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The Correlation between Types of Hipospadia and *Hypospadias Objective Penile Evaluation Score* in Padang

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Authors' contributions

This work was conducted in collaboration among all authors. Author HP collected the data, searched the literature, wrote the draft and performed the research. Author YZ performed the surgery, designed the study model and supervised the work. Author EM performed the surgery and supervised the work. Author HB designed the statistical analysis and supervised the work. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: Hypospadia was an abnormal growth of the penis where the uretral fold failed to grow led to the meatus urethra located on the proximal ventral penis with or without chorde. The incidence of hypospadias was 1 per 250-300 of male children. The treatment is urethroplasty. The purpose of the hypospadia repair is to create functional, validity, and cosmetically outcome neourethra.
Methods: This is an analysis observational study with cross sectional comparative design. Total of the sample was 26. The HOPE score was calculated using physical examinations and the picture taken by a DLSR D 5300 camera.

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Results: The percentage of satisfied patient based on HOPE score was higher in distal hypospadia compared to the proximal hypospadia (69,2%) and there was a significant difference between the types of hypospadia and HOPE score (p<0,05).
Conclusion: There is a significant difference between the hypospadia types and HOPE Score, where the distal hypospadia had better HOPE Score.

Keywords: Hypospadias types; HOPE score; urethroplasty.

1. INTRODUCTION

Hypospadias is an abnormal growth of penis. There is failure of urethral fold development led the urethral meatus moved from the normal position at penile granular into ventral proximal part of the penis, with or without chorde. [1,2,3,4,5,6,7,8].

The incidence rate is 1 in 250-300 births of male baby. Hypospadias Objective Penile Evaluation *(HOPE)* score is a scoring system to assess the cosmetical outcome of hypospadia repair. *HOPE* score meets the criteria of a valid measurement instrument, including objectivity, and reliability. In Indonesia, from the data obtained, the incidence of hypospadia in some government hospitals also seemed to increase [7,9,10,11,12].

At urology subdivision of M Djamil hospital, Padang, there was increasing rate of urethroplasty action year after year, from 15 cases in 2009-2011, to 65 cases in 2011-2014 [9,13].

Hypospadia pathogenesisis still remain unclear, but there are some risk factors associated with hypospadia, including genetic, environmental, and endocrine factors. Babies born from too young or too old mothers and with low birth weight are at risk to get hypospadia [9].

Hypospadia classification, based on urethral meatus position, is divided into distal and proximal types. Distal hypospadia includes granular, subcoronal, distal penile, midshaft, and proximal penile part. While proximal hypospadia includes penoscrotal, scrotal, and perineal [14].

Urethroplasty technique is growing rapidly. There are more than 200 urethroplasty techniques. Complication of urethroplasty, such as bleeding, hematoma, meatal stenosis, urethrocutaneous fistula, urethra diverticulum, *balanitis xerotica obliterans*, recurrent penile curvature, stricture, intra-urethral hair growth, and could also be an urethroplasty failure. Because the complication of this action is large, so it is necessary to perform post-urethroplasty follow up [1,15].

The aim of modern hypospadia repair is creating neo-urethral functional, straighten the arch and gaining normal penis appearance cosmetically with minimal complication. Since modern hypospadias repair was found, the complication rate decreased. Currently, the focus of hypospadias repair must be in increasing of cosmetical outcome [16,17,18].

Hypospadias Objective Penile Evaluation (HOPE) score is a scoring system to measure cosmetical outcome in hypospadiarepair. HOPE score has fulfilled valid measurement instrumental criteria, including objective, reliable, and valid. HOPE score evaluates penile appearance on five basic surgically repairable items, including meatal position, the form of the gland, the form of penile skin and axis, penile torsion (observed in condition of erection), and penile curvature. The total of HOPE score range from 1 to 10. The interpretation of HOPE score is divided into two groups, not satisfied group with HOPE score ≤ 45, and satisfied group with HOPE score > 45 [14,19].

2. METHODS

This was an observational analytic study with comparative cross-sectional design, conducted from December 2016 to January 2017 at urology department M Djamil Hospital, padang. Home visit was also performed.

This study involved 26 patients with all types of hypospadia who undergone urethroplasty and met the following criteria : patients who undergone urethroplasty more than 6 months before this study conducted with complete wound healing and without further intervention plan.

3. RESULTS AND DISCUSSION

From 26 patients who underwent urethroplasty in this study, 13 patients had proximal hypospadia and 13 patients had distal hypospadia.

