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Original Article

Evaluation of Cosmetic Outcome Following Hypospadias Surgery Using the Hypospadias Objective Penile Evaluation (HOPE) Score

Alam AKMM[1], Moniruzzaman M[2], Shibli MMR[3]
Sarker MMR[4], Nabi A[5], Biswas A[6], Hossain AKMZ[7]

Abstract

Methods: This prospective observational study was conducted in the Department of Pediatric Surgery, Bangladesh Medical University (BMU), from July 2019 to June 2020. Seventy patients aged 1–14 years with anterior or mid-penile hypospadias who underwent surgical repair were included. Cosmetic outcomes were assessed preoperatively and postoperatively at 1, 3, and 6 months using the HOPE score. Statistical analysis was performed using SPSS version 26.0.

Results: The mean total HOPE score increased significantly from 37.50 ± 9.05 preoperatively to 48.67 ± 3.41 at six months postoperatively. Significant improvement was observed in all evaluated domains, including meatal position, meatal shape, glans shape, penile skin, and penile axis. The cosmetic outcome remained stable from one month through six months postoperatively.

Conclusion: The HOPE score is a reliable and objective tool for assessing cosmetic outcomes after hypospadias repair. Significant postoperative improvement in HOPE scores reflects successful surgical correction and satisfactory cosmetic results.

Keywords: Cosmetic outcome, HOPE score, Hypospadias repair

1. A. K. M. Mahbub Alam
IMO, Department of Pediatric Surgery, Shaheed Ziaur Rahman Medical College Hospital, Bogura, Bangladesh
2. Md. Moniruzzaman
Assistant Professor, Department of Pediatric Surgery, Shaheed Ziaur Rahman Medical College Hospital, Bogura
3. Muhammad Mizanur Rahman Shibli
Associate Professor, Department of Pediatric Surgery, Shaheed Ziaur Rahman Medical College Hospital, Bogura
4. Md. Mahabur Rahman Sarker
Assistant Professor, Department of Pediatric Surgery, Dhaka Medical College Hospital, Dhaka
5. Ashfaque Nabi
Assistant Professor, Department of Pediatric Surgery, Dhaka Medical College
6. Amitava Biswas
Assistant Professor, Department of Pediatric Surgery, Dhaka Medical College
7. A. K. M. Zahid Hossain
Professor, Department of Pediatric Surgery, Bangladesh Medical University (BMU), Dhaka

Correspondence to: Dr. A. K. M. Mahbub Alam
IMO-Pediatric Surgery
Shaheed Ziaur Rahman Medical College Hospital
Bogura. E-mail: dr.mahbub26@gmail.com

Introduction:

Hypospadias is a congenital anomaly characterized by ectopic placement of the urethral meatus on the ventral surface of the penis, with an incidence ranging from 0.8 to 8.2 per 1,000 live male births. The meatus may be located anywhere from the glans to the perineum, and classification is based on meatal position after chordee correction. Anterior hypospadias accounts for approximately 65–70% of cases, mid-penile for 10–15%, and posterior for 20% [1].

The primary goals of hypospadias surgery include straightening of the penile shaft, placement of the meatus at the glans tip, formation of a conical glans, construction of a uniform neourethra, and achievement of satisfactory cosmetic appearance [1,2]. With improvements in surgical techniques and reduced complication rates, emphasis has shifted toward cosmetic outcomes and long-term psychosocial well-being [3–6].

Poor cosmetic results have been associated with negative genital perception, psychosocial distress, and

impaired quality of life [7–9]. Therefore, objective and validated assessment tools are essential. The HOPE score evaluates surgically correctable cosmetic aspects and has demonstrated good reliability and validity [10].

This study aimed to evaluate cosmetic outcomes following hypospadias surgery using the HOPE scoring system.The HOPE-score uses 6 elements of objectivity. Each element contains 10 points, so the lowest score is 6 and the height is 60 and above 55 score appreciate more satisfactory cosmetic result.

Materials and Methods:

Study Design and Setting

A prospective observational study was conducted in the Department of Pediatric Surgery, BMU, Dhaka, Bangladesh, from July 2019 to June 2020. Ethical approval was obtained prior to study initiation.

Study Population

Children aged 1–14 years diagnosed with anterior or mid-penile hypospadias and undergoing primary surgical repair were included.

