

COMPLICATIONS AND OUTCOME OF ANORECTAL MALFORMATION FOLLOWING PSARP (POSTERIOR SAGITTAL ANO RECTOPLASTY) PROCEDURE: A RETROSPECTIVE STUDY FROM SINGLE INSTITUTION

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Received : 18/07/2022
Received in revised form : 10/09/2022
Accepted : 20/09/2022

Keywords:
Complications, Outcome,
Anorectal Malformation,
PSARP

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DOI: 10.47009/jamp.2022.4.4.92

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2022; 4 (4); 471-474



Abstract

Background: ARM has been a source of concern for centuries and has been recognized in animals since the time of Aristotle in the third century BC. The objective is to study the complications and outcome of anorectal malformation following PSARP. **Materials and Methods:** This study was conducted in RIMS Raichur Karnataka. The study period was from December 2014 to December 2020. **Result:** All PSARP surgery was done by different surgeons, there were no anaesthetic complications. Postoperatively, complications included, superficial wound infection, anal strictures, rectal retraction where the neo-anus was not centred within the sphincter complex. **Conclusion:** PSARP and its modifications can improve the dismal outcome found in adult patients who have undergone conventional repairs.

INTRODUCTION

Anorectal malformation is a congenital malformation in which the terminal portion of the hindgut lies partially or completely outside the sphincter mechanism. There may be an associated fistula or other associated defects, such as those of the VACTERL association. Significant advances have been made in the management of this complex condition in recent years.

There are many classification system for anorectal malformation has been proposed in the literature, these classification systems underwent many modifications, at present recently proposed classification system was the Krickenbeck international classification system, this is being fallowed because the previous classification systems did not give clear idea regarding the approaches to the ARM patients in terms of surgical management and standard post-operative fallow up and comparison.

The most common previous international classification was referred to as the Wingspread classification of anorectal malformations, elaborated in Wingspread, Wis, in 1984.^[1] This classification distinguished between high, intermediate, and low anomalies in the male and female, with special groups established for cloacal and rare malformations. High-type anorectal malformations

were subdivided into anorectal agenesis with and without fistula, and rectal atresia. The intermediate malformations were classified as rectovestibular and rectovaginal fistula in the female and rectobulbar fistula in the male as well as anal agenesis without fistula in both sexes. The low-type malformations were classified as anovestibular fistula in the female and, in both sexes, as anocutaneous fistula and anal stenosis. This classification was widely accepted over the years and was based on detailed embryological and anatomic studies performed especially by Stephens et al and Kelly on anatomic sections and radiographic investigations.^[1,2] They recognized that the pubococcygeal line extending from the upper border of the os pubis to the os coccyx corresponds with the attachment of levator ani muscles to the pelvic wall, separating high-type malformations lying above the levator muscle and intermediate and low forms of anorectal agenesis lying below this anatomic line. Furthermore, in healthy individuals, the lowest point of the ischial tuberosity, the so-called I-point, represents the deepest point of the funnel of the levator ani muscles.

For those with high or intermediate defects (supra-levator or levator-level defects), colostomy in the newborn period is life-saving. However, long-term quality of life after construction of a neo-anus and colostomy closure is still unsatisfactory. But in

posterior sagittal anorectoplasty rectal mobilization for gaining length is done by circumferential per rectal dissection with division of the vessels that hold the rectum. The rectum will depend on the intra-mural blood supply. If the rectal wall is injured, this blood supply is damaged and ischemia may occur. In cases of recto-bladder neck fistula, a laparotomy, in addition to the posterior sagittal approach is mandatory. The present study was to study the complications and outcome of anorectal malformation following PSARP.

MATERIALS AND METHODS

This retrospective study was conducted on ARM patients in Department of Pediatric Surgery, Raichur Institute of Medical Sciences/Rajiv Gandhi Super Speciality Hospital Raichur Karnataka. The study period is from December 2014 to December 2020, 6 years. The approval was taken from institutional ethical committee.

Inclusion Criteria

All patients undergoing PSARP for ARM.

