms and post-operative complications was collected. Gut was prepared for 2 days pre-operatively. All surgeries were performed under general anesthesia in supine position. Selected patients were operated following Classic Swenson abdomino-perineal pull through technique.

Results: 40 patients were selected for the study. Pre-operative clinical feature of the disease included delayed passage of meconium {n=33(82.5%)}, constipation {n=24(60%)}, failure to thrive {n=13 (32.5%)}, vomiting {n=9 (22.5%)} and abdominal distension {n=6 (15%)}. No post-operative complications were seen in 32 (80%) patients. Recurrence of constipation was seen in 3 (7.5%) patients. Fecal incontinence was seen in 2 (5%) patients. Urinary incontinence and anastomosis leakage was seen in 1 (2.5%) patient. Enterocolitis was seen in 1 patient {n=1 (2.5%)}. There was no death reported post-operatively. Three (7.5%) patients required a redo surgery due to various complications.

Conclusion: It is concluded in our study that classic Swenson abdomino-perineal pull through procedure in the treatment of hirschsprung's disease is very efficient technique with very few short term complications.

Keywords: Hirschsprung's disease, classic Swenson abdomino-perineal, pull through technique.

INTRODUCTION

Hirschsprung's disease is a disorder characterized by the absence of enteric neurons at the distal gut. This developmental defect of the enteric nervous system of the gut results in functional obstruction of the gut. Incidence of disease is about 1 per 5000 live births. Hirschsprung's disease is suspected in a new born if he or she fails to pass meconium in first 24 to 48 hours after birth. It is characterized by vomiting, constipation, abdominal distention and failure to thrive. Barium enema and rectal biopsy can be done to confirm the diagnosis. Despite advances in treatment this disease results in high morbidity and mortality.^{1,2,3}

Definitive treatment involves surgical removal of the defective gut. Various surgical techniques have been demonstrated in the past with varying degree of success. Most commonly employed surgical techniques include the Swenson⁴, Duhamel⁵, and Soave⁶ procedures.

The Swenson technique was the original breakthrough pull-through procedure used to treat Hirschsprung's disease. This technique involves the resection of aganglionic segment down to the sigmoid colon and rectum, and then oblique anastomosis is performed between the normal colon and the low rectum.⁷

Various surgical techniques have been employed in various pediatric surgical set ups in Pakistan for Hirschsprung's disease. We followed the classic Swenson

abdomino-perineal pull through technique in our institution Civil Hospital Khairpur civil hospital sukkur over the period of four years analyzed the short term post operative complications.

METHODOLOGY

We conducted this prospective observational study at the department pediatric of KMC Civil hospital Khairpur and GMMMC Civil Hospital Sukkur from 1st July 2016 to 30th June 2020, after getting approval from ethical review committee of the hospital. Total of 40 patients were selected and recruited for the study after taking written consent for participation in the study. Patients with multiple co-morbidities and those unwilling to participate in the study were excluded from the study.

Selected patients were operated by following Classic Swenson abdomino-perineal pull through technique. Data was collected on a specially designed preforma. Data included the pre-operative symptoms of the patients and post-operative complications. Post-operative follow ups were carried out at 1st, 2nd, 4th, 8th and 12th weeks following surgery to see the fecal incontinence, wound infection, leakage of anastomosis, recurrence of constipation, urinary incontinence and death. Data of duration of surgery and post-operative hospital stay were also collected. Data was analyzed using Statistical Package for Social Sciences (SPSS) version 24.

All patients went through gut preparation for 2 days before the surgery. After the induction of general anesthesia, patients were placed in the supine position. Urinary catheter was passed in all patients. Anastomosis was done through perineal approach after eversion of the aganglionic rectum. Coloanal anastomosis was done 1 cm proximal to dentate line. Dissection continued up to the tip of coccyx. Then dissected aganglionic gut was pulled through the anus in everted fashion. At the end, the healthy gut was pulled through the aganglionic gut keeping a seromuscular cuff measuring 1 cm anteriorly and 0.5 cm posteriorly.

RESULTS

Forty patients were selected for this study. Age range of the patients was from 8 months to 7 years with mean age and standard deviation of 23.63±13.62 months. Out of 40 patients, 33(82.5%) were male while 7 (17.5%) were female with male to female ratio of 4.71:1.

Details of the clinical features of the disease in all 40 patients are shown in table 1.