3.1 Age Distribution

Table 1 showed that hypospadia was most commonly found in the 10 – 14 years age group (*n* = 6), dan mean age of distal hypospadia was higher than proximal hypospadia (mean 11,5 ± 3,85).

Table 1. Age distribution of patients with hypospadia at M. Djamil General Hospital and Ropanasuri Hospital from December 2016 to January 2017

Age distribution of sample			
Variables	**F**	**%**	**Description**
Age			
Proximal hypospadia			
0 – 4 yrs	2	15,38	Mean: 10,77± 4,36
5 – 9 yrs	3	23,08	
10-14 yrs	6	46,15	
15-19 yrs	2	15,38	
Distal hypospadia			
0 – 4 yrs	0	0	Mean: 11,15± 3,85
5 – 9 yrs	4	30,77	
10-14 yrs	6	46,15	
15-19 yrs	3	23,08	

(Source: Primary data)

Mean age of hypospadia repair surgery in this study was 10,77 years in proximal type and 11,15 years in distal type. In Indonesia, primary hypospadia repair surgery is generally performed at the age of 6 to 18 months, although hypospadia repair at the age of 4 to 6 months had also been reported [20,21,22].

Based on Table 2, the mean of HOPE score in distal hypospadia was higher than proximal type (45.15 ± 2.97 vs 38.69 ± 7.33) and that value was statistically significant (p<0.05), thus we concluded that there is a significant association of the comparison of the mean of HOPE score.

However, this study did not found an association between *HOPE Score* and patients age when the operation is performed or the morphology of the penis before the surgery.

In Table 3 we can see that the percentage of satisfaction level based on *HOPE score* was higher in distal hypospadia compared to the proximal hypospadia (69,2%) and there was a significant difference between the types of hypospadia and *HOPE score* (p<0,05).

Table 2. Comparison of mean of *HOPE score*

Distribution of *HOPE* score		
HOPE score	**Description**	**p - value**
Proximal hypospadia	Mean: 38,69 ± 7,33	0,01
Distal hypospadia	Mean: 45,15± 2,97	

(Source: Primary data)

Many factors led to the high post surgery complications on the proximal type of hypospadia especially in term of the cosmetic outcome, it can be from the process of hypospadia disease, the degree of hypoplastic tissues of the penis, and inadequate surgery techniques [14,23,24].

Patients with proximal hypospadia often complained about the size of the penis after succesful surgery, where the penis is shorter than normal penis and this shorten is getting worse with increasing severity of the disease. This is due to the corpus cavernosum and the *erectile bodies* of the penis is smaller than normal, and also the elasticity of corpus network in penis is lower. Severe *chordae* where the degree of curvature > 30° often occurs after proximal hypospadias surgery, this is due to the inadequate surgical technique. In addition, the *chordae* occurs because of the disproportion of penile corpus growth size, especially when the patient is experiencing puberty [25,26,27].

Mobilization of urethra aggressively on proximal hypospadia repair increased the risk of *ischemic-induced urethral stricture* and *persistent chordae*. The penile glands size 14 mm or less on proximal type of hypospadia increased the complications during surgery, such as the occurrence of tension at the closing process of

Table 3. Comparison of post repair satisfaction level between hypospadia types

The relation of hypospadia type with *HOPE score*							
Hypospadia type	***HOPE score***				**Total**		**p-value**
	Satisfied		**Dissatisfied**				
	f	**%**	**f**	**%**	**f**	**%**	
Proximal	3	23.1	10	76.9	13	100	0.049
Distal	9	69.2	4	30.8	13	100	

(Sourcer: Primary data)

glans led the *glans dehiscence*, *meatal stenosis* and *urethral stricture*. That risk can cause the unsatisfactory cosmetical results [27].

4. CONCLUSION

The majority of proximalor distal hypospadia occur in the age 10-14 years, and the average age of distal hypospadia was higher than proximal hypospadia.

The mean *HOPE Score* on distal hypospadia was higher than proximal hypospadia.

There is a significant difference between hypospadia types and *HOPE Score*, where the distal hypospadia had better *HOPE Score*.

CONSENT

All authors declared that written informed consent was obtained from approved parties (parents or caregivers) for publication of these data.

ETHICAL APPROVAL

All authors hereby declared that the study was approved by the appropriate ethics committee and was performed in accordance with the ethical standards based on the 1964 Declaration of Helsinki.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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