

# Does fecal continence improve with time after posterior sagittal anorectoplasty for high type imperforate anus?

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## Abstract

**Background:** anorectal malformation represent a spectrum of defects, which may be benign, non complex with a good functional prognosis, to more severe malformations involving the genitourinary system with poor prognosis for bowel and urinary function.

**Aim:** to assess fecal continence after posterior sagittal anorectoplasty (PSARP) with its relation to the post-operative time and to describe the complications of PSARP.

**Patients and method:** this prospective study was conducted in the pediatric surgery department of Al-Kadhymia teaching hospital. The duration of the study was five years from 1st January 2009 to the 31st December 2013. Kelly's methods was applied for assessing the grade of continence after 6 months, one year, and two years after closure of colostomy. Also we describe the complications of PSARP after closure colostomy. PSARP was performed according to Pena method & the results were evaluated after colostomy closure.

**Results:** forty patients with high type imperforate anus were included in this study. They were 25 males (62.5%) and 15 females (37.5%). Genitourinary anomalies were the commonest associated anomalies. There was no accidental defecation in 12 cases (30%) after six months, and 15 cases (37.5%) after two years, while there was constant defecation in 4 patients (10%) after 6 months, in 3 patients (7.5%) after 1 year, and in two patients (5%) after two years. Wound infection was the commonest complication and occurred in 8 patients (20%), followed by rectal prolapse in 7 patients (17.5%).

**Conclusion:** Initial poor results should not discourage the surgeon as the condition of the patient and grade of the continence keeps improving as child grows.

**Key words:** imperforate anus, Kelly's method, posterior sagittal anorectoplasty.

## INTRODUCTION

Anorectal malformation is one of the commonest causes of intestinal obstruction in the newborn, occurring in 1 in 5000 live births. Imperforate anus has been a well-known condition since antiquity.

For many centuries, physicians, as well as individuals who practice medicine, tried to help these children by creating an orifice in the perineum.<sup>1</sup> There are many different subtypes of anorectal malformations, and they are often associated with other congenital defects, such as vertebral, anal, cardiac, trachea-esophageal, renal and limbs. Surgical correction of these anomalies is difficult as the rectum and anus have lost their

relationship to the sphincter muscles, which themselves may be abnormal in their development and have a poor nerve supply.<sup>2,3</sup>

The management of ARM is still affected by some unsolved problems. Pena advocates 3 - staged management – colostomy at birth, PSARP, and closure of the colostomy.<sup>4,5</sup> This surgical approach is considered the most effective in preventing incontinence. In the last two decades, with the advent of laparoscopy, new approaches to anorectal malformations (ARMs) were proposed by Georgeson.<sup>6</sup> One- stage repair of high and intermediate anorectal anomalies, both in males and females without protective colostomy has been proposed by some surgeons in the last two decades, in

males and females with non-communicating lesions, one- stage repair should be done in the first 48 hours of life. In females with rectovestibular fistula this can be deferred till the age of 4-8 weeks because gastrointestinal tract can be decompressed through the fistula.<sup>7,8</sup>

Continence is the major issue related to PSARP. There are various methods of assessment of degree of continence after PSARP. Some methods like Goon HK<sup>8</sup> and Bhavnagar V<sup>9</sup> are used for qualitative assessment, and others like tempelton and Diteshiem<sup>10</sup> and Kelly's<sup>11</sup> method used for quantitative assessment.<sup>11</sup> The Kelly's score of continence : this system of scoring awards points for three basic parameters .An overall score of 5-6 is considered good , 3-4 fair and 0-2 poor. It is by far the simplest of all scoring system and the easiest to apply even in the office setting.( table 1).

