



ORIGINAL ARTICLE

ONE- STAGE OR THREE- STAGE CORRECTION OF HIGH AND INTERMEDIATE IMPERFORATE ANUS IN MALES

By

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Aim: Our aim of this study was to assess the safety and feasibility of complete one stage correction of high and intermediate imperforate anus in males and to compare it with three- stage procedure.

Methods: Twenty patients with high and intermediate imperforate anus and divided into two groups (10 for each). Group I: complete one stage posterior sagittal ano-rectoplasty (PSARP). Group II: (retrospective study) three-stage PSARP consisted of colostomy then PSARP and finally closure of colostomy.

Results: Group I developed wound infections occurred in 2 cases and another one case developed partial wound dehiscence. According to modified Wingspread scoring, there were excellent and good outcomes in 7 cases (70%) but fair and poor outcome in 3 cases (30%). In group II complications developed in all stages as prolapsed colostomy, skin infection, partial skin dehiscence with subsequent incisional hernia. There were 6 cases (60%) have excellent and good outcome but 4 cases (40%) have poor and fair outcome.

Conclusion: One stage PSARP is a safe and feasible procedure for correction of high and intermediate imperforate anus.

Keywords: Anorectal malformations, neonates, anoplasty.

INTRODUCTION

The traditional surgical correction of high and intermediate imperforate anus in male neonate is staged over several weeks or months. This usually entails a diverting colostomy, posterior sagittal ano-rectoplasty (PSARP) as described by Peña⁽¹⁾ and colostomy closure as the third and final stage.⁽²⁾ Obviously, the 3 procedures burden the patients and their parents physiologically, psychologically and economically.⁽³⁾ Despite performing a technically perfect operation, there are a subset of children that require significant life long bowel management for constipation and incontinence.⁽⁴⁻⁵⁾ Early restoration of gastrointestinal continuity that is, anorectoplasty performed in the neonatal period would train the perineal musculature and result in long term fecal continence without morbidity.⁽²⁾

Our aim of this study was to assess the safety and feasibility of complete one stage correction of high and intermediate imperforate anus in males and to compare it with three-stage procedure.

PATIENTS AND METHODS

Twenty patients with high and intermediate imperforate anus and divided into two groups (Ten cases of one stage correction are compared retrospectively to 10 cases of three- stage-correction).

Group I: Complete one stage PSARP as described by Peña⁽¹⁾ was performed for 10 newborns.

Group II: This was a retrospective study of 10 newborns underwent three-stage correction of high and intermediate imperforate anus. Diverting sigmoid colostomy was done

after birth as first stage, distal colostography to localize the site of urinary fistula, then, PSARP as described by Peña⁽¹⁾ as 2nd stage and finally closure of colostomy as 3rd stage.

All newborns were subjected to the followings:

- Full history taking.
- Complete clinical examination.
- Chest, X. Ray.
- Skeletal survey to rule out any bone deformities.
- Abdominal ultrasonography to assess any abnormalities as renal anomalies.
- Echocardiography to assess cardiac anomalies.
- Invertogram to assess the level of rectal pouch after 12-24 hours from birth.
- Nasogastric tubes were inserted to decompress the stomach and the patients resuscitated with fluids and electrolyte supplements.
- A fistula to urinary tract was suspected in cases of group I based on the absence of meconium at the perineum and mixing of urine with meconium.
- Parents signed informed consent for a colostomy in group II as well as in group I if one stage PSARP can not be completed.
- Neonates with severe cardiac, pulmonary or spinal anomalies were excluded from one stage PSARP (Group I).