Exclusion Criteria

Low ARM patients, Patients of ARM with pouch colon, Patients of ARM who have undergone redo procedure, Patients who have undergone Primary PSARP and Patients of cloaca.

Procedure

PSARP (Posterior Sagittal Ano recto plasty)- Following the institution of general anaesthesia and administration of preoperative antibiotics.

Catherization: infant feeding tube

Position: Prone at the edge of the table and pelvis elevated by keeping the soft cotton roll underneath the groin

Incision: Midline (from the mid sacrum to the marked anterior extent of the sphincter, the muscles of the perineum and external sphincter is divided in midline, presacral fascia is reached, the attachments near the tip of the coccyx is dissected, the overlying fascia opened and rectum identified, the rectum is followed anteriorly till narrowing is visible it indicates the fistula, then the rectum is separated all around circumferentially, after hooking the fistula, fistula ligation and dissection of fistula is done. In some cases the posterior wall of the rectum is opened in midline near the fistula, and fistula opening into the urethra identified, circumferential dissection of the fistula opening done and closed with vicryl (5,0). The remaining procedure done as said previously, and anoplasty done at the previously marked sphincter site.

Patient Work Up

1. A written informed consent is taken from the patient before enrolling them for the study.
2. Detailed history and Kelly's Scoring of all the patients noted.

Clinical history involved Questioner regarding Continence in terms of whether the patient had any soiling,

Clinical examination: Perineal examination and Digital rectal examination, Soiling / no soiling,

Kelly's Score

Overall Score 5-6 – Good, 3-4 – Fair, 0-2 – Poor.

RESULTS

Total of 65 ARM patients treated over a study period December 2014 to December 2020. All the patients who are operated for anorectal malformation, they underwent first surgery (high sigmoid loop colostomy) within the second and third day of neonatal period, and second surgery PSARP within the six weeks to three months of the first surgery.

Infection at the sub cutaneous level which is seen in 2.10% cases of the study subjects which is due to the surgical site haematoma. 12(12.63%) cases had wound dehiscence at the neo anal site of which half had complete wound dehiscence half had partial dehiscence. And in post recovery healed status there was no retraction of the neo anus. 6.3% of cases have retraction of the neo anus. Among them 4.2% retraction occurred in high rectoproststic urethral fistula these are the patients during mobilization of the rectum difficulty has occurred per operatively, 2 cases (2.1%) with rectobulbar urethral fistula had retraction. All the patients underwent PSARP in later. These are the patients they presented later to us with features of bowel incontinence and were managed with rectal wash and MACE (malones anti grade continent enema). Ectopically placed neo anus is seen in 3.15% patients and later on these patients was done by ASARP. These patients had intermittent.

All PSARP surgery was done by different surgeons, there were no anaesthetic complications in both groups, Surgical complications are listed in Table 2, Postoperatively, complications included, superficial wound infection, anal strictures, cases of prolapse, rectal retraction, and case where the neo-anus was not centred within the sphincter complex (detected clinically and based on MRI).

There were no per operative complications in PSARP. Early post-operative complication considered here are superficial wound infection at in 2.10% cases. In post recovery healed status there was no retraction of the neo anus, Retraction of the neo anus is seen in 6(6.3%) of PSARP subjects, among them 4.2% retraction occurred in high rectoproststic urethral fistula these are the patients during mobilization of the rectum difficulty has occurred per operatively, 2 cases (2.1%) with recto bulbar urethral fistula had retraction. All the cases under went redo surgery. These are the patients they presented later to us with features of bowel

incontinence and were managed with rectal wash and MACE (malones antigrade continent enema). These patients had intermittent incontinence in later fallow up period. In 2.1% cases, redo anoplasty for anal stenosis was done. There were mucosal prolapse in 11 cases out of which 8(8.42%) belongs to PSARP cases, 5 had partial prolapse and 3 had full thickness prolapsed.

