

Original Article

THE RESULTS OF POSTERIOR SAGITTAL ANORECTOPLASTY
IN ANORECTAL MALFORMATIONS

Ahmad Khaleghnejad-Tabari MD*, Mahmood Saeeda MD**

Background: Posterior sagittal anorectoplasty (PSARP) is the newest and most-widely-used technique for correction of anorectal malformations (ARMs). In the present investigation, the functional outcomes of PSARP and also the relationship between the complications and the sacral ratio (SR) have been studied.

Methods: The study group included 49 patients (25 males and 24 females) with ARMs, operated on by the PSARP technique during 1995 – 1999. The patients had been followed up for at least 4 years. Those with mental retardation were not included in this retrospective study. For objective evaluation of the sacrum, the SR was calculated in all of the patients.

Results: In the female patients, rectovestibular fistula (46%) and in the males, perineal fistula and imperforate anus without fistula, each with equal frequency (28%) were the most common anomalies. The mean SR in the study group was 0.72 ± 0.04 . SR was 0.67 ± 0.03 among patients who had associated urogenital anomalies, 0.69 ± 0.04 in patients suffering from soiling, and 0.67 ± 0.02 in patients who had postoperative fecal incontinence. The most common complication following PSARP was soiling (44.9%) and then constipation and fecal incontinence in order of frequency. None of the cases developed urinary incontinence or other urinary complications after PSARP. Seventy-three percent of the patients had voluntary bowel movements (VBMs) and 51% were totally continent.

Conclusion: Although the PSARP has a negligible complication rate, the success and outcome of the surgical correction in view of the bowel function depend on the development of the sacral nerves. SR reflects the sacral bone development and can be easily calculated by a pelvic AP film. Considering the lower SR in patients suffering from postoperative soiling and fecal incontinence, in comparison to the normal group (0.77), SR could be used as a prognostic index to predict the probability of achieving total continence following PSARP.

Archives of Iranian Medicine, Volume 8, Number 4, 2005: 272 – 276.

Keywords: Anorectal malformations (ARMs) • imperforate anus • posterior sagittal anorectoplasty (PSARP) • sacral ratio

Introduction

Anorectal malformations (ARMs) are common anomalies encountered in the neonatal period with a wide spectrum of presentations. Since 1982, the description of posterior sagittal anorectoplasty (PSARP) by de Vries and Peña, it has gained popularity among pediatric surgeons and so PSARP is currently the

most-widely-used technique for correction of ARMs.¹⁻⁴

Considering that the functional outcomes of PSARP have not yet been assessed in Iran, this study reviews both intraoperative and postoperative complications of this technique along with the relationship between sacral ratio (SR) and later functional problems such as fecal incontinence and soiling.

Materials and Methods

Between 1995 – 1999, at the Department of Pediatric Surgery, Mofid Children's Hospital, 49 patients including 25 boys (51%) and 24 girls

Authors' affiliations: *Department of Pediatric Surgery, Shaheed Beheshti University of Medical Sciences, **Milad General Hospital, Iranian Social Security Organization, Tehran, Iran.

Corresponding author and reprints: Ahmad Khaleghnejad – Tabari MD, Department of Pediatric Surgery, Mofid Children's Hospital, Tehran, Iran. Fax: +98-21-22251736.

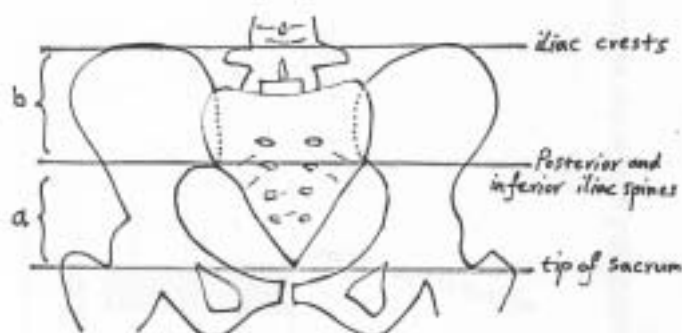


Figure 1. Sacral ratio in the AP view. The transverse lines are drawn across the uppermost portion of iliac crests, posterior iliac spines, and the lowermost radiologically visible point of sacrum ($SR = a/b$).

(49%) who had suffered from some forms of ARMs and treated by a surgeon, were included in this study.