Operative technique of PSARP: General anaesthesia with endotracheal intubation. The patients were prepared with Betadine antiseptic solution and draped such that both a perineal and transabdominal approach could be performed. Cephalosporine and metronidazol were given with induction of anaesthesia and continued 3 days postoperatively. Patients were catheterized then positioned prone. PSARP as described by Peña⁽¹⁾ was done. An incision was made in the midline from above coccyx to below the anal dimple as (Fig. 1). Rectal pouch was opened between stay sutures to allow gas and meconium to escape thus decompressing the abdomen to make ventilation easier in the neonate as (Fig. 2). The rectum was packed with gauze to prevent meconium contamination of the wound. The recto-urinary fistula, if present, was dissected and separated from the rectum then closed with 5.0 polyglycolic acid sutures as (Fig. 3). Mobilization of the rectal pouch was continued with its separation from the urethra. Finally, anoplasty was performed with suitable size according to age of the patients for both groups as (Fig. 4). The patients were turned supine and rectum was irrigated from meconium in the neonate.

Post operative management and follow up:

- In the newborn care unit, each baby was placed in a prone position with the wound exposed.
- Food and water were prohibited for 3 days.
- The patients with urinary tract fistula had a urinary bladder catheter placed for at least 5 days.
- Anal dilatations were begun 2 weeks postoperatively up to size 8-10 Hegar for neonates and 12-14 for older patients.⁽³⁾
- Follow up period for both groups ranged from 12-18 months and based on post operative complications and clinical outcome. According to modified Wingspread scoring,⁽⁶⁾ the clinical outcome after PSARP was designated as "excellent" "good" "fair" and "poor". The patients with a poor outcome were totally incontinent or required daily enemas because of severe constipation. The patients with a fair outcome had intermittent soiling requiring protective aids or frequent change of underwear. The patients with a good outcome rarely soiled, but may have had occasional staining. They did not require protective aids or change of underwear. Chronic constipation requiring laxatives or dietary management was allowed in the fair and good groups. The patients with an excellent outcome were reported to have neither soiling nor persistent constipation.⁽⁷⁾

RESULTS

In group I (one stage procedure), the mean age at operation of complete one stage PSARP was 36 hours (from 30 to 48 hours). There were associated congenital anomalies as polydactyl and talipes equinovarus but no gross cardiac, pulmonary and renal anomalies. Invertogram showed high anomalies in 7 cases and intermediate type in 3 cases. All cases underwent complete one stage PSARP. One case required conversion to laparotomy for colostomy because of very high rectal pouch with difficulties during PSARP and excluded from this study in group I. This case had also flat buttock and deficient sacral vertebrae. During operation we found eight neonates had fistulae with the urethra but 2 neonates had no fistulae (intermediate type). Postoperative complications of group I developed in 3 cases (30%). Wound infections occurred in 2 cases and responded to conservative measures without developing anal stricture. Another one case developed partial wound dehiscence with subsequent anal stricture and responded to repeated anal dilatations for 3 months. According to modified Wingspread scoring, there were excellent and good outcomes in 7 cases (70%) but fair and poor outcome in 3 cases (30%) as in Table 1.

In group II (three - stage procedure), the mean age of diverting sigmoid colostomy (1st stage) was 36 hrs (from 24 to 48 hrs). The 2nd stage of definitive PSARP was done at

age ranged from 4th to 6th months (mean age 4.8 months). Finally, the 3rd stage of closure of colostomy was performed with mean age of 6.5 months (from 5th to 8th months). Atrial septal defect (ASD), was diagnosed by Echocardiography and polydactyl and talipes equinvarus were associated congenital anomalies. There were no pulmonary or renal anomalies. Invertogram showed high anomalies 8 cases and 2 cases of intermediate types. Colostogram, was done before 2nd definitive stage, showed recto-urinary with the urethra in 8 cases and no fistulae in the remaining 2 cases of group II. There were 4 cases (40%) of group II suffered from one or more

complications during all three-stage. Complications of the 1st stage (colostomy) developed in 2 cases (20%) and included prolapsed colostomy, skin infection and partial skin dehiscence. Complications of 2nd definitive stage (PSARP) developed in one case and included partial skin dehiscence with no subsequent anal stenosis. Complications of 3rd stage (closure of colostomy) occurred in one case and included wound infection with subsequent incisional hernia. According to modified Wingspread scoring, 6 cases (60%) have excellent and good outcome but 4 cases (40%) have poor and fair outcome as in Table 2. There was no mortality of both groups.