Seventy percent were eligible for evaluation in long-term continence, and mean age was 4.2 yrs. Only 60 percent found voluntary bowel movements. 15 percent of the PSARP cases depended on rectal washouts through per rectum. Mostly patients with high fistula specially the rectovesical fistula presented with history of soiling, 10% cases presented with severe constipation. [Table 3]

Table 1: Distribution of ARM

Type of ARM	PSARP (%)
R V fistula	7.69
Recto prostatic urethral fistula	56.92
Recto bulbar urethral fistula	32.30
No fistula	3.07

Table 2: Surgical complications

Per operative	PSARP
Urethral injury	0
Vas iniury	0
Conversion to laparotomy	2 (fistula at the level of bladder neck)
Early post-operative	
Wound Sepsis(sub cutaneous level)	2
Wound dehiscence	12
Retraction	6
Laparotomy needed	0
Late post-operative	
Mal placed anus at fallow up EUA	3
Anal stenosis/stricture	2
Mucosal prolapse	5
Full thickness prolapse	3
Redo anoplasty	2
Redo anorectoplasty	6

Table 3: Outcome of Kelly's score

Type of ARM	PSARP study cases
Rectovesical fistula	4.10
Recto prostatic urethral fistula	4.08
Rectobulabar urethral fistula	4.12
No fistula	4.13

DISCUSSION

Significant morbidity is associated with Anorectal malformations. Fecal continence after surgical correction is main reason of this. In 1982, modern approach to ARM was by the description of PSARP.^[3] Rehbein and Kiesewetter,^[4,5] to name a few, appreciated the concept of placement of the rectum into the levator sling mechanism, and developed the abdominoperineal and later the sacroabdomino perineal approaches for treatment of high ARM. These surgeons also believed that surgical dissection through the sphincter muscles could be detrimental for future continence. Clinical results suffered most due to the fact that adequate visualisation of the levators and external sphincter complex was not possible in the above techniques. Even though addition of the sacral incision was supposed to facilitate identification of pubococcygeus and accurate tunneling of the rectum to the perineum, the exposure essentially was tangential to the plane of the structures that needed to be seen, and results of these operations were unsatisfactory. This problem was remedied by the

realization of de Vries and Pena,^[2] where adequate visualisation of the sphincteric mechanism could be achieved through posterior sagittal approach by division of the external sphincter and levators in the midline to expose the bowel and the associated genito urinary fistula. There was no dependence on blind palpation of the appropriate muscle plane.^[6] Unfortunately PSARP while exposing the muscles responsible for the continence also divides the constricting mechanism of the muscle complex. This may be detrimental for continence.

The evaluation of functional outcome after operative repair of ARM has been severely compromised by confusion over classification and the lack of a universally accepted method of assessing continence. Various scores including those of Kelly,^[2] Templeton and Ditesheim,^[7] Kiesewetter and Chang⁸ and Holschneider⁹ have been used. The Kelly score requires a digital examination, whereas the Holschneider scores requires anorectal manometry.

Magnetic resonance imaging of the pelvis was performed postoperatively, and a semiquantitative score was used to assess the degree of sphincter

symmetry, perirectal fibrosis, and the position of the pull-through rectum. Defecation status was also recorded. Eight patients who had previously undergone PSARP served as a control group.^[8,9,10] In a study by Kudou and associates,^[11] the clinical data were compared with 7 patients who underwent PSARP before 2000. Anorectal function of these patients was evaluated using the Kelly's score and manometry at the ages of 5 to 6 years (PSARP). In another study by Ichijo et al,^[12] 24 cases of high/intermediate-type imperforate anus were studied. Within the group, 9 underwent PSARP. Anal endoultrasonography and MRI were done postoperatively. A 5-parameter CEQ questionnaire was administered to 16 of 24 subjects followed up for more than 3 years. It was concluded LAARP appeared to provide better outcomes based on CEQ scores. In our study Functional outcome of high lesions after PSARP is not uniformly good, with social continence achieved in only 70%, Severe constipation was reported in 10%.

CONCLUSION

Despite significant developments in the understanding of the pathological anatomy and physiology, and innovation of novel surgical techniques, the results of surgical therapy of ARM remain far from perfect. Completely normal bowel function, comparable to that of healthy individuals, is not possible in many patients with high and intermediate malformation.

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