One Stage Posterior Sagittal Anorectoplasty for Treatment of High and Intermediate Anorectal Anomalies at Birth

Ibrahim Ali Ibrahim

Department of general surgery, Assiut University, Egypt

Abstract:
Background/ Purpose: Posterior sagittal anorectoplasty (PSARP) is the standard treatment of high and intermediate anorectal anomalies. Traditionally PSARP was done as three stages. Recently, some limited clinical trials reported the feasibility of this technique as one stage at birth. The aim of this study was to determine the feasibility and to audit the results of this approach for the treatment of high and intermediate anorectal anomalies at birth.

Materials & Methods: This study included 16 patients (11 males and 5 females) with high (10 patients) and intermediate (6 patients) anorectal anomalies treated during the last 4 years. Invertogram, skeletal X ray and abdominal sonography were done. All the patients were treated by one stage PSARP except one. Exclusion criteria included patients with major associated anomalies, respiratory distress, bad general condition, patients with expected very high anomalies and difficult catheterization.

Results: 15 patients could be treated successfully by PSARP One patient required laparotomy. Intra operative injury of the urethra at the site of rectourethral fistula occurred in one patient. Postoperative anal stenosis occurred in 2 patients, one responded to regular dilatation and the other needed limited anoplasty. Perianal fistula occurred in one male patient at the age of 3 months and healed spontaneously on conservative treatment. Four of the 6 patients older than 3 years are continent, 12 patients pass stool spontaneously and 4 have variable degrees of constipation which is improving on medical treatment. All the patients are alive with good general health.

Conclusion: One stage PSARP for treatment of high and intermediate anorectal anomalies is feasible and safe in properly selected patients with minimal early postoperative complications and expected good long term outcome.

Index Word: Anorectal malformations, one stage PSARP.
included a blind, potentially injurious step usually in a crucial area where the posterior urethra, seminal vesicles and possibly ectopic ureters resides. In 1990, Moore reported that sagittal anorectoplasty can be safely and successfully carried out in the newborn with high imperforate anus without the need for colostomy. We describe our experience with one stage posterior sagittal anorectoplasty for high and intermediate imperforate anus at birth.

**PATIENTS AND METHODS**

From September 2004 to December 2007, sixteen patients with high and intermediate imperforate anus were treated by one stage PSARP after obtaining an informed consent from their parents.

In all patients, the diagnosis was made initially by careful clinical examination at birth to rule out perineal fistulas, presence of other anomalies. The examination was repeated on the operative table to be sure of diagnosis.

An invertogram was performed to show the level of the rectal pouch and any sacral anomalies. The rectal pouch was assessed also using transperineal sonography. Abdominal sonography was also used to assess renal anomalies. No other investigations for diagnosis were done.

An 8 Fr nasogastric tube was inserted to exclude esophageal atresia and a piece of guaze was placed on the tip of the penis to check for presence of meconium particles, if not present urine examination is done.

A third generation cephalosporin and metronidazole were started on admission and for 4 days postoperatively, then oral broad spectrum antibiotic are taken for another 4 days.

**Surgical Technique:**

A number 6 Fr urethral catheter was applied. The patient was put in the jackknife position and posterior sagittal anorectoplasty (PSARP) as described by De Vries and Pena was done. Rectal pouch was identified by its anatomical position and the color of the contained meconium (Figs 1,2).

The rectal pouch was opened between stay sutures and gas and meconium are allowed to escape. The pouch was washed by saline until it is become clean (Figs. 3,4). Rectourinary fistula if present was dissected and ligated (Figs. 5,6). The neo-anus was fashioned to accept a no 9 Hegar dilator (Fig. 7). A small piece of gauze was put in the neo-anus and the wound was closed.

The baby was nursed in the prone or lateral position. After 24 hours, the wound was left exposed and the piece of guaze was extracted and oral feeding was started. The neo-anus was cleaned by saline and betadine with every passage of stool. The urethral catheter was removed after 48 hours except in cases with rectourinary fistula it was left for 8 days. Stitches in the wound were removed after 10-12 days. Gradual anal dilatation was started after 15 days.

**RESULTS**

One stage PSARP has been successfully performed in 15 of 16 cases. In one case, the rectal pouch couldn't be identified and laparotomy was needed and revealed congenital pouch colon and a colostomy was done (Fig. 8). There were 11 males and 4 females. High anomaly was diagnosed in 9 patients, 6 males and 3 females. Six patients diagnosed as intermediate anomaly.

All cases were operated upon at the age of 1-3 days. There were no gross cardiac, pulmonary, renal or skeletal anomalies.

One patient could not be catheterized even under general anesthesia. This patient was excluded from the study. Exclusion criteria also included one patient with respiratory distress and another patient with deep Jaundice and septicemia. The mean operative time was 90 minutes. There were no operative complications except in one male patient the recto-urethral fistula avulsed from the urethera and the urethral catheter appeared in the operative field. The urethera was repaired easily. Cross matched blood was ready. Three patients required blood transfusion.

All patients passed stool within 12 hours, started oral feeding after 24 hours and discharged after 4-7 days.