Table 1. Results of Group I.

Pt. No	Age at operation (hours)	Associated Congenital Anomalies	Types of Ano-rectal malformations	Types of Fistula	Complications	Outcome +
1	36	-	High	Recto-urethral	Wound infection	Good
2	48	-	Intermediate	-	-	Excellent
3	30	Polydactyl	High	Recto-urethral	-	Fair
4	30	Polydactyl	High	Recto-urethral	-	Good
5	36	-	Intermediate	-	-	Excellent
6	36	Talipes equinvarus	High	Recto-urethral	Wound infection	Good
7	48	-	High	Recto-urethral	-	Excellent
8	30	-	High	Recto-urethral	Wound dehiscence	Poor
9	30	-	High	Recto-urethral	-	Fair
10	36	Talipes equinvarus	High	Recto-urethral	-	Good

* Pt. No: Patients number

+ According to modified Wingspread scoring

Table 2. Results of Group II.

Pt. No	Age at operation			Associated congenital anomalies	Types of ARM	Type of fistula	Complications	Outcome +
	Colostomy (hours)	PSARP (months)	Closure of colostomy (months)					
1	24	6th	8th	ASD	High	Recto-urethral	-	Excellent
2	36	4th	6th	Polydactyl	High	Recto-urethral	Prolapse of colostomy	Excellent
3	38	5th	6th	Talipes equinvarus	Intermediate	-	Partial skin dehiscence of PSAP	Good
4	48	4th	7th	-	High	Recto-urethral	-	Excellent
5	40	4th	5th	-	High	Recto-urethral	Partial skin dehiscence of PSAP	Poor
6	36	6th	8th	Polydactyl	High	Recto-urethral	-	Fair
7	24	5th	6th	-	Intermediate	-	-	Good
8	30	6th	8th	-	High	Recto-urethral	Inscional hernia	Fair
9	48	4th	5th	-	High	Recto-urethral	-	Good
10	38	4th	6th	-	High	Recto-urethral	-	Fair

* Pt. No: Patients number

†ARM: Ano-rectal malformations

‡PSARP: Posterior sagittal ano-rectoplasty

§ ASD: Atrial septal defect

+ According to modified Wingspread scoring



Fig 1. Posterior sagittal incision.

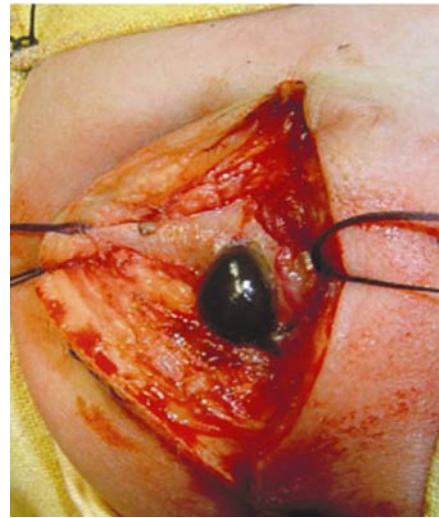


Fig 2. Rectal pouch was opened between stay sutures with meconium.

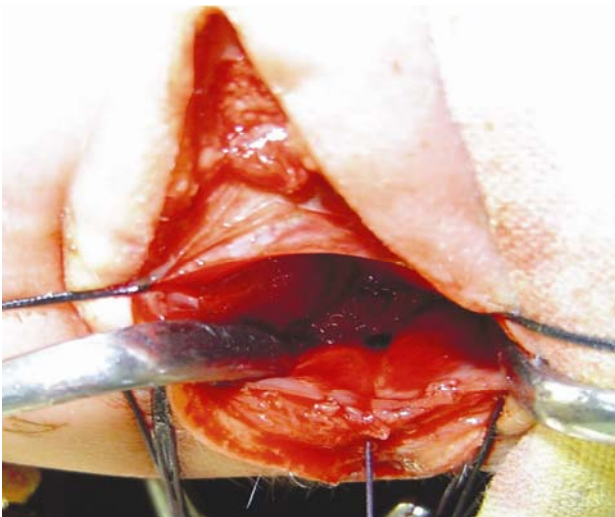


Fig 3. Rectal pouch was opened with recto-urethral fistula.



