

# Evaluation of Surgical Outcomes in Different Hypospadias Types by HOSE Score

## Farklı Hipospadias Tiplerinde Cerrahi Sonuçların HOSE Skoru ile Değerlendirilmesi

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### What's known on the subject? and What does the study add?

Hypospadias objective scoring evaluation score is an objective and reliable scoring system that can be used to evaluate the results of hypospadias surgery.

### Abstract

**Objective:** We aimed to present outcomes of hypospadias surgery with the help of the Hypospadias objective scoring evaluation (HOSE) system and to demonstrate the reliability of the HOSE.

**Materials and Methods:** Data of patients, who were operated for hypospadias in our clinic between January 2017 and March 2019, were retrospectively analyzed. The parameters included demographic data, location of the meatus preoperative, postoperative complications, follow-up period, recurrence and postoperative HOSE score.

**Results:** A total of 46 patients were included in the study. The mean age of the patients was  $8.5 \pm 5.4$  years. Fifteen patients had distal hypospadias, 13- subcoronal, 9- penile, 6- proximal and 3 had glanular hypospadias. Tubularized incised plate urethroplasty was performed in 35 patients, Bracka 2- stage repair in 6 patients and meatal advancement and glanduloplasty in 3 and, the onlay flap technique was used in 2 patients. The mean postoperative HOSE score was  $14.6 \pm 1.7$ . The lowest HOSE score was found in patients with proximal hypospadias and the highest HOSE score was in those with glanular hypospadias (12.6 versus 15.6) ( $p=0.26$ ). When HOSE scores of the patients were evaluated by a different physician, the mean HOSE score was found to be  $14.5 \pm 1.7$ . There was no significant intraobserver variation (Kappa score: 0.698), ( $p<0.0001$ ).

**Conclusion:** HOSE is an objective and reliable scoring system that can be used to evaluate the outcomes of hypospadias surgery.

**Keywords:** Hypospadias, HOSE, Penile reconstruction

### Öz

**Amaç:** Hipospadias cerrahisi sonuçlarını Hipospadias objective scoring system (HOSE) skorum sistemi yardımıyla sunmayı ve HOSE skorumunun güvenilirliğini ortaya koymayı amaçladık.

**Gereç ve Yöntem:** Kliniğimizde Ocak 2017 - Mart 2019 yılları arasında hipospadias nedeni ile opere edilen hastaların verileri retrospektif olarak incelendi. İncelenen parametreler hastaların demografik verileri, hipospadias lokalizasyonu, peroperatif ve postoperatif komplikasyonlar, takip süresi, nüks olup olmadığı, postoperatif HOSE skorundan oluşmakta idi.

**Bulgular:** Çalışmaya toplam 46 hasta dahil edildi. Hastaların ortalama yaşı  $8,5 \pm 5,4$  yıl idi. Hastaların hipospadias me yerleşimleri, 15'i distal, 13'ü subkoronal, 9'u mid penil, 6'sı proksimal, 3'ü glanüler şeklinde idi. Hastaların 35'ine TİPU, 6 tanesine iki basamaklı Braca, 3 tanesine MAGPI ve 2 tanesine onlay flep yapılmıştı. Hastaların postoperatif ortalama HOSE skoru değeri  $14,6 \pm 1,7$  idi. HOSE skoru proksimal hipospadias olanlarda en düşük iken glanüler hipospadias olanlarda en yüksek idi, 12,6'ya karşın 15,6 ( $p=0,26$ ). Farklı bir hekim tarafından aynı hastaların HOSE skorları değerlendirildiğinde ortalama HOSE skoru  $14,5 \pm 1,7$  bulundu. Gözlemciler arasında değerlendirme açısından farklılık bulunmadı (Kappa skoru: 0,698),  $p<0,0001$ ).

**Sonuç:** HOSE skoru hipospadias cerrahisinin sonuçlarının değerlendirilmesinde kullanılabilecek objektif ve güvenilir bir skorum sistemidir.

