

## Defecation Patterns after Posterior Sagittal Anorectoplasty with an Objective Scoring System<sup>†</sup>

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= Abstract = **Imperforate anus, the common name representing a wider spectrum of anorectal malformations in newborns is one of the major congenital lesions in pediatric surgery. Since the establishment of pediatric surgery in Seoul National University (1978), more than 500 cases of anorectal anomalies had been treated up to 1990. To evaluate the quality of life after corrective treatment, defecation patterns were studied using clinical Kelly scores in 90 patients with high type ano-rectal anomalies repaired during the 1978-1985 period. These 90 patients were treated by two surgical repair methods (26 Rehbein, 64 Pena). Not only the continence scores but also other aspects of social adaptation as well as an index of quality of life were compared with a control group. Although precise anatomical repair under direct view (Pena) will give a better defecation pattern compared to the blind type of abdomino-perineal repair, their long term adaptation is not significantly superior. This study showed that the function is not always the net result of anatomic repair. Thus, the importance of the initial corrective operation is again emphasized.**

Key Words: *Imperforate anus, Anorectal malformations, Posterior sagittal anorectoplasty, Kelly score, Incontinence*

### INTRODUCTION

Potts (1959) made the famous remark about 3 decades ago: "In general, atresia of the rectum is more poorly handled than any other congenital anomaly of the newborn." Unfortunately, even after 30 years, current status

is not that greatly different. The purpose of this study is to analyze with an objective scoring system the results of the correction of 90 cases of high type imperforate anus who were treated during the 1978-85 period and were followed up for more than 6 years (6-13.5 years). Most pediatric surgeons agree that these imperforate anus or anorectal malformations are one of the most difficult, unsolved problems. It is well known that the term "imperforate anus" has been used for a long time. But it is too simplified and non-descriptive. Ano-rectal malformation is a more proper term. But, for convenience, it will be used interchangeably in this study. Since the

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establishment of the first pediatric surgical units in universities in Korea, a fairly large number of patients were collected during earlier years. It was handled by a single surgeon in the earlier stage. Anorectal malformation is the most common congenital anomaly in our patient population. This does not mean we have an epidemic of this disease. It simply means we have more patients compared to other hospitals in Korea.

### MATERIALS AND METHODS

During the 1978-1990 period, more than eight hundred operations were performed for the repair of imperforate anus, although the actual number of anomalies was 539. One hundred and seventyone patients or thirtyone per cent belonged to the high type anomaly. For the high type, the Rehbein type abdominoperineal repair (Rehbein 1967) was used at the beginning (1978-1981 period). Then, the posterior sagittal approach (deVries and Pena 1982) has been used since 1982 (Table 1).

For the objective evaluation of defecation patterns, clinical Kelly (1972) scores have been used. Zero to two points are given to each aspect of continence of the fecal stream, staining of the anus or underpants, and sphincter contraction on digital examination. To make a fair comparison, new cases of both types of corrective operation are analyzed in detail. To test the correlation with other scoring systems in this study, Templeton's (1985)

Table 1. Number, operative methods of imperforate anus by study period

groups	1978-81	1982-85	1986-90
total	26	69	76
operation	Rehbein	Pena	Pena
available for f/u	26	64	
lost to f/u	0	1	
operative death	0	1	
unrelated death		3	
new, primary repair	20	44	
converted to Pena	(6)		
low type	135	109	96

f/u: follow up

quantitative continence scores were compared to Kelly's. Toilet training, accidents, the need for extraunderpants, social problems, activity restriction and presence of rashes were given scores of 0, 0.5, and 1. For fair comparison, 1981 and 1982 results were studied. This close proximity of repair periods can minimize the differences in the surgeon's skill level. Finally, to check the satisfaction level of parent/or patient, a scoring system was made by us (Table 2). To emphasize social activity, higher scores were given to school, camp or overnight trips, sport and popularity among friends. To give a similar feeling, 0-2 were regarded as unhappy and scores of 5-6 were regarded as happy.

Table 2. Scoring of satisfaction level, both parents and patients

1) Will you take another operation to improve your condition a little?		
yes (0 point)		no (1 point)
2) Will you take another operation to improve your condition significantly		
yes (0 point)		no (1 point)
3) Is you/your children socially continent?		
missing school yes (0 point)		no (1 point)
missing camping trip: yes (0 point)		no (1 point)
missing sport activity: yes (0 point)		no (1 point)
unpopular among friends: yes (0 point)		no (1 point)

1 point to each "No": happy (6-5 point), unhappy (0-2 points)

## RESULTS

### 1. Continence result

The results of clinical Kelly scores on 3rd, 6th year post-repair and current year (1992) are in Table 3. As a whole, neither Rehbein nor Pena groups showed significant improvement as time passed. But new patients in each group and redo Pena showed some significant improvement in mean value. But, for the new cases, although there is statistically significant improvement in mean Kelly scores, there are no significant changes in the proportion of so-called good (score 5-6), fair (score 3-4) and poor (score 0-2) groups.