Inclusion Criteria

- Anterior or mid-penile hypospadias
- Age 1–14 years
- Written informed consent from parents or legal guardians

Exclusion Criteria

- Posterior hypospadias
- Penoscrotal transposition
- Previous penile surgery or trauma
- Urethrocutaneous fistula

Outcome Assessment

Cosmetic outcomes were assessed using the HOPE score, which evaluates:

- Position of meatus
- Shape of meatus
- Shape of glans
- Shape of penile skin
- Penile axis (torsion only; curvature excluded due to absence of induced erection)

Assessments were performed preoperatively and postoperatively at 1, 3, and 6 months.

Statistical Analysis

Data were analyzed using SPSS version 26.0. Results were expressed as mean ± standard deviation.

Results:

A total of 70 patients were included, with a mean age of 4.97 ± 2.32 years. The majority (62.9%) were aged 1–5 years. Hypospadias types included glandular (30%), coronal (40%), and mid-penile (30%).

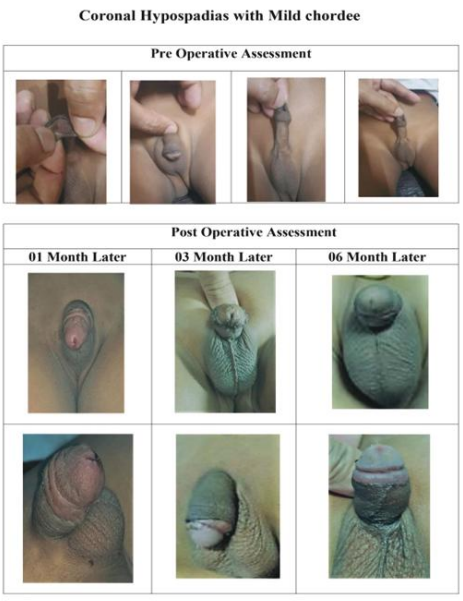
Significant improvement was observed in all HOPE score domains following surgery. The mean total HOPE score increased from 37.50 ± 9.05 preoperatively to 48.67 ± 3.41 at six months postoperatively, representing a mean increase of 11.17 points. Postoperative scores remained stable across follow-up intervals.

Analysis of Cosmetic Outcomes of Hypospadias Surgery

Pre and post-operative assessment of Glanulal hypospadias

Pre and post-operative assessment of coronal hypospadias

Pre and post-operative assessment of Mid penile hypospadias



Pre and post-operative assessment of coronal hypospadias

Discussion:

The present prospective observational study was designed to evaluate the cosmetic outcome following hypospadias surgery using the Hypospadias Objective Penile Evaluation (HOPE) score. With advancements in surgical techniques and declining complication rates, the focus of hypospadias surgery has progressively shifted toward achieving optimal cosmetic appearance and long-term psychosocial well-being of patients [1–3]. Objective assessment of cosmetic outcome is therefore essential for surgical audit, comparison of techniques, and continuous improvement of care.

Age at Surgery and Clinical Implications

In the present study, the mean age at surgery was 4.97 ± 2.32 years, with most patients operated between 1 and 5 years of age. Current recommendations suggest that hypospadias repair should ideally be performed between 6 and 18 months of age to minimize psychological stress and optimize tissue healing [4,5]. However, delayed presentation is common in developing countries due to lack of awareness, socioeconomic constraints, limited access to specialized pediatric surgical services, and delayed referral systems [6].

Despite the relatively higher mean age in this study, postoperative cosmetic outcomes were favorable, and age did not appear to adversely affect HOPE scores. Similar findings have been reported by Holland et al. and Guner et al., who observed satisfactory cosmetic outcomes even in older children when appropriate surgical techniques were employed [7,8]. This suggests that while early surgery is preferable, delayed repair can still yield acceptable cosmetic results.

Distribution of Hypospadias Types

This study included only anterior and mid-penile hypospadias, with coronal hypospadias being the most common subtype (40%). Posterior hypospadias was excluded to minimize heterogeneity, as proximal varieties often require staged procedures and are associated with higher complication rates and variable cosmetic outcomes [9,10]. Since more than 80% of hypospadias cases are distal or mid-shaft, cosmetic appearance is often the primary indication for surgical correction in these patients [11].

The distribution of hypospadias types in this study is consistent with previous epidemiological reports [12]. Restricting the study population to distal and mid-penile hypospadias allowed a more accurate evaluation of cosmetic improvement using the HOPE score.

Improvement in Individual HOPE Score Parameters

A significant improvement was observed across all individual components of the HOPE score following surgery.