All of the patients with high-type anomalies (37 cases), underwent a divided loop high sigmoid colostomy via a curved incision in the left lower quadrant with tapering of the distal stoma, as mucous fistula positioned at the medial corner of the incision and a proximal matured stoma at the uppermost portion of the incision. We routinely fixed the seromuscular coat of the bowel only to the peritoneum (silk) and subcutaneous layer of the skin, with an absorbable suture material.

While performing a thorough evaluation to rule out the associated urogenital, cardiovascular,

skeletal, and vertebral anomalies, the SR of every patient was calculated and then under optimal conditions the patients underwent PSARP. Figure 1 shows the SR of a normal pelvis in an anteroposterior (AP) film.

All records of the cases were reviewed and the early and late postoperative complications (urologic and gastrointestinal) were assessed during the follow-up visits. The three parameters of bowel function used in this study were: 1) voluntary bowel movements (VBM), 2) soiling, and 3) constipation.

Also, the relationship between SR and functional complications was evaluated and a comparison between the groups was carried out by

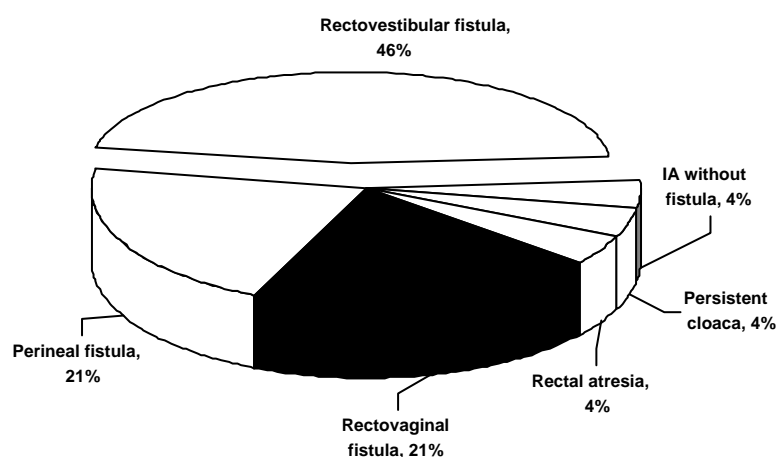


Figure 2. Types of anomalies in the female patients. IA = imperforate anus.

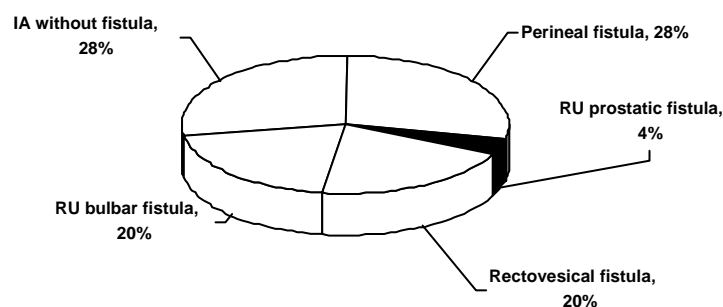


Figure 3. Types of anomalies in the male patients. IA = imperforate anus; RU = rectourethral.

t-test, using the SPSS statistical package and *P* values of less than 0.05 were considered as significant.

The duration of follow-up was from 4 to 8 years.

Results

The most common anomalies encountered in the female patients were rectovestibular and then perineal fistulas. Figure 2 shows the frequency of anomalies in the female patients. In the male patients, the most common malformations were perineal fistula and imperforate anus without fistula (Figure 3).

Forty-one percent of the patients had associated

anomalies and this frequency was higher among patients with high-type malformations (51%). On the other hand, only 8.3% of the patients with perineal fistula had associated anomalies. The most frequent associated anomalies were, in order of frequency, urogenital, skeletal, cardiovascular, and gastrointestinal defects.

During PSARP no injury to the ureters, vas deferens, or other parts of urinary system occurred.

Early postoperatively, stenosis of neoanus developed in 6 patients (12.2%) which was treated by dilatation and bougienage in one case, cutback appeared in another one, and Y-V anoplasty in four other patients.

