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Research Paper

Posterior Sagittal Anorectoplasty with or Without Muscle Complex Saving for High and Intermediate Variety Anorectal Malformation.

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ABSTRACT

Background: *Posterior sagittal anorectoplasty (PSARP), popularized by de Vries and Peña has become the standard technique for the management of anorectal malformations (ARM). Before 1980, the anatomy of these defects was not known, and the surgical procedure involved several blind steps. In the posterior approach, surgical exposure became available and exposure to the anatomic features of these defects has led to a better understanding of the basic anatomy of ARM. The benefit of complete exposure isa visualization of the anatomy of the area such as there is a strong funnel-like muscle that forms the sphincter mechanism, the upper portion of the funnel is formed by the levator muscle that is arranged horizontally and the lower portion of this funnel is made mainly of vertical fibres that are called muscle complex.*

Objectives: *To evaluate the early postoperative outcome of posterior sagittal anorectoplasty with or without muscle complex saving for high and intermediate variety anorectal malformation.*

Methods: *Experimental study (Randomized controlled trial) was carried out in the Faculty of Pediatric Surgery, Bangladesh Shishu Hospital and Institute. In group A (Muscle complex saving PSARP) 15 & group B (Without muscle complex saving PSARP) 15 patients so, a total of 30 patients were included in this study after fulfilment of all selection criteria during the study period.*

Results: *In group A, no patients had wound infection, wound dehiscence and anal stricture or anal stenosis but in group B, one patient (6.7%) had wound infection and 1(6.7%) had wound dehiscence. In group A, 10 (66.7%) patients had 1-5 bowel movements per day & 08 (53.3%) patients had 1-5 bowel movements per day in group B. No patient had > 5 bowel movements per day in both groups. In group A, 9(60%) patients had no perianal soiling & 6(40%) patients had occasional perianal soiling. In group B, 7 (46.7%) patients had no perianal soiling & 8(53.33%) patients had occasional perianal soiling.In group A, 10(66.7%) had no constipation but in group B,07 (46.7%) patients had no constipation. Total of 5(33.3%) in group A & 8(53.4%) patients in group B had constipation.*

Conclusion: *Posterior sagittal anorectoplasty with muscle complex saving is a better operative procedure than without muscle complex saving for high and intermediate variety anorectal malformation.*

Keywords: *ARM, PSARP.*

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I. INTRODUCTION

Anorectal malformation (ARM) is one of the commonest anomalies in pediatric surgical practice. The specific cause of anorectal malformation is unknown. The overall incidence of ARM worldwide is 1 in 5000 live births. A slight male predominance exists [1].There have been many different surgical techniques to treat anorectal malformations such as anterior and posterior perineal approaches and many different types of angioplasties. Most pediatric surgeons now use the posterior sagittal approach with or without laparotomy or laparoscopy to repair these malformations [1]. In the case of high and intermediate varieties, staged operations are performed.Posterior sagittal anorectoplasty (PSARP), popularized by de Vries and Peña (1982) has become the standard technique for the management of anorectal malformations (ARM). Before 1980, the anatomy of these defects was not known, and the surgical procedure involved several blind steps. In the posterior approach, surgical exposure became available and exposure to the anatomic features of these defects has led to a better understanding of the basic anatomy of ARM.In PSARP, complete exposure of the anorectal region by median sagittal incision from the sacrum to the anal dimple, cutting through the sphincter mechanism [2].The benefit of complete exposure isa visualization of the anatomy of the area such as there is a strong funnel-like muscle that forms the sphincter mechanism, the upper portion of the funnel is formed by the levator muscle that is arranged horizontally and the lower portion of this funnel is made mainly of vertical fibres that are called muscle complex [2].There are several complications of PSARP such as constipation, perianal soiling, fefaecalncontinence, rectal prolapse, urologic injury and neurogenic bladder. The most common functional disorder is constipation after PAARP [3].Muscle complex is formed by the puborectalis muscle and external anal sphincter and is a functionally important structure for continence. Placement of neoanus within the center of the muscle complex during definitive repair has an important impact on future faecal continence [2,3].In muscle complex saving posterior sagittal anorectoplasty,proper identification of muscle complex with muscle stimulator, saving the muscle complex and placement of distal pouch within the muscle complex, so less chance of complication than without muscle complex saving posterior sagittal anorectoplasty [4].