The position of the meatus showed marked improvement from a mean preoperative score of 5.30 to 9.74 postoperatively. Proper placement of the meatus at the glanular tip is a key determinant of normal penile appearance and patient satisfaction [13]. Similar improvements have been reported by van der Toorn et al., who demonstrated that surgical correction significantly enhances meatal position scores using the HOPE system [14].

The shape of the meatus and glans also improved

substantially. A slit-like meatus and conical glans are considered hallmarks of successful hypospadias repair [15]. Snodgrass and Nguyen emphasized that meticulous glansplasty and urethral plate reconstruction play a crucial role in achieving favorable cosmetic outcomes [16]. The present findings support these observations.

The penile skin appearance demonstrated a modest yet significant improvement. Preoperative scores were already relatively high, reflecting adequate skin coverage in distal hypospadias. Postoperative improvement highlights the importance of careful tissue handling and appropriate flap design to avoid scarring and asymmetry [14,17].

The penile axis (torsion) achieved a perfect postoperative score in all patients. Correction of penile torsion is essential, as even mild residual torsion can be cosmetically noticeable and psychologically distressing [18]. Mouriquand et al. and Manzoni et al. emphasized the importance of addressing torsion during hypospadias repair to achieve optimal cosmetic alignment [3,11].

Total HOPE Score and Stability Over Time

The mean total HOPE score increased from 37.50 ± 9.05 preoperatively to 48.67 ± 3.41 postoperatively, representing a mean improvement of 11.17 points. Importantly, postoperative scores remained stable at 1, 3, and 6 months, indicating durable cosmetic outcomes.

Van der Toorn et al. demonstrated that the HOPE score has good inter-observer reliability and reproducibility, making it suitable for serial postoperative assessment [14]. The stability of scores over time in the present study suggests that early postoperative cosmetic assessment may reliably predict mid-term cosmetic results.

Comparison with Other Cosmetic Assessment Tools

Several scoring systems have been developed to assess cosmetic outcomes after hypospadias repair, including the Hypospadias Objective Scoring Evaluation (HOSE), Pediatric Penile Perception Score (PPPS), Mureau score, and Hadidi score [7,19–21]. While these tools provide valuable insights, many rely on subjective assessment or patient-reported outcomes, which may be difficult to obtain reliably in young children.

The HOPE score offers distinct advantages by focusing exclusively on objectively measurable, surgically correctable parameters, minimizing observer bias and allowing standardized comparison between surgeons and institutions [14]. The results of this study further support the HOPE score as a practical and reliable tool for cosmetic outcome evaluation.

Psychosocial Relevance of Cosmetic Outcome

Cosmetic appearance of the penis has a profound impact on psychological development, self-esteem, and sexual confidence. Studies have shown that boys with poor cosmetic outcomes after hypospadias surgery may experience negative genital self-perception, social anxiety, and impaired quality of life [22–24]. Sandberg et al. demonstrated that poor cosmetic results are associated with worse psychosocial adaptation and school performance [22].

Therefore, achieving optimal cosmetic results is not merely an aesthetic concern but an essential component of holistic patient care. The significant improvement in HOPE scores observed in this study suggests a favorable impact on long-term psychosocial well-being.

Strengths and Limitations

The strengths of this study include its prospective design, use of a validated and objective scoring system, and standardized follow-up intervals. However, several limitations should be acknowledged. Posterior hypospadias was excluded, limiting generalizability to more severe forms. Penile curvature was not assessed due to the absence of induced erection, which may have resulted in slight underestimation of total HOPE scores. Additionally, long-term outcomes beyond six months and patient-reported satisfaction were not evaluated.

Future studies incorporating longer follow-up, inclusion of proximal hypospadias, assessment of sexual function in adolescence, and correlation with patient-reported outcome measures would provide a more comprehensive evaluation of surgical success [25].

Overall Interpretation

The findings of this study clearly demonstrate that hypospadias repair results in significant and sustained improvement in penile cosmetic appearance. The HOPE score proved to be an effective, objective, and reproducible tool for evaluating cosmetic outcomes and identifying areas requiring technical refinement. Routine use of the HOPE score may enhance surgical audit, improve outcome reporting, and ultimately contribute to better patient-centered care.

Conclusion

The HOPE score is a valuable objective tool for evaluating cosmetic outcomes following hypospadias surgery. Significant postoperative improvement in HOPE scores indicates successful surgical correction and satisfactory cosmetic results. Routine use of the HOPE score may aid in surgical audit and technique refinement.