Fig 4. Anoplasty.

DISCUSSION

Effective care of patients with ano-rectal malformations begins with a carefully thought plan in the neonatal period.⁽⁸⁾ These patients are traditionally treated in three stages, a diverting colostomy in the neonatal period, then definitive surgery (PSARP) and finally closure of colostomy.⁽²⁾ Colostomy is socially unaccepted in many developing countries. Even when performed, many complications developed. On other hand, colostomy helps to protect the future operated site, diminish the frequency

of infection of the wound, reduce the damage to the perineal musculature and via colostogram can localize the site of recto - urinary fistulas.⁽³⁾

Complications of colostomy in these patients were highlighted by many investigators.^(9,10,11) Our study supports these results and advocates early definitive operations without colostomy provided the operations are safe. There were also complications developed after 2nd and 3rd stages in our study and the study of Liu et al.⁽³⁾

If a single and safe operative procedure and one hospital

admission (rather than three) as one stage PSARP could effectively solve the problems, the cost and stress on the patients and their parents would be very significantly reduced.

Albanese et al⁽²⁾ thought that early restoration gastrointestinal continuity would train the perineal musculature and improve long – term fecal continence. On the contrary, if the repair of anorectal anomalies is delayed, the critical time may be lost in which neuronal networks and synapses would have formed resulting in normal or near normal function. Also that it is very important to establish brain – defecation reflexes early. So, it is very important to restore the gastrointestinal continuity in the neonate. Therefore, the earlier definitive operation, the higher chances of achieving continence.⁽¹¹⁻¹²⁾

On other hand, in one stage PSARP, it is very difficult to ascertain the precise level of rectal pouch without a distal colostogram and the site of recto–urinary fistula.

Preoperatively, detailed physical examinations, such as looking for cutaneous fistula, examination the contour of buttocks, and testing the contraction over the anal dimple, are needed. In general, the diagnosis of the low anomaly is made on the finding of a cutaneous fistula. A catheter is inserted into baby's bladder to observe the colour of urine, then we can conclude whether there is a recto–urinary fistula. Flat buttocks with anomalies of spine suggest the high anomaly. Diagnosis of exact site of recto–urinary fistulas, preoperatively, was difficult as no colostomy for colostogram. However, during the operation, identifying of the fistula and its closing was easy with a surgeon experienced in the standard Peña operation. Postoperatively, anal dilatation was started 2 weeks after the definitive operation and continued regularly. Many patients could not keep their anal dilatation appointment. We, therefore teach the mothers to dilate the anus regularly with a lubricant gloved little finger.

In our study, postoperative complications developed in group II (staged PSARP) more than group I (one stage PSARP) as in the study of Liu et al.⁽³⁾ Postoperative clinical evaluation of both groups according to modified Wingspread scoring showed better scoring of group I than group II. In the study of Liu et al.⁽³⁾ there were no significant differences between both groups. This can be explained by the number of our cases were smaller than of Liu et al.⁽³⁾ and shorter follow up period.

Therefore, the current desire of pediatric surgeons should be definitive operations for these patients in the neonatal period without an initial diverting colostomy. A larger series will be necessary for definitive conclusions, but this preliminary result, if maintained, offers a new hope for these children and their families.

We can conclude that one stage PSARP is a safe and feasible procedure for correction of high and intermediate imperforate anus. One stage PSARP can achieve better clinical outcomes and fewer complications than three-stage procedure. To complete the safety and feasibility of one stage PSARP, this procedure must be performed by an experienced pediatric surgeon.

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