Table 1. Frequency and percentage of clinical features of disease

Clinical Feature	Frequency (%)
Delayed passage of meconium	33 (82.5%)
Constipation	24 (60%)
Failure to thrive	13 (32.5%)
Vomiting	9 (22.5%)
Abdominal distention	6 (15%)

Details of the post-operative complications observed in all forty patients are shown in table 2. Three (7.5%) patients required a redo surgery due to various complications.

Table 2. Frequency and percentage of post-operative complications

Complication	Frequency (%)
No complication	32 (80%)
Recurrence of constipation	3 (7.5%)
Fecal incontinence	2 (5%)
Urinary incontinence	1 (2.5%)
Anastomosis leakage	1 (2.5%)
Enterocolitis	1 (2.5%)
Death	0 (0%)

Mean duration of surgery was 106.33±15.69 minutes. Mean duration of hospital stay was 8.55±3.60 days.

DISCUSSION

Hirschsprung's disease was first described by a Danish pediatrician Harald Hirschsprung.^{2,8}Disease is caused by the absence of the ganglions of Auerbach and Meissner plexuses in distal gut. Diagnosis is often confirmed with rectal biopsies.⁹Various surgical procedures have been employed to resect the aganglionic gut portion. A Swedish borne American pediatric surgeon named Orvar Swenson was the first one to perform the pull through surgery in a pediatric patient with Hirschsprung's disease.¹⁰

In this study we performed classic swensonabdomino-perineal pull through technique on forty patients of Hirschsprung's disease and observed the patients for short term post-operative complications.

In our study,age range of the patients was eight months to seven years. Majority of the patients were male with male to female ratio of 4.71:1 which is comparable to another study conducted by Swande O et al.¹¹

In our study we observed that majority of the patients had no post-operative complications. These results are consistent with various international studies.^{11,12,13,14}On the other hand, a study conducted by Pakarinen M concluded that this technique is associated with significant and debilitating post-operative complications.¹⁵Most common post-operative complications observed in our study was recurrence of constipation. Out of forty, three patients had this complaint. Two patients were managed with conservative treatment while a redo surgery was done in third patient. This patient also developed the leakage of anastomosis.

One patient developed urinary dribbling post-operatively. This patient was also managed conservatively and urinary incontinence subsided within 4 weeks of post-operative period. Cause of urinary incontinence could be of multifactorial nature. Pelvic dissection and manipulation of the bladder during surgery could lead to this complication. Damage of the sphincter vesicae externus muscle could play an important part in the post-operative incontinence.^{16,17}

In our study mean operative time was 106.33±15.69 minuteswhile mean duration of hospital stay was 8.55±3.60 days which is comparable to the operative times and duration of hospital stay of a study conducted by Al-Baghdady A et al.¹⁸

A local study conducted by Saleem M et al conducted at three different hospitals of Lahore that Duhamel procedure is superior method of treatment for Hirschsprung's disease.¹⁹

Our study had its own limitations. We only looked for short term post-operative complications. Tough there were very few short term complications but further studies are advised to look for long term post-operative complications

CONCLUSION

It is concluded in our study that classic swensonabdomino-perineal pull through procedure in the treatment of hirschsprung's disease is very efficient technique with very few short term complications.

REFERENCES

1. Heuckeroth R. Hirschsprung disease — integrating basic science and clinical medicine to improve outcomes. *Nat Rev Gastroenterol Hepatol.* 2018; 15(1):152–167 .<https://doi.org/10.1038/nrgastro.2017.149>
2. Amiel J, Sproat-Emison E, Garcia-Barcelo M, Lantieri F, Burzynski G, Borrego S et al. Hirschsprung disease, associated syndromes and genetics: A review. *Journal of Medical Genetics.* 2007; 45(1):1-14. doi:10.1136/jmg.2007.053959
3. Neuvonen MI, Korpela K, Kyrklund K, Salonen A, De Vos W, RintalaRJet al. Intestinal microbiota in Hirschsprung disease. *Journal of Pediatric Gastroenterology and Nutrition.* 2018; 67(5):594-600. doi:10.1097/mpg.0000000000001999
4. Yokota K, Uchida H, Tainaka T, Tanaka Y, Shirota C, Hinoki A et al. Single-stage laparoscopic transanal pull-through modified Swenson procedure without leaving a muscular cuff for short- and long-type Hirschsprung disease: A