II. METHODOLOGY

This randomized controlled trial was carried out in the faculty of pediatric surgery, Bangladesh Shishu Hospital and Institute, Sher-e-Bangla Nagar, Dhaka. The aim of this study was the evaluation of the early postoperative outcome of posterior sagittal anorectoplasty with or without muscle complex saving for high and intermediate variety anorectal malformation. This study was conducted from March 2020 to February 2022. A totalof 30 participants were included in this study, among them group A (Muscle complex saving PSARP) 15 and group B (without muscle complex saving PSARP) 15 patients. In this study, in group A, 12 (80%) patients were intermediate variety and 3(20%) patients were high variety anorectal malformation & in group B, 11 (73.3%) patients were intermediate variety and 4(26.7%) patients were high variety, anorectal malformation patients. Statistical analysis was carried out using the Statistical Package for Social Sciences version 26.0 for Windows (SPSS Inc., Chicago, Illinois, USA).

Operative technique for Muscle complex saving posterior sagittal anorectoplasty -

The urinary catheter was inserted after general anaesthesia and then the patients were placed in the prone position (Fig. 1). The site of the neoanus was located using a muscle stimulator (Fig. 2). A sagittal skin incision was made starting from the lower portion of the back of the sacrum to the anterior margin of the neoanus. The parasagittal fibres were divided in the midline. Starting at the tip of the coccyx, the upper portion of the sphincter, the levator muscle, was divided in the midline; this muscle division was arrested at the level of the upper limit of the muscle complex which joins the levator muscle with a nearly 90° angle.The deep pelvic fascia was opened exposing the rectal pouch. Two silk sutures were placed in the posterior rectal wall, and the rectal pouch was opened longitudinally between both sutures. Once the fistula was visualized, separation of the rectal pouch from the urethra was performed and the rectal blind pouch was mobilized upwards above the level of the muscle complex, which can be demonstrated clearly; perioperatively using the muscle stimulator. The fistula was closed in two layers.The lower part of the funnel formed by the muscle complex was once again defined by a muscle stimulator. A tunnel was created through the center of the funnel, starting from the lower part of the muscle complex and pushed through the center of the muscle complex funnel and at this point, an electrostimulation test proves the contraction of the muscle complex (Fig. 3).The created pathway was serially dilated until it accommodates the proper Hegar dilators. The tapered new rectum was pulled down through the tunnel, and then fixed proximally at the upper ring of the muscle complex funnel and to the levator plate by several sutures (Fig. 4). Finally, a standard eight-sutureanorectoplasty was performed (Fig. 5).

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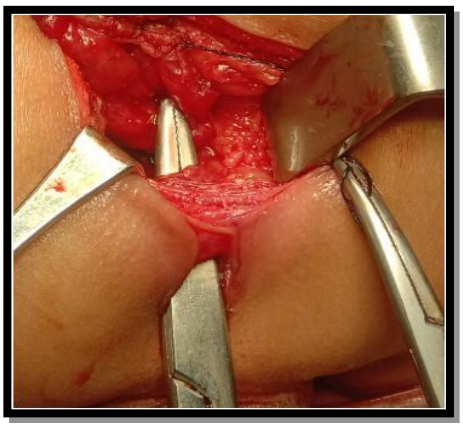

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Figure: 1) Positioning of the patient. 2) Localization of neoanus by muscle stimulator. 3) Tunnel was created through the center of the muscle complex. 4) Tapered new rectum was pulled down through the center of the muscle complex. 5) After completion of anorectoplasty.

Operative technique for Posterior sagittal anorectoplasty –

The urinary catheter was inserted after general anaesthesia and then the patients were placed in a prone position.The site of the neoanus was located using a muscle stimulator. A mid-sagittal incision was performed.

The sphincter mechanism was completely divided into the midline. The rectum was separated from the genitourinary tract and was mobilized until enough length is gained and the rectum can be moved down to the perineum. Sometimes, the rectum must be tailored to guarantee its accommodation within the limits of the sphincter mechanism. Once the fistula was visualized, separation of the rectal pouch from the urethra was performed. The fistula was closed in two layers. Finally, a standard eight-sutureanorectoplasty was performed.