None of the patients developed wound infection, mucosal prolapse, dehiscence of

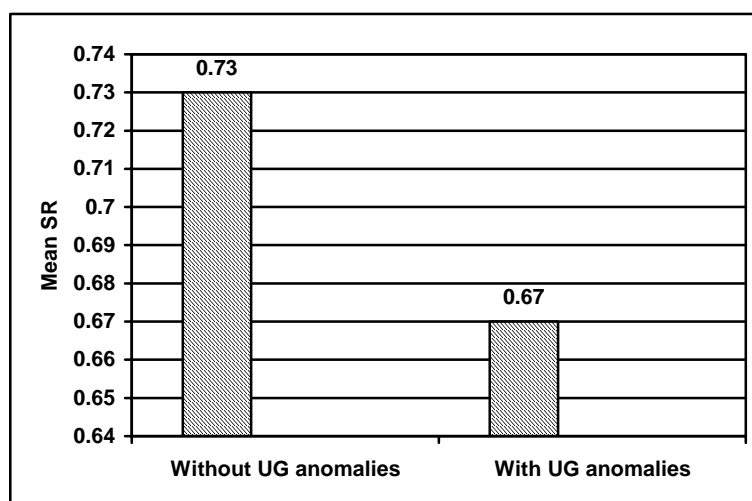


Figure 4. Sacral ratio in patients with and without associated urogenital (UG) system anomalies (*P* < 0.05).

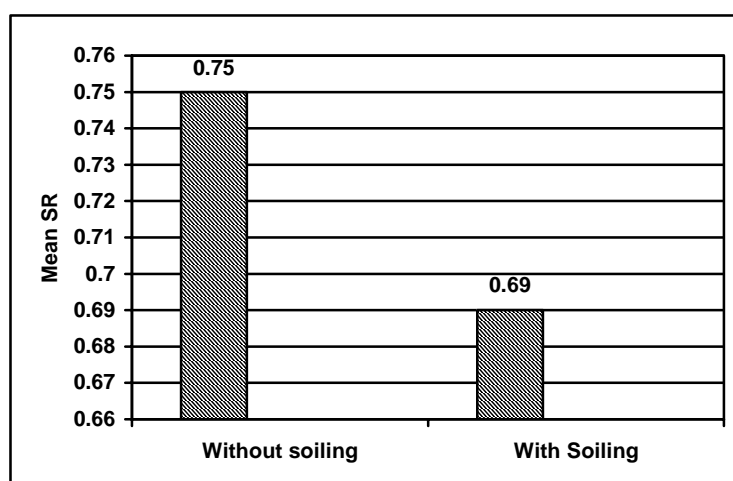


Figure 5. Sacral ratio in patients with and without soiling ($P < 0.05$).

anastomosis, or transient femoral nerve palsy following PSARP.

Among postoperative urologic complications, none of our cases developed any form of complications like urinary incontinence, urethral stricture, or recurrence of fistula.

Two patients (4%) had “aganglionic bowel”, confirmed by histopathologic reports. They underwent anorectal myectomy and one of them who did not respond to this procedure, was treated by pullthrough (Soave) procedure. Both of these cases of Hirschsprung’s disease have normal bowel habit now.

The most frequent bowel function complications were soiling (44.9%), constipation (30.6%), and fecal incontinence (26.5%).

Total continence was present in 51% of the patients after PSARP.

The mean SR was 0.72 ± 0.04 among our cases.

The normal SR is considered to be 0.77. SR of the patients with associated urinary system anomalies was 0.67 ± 0.03 (Figure 4).

The patients who developed soiling and fecal incontinence had SR of 0.69 ± 0.04 and 0.67 ± 0.02 , respectively (Figures 5 and 6). There was no significant difference between SR of the patients with postoperative constipation and those patients who did not develop this problem.

Discussion

No urologic complication developed after PSARP in our cases. In one study, the incidence of ureteric or vas injury was 0.18% and urinary incontinence 9.3%.³⁻⁵ The reported 0.45% incidence of wound infection after PSARP was never seen in our patients.⁴

Following PSARP, 12.7% of our patients

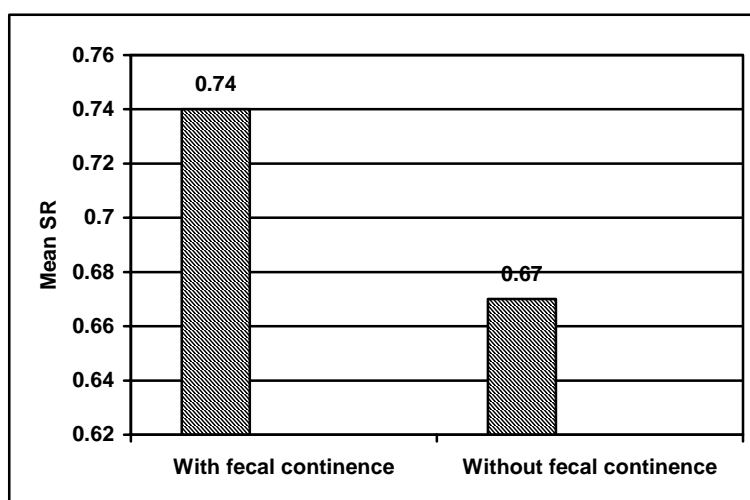


Figure 6. Sacral ratio in patients with and without fecal continence ($P < 0.05$).

