

Assessment of Post-Operative Cosmetic Results in Hypospadias Patients Using “HOPE” Score

Mohammad Zeeshan Haider¹, Esha Ali^{*2}, Noor Muhammad³, Mohammad Aslam¹

¹Department of Plastic Surgery, Lady Reading Hospital, Peshawar, Pakistan

²Department of Plastic Surgery, Muhammad College of Medicine and Mohammad Teaching Hospital, Peshawar, Pakistan

³Department of Plastic Surgery, Hayatabad Medical Complex, Peshawar, Pakistan

*Corresponding author's email address: eshaali91@yahoo.com

(Received, 24th April 2025, Accepted 22nd July 2025, Published 31st August 2025)

Abstract: Hypospadias is a common congenital anomaly of the male urethra, and surgical correction aims to achieve both functional and optimal cosmetic outcomes. The Hypospadias Objective Penile Evaluation (HOPE) score is a validated tool for assessing postoperative cosmetic appearance. However, data regarding cosmetic outcomes following staged repair techniques remain limited. **Objective:** To evaluate the cosmetic appearance in hypospadias patients using the Hypospadias Objective Penile Evaluation (HOPE) score. **Methods:** This descriptive case series was conducted in the Plastic Surgery Unit at Lady Reading Hospital from October 20, 2018, to April 20, 2019, after obtaining ethical approval. Patients diagnosed with hypospadias and scheduled for Bracka two-stage repair were included. Preoperative assessment and standardised photographs were obtained and evaluated using the HOPE score. A single surgeon performed all surgeries. Postoperative follow-up was conducted at 1 week, 3 weeks, 3 months, and 6 months. Cosmetic outcomes were assessed at 6 months postoperatively using standardised photographs. Data were collected using structured questionnaires and analysed with SPSS version 25. Mean scores were compared, and statistical significance was set at $p < 0.05$. **Results:** The mean patient age was 9.0 ± 4.52 years, with the majority of patients aged 3-10 years. The mean penile curvature and torsion were 38 ± 9.17 degrees. A distal urethral meatus was observed in 80% of cases. Mild metalar, glanular, and skin abnormalities were noted in 60% of patients. HOPE score analysis demonstrated no statistically significant difference in cosmetic outcomes across different age groups ($p = 0.10$). **Conclusion:** The cosmetic outcomes following staged hypospadias repair, as assessed by the HOPE score, were generally satisfactory and not significantly influenced by patient age. Long-term follow-up and comprehensive patient counselling are essential for optimal outcomes. Prospective studies with extended follow-up are recommended to evaluate long-term cosmetic and functional outcomes better.

Keywords: Hypospadias, Hope Score, penile

[How to Cite: Haider MZ, Ali E, Muhammad N, Aslam M. Assessment of post-operative cosmetic results in hypospadias patients using “HOPE” score. *Biol. Clin. Sci. Res. J.*, 2025; 6(8): 125-128. doi: <https://doi.org/10.54112/bcsrj.v6i8.2213>

Introduction

Hypospadias is one of the most common urogenital malformations in male newborns, with a prevalence of approximately 1:200 to 1:300 live births. (1). It is characterised by a ventral displacement of the external urethral meatus, with the urethral opening being located along the underside of the penis from the glans to the perineum. (2). Additionally, penile curvature (chordee), abnormal foreskin distribution, and disturbances of urinary flow may occur. (3). Hypospadias is the most common congenital malformation in male newborns, but its diagnosis is often overlooked before birth. (4). Surgical correction of hypospadias is usually performed in early childhood and aims to achieve several goals: functional restoration of the urinary tract, penile straightening, satisfactory aesthetics, and normal psychosocial development. (5, 6).

In the past, the focus of many surgical techniques was primarily on functional reconstruction, while aesthetic outcomes were often assessed subjectively and without standardised criteria. With growing awareness of the importance of physical appearance, particularly with regard to patients' self-image and future sex life, the objective assessment of cosmetic results is becoming increasingly important.

The "HOPE" score (Hypospadias Objective Penile Evaluation) was developed to systematically and objectively assess aesthetic outcomes after hypospadias surgery. (7, 8). This assessment standard takes into account several characteristics, such as the position and shape of the meatus, the appearance of the glans, skin symmetry, and the presence or absence of scars or asymmetries. It serves both as a quality control tool and as a means of comparing different surgical techniques.