- comparative study. *Pediatric Surgery International*. 2018;34(10):1105-1110. doi:10.1007/s00383-018-4318-1
5. Mao Y, Tang S, Li S. Duhamel operation vs. transanal endorectal pull-through procedure for Hirschsprung disease: A systematic review and meta-analysis. *Journal of Pediatric Surgery*. 2018; 53(9):1710-1715. doi:10.1016/j.jpedsurg.2017.10.047
 6. Onishi S, Nakame K, Kaji T, Kawano M, Moriguchi T, Sugita K et al. The bowel function and quality of life of Hirschsprung disease patients who have reached 18 years of age or older – the long-term outcomes after undergoing the transabdominal Soave procedure. *Journal of Pediatric Surgery*. 2017; 52(12), 2001-2005. doi:10.1016/j.jpedsurg.2017.08.036
 7. Nasr A, Haricharan RN, Gamarnik J, Langer JC. Transanal pull-through for Hirschsprung disease: Matched case-control comparison of Soave and Swenson techniques. *Journal of Pediatric Surgery*. 2014; 49(5):774-776. doi:10.1016/j.jpedsurg.2014.02.073
 8. Hirschsprung H. Stuhlträgheitneugeborenerinfolge von dilatation und hypertrophic des colons. *Jbinderheilk* 1888;27(1):1
 9. Allen AR, Putnam AR, Presson AP, Allen CM, Barnhart DC, Rollins MD. Accuracy of suction rectal biopsy for diagnosis of Hirschsprung's disease in neonates. *European Journal of Pediatric Surgery*. 2018; 29(5), 425-430. doi:10.1055/s-0038-1667040
 10. SWENSON O, BILL AH. Resection of rectum and rectosigmoid with preservation of the sphincter for benign spastic lesions producing megacolon; an experimental study. *Surgery*. 1948;24(2):212-20
 11. Sowande O, Adejuyigbe O. Ten-year experience with the Swenson procedure in Nigerian children with Hirschsprung's disease. *African Journal of Paediatric Surgery*. 2011; 8(1):44. doi:10.4103/0189-6725.78668
 12. Mahmud K, Khan A, Yasmeen BN, Islam M, Karim, S. Classic Swenson abdomino perineal pull through in the treatment of Hirschsprung's disease 3 years experience in a tertiary care paediatric hospital in Bangladesh. *Northern International Medical College Journal*. 2017; 8(1), 185-188. doi:10.3329/nimcj.v8i1.32395
 13. Sookpotarom P, Vejchapipat P. Primary transanal Swenson pull-through operation for Hirschsprung's disease. *Pediatr Surg Int*. 2009;25(10):767-773 <https://doi.org/10.1007/s00383-009-2428-5>
 14. Mahanta K, Gogoi M. Complications of Swenson's procedure in hirschsprung's disease- A hospital based 5 year study. *Journal of Evolution of Medical and Dental Sciences*. 2019; 8(21):1690-1694. doi:10.14260/jemds/2019/372
 15. Pakarinen M. Perioperative complications of Transanal pull-through surgery for Hirschsprung's disease. *European Journal of Pediatric Surgery*. 2018; 28(2):152-155. doi:10.1055/s-0038-1632393
 16. Holschneider A, Kraeft H, Scholtissek C. Urodynamische Untersuchungen von Blasenentleerungsstörungen bei Analatresie und morbus Hirschsprung 1,2. *European Journal of Pediatric Surgery*. 1982; 35(2):64-68. doi:10.1055/s-2008-1059904
 17. Fonkalsrud EW. Complication of Hirschsprung's disease and allied disorders. In: Holschneider, AM., Puri, P. (eds). *Hirschsprung's disease and allied disorders*. Harwood, Singapore. 2000;2:425-31
 18. Al-Baghdady AA, El-Shafei EA, El-Asmar KM. One-stage transanal Swenson procedure for rectosigmoid Hirschsprung's disease in infants and children. *Annals of Pediatric Surgery*. 2016; 12(3):104-108. doi:10.1097/01.xps.0000482859.77300.04
 19. SALEEM M, SHAUKAT M, MALIK N, SHIEKH AH, SAQIB RU, RAUF A et al. Hirschsprung's Disease: Experience Of 145 Patients. *Annals of King Edward Medical University*. 1998; 4(2):38-42. Retrieved from <https://annalskemu.org/journal/index.php/annals/article/view/3822>