Gradual anal dilatation started 2 weeks after the operation and continued for variable periods according to the results.
There were no early postoperative complications. There was sound healing of the wound and stitches were removed after 10-12 days. Anal stenosis occurred in two male patients one responded to regular dilatation and the other required a limited anoplasty. This later patient is now doing well.

Perianal fistula occurred in one patient during the period of dilatation at the age of 3 months and healing occurred spontaneously on conservative treatment within 2 months.

All of our patients are alive, only 6 patients are older than 3 years, 4 of them are continent and 2 patients are incontinent but improving on enema program and biofeedback therapy.

Variable degrees of constipation occurred in 4 cases and improved on oral laxative. Of the 9 patients younger than 3 years, 7 pass stool spontaneously without soiling in between passages.

All of our patients pass urine normally without evidence of neurogenic bladder.
DISCUSSION

Since 1982, PSARP as described by De vries and Pena has become the most commonly performed surgical procedure in many medical centers for patients with imperforate anus. It had been strongly recommended that early colostomy followed by PSARP during the first year of life should be done for high anomalies.

The rationale behind it included the following: 1. The anatomy of this area in newborn babies could in theory be less well defined specifically where the sphincter mechanism resides making dissection less precise and more prone to straying from the midline; 2. A distal colostogram would accurately show the actual site of rectourinary fistula; 3. There is a risk of dehiscence and infection in a primary repair; 4. Colostomy may be essential for the survival of some newborns especially low birth weight newborns.
Ibrahim I.

Moor first described sagittal anorectoplasty without colostomy in newborns with rectourinary fistulas with excellent results. In his series, sagittal anorectoplasty was performed in the newborn as one stage through an anterior approach with the baby in the supine modified lithotomy position.\(^5\) Albanese reported 5 newborns, who underwent successful primary PSARP and since that many other papers of one stage PSARP have been published and reported successful primary PSARP.\(^7-11\)

Despite being the standard practice for high and intermediate anorectal anomalies, the three-stage operation has many disadvantages including: 1. Colostomy represents a significant source of morbidity and even mortality, these complications related to colostomy were well documented in many series including Patwardhan et al in 2001. These complications are even more serious in developing countries where most parents are illiterates and there are no colostomy care.\(^8\) 2. Colostomy requires 3 hospital admissions with more social problems and economic costs.

Liu and Hill series of 7 male newborns with rectourinary fistula who underwent primary PSARP showed good results.\(^9\) Our series included 16 patients for them all primary PSARP has been performed. In all cases the superficial parasagittal muscle fibers and the muscle complex as described by Pena (1992)\(^6\) were easily identified during the dissection. In newborns with rectouretheral fistula, the fistula could be easily identified and repaired through the posterior sagittal approach and this is also true for the rectovaginal fistula.

Fortunately none of our patients has rectovesical fistula:
All of our patients were successfully operated upon except one where the rectal pouch was too high to be reached, laparotomy revealed congenital pouch colon. Primary correction was difficult so, colostomy was performed. We reported no other operative difficulties and there were no operative complications; except in one patient, who had avulsed rectouretheral fistula just at its junction with the urethera. The urethera was repaired easily.

Elhalaby in his series of 39 cases in 2006 reported injury to seminal vesicle in one case with high rectal pouch and wound infection in 9 cases, six of them were mild and superficial. However, one required colostomy and 2 required secondary sutures.\(^10\) Adeniran in 2005 in his series of 15 cases reported 2 cases of superficial wound infection.\(^11\) None of our patients, like the reports of Liu and Hill, had wound infection, anastomotic dehiscence or recurrent fistula. The possibility of wound infection could be minimized by nursing the patient in the prone or lateral position, leaving the wound exposed with its cleaning after each passage of stool.

One of our patient developed perianal fistula at the age of 3 months which could be due to forcible dilatation. The fistula healed spontaneously on conservative treatment.

Unlike the reports of Liu and Hill, one patient developed postoperative stricture not responded to dilatation. Minimal anoplasty was needed.

After anorectal surgery the functional results and continence to urine and stool, if present, can be evaluated only around the age of 3 years.\(^12\) Theoretically, primary repair of anorectal malformations has a better chance of continence to urine and stool as the neuronal framework for normal bladder and bowel function exists at birth, but there is learning or training period when long lasting activity driven neuronal changes take place during neuronal circury development. If definitive repairs are delayed, critical time may be lost in which neuronal networks and synapses would have formed resulting in normal rectal function.\(^7,5\)

Liu et al did not notice any significant difference in the postoperative bowel habit in their comparative study between one stage and three stages PSARP.\(^13\)

From our experience, the results of continence of one stage PSARP would be expected to be better than the three stages operation. This is based on our results of anorectal continence status in 4 out of 6 patients older than 3 years, and the notice that the patients younger than 3 years are clean in between passages of stool. Likewise, we have also noticed visible contractions of the sphincters on perineal touch as well as palpable contraction by P-R examination. To prove that, we need a longer period of follow up and a larger number of patients.

CONCLUSION

One stage PSARP for treatment of high and intermediate anorectal anomalies at birth is safe, technically feasible in experienced hands and properly selected patients.
REFERENCES