The present study aimed to assess the cosmetic appearance of patients with hypospadias using the HOPE score. This will provide reliable data on postoperative aesthetics and help optimise surgical care.

To study the cosmetic appearance in hypospadias patients in terms of the mean using the HOPE score.

Methodology

After approval from the hospital's ethical committee, the study was conducted in the Plastic Surgery unit at Lady Reading Hospital. All patients who fulfilled the inclusion and exclusion criteria were included. They were admitted to the ward through outpatient or referral, investigated, consented, and prepared for Aivar Bracka's two-stage repair. Informed written consent was taken before their formal induction into this study. The meatal site, chordae, and degree of torsion were assessed preoperatively using the HOPE score. Pre-operative photographs were taken. A pre-operative single dose of an injectable antibiotic was given, followed by 5 days of oral treatment. The same surgeon did all the cases to exclude inter-operator bias. Post-operative follow-up visits were scheduled at 1 week, 3 weeks, 3 months, and 6 months. A separate Performa was filled for each patient. The HOPE scoring system was applied to evaluate for penile appearance on the basis of six variables, i.e., the position of meatus, shape of meatus, shape of glans, shape of penile skin, and penile axis, including penile torsion and penile curvature, by comparing post-op pictures at 6 months follow-up visit with standardized reference pictures according to the HOPE score. Scoring was done from 10(perfect) to 1(worst appearance imaginable). Data was collected for six months, and the penis was photographed in a standard 5 different views, respectively dorsal, right lateral, left lateral, ventral overview, and ventral



detail of glans/meatus. These photographs were taken for record-keeping, comparing them with previous photographs and the cosmetic outcome. Informed written consent for the photographs was obtained. The patient's confidentiality was strictly observed in this regard. SPSS Version 20 analyzed the data. Mean ± standard deviation was calculated for quantitative variables, including patient age, penile curvature, and penile torsion. Frequencies and percentages were calculated for the qualitative variables, including the position of the meatus, the shape of the meatus, the glanular shape, and penile skin. Effect modifiers such as age, penile curvature, penile torsion, position of the meatus, shape of the meatus, glanular shape, and penile skin were controlled through stratification. Post-stratification independent T-test/ANOVA was applied, with P-values ≤ 0.05 considered significant.

Results

The mean age of patients was 9±4.52 years, with the majority (53.33%) aged between 3–10 years and the remaining 46.66% between 11–20 years. The mean penile curvature and torsion were both 38±9.17 degrees. Regarding the position of the meatus, 80% had a distal penile location, followed by glanular (6.66%), penoscrotal (6.66%), coronal (4.44%), and mild penile (2.22%). The shape of the meatus was slightly abnormal in 60% of cases, normal in 17.77%, moderately abnormal in 20%, and severely abnormal in 2.22%. Similarly, the glanular meatus and penile skin were slightly abnormal in 60% of patients, normal in 17.77%, moderately abnormal in 20%, and severely abnormal in 2.22% (Table 1). Tables 2 and 3 show the stratification of the Hope Score for penile curvature and penile torsion, respectively, by age in 45 patients. In both cases, the mean score in the 3–10 years age group was 36 ± 9.4, while in the 11–20 years group it was 38 ± 8.70. The p-value for both comparisons was 0.10, indicating no statistically significant difference in Hope Scores between the two age groups for either penile curvature or torsion.

Table 1: Descriptive Statistics of Patient Demographics and Penile Anomalies (n=45)

Variables	Values
Age (Years)	9±4.52
Penile Curvature	38±9.17
Penile torsion	38±9.17
Age Groups	
03-10 years	24(53.33%)
11-20 years	21(46.66%)
Position of Meatus	
Coronal	02(4.44%)
Distal Penile	36(80.0%)
Glanular	03(6.66%)
Mild Penile	01(2.22%)
Penscrotal	03(6.66%)
Shapes Of Meatus	
Normal	08(17.77%)
Slightly Abnormal	27(60.0%)
Moderately Abnormal	09(20.0%)
Severely Abnormal	01(2.22%)
Glanular Meatus	
Normal	8(17.77%)
Slightly Abnormal	27(60.0%)
Moderately Abnormal	9(20.0%)
Severely Abnormal	1(2.22%)
Penile Skin	
Normal	8(17.77%)
Slightly Abnormal	27(60.0%)
Moderately Abnormal	9(20.0%)
Severely Abnormal	1(2.22%)