**Anahtar Kelimeler:** Hipospadias, HOSE, Penil rekonstrüksiyon

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## Introduction

Hypospadias is a common congenital anomaly affecting one out of every 200 to 300 newborn males (1). Hypospadias surgery also aims functional recovery in addition to improving cosmetic appearance (2). More than 200 techniques have been defined for the surgical treatment of hypospadias. Some of these surgical techniques may have more complications (3). While a straight penis in erection, a meatus near the tip of the glans, ability to urinate in a standing position and being able to have sexual intercourse were found to be satisfactory in the evaluation of surgical success in the past, a functionally and cosmetically normal penis is aimed today. Evaluation of hypospadias surgery outcomes sheds light on future clinical practice (4).

Different scoring systems for assessment of hypospadias surgery outcomes have been suggested (5,6,7,8). Surgical success and functional results of hypospadias surgery can be predicted with these scoring systems. Our aim in this study was to present the outcomes of hypospadias surgery performed in our study using the hypospadias objective scoring evaluation (HOSE) system and also to investigate the reliability of the HOSE.

## Materials and Methods

After obtaining local ethics committee approval (protocol no. 2019-241; 20.05.2019), records of patients, who underwent surgery due to hypospadias in our clinic between January 2016 and March 2018, were retrospectively analyzed. The examined parameters were demographic characteristics, location of the meatus, preoperative and postoperative complications, follow-up duration, recurrence data and HOSE score in the postoperative 12<sup>th</sup> month. The HOSE is a 5- point scoring system evaluating meatal location, meatal shape, urinary stream, erection and presence of fistula. The minimum total score is 5 and the maximum is 16 points (9).

Seven out of a total of 55 patients who had hypospadias operation were excluded from the study due to previous hypospadias surgery and two others were excluded as they were over the age of 18 and the study covered 46 patients in total.

## Statistical Analysis

IBM SPSS statistics for Mac version 21 (Chicago, IL, USA) was used for data analysis. While constant variables were given in mean  $\pm$  standard deviation, categorical variables were given in numbers and percentages. The Kolmogorov-Smirnov test was used to test normal data distribution. For the comparison of two groups, the Mann-Whitney U test was used for numerical data and chi-square tests were used for categorical variables. The One-Way ANOVA was used for comparing numerical data of more than two groups. Intraobserver reliability was measured using the kappa coefficient.

## Results

A total of 46 patients were included in the study. The mean age of the patients was  $8.5 \pm 5.4$  years. Fifteen patients had distal (meatus located on the glans or distal shaft), 13- subcoronal (just below the glans penis), 9- penile (in the midshaft), 6- proximal (at the penoscrotal junction) and 3 patients had glanular hypospadias (meatus on the glans penis but not at the tip). Thirty five of the patients underwent tubularised incised plate urethroplasty (TIPU), 6 had Bracka 2- stage repair and 3 had meatal advancement and glanuloplasty incorporated (MAGPI), and the onlay flap technique was used in 2 patients. The average duration of catheterization was  $12.1 \pm 4.6$  days. The average length of hospital stay was  $3.2 \pm 0.9$  days and the average follow-up period was  $22.7 \pm 15.6$  months. Recurrence was observed in 13 patients after  $4.9 \pm 4.8$  months in average. Among the patients with recurrence, 10 (76.9%) had urethrocutaneous fistula, 2 (15.4%) had meatal stenosis and 1 (7.6%) had wound infection. The mean postoperative HOSE score was  $14.6 \pm 1.7$ . While HOSE score was lowest in patients with proximal hypospadias, it was highest in patients with glanular hypospadias (12.6 vs 15.6) ( $p=0.26$ ). 11 patients had a total HOSE score below 14 (23.9%) and 35 patients (76.1%) had 14 and above (Table 1).

When the groups with and without complication were examined, the mean HOSE score in the group with and without complication was  $13 \pm 1.75$  and  $15 \pm 1.05$ , respectively ( $p=0.106$ ).