Table 3. Clinical Kelly score(mean) at 3rd, 6th year post-repair

	3rd year	6th year	Current(1992)
26 Rehbein	3.9	4.2	4.3
20 new cases *	4.0	4.3	4.5
6 reoperation	3.8	3.9	4.0
64 Pena	4.2	4.5	4.6
44 new cases *	4.5	4.8	4.9
20 redo *	2.9	4.0	4.2

\*: statistically significant improvement in mean value.

Table 4. Comparison of Kelly score and Templeton/Ditesheim score in patients 1981-82 group (11 Rehbein, 29 Pena)

scoring system (year)	clinical Kelly (score 0-6)	radiologic Kelly (score 0-6)	Templeton score (score 0-5)
11 Rehbein* (1981)	mean 4.27* (2-6)	mean 4* (2-6)	mean 3.18** (1.5-4.5)
29 Pena*** (1982)	mean 4.75 (2-6)	mean 4.83 (2-6)	mean 4.15 (1.5-4.5)

\*:2 converted Pena

\* correlation coefficient:kappa= 0.9401

\*\* kappa=0.9004

\*\*\*: in 29 Pena, three scoring system is significantly correlated.

### 2. Correlation with other scoring systems

Both clinical and radiologic Kelly scores were compared to the Templeton/Ditesheim scoring system for the patients of the 1981-82 period. The close proximity of year in the two group was to provide fairness of comparison (Table 4). These three scores are statistically correlated in mean value.

### 3. Parent/patient satisfaction scores

These Kelly's assessments were compared with our parent satisfaction scores. It was found that these two scoring systems are very closely related in most cases (Table 5). But this parent scoring system was only made last year, its real value has to be tested more over time.

In summary, based on these findings, anatomic repair under direct vision (posterior sagittal approach) gave the best results at the moment. The initial operation is so important because time does not improve this much. The Kelly score is very useful, and closely correlates with clinical status. Parent satisfaction levels were tested. These gave a very close correlation to the Kelly as well as other objective scores.

## DISCUSSION

At the end of the 20th century, as death from ano-rectal malformation became less likely,

Table 5. Correlation between subjective feeling and Kelly score in 1992, expressed as per cent of each group:

	(Kelly : No.:	good	fair	poor)
Rehbein	20	45%	30%	25%
happy (5-6)	6 (30%)			
unhappy(0-2)	10 (50%)			
Pena	44	60%	25%	15%
happy (5-6)	24 (54%)			
unhappy (0-2)	15 (34%)			

(by Spearman rank correlation coefficient:rs P<0.01)  
Kelly scores were expressed as good, fair, and poor group on top row.

incontinence became a major problem in dealing with this anomaly (Stephens and Smith 1971). More precise anatomic repair became surgeons' aim since they saw many incontinent unhappy children. The main controversies are about the anatomy of the sphincter of the rectum (deVries and Cox 1985, Pena 1991, Okada 1992) and the assessment of continence. Since many surgeons (Swenson and Donnellan 1967, Kiesewetter 1967, Kim 1987) report their results with remarks like "poor, fair and good", an objective type of system is required to evaluate and compare the results of repair. Stephens and Smith (1971) introduced what is known as the Kelly score. It is the most well-known continence scoring system. This scoring system is over simple. But it is useful even for retrograde study since one can easily observe if they have had an accident, smearing of undergarments, and the power of rectal squeeze. In this study, Kelly's scoring system of incontinence was used for three reasons: its originality and easiness to check, and its close correlation with other scoring systems. All one has to do is ask if the patient has had an accident in defecation, stained underpants, and do a rectal examination. Kelly (1969) also used radiologic evaluation on these patients to add credibility. Since then, many systems of scoring have been devised by several authors. (Rehbein 1967; Stephens 1971; Templeton and Deteshein 1985). Stephens/Smith also advocated use of other

parameters, such as rectal sensation, stool consistency, appearance of the anus and others (age, mentality, social/parental adequacy). Other parameters are very important. But very difficult to score objectively. Kelly suggested combining clinical and radiologic scoring together to strengthen his over simple clinical score. Although there are numerous newly advocated objective scoring systems, we are quite satisfied to use this original clinical score.

In this study, clinical Kelly scores are closely correlated to the actual quality of life, especially the level of satisfaction of both parents and patients. Improvement of Kelly score per se can be observed in the new cases, especially in patients with Pena operations. But change of class (good, fair, poor) is rare. In other words, the initial corrective operation is very critical since significant improvements over time are uncommon in this study. Kelly scores in the reoperated group showed very poor results which is also closely correlated to the level of satisfaction. However, it is not certain if the Kelly score can be used as a criterion for reoperation. Sphincter tone with digital rectal examination is still the most reliable criterion for reoperation in our experience.

It is very difficult to get a Kelly score during the first 2 years after surgery. For the evaluation of that period, cine radiographic scores are more reliable. But in most cases, early assessment is not required unless it is a reoperation. For more satisfactory results after corrective surgery, controversies on the anatomy and function of the "pelvic muscle complex" should be resolved. Also a more precise assessment can be achieved only after the resolution of controversy.

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