Table 2: Stratification of Hope Score of Penile Curvature with respect to Age (n=45)

Age groups	Mean±SD	p-value
3-10 Years	36±9.4	0.10
11-20 Years	38±8.70	

Table 3: Stratification of Hope Score of Penile Torsion with respect to Age (n=45)

Age groups	Mean±SD	p-value
3-10 Years	36±9.4	0.10
11-20 Years	38±8.70	

Discussion

The present study aimed to evaluate postoperative cosmetic outcomes in patients with hypospadias using the HOPE (Hypospadias Objective Penile Evaluation) score. The results show that the majority of patients underwent surgery during childhood, with a mean age of 9 ± 4.52 years. More than half of the patients were in the 3- to 10-year-old age group, which is consistent with current recommendations for early surgical correction of hypospadias. Regarding the postoperative assessment, the mean penile curvature and torsion were 38 ± 9.17 degrees, indicating a moderate anatomical deviation. The HOPE score enabled a standardized assessment of the cosmetic outcome, particularly regarding the position and shape of the meatus, as well as the appearance of the penile skin and glans.

The majority of patients (80%) had a distal meatus position postoperatively, which is considered a more favorable cosmetic outcome. The meatus shape was slightly abnormal in most cases (60%), while only a small proportion showed severely abnormal features (2.22%). Similar patterns were also observed in the evaluation of the glans and penile skin. Comparing the HOPE scores between age groups revealed no significant difference (p = 0.10), suggesting that the cosmetic outcome remains comparable regardless of age at the time of surgery. This supports the consistency and reliability of the surgical technique across different age groups.

Hypospadias is one of the most common congenital anomalies with an incidence of about 1 in 300. Hypospadias is defined as a meatal anomaly on the ventral aspect of the penis. It is generally comprised of three associated anomalies: an ectopic meatus, ventral prepuce deficiency, and ventral curvature of the penis (chordae). About 70% comprises distal penile; the rest are midpenile, and the remaining 9% have more severe proximal deformity (9). More than 300 surgical procedures show the lack of surgical ingenuity and dissatisfaction with the outcomes. The goals of modern hypospadias repair are to create a functional neo-urethra, chordae release, and to achieve a cosmetically acceptable appearance of the penis with minimal complications (8, 10). In more than 80% of cases, the meatus is either at the distal or midshaft position, in which case, improvement in cosmetic outcome is the most important indication for surgical management. Boys who underwent such corrections are not often content with the results and tend to be less active in sexual contact than those without hypospadias due to a negative perception of the results. Also, the quality of life of these patients is made miserable by negative penile self-perception, sense of shame, and teasing remarks by mates (11-13). Assessment of outcome includes: complication rate, functional outcome (micturition, sexuality), cosmetic appearance of the penis, and psychological factors such as quality of life and psychosexual life. Most outcome-based studies cover the complication and functional aspect, while the cosmetic outcome is almost totally neglected. Various assessment tools have been proposed to evaluate the cosmetic outcome of hypospadias repair, including HOSE, Mureau, PPPS, Hadidi score, and HOPE score (14-17). Long-term follow-ups and assessment of cosmetic outcomes may have a major impact on future clinical practice. In one study, the HOPE score was analyzed in 79 preoperative and 66 postoperative patients. Mean HOPE score was found to be 30.2±5.9