**Table (1) Kelly's method of fecal continence assessment<sup>[11]</sup>**

A	staining	Score
	No staining, always clean	2
	Occasional staining	1
	Always stained	0
B	Occurrence of accidental defecation	Score
	None	2
	Occasional accident, feces – flatus escape	1
	Constant	0
C	Strength of sphincter squeeze on digital examination	Score
	Strong and effective squeeze	2
	Weak and partial squeeze	1
	No contraction	0
D	Total score (range)	0-6 points
	Good	5-6 points
	Fair	3-4 points
	Poor	2 points or less

## PATIENTS AND METHODS

This is a prospective study which was conducted at pediatric surgical department of Alkadhyia Teaching hospital . Forty cases of high type of ARMs were managed between the 1st January 2009 to the 31<sup>st</sup> December 2013.The patients were registered for the study at the time of diagnosis, and were followed up to the definitive treatment and fortnightly intervals subsequently. Posterior sagittal anorectoplasty (PSARP) by Pena was performed in all our cases. In all children with ARM in this series, the type of imperforate anus was determined depending on the basis of perineal appearance, presence or absence of meconium within urine, or on the perineum, and cross-table lateral film of the pelvis in the prone position in questionable cases and we excluded the low\_ type imperforate anus from this study. An intravenous urogram, and a micturating

cystourethrogram were also performed in cases where urological anomalies were detected by ultrasonogram or suspected on clinical grounds. Double-barreled descending colostomy was performed at time of diagnosis, usually at the second day of life, except those with vestibular anus, which was done two weeks prior to PSARP.A preoperative distal colostogram was performed 3-4 weeks prior to definitive surgery (which usually done at 4-6 months of patient's age) to define the anatomy of the distal bowel, and to establish the site of any fistulous connection with genitourinary tract .During follow up, all the patients underwent rectal examination to assess the sphincter tone, presence of any rectal prolapse, or a tight anal ring. Specific questions were asked to the parents about incontinence, and constipation. The assessment for incontinence and constipation started 6 months, one year, and two years after closure of the colostomy. The assessment is done according to the Kelly's method for continence assessment. Results were recorded and tables were done.

## RESULT

Forty patients underwent PSARP for high type ARM during the study period . There were 25 males (62.5%) and 15 females (37.5%). The most common type of ARM in male patients was a recto- bulbar urethral fistula, and it occurred in 15 patients (60%) followed by a recto- prostatic urethral fistula (6 patients:24%), two patients(8%) had anorectal agenesis without fistula, while recto\_ bladder neck fistula, and rectal atresia occurred in one patient (4%) for each one. Anovestibular fistula was the most common type in female patients (11 patients:73.3%), two patients(13.3%) had imperforate anus without fistula; one of them had Down syndrome and two patients(13.3 %) had persistent cloaca.

Various associated congenital anomalies were noted, and the genitourinary anomalies were the most common and occurred in 30% of our patients (table2).

**Table (2) associated congenital anomalies**

Associated congenital anomaly	No. of cases	%	male	female
Genitourinary	12	30%	9	3
cardiovascular	10	25%	8	2
Skeletal and spinal	4	10%	3	1
Gastrointestinal	1	2.5%	1	0
Nervous system	1	2.5%	0	1
<b>Total</b>	<b>28</b>	<b>70%</b>	<b>21</b>	<b>7</b>

Regarding continence according to Kelly's method , there was no staining in 11 patients (27.5%) after 6months, in 16 patients (40%) after one year, and in 20 patients (50%) after two years, while there was continuous staining in 3 patients (7.5) after 2years (table 3).

**Table (3): Fecal staining**

Score	After 6 months	After 12 months	After 2 years
No staining (grade 2)	11 (27.5%)	16 (40%)	20 (50%)
Occasional staining (grade 1)	20 (50%)	18 (45%)	17 (42.5%)
Always staining (grade 0)	9 (22.5%)	6 (15%)	3 (7.5%)
Total	40 (100%)	40 (100%)	40 (100%)

$\chi^2=5.850$ , Degree of freedom (df)=4, p\_value = 0.211

The second component of Kelly's method is accidental defecation .There was no accidental defecation in 12 patients (30%) after six months, and 15 patients (37.5%) after two years , while there was constant defecation in 4 patients (10%) after 6 months , in 3 patients (7.5%) after 1 year, and in two patients (5%) after two years. (table 4).

**Table(4): Accidental defecation**

Score	After 6month	After 1 year	After 2 year
No accidental defecation (Grade 2)	12 (30%)	13 (32.5%)	15 (37.5%)
Occasional defecation (grade 1)	24 (60%)	24 (60%)	23 (57.5%)
Constant defecation (grade 0)	4 (10%)	3 (7.5%)	2 (5%)
Total	40(100%)	40(100%)	40(100%)

$\chi^2=1.045$ , df=4, p\_value= 0.903

The last component of Kelly's method is strength (squeeze) of the anal sphincter on digital rectal examination. There was a strong squeeze in 10 patients (25%) after 6 months, increasing with time to reach 14 patients (35%) after two years, while there is no squeeze on digital rectal examination in 4 patients (10%) after 6 months, decreasing with time to reach 2 patients(5%).(table1).