The follow-up visit was-
Follow up were taken every month after colostomy closure and continuedfor up to 6 months.

On each follow-up, the following were checked:
- Frequency of bowel movement - Grade 1 - 1-5 per day, Grade 2 - Very often (>5 /day) Grade 3 - Every alternative day or less than 3 per week.
- Soiling Yes/no, Grade 1- Occasionally (once or twice per week), Grade 2 - Every day, no social problem, Grade 3 - Constant, social problem.
- Constipation Yes/no, Grade 1- Manageable by changes in diet, Grade 2 - Requires laxative, Grade 3 - Resistant to laxatives and diet.

III. RESULTS

In group A, no patients had wound infection, wound dehiscence and anal stricture or anal stenosis but in group B, one patient (6.7%) had wound infection and 1(6.7%) had wound dehiscence. In group A, 10 (66.7%) patients had 1-5 bowel movements per day & 08 (53.3%) patients had 1-5 bowel movements per day in group B. No patient had > 5 bowel movements per day in both group. In group A, 5(33.3%) & group B, 07(46.7%) patients had grade 3 (Every alternative day or < 3 per week) bowel movement. In group A, 9 (60%) patients had no perianal soiling & 6(40%) patients had occasional perianal soiling. In group B, 7 (46.7%) patients had no perianal soiling & 8(53.33%) patients had occasional perianal soiling.In group A, 10(66.7%) had no constipation but in group B,07 (46.7%) patients had no constipation. Total of 5(33.3%) in group A & 8(53.4%) patients in group B had constipation. In group B, among the constipation patient, 7(46.7%) were managed by changing diet and 1(6.7%) were managed by laxatives but in group A all were managed by changing diet.

IV. DISCUSSION

In the present study, in group A, no patients had wound infection, wound dehiscence and anal stricture or anal stenosis but in group B, one patient (6.7%) had wound infection and 1(6.7%) had wound dehiscence Emre and Orkan reported that short-term postoperative complications following PSARP were wound infection (7-24%), wound dehiscence (7.5-10.6%) and anal stricture or stenosis (16-38%) [5]. Maqtadir et al. reported that wound dehiscence was 14.8% and the wound infection rate was 13% [6]. Tofft et al. reported that wound dehiscence was 31%. In our study, only one patient had a wound infection in group B. The lower rate of wound infection in both groups is due to three-stage operation (Primary colostomy followed by PSARP and colostomy closure) [7].In the present study in group A, 10 (66.7%) patients had 1-5 bowel movements per day & 08(53.3%) patients had 1-5 bowel movements per day in group B. No patient had >5 bowel movements per day in both groups. Akshay et al. reported that the average number of bowel movements after sphincter-saving PSARP was 3-5 per day [8]. In the previous study, 75% of patients had voluntary bowel movements after PSARP [2,9]. Sejdi et al. reported that 62.7% had voluntary bowel movements after PSARP [10]. But the present study, voluntary bowel movement could not be assessed due to the short follow-up period.In the present study, in group A, 9(60%) patients had no perianal soiling & 6(40%) patients had occasionalperianal soiling. In group B, 7(46.7%) patients had no perianal soiling & 8(53.33%) patients had occasional perianal soiling. In the previous study, 75% of patients had voluntary bowel movements but half of these patients (37.5%) still soil their underwear occasionally after PSARP [2,9]. Sejdi et al. reported that 36.36% of patients had occasional perianal soiling after PSARP [10]. In the present study in group A, 10(66.7%) had no constipation but in group B, 07(46.7%) patients had no constipation. Total of 5(33.3%) in group A & 8(53.4%) patients in group B had constipation. In group B, among the constipation patient, 7(46.7%) were managed by changing diet and 1(6.7%) were managed by laxatives but in group A all were managed by changing diet.Pena and Hong reported that 48% had constipation [9]. Sejdi et al. reported that 52.38% had constipation [10]. Emre and Orkan reported that 30-80 % had constipation after PSARP5. In group A, soiling and constipation were less than in the previous study due to proper identification of the muscle complex with a muscle stimulator, preserving it and placement of the rectum within the muscle complex

V. CONCLUSION

Posterior sagittal anorectoplasty with muscle complex saving is a better operative procedure than without muscle complex saving for high and intermediate variety anorectal malformation.

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