preoperatively and 43.7 ± 3.4 postoperatively. A significant association was observed between HOPE score and the severity of hypospadias preoperatively, i.e., 36.3 ± 5.4 , 29.6 ± 4.4 , and 21.1 ± 3.5 for glanular, distal, and proximal hypospadias, respectively, and between HOPE score and post-operative outcome, i.e., 45.1 ± 5.4 (8). In our study, the mean and SDs for penile curvature were $38 + 9.17$, whereas those for penile torsion were $38 + 9.17$. (Table No. 2). In another study, post-op comparison was made between the HOPE score and PPPS, in which 42 post-operative patients were included. Parents' perception of the cosmetic outcome was worse than the surgeon's, i.e., 81.13% versus 92.81% (12). As Literature is sparse on the HOPE-score, another study was conducted to correlate the GMS hypospadias score with postoperative complications. 262 patients were enrolled in the study. Mean GMS score was 7 ± 2.5 . 37 patients (14.1%) had 45 complications. A significant association between the total GMS score and presence of any complication ($p < 0.001$) was observed; for every unit increase in GMS score, the odds of any postoperative complication increased 1.44 times (95% CI, 1.24–1.68) (18). In our study, the mean and SDs for penile curvature were recorded as $38 + 9.17$, whereas those for penile torsion were $38 + 9.17$. While the location and shape of the meatus, as well as the presence of a fistula, are relatively straightforward to assess objectively, a key limitation of the HOSE score in our study was the difficulty in objectively evaluating penile straightness and urinary stream. Observing a child or adult during micturition, or inducing an erection for assessment purposes, falls outside the boundaries of accepted cultural practices in many Asian societies, including Malaysia.

However, Xiaozhi Zheng et al. (19) suggested that penile erection can be evaluated either by direct observation by the assessor or through reports from parents. Only a limited number of studies have examined voiding function after urethral repair, and even fewer have focused specifically on patients who underwent distal hypospadias repair without complications. Urethral stricture is a well-known complication following urethral reconstruction, yet the long-term implications of asymptomatic narrowing remain unclear. Current methods used to assess the function of the reconstructed urethra include direct visualization of the urinary stream, voiding cystourethrogram, and uroflowmetry. Notably, Rynja et al. (20) reported a discrepancy between subjective and objective assessments of urinary function in both hypospadias patients and healthy controls, highlighting the need for comprehensive evaluation techniques.

Conclusion

It was concluded that follow-up and adequate counseling of hypospadias patients up to adult life is necessary, although demanding. Long-term assessment should be designed in prospective studies.

Declarations

Data Availability statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department concerned. (IRBEC-LRH-923/18)

Consent for publication

Approved

Funding

Not applicable

Conflict of interest

The authors declared no conflict of interest.

Author Contribution

MZH

Manuscript drafting, Study Design,

EA

Review of Literature, Data entry, Data analysis, and drafting an article.

NM

Conception of Study, Development of Research Methodology Design

MA

Study Design, manuscript review, and critical input.

All authors reviewed the results and approved the final version of the manuscript. They are also accountable for the study's integrity.