<b>Tablo 1. Hypospadias objective scoring evaluation</b>	
<b>1) Meatal location</b>	
Distal -----	4
Proximal glanular -----	3
Coronal -----	2
Penile shaft -----	1
<b>2) Meatal shape</b>	
Vertica l -----	2
Circular -----	1
<b>3) Urinary Stream</b>	
Single stream -----	2
Spray -----	1
<b>4) Erectile function</b>	
Straight -----	4
Mild angulation (<10°) -----	3
Moderate angulation (>10°, <45°) -----	2
Severe angulation (>45°) -----	1
<b>5) Fistula</b>	
None -----	4
Single-subcoronal or more distal -----	3
Single-proximal -----	2
Multiple or complex -----	1

Although no statistically significant difference was detected in HOSE score between the groups, the lowest HOSE score was found in the complication group.

When the relationship between surgical method and HOSE score was examined, the mean HOSE score in 35 patients who had TIPU was  $14.9 \pm 1.4$  while it was  $13.5 \pm 2.3$  ( $p=0.167$ ) in those who underwent surgery performed using other methods (MAGPI, onlay flap, Bracka). No significant difference was detected in HOSE score when surgical methods were compared but HOSE score was higher in TIPU group. The mean HOSE score was found to be  $14.5 \pm 1.7$  when the HOSE scores of the patients were evaluated by a different doctor. There was no significant intraobserver variance (Kappa score: 0.698), ( $p < 0.0001$ ).

## Discussion

Hypospadias is one of the most difficult fields of urogenital reconstructive surgery. Many different techniques have been suggested for hypospadias repair. Complication rates, cosmetic appearance of the penis, urination and sexual functions, quality of life and psychosexual life should be considered when evaluating outcomes of hypospadias surgery. Today, different scoring systems are used for evaluating the surgical outcomes. Some of these are HOSE, hypospadias objective penile evaluation (5), Pediatric Penile Perception Score (6), Mureau (7) and Hadidi (8) scores (4). All these different scoring systems have their unique positive and negative aspects. In this study, we used HOSE to evaluate our hypospadias surgery outcomes.

HOSE score was defined by Holland et al. (9) in 2001. In an original study, randomly selected 20 patients were evaluated nearly 12 months after hypospadias surgery and HOSE score was given by four different observers (two doctor, one nurse and one relative of patient) to the patients and no significant intraobserver variation was observed (mean weighted kappa: 0.66). As a result, it was stated that HOSE score was a reproducible, objective outcome measure and independent of the preoperative severity of the defect (9).

In our study, no significant intraobserver variation of HOSE score was observed (Kappa: 0.69).

In a study made by Aulagne et al. (1) on 48 patients aged 20-35 years who had been operated due to severe posterior hypospadias in childhood, 27 follow-up patients were administered HOSE and a quality of life questionnaire prepared by the authors. Satisfaction rate in 21 patients with a HOSE score of 14 or above was 71%, it was 51% in patients with a HOSE score below 14.

In another study including 55 patients, 34.5% of the patients had acceptable outcomes with a total HOSE score of 14-16. HOSE score and uroflowmetry were suggested as simple, non-

invasive and non-expensive techniques for evaluating long-term outcomes of hypospadias surgery (10).

In another study including 99 patients who underwent hypospadias repair using the meatal mobilization technique, 94% of patients reached the maximum of 16 points and 6% had 12-15 points on the HOSE symptom score (11). In our current study, the HOSE score of 14 and above in 76.1% of the patients may be explained by the fact that some of these patients had severe proximal hypospadias.

## Conclusion

HOSE is an objective and reliable scoring system which can be used to evaluate outcomes of hypospadias surgery.

## Ethics

**Ethics Committee Approval:** Ethics committee approval was received on 20.05.2019

**Informed Consent:** All patients had given written informed consent before the surgery for giving permission for the use of the collected data at any time.

**Peer-review:** Internally peer-reviewed.

## Authorship Contributions

Concept: Y.A., E.G., Design: Y.A., E.G., Data Collection and/or Processing: Y.A., E.G., Analysis and/or Interpretation Y.A., E.G., Literature Research: Y.A., E.G., Writing: Y.A., E.G.

**Conflict of Interest:** No conflict of interest was declared by the authors.

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