References

1. Murphy JP. Hypospadias. In: Holcomb GW III, Murphy JP, Ostlie DJ, St Peter SD, editors. Ashcraft's Pediatric Surgery. 6th ed. Philadelphia: Elsevier Saunders; 2014. p. 794–798.

2. Mouriquand PDE, Persad R, Sharma S. Hypospadias repair: current principles and procedures. Br J Urol. 1995;76(Suppl 3):9–22.

3. Manzoni G, Bracka A, Palminteri E, Marrocco G. Hypospadias surgery: when, what and by whom? BJU Int. 2004;94:1188–1195.

4. Snodgrass WT. Assessing outcomes of hypospadias surgery. J Urol. 2005;174:816–817.

5. Thomas DF. Hypospadiology: science and surgery. BJU Int. 2004;93:470–473.

6. Woodhouse CR, Christie D. Nonsurgical factors in the success of hypospadias repair. BJU Int. 2005;96:22–27.

7. Holland AJ, Smith GH, Ross FI, Cass DT. HOSE: an objective scoring system for evaluating the results of hypospadias surgery. BJU Int. 2001;88:255–258.

8. Guner A, Arikan A. Cosmetic outcomes after hypospadias surgery: objective assessment. J Pediatr Urol. 2020;16:XXX–XXX.

9. Montfort G, Bretheau D, de Benedetto V, Bankole R. Posterior hypospadias repair: mobilization of the urethral plate and Duplay urethroplasty. Eur Urol. 1992;22:137–141.

10. Hardwicke JT, Bechar J, Hodson J, Osmani O, Skillman J, Dickson AP. Fistula after single-stage primary hypospadias repair: a systematic review. J Plast Reconstr Aesthet Surg. 2015;68:1647–1655.

11. Manzoni G, Bracka A, Palminteri E, Marrocco G. Hypospadias surgery: cosmetic and functional indications. BJU Int. 2004;94:1188–1195.

12. Pierik FH, Burdorf A, Nijman JM, de Muinck Keizer-Schrama SM, Juttmann RE, Weber RF. A high hypospadias rate in The Netherlands. Hum Reprod. 2002;17(4):1112–1115.

13. Uygur MC, Ersoy E, Erol D. Analysis of meatal location in healthy men. Pediatr Surg Int. 1999;15:119–120.

14. van der Toorn F, de Jong TP, de Gier RP, Callewaert PR, van Dijk-de Vries A, van der Horst HJ, et al. Introducing the HOPE (Hypospadias Objective Penile Evaluation) score. J Pediatr Urol. 2013;9:1006–1017.

15. Baskin LS. Hypospadias: a critical analysis of cosmetic outcomes using photography. BJU Int. 2001;87:534–539.

16. Snodgrass W, Nguyen M. Current technique of tubularized incised plate hypospadias repair. Urology. 2002;60(1):157–162.

17. Firlit CF. The mucosal collar in hypospadias surgery. J Urol. 1987;137:80–82.

18. Mouriquand PDE, Persad R, Sharma S. Hypospadias repair: current principles. Br J Urol. 1995;76(-Suppl 3):9–22.

19. Weber DM, Landolt MA, Gobet R, Kalisch M. The Penile Perception Score after hypospadias repair. J Urol. 2013;189:189–193.

20. Mureau MA, Slijper FM, Slob AK, Verhulst FC. Satisfaction with penile appearance after hypospadias surgery. J Urol. 1996;155:703–706.

21. Hadidi A, Azmy A. Hypospadias Surgery: An Illustrated Guide. 1st ed. Berlin: Springer; 2004.

22. Sandberg DE, Meyer-Bahlburg HF, Yager TJ, Hensle TW, Levitt SB, Kogan SJ. Psychosocial adaptation of boys with hypospadias. J Pediatr Psychol. 2001;26:465–475.

23. Schönbucher VB, Landolt MA, Gobet R, Weber DM. Health-related quality of life in children with hypospadias. J Pediatr. 2008;152:865–872.

24. Weber DM, Schönbucher VB, Landolt MA, Gobet R. Pediatric Penile Perception Score after hypospadias repair. J Urol. 2008;180:1080–1084.

25. Springer A. Assessment of outcome in hypospadias surgery – a review. Front Pediatr. 2014;2:2.