References

- Chen Y, Zhang H, Zhang W, Ning W, Chen Y. The prevalence of hypospadias in newborn males in Hangzhou, China, from 2011 to 2020: a cross-sectional population-based study. *J Pediatr Urol.* 2023;19(5):583.e1-583.e7. <https://doi.org/10.1016/j.jpuro.2023.06.009>
- Hadidi AT. Morphology of hypospadias. In: Hadidi AT, editor. *Hypospadias surgery: an illustrated textbook.* 2nd ed. Cham: Springer; 2022. p. 137-161. <https://doi.org/10.1007/978-3-030-94248-9>
- Su JJ, Netto JMB, Hittelman AB. Urologic anomalies and surgical implications. In: Mattei P, editor. *Surgical and perioperative management of patients with anatomic anomalies.* Cham: Springer; 2020. p. 267-342. https://doi.org/10.1007/978-3-030-55660-0_13
- Çayan F, Çayan S. Prenatal diagnosis of penoscrotal hypospadias and review of the literature. *Turk J Urol.* 2013;39(2):116-118. <https://doi.org/10.5152/tud.2013.028>
- Andersson M. *Hypospadias surgery: long-term outcome focusing on adolescence [thesis].* Gothenburg: University of Gothenburg; 2018.
- Radmayr C, Bogaert G, Dogan HS, Kocvara R, Nijman JM, Stein R, et al. *EAU guidelines on paediatric urology.* Arnhem (NL): EAU Guidelines Office; 2023.
- Tariq MN, Zaidi SFZ, Khan MD, Awan A, Ahmad M, Malik I, et al. Scoring system for evaluating cosmetic appearance in operated hypospadias patients: cosmetic outcomes in hypospadias surgery. *J Health Rehabil Res.* 2024;4(3):1-5. <https://doi.org/10.61919/jhrr.v4i3.1532>
- Krull S, Rissmann A, Krause H, Mohnike K, Roehl FW, Koehn A, et al. Outcome after hypospadias repair: evaluation using the hypospadias objective penile evaluation score. *Eur J Pediatr Surg.* 2018;28(3):268-272. <https://doi.org/10.1055/s-0037-1602252>
- Baskin LS, Ebberts MB. Hypospadias: anatomy, etiology, and technique. *J Pediatr Surg.* 2006;41(3):463-472. <https://doi.org/10.1016/j.jpedsurg.2005.11.059>
- Baskin LS. Hypospadias: a critical analysis of cosmetic outcomes using photography. *BJU Int.* 2001;87(6):534-539. <https://doi.org/10.1046/j.1464-410X.2001.00092.x>
- Springer A. Assessment of outcome in hypospadias surgery: a review. *Front Pediatr.* 2014;2:2. <https://doi.org/10.3389/fped.2014.00002>
- Canning DA. Re: Penile appearance after hypospadias correction from a parent's point of view: comparison of the hypospadias objective penile evaluation score and parents' penile perception score. *J Urol.* 2017;197(6):1562-1563. <https://doi.org/10.1016/j.juro.2017.03.055>
- Ardelt PU, Cederqvist M, Barth M, Frankenschmidt A. The SIGHT questionnaire: a novel assessment tool for satisfaction in genital hypospadias treatment. *J Pediatr Urol.* 2017;13(1):33.e1-33.e8. <https://doi.org/10.1016/j.jpuro.2016.10.011>
- Robinson AJ, Harry LE, Stevenson JH. Assessment of long-term function following hypospadias reconstruction: do flow rates, flow quality, and cosmesis improve with time? Results from the modified Bretteville technique. *J Plast Reconstr Aesthet Surg.* 2013;66(1):120-125. <https://doi.org/10.1016/j.bjps.2012.07.011>
- Holland AJ, Smith GHH, Ross FI, Cass DT. HOSE: an objective scoring system for evaluating the results of hypospadias surgery. *BJU Int.* 2001;88(3):255-258. <https://doi.org/10.1046/j.1464-410X.2001.02280.x>

16. Weber DM, Schönbacher VB, Landolt MA, Gobet R. The Pediatric Penile Perception Score: an instrument for patient self-assessment and surgeon evaluation after hypospadias repair. *J Urol.* 2008;180(3):1080-1084. <https://doi.org/10.1016/j.juro.2008.05.060>
17. van der Toorn F, de Jong TPVM, de Gier RPE, Callewaert PR, van der Horst HJR, Steffens MGA, et al. Introducing the HOPE (Hypospadias Objective Penile Evaluation) score: a validation study of an objective scoring system for evaluating cosmetic appearance in hypospadias patients. *J Pediatr Urol.* 2013;9(6 Pt B):1006-1016. <https://doi.org/10.1016/j.jpuro.2013.01.015>
18. Arlen AM, Kirsch AJ, Leong T, Broecker BH, Smith EA, Elmore JM. Further analysis of the Glans-Urethral Meatus-Shaft (GMS) hypospadias score: correlation with postoperative complications. *J Pediatr Urol.* 2015;11(2):71.e1-71.e5. <https://doi.org/10.1016/j.jpuro.2014.11.015>
19. Zheng X, Ji P, Mao H, Wu J. Evaluation of penile erection rigidity in healthy men using virtual touch tissue quantification. *Radiol Oncol.* 2012;46(2):114-118. <https://doi.org/10.2478/v10019-012-0012-4>
20. Effendi R, Situmorang GR, Wahyudi I, Rodjani A, Raharja PAR, Abbas TO. Adult sexual function following hypospadias repair in childhood: a systematic review and meta-analysis of long-term patient outcomes. *Urology.* 2025;204:242-251. <https://doi.org/10.1016/j.urology.2025.05.015>



Open Access This article is licensed under a Creative Commons Attribution 4.0 International License, <http://creativecommons.org/licenses/by/4.0/>. © The Author(s) 2025