developed anal stenosis. In one study, 30% of the patients had this problem after PSARP.⁶

While the incidence of mucosal prolapse has been reported to be 23%, none of our patients developed this complication.⁶

The bowel function of each patient was evaluated independent of any medical treatment, such as the use of suppositories, laxatives, or enemas. VBMs are defined as the act of feeling the urge to use the toilet for a bowel movement and the capacity to verbalize it and to hold it until the patient reaches the bathroom. Soiling is defined as the involuntary leakage of small amounts of stool, which produces smearing of the underwear. Constipation is the incapacity to empty the rectum spontaneously (without help) everyday.

Patients who had VBMs and never soiled, were considered totally continent.⁵ The incidence of soiling and constipation in our study group was lower than the other studies, which have reported values of 57% and 43.1%, respectively. However, fecal incontinence was similar to the results of other studies (26%).³⁻⁸

Seventy-three percent of our patients had VBMs, which correspond to the results of other studies (74.3%).³⁻⁷ Fifty-one percent of the cases in our study were totally continent, whereas this value is between 35% and 58% in other studies.³⁻¹⁰

As in other studies, soiling and fecal incontinence were more prevalent in high anomaly cases and constipation was more common in the low-type anomalies.⁵⁻¹¹

SR is indicative of sacral bone and nerve development. The SR value of our patients was lower than the normal value. This ratio was even significantly lower in the cases with concomitant urinary system anomalies, those with postoperative

soiling, and fecal incontinence.⁷

Considering the low mortality and complication rates along with acceptable function results, it seems that PSARP is a fully-suitable, safe, and effective method for surgical correction of anorectal malformations.

References

- 1 Peña A, de Vries PA. Posterior sagittal anorectoplasty, important technical considerations and new applications. *J Pediatr Surg.* 1982; **17**: 796 – 811.
- 2 de Vries PA, Peña A. Posterior sagittal anorectoplasty. *J Pediatr Surg.* 1982; **17**: 638 – 643.
- 3 Kiely EM, Peña A. Anorectal malformations. In: O'Neill JA, Rowe MI, Grosfeld JL, et al, eds. *Pediatric Surgery*. 5th ed. St. Louis: Mosby; 1998: 1425 – 1448.
- 4 Peña A. Imperforate anus and cloacal malformations. In: Ashcraft KW, Holder TM, eds. *Pediatric Surgery*. 2nd ed. Philadelphia: Saunders; 2000: 473 – 492.
- 5 Peña A. Anorectal malformations: experience with the posterior sagittal approach. In: Stringer MD, Oldham KT, Mouriquand PDE, et al, eds. *Pediatric Surgery and Urology*. Philadelphia: Saunders; 1998: 376 – 385.
- 6 Nixon HH, Puri P. The results of treatment of anorectal anomalies: a thirteen- to twenty- year follow-up. *J Pediatr Surg.* 1977; **12**: 27.
- 7 Peña A. Results in the management of 322 cases of anorectal malformations. *Pediatr Surg Int.* 1988; **3**: 105 – 109.
- 8 Peña A. Anorectal malformation. *Semin Pediatr Surg.* 1995; **4**: 35 – 47.
- 9 Gil-Vernet JM, Asensio M, Marhuenda C, et al. Nineteen years experience with posterior sagittal anorectoplasty as a treatment of anorectal malformations. *Cir Pediatr.* 2001; **14**: 108 – 111.
- 10 Martins JL, Lederman HM, Pinus J. Clinical and radiological postoperative evaluation of posterior sagittal anorectoplasty in patient with upper and intermediate anorectal malformations. *Rev Paul Med.* 1997; **115**: 1566 – 1569.
- 11 Rintala R, Lindahl H, Louhimo I. Anorectal malformations: result of treatment and long-term follow-up in 208 patients. *Pediatr Surg Int.* 1991; **6**: 36.