**Table (5) anal sphincter squeeze on digital rectal examination**

Score	After 6month	After 1 year	After 2 year
Strong squeeze grade 2	10 (25%)	12 (30%)	14 (35%)
Weak squeeze grade 1	26 (65%)	25 (62.5%)	24 (60%)
No contraction (squeeze) grade 0	4 (10%)	3 (7.5%)	2 (5%)
Total	40(100%)	40(100%)	40(100%)

$\chi^2=1.413$ , df=4, P\_value= 0.842

Regarding postoperative complications after PSARP , wound infection was the commonest complication, and occurred in 8 patients (20%) , followed by rectal prolapse in 7 patients (17.5%), while bleeding was the

in the bottom of the list of complications and occurred in 2 patients (5%).( Table 6) .

**Table (6): Complications after PSARP**

Complications	No. of patients	%
Skin infection	8	20%
Rectal prolapse	7	17.5%
Anal stenosis	6	15%
Rectal retraction	3	7.5%
Bleeding	2	5%

## DISCUSSION

The major objectives in management of high ARMs, are the relief of intestinal obstruction if present, restoration of anorectal continuity with optimal sphincter function, early establishment of the brain defecation reflex, and reduction of the physical, and psychological stress to the patient, and his family <sup>12</sup> . Bowel continence depends on the integrity and normal function of three elements: sensation, sphincter, and colonic or rectosigmoid motility. Recent evidence seems to indicate that the most distal part of the blind rectum that communicates with the urinary tract (urinary fistula), seems to have a circular smooth muscle layer that may behave as an internal sphincter, and therefore, it would be advisable to preserve that part of the rectum as much as possible <sup>13,14</sup>.

In this study, we have compiled our results on the basis of observations and examination made after 6months, one year and two years of the colostomy closure. Staining was occasional in 18 patients (45%) after one year, which is higher than that of Nixon study who mentioned that 40% of patients had occasional staining.<sup>14</sup> while Pena found staining in 57% in his study which is higher than our study. <sup>1</sup> All these results are quite different from Rintala, who showed occasional staining in 14% of his patients. <sup>15</sup> There was occasional accidental defecation in 23 patients (57.5%) after two years from the closure of the colostomy in this study which is higher than the study of Nixon who reported that 20% of his cases had the same problem.Rintala gave a figure of 22% for patients having accidental defecation. Regarding sphincter squeeze (contraction),strong contraction was present in 10 patients (25%) after six months, increasing to 14 patients (35%) after two years, which is higher than Amir Hanif study <sup>16</sup> who reported a strong squeeze in 23.3% of his patients , but it is quite lower than that of the study of Kubota <sup>17</sup> , who showed a good squeeze in 55% of patients undergone PSARP.

Wound infection was the most frequent early complications after colostomy closure, for patients who

underwent PSARP, and was present in 8 patients (20%), which is lower than Amir Hanif's study who reported (33.3%) of his patients had wound infection, while Nakayama<sup>19</sup> described wound infection as a major early complication occurring in 23% of patients.

Among the late complications, rectal prolapse occurred in 7 patients (17.5%), followed by rectal stenosis in 6 patients (15%), which was different from Nixon's study who reported anal stenosis as a major late complication in 30% of patients in his series, but it was almost similar to Amir Hanif's study who noted the anal stenosis in 15% of his series and also similar to Nadeem et al. who noted 15% on his patients had rectal prolapse.<sup>18</sup> Thus, many patients with anorectal malformations achieve a very satisfactory bowel continence, whereas others either remain fecal incontinent, or suffer from important functional disorders. The problem of incontinence imposes considerable strain on the child and his family.

During the study period it was noted that the grade of continence kept improving as the child grew older i.e. after two years the patients were more continent than they were after six months.

### **Conclusion**

Initial poor results regarding fecal continence after repair of high ARMs should not discourage the surgeon and the family, as the condition of the patients and the grade of continence keep improving as the child grows.

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