Original article

Surgical Outcome of Hypospadias Repair at KIST Medical College Teaching Hospital

Kushal Karki, Narayan Bhusal

Abstract

Introduction: Hypospadias is a common congenital anomaly in male newborns, characterized by an ectopic urethral meatus located on the ventral aspect of the penis. This study aimed to evaluate the surgical outcomes of hypospadias repair performed at KIST Medical College Teaching Hospital over a seven-year period.

Methods: We retrospectively reviewed 54 cases of hypospadias repair conducted between January 2016 and January 2023. Patients were followed up in the outpatient department to identify postoperative complications. A total of 47 patients met the inclusion criteria: age under 10 years at the time of surgery and a minimum of one year of postoperative follow-up. Data were collected through telephone interviews with parents and clinical examinations. Surgical outcomes were assessed based on meatal position, skin condition, presence of urethrocutaneous fistula, residual chordee, cosmetic appearance, and urinary stream.

Results: The mean age at surgery was 4.34 ± 3.87 years, with a mean follow-up duration of 43.3 months. Surgical techniques included Tubularized Incised Plate (TIP) urethroplasty (68.08%), Bracka's staged repair (21.27%), STAG repair (6.38%), and meatal advancement procedures (4.25%). A total of 31 complications were observed, with meatal stenosis, urinary stream deviation, and urethrocutaneous fistula being the most frequent. TIP repairs demonstrated the highest incidence of meatal stenosis, whereas Bracka's repair was associated with multiple complications including residual curvature and fistula formation. The overall surgical success rate was 72%.

Conclusion: The outcomes of hypospadias repair are significantly influenced by the location of the urethral meatus and the quality of surrounding tissues. Proximal hypospadias remains surgically challenging and is associated with a higher complication rate. Ongoing postoperative follow-up and refinement of surgical techniques are essential for optimizing both functional and cosmetic outcomes. Long-term, patient-centered evaluation is recommended to assess satisfaction and quality of life.

Keywords:Complications; Hypospadias; surgical outcome, urethroplasty

Author affiliations:

Department of Urology,
KIST Medical College Teaching Hospital,
Imadol, Lalitpur, Nepal.

Correspondence:

Dr. Kushal Karki,
Department of Urology,
KIST Medical College Teaching Hospital,
Imadol, Lalitpur, Nepal.

Email: drkushalkarki@gmail.com

Disclosures:

Ethical Clearance: Taken

Conflict of interest: None

Financial aid: None

How to cite this article:

Karki K, Bhusal N. Surgical outcome of hypospadias repair at KIST Medical College Teaching Hospital. J Soc Surg Nep. 2025;28(1):11-14.

DOI:

https://doi.org/10.3126/jssn.v28i1.85309

Introduction

Hypospadias is a common congenital anomaly in newborns, characterized by the external urethral meatus opening along the ventral side of the penis, from the glans to the perineum. It is often associated with chordee, dorsal hooding of the preputial skin, meatal stenosis, and other anomalies.[1] The incidence ranges from 1 in 200 to 1 in 300 newborns.[2] Surgical intervention is the only treatment option, aimed at correcting chordee, enabling the child to void while standing, making the penis functional for insemination, and improving cosmetic appearance.[3]

Hypospadias is classified based on the location of the external urethral meatus as distal, mid, and proximal, with proximal repairs being more complex and having lower success rates after surgical repair.[4] Surgical outcomes depend on several factors. The status of the urethral plate, tissue vascularity, surgical technique, and the surgeon's experience also influence outcomes.[5,6] According to the American Academy of Pediatrics (AAP), surgical repair is recommended between 6 and 12 months of age.[7] Over 300 variations of surgical techniques are documented in the literature.[8]

This study evaluates the short-term and mid-term outcomes of hypospadias repairs performed over the past 7 years at our institution.

Methods

Following approval from the institutional review committee (IRC), records of hypospadias repairs performed between January 2016 and January 2023 were reviewed. Patient files were obtained from the hospital records, with a total of 54 files retrieved. Contact information was extracted, and parents were contacted via phone. Out of 54 patients, 47 parents responded and consented to participate. Inclusion criteria were patients who had undergone hypospadias repair before January 2023 and were younger than 10 years. Exclusion criteria were patients who had repeat surgeries for hypospadias failure or received testosterone treatment.

During outpatient visits, demographic information was recorded, and patient and parental complaints were analyzed. Operative sites were examined for meatal position, skin condition, fistula presence, chordee, and cosmetic appearance. Documented Urinary tract infection (UTI) in follow-up period was recorded. Urinary stream was observed directly or via recorded video, noting deviations, post-void dribbling, and stream strength.

The following complications were defined:

Urine spraying: Defined as a diffuse or scattered urinary stream observed during micturition, not projecting in a single cohesive stream.

Urine deviation: Characterized by a stream that deviates from the midline axis, resulting in unusual directionality during voiding.

Residual curvature: Identified as persistent penile ventral curvature after surgical correction. Parents were advised to take the photograph of the curvature whenever they noticed it.

Surplus skin: Refers to excess preputial or penile shaft skin, either asymmetrically distributed or causing cosmetic concerns post-repair.

Successful surgery was defined as a cosmetically acceptable penis with a slit-like meatal opening, absence of fistula and stricture, and no residual chordee.[9]

All procedures were performed by a single surgeon. A surgical technique was chosen after penile degloving. For boys with a good-sized (≥8mm, curved, and supple) urethral plate, a Tubularized Incised Plate (TIP) repair was performed.[10] Unfavorable urethral plates or severe chordee necessitated a two-stage procedure, using Bracka repair or Byars flap, or STAG techniques.[11-13] Chordee was corrected using the modified Nesbit technique or fairy cuts.[14]

Numerical data were summarized as mean±SD and categorical data as frequency and percentage. All analyses were conducted using SPSS 23 (SPSS Inc., IBM Corp., Armonk, NY).

Results

Forty-seven patients were included in the study. The mean age of the patients was 4.34 ± 3.87 years, ranging from 1 to 10 years. The mean duration of follow-up was 43.3 months, with a range from 12 to 85 months.

Table 1 details the types of hypospadias based on the location of the meatal opening. After degloving, 29 patients (61.7%) had a distal meatal opening, 13 patients (27.65%) had a mid-penile opening, and 5 patients (10.63%) had a penoscrotal opening.

Table 2 outlines the methods of surgical repair used. The majority of repairs, 32 (68.08%), were performed using the Tubularized Incised Plate (TIP) technique. Bracka's repair was used in 10 cases (21.27%), STAG (staged tubularized autograft) repair in 3 cases (6.38%), and meatal advancement in 2 cases (4.25%).

During the follow-up assessments, eight different types of complications were observed. **Table 3** lists these complications, totaling 31 instances. Fourteen complications were noted in the TIP repair group, including meatal stenosis in 4 patients, urinary stream deviation and

Table 1. Location of meatus at presentation

Location	n (%)
Distal	29 (61.7%)
Mid-penile	13 (27.65%)
Penoscrotal	5 (10.63%)

Table 2. Techniques of hypospadias repair [n=47]

Technique	n (%)
TIP repair	32 (68.08%)
Bracka`s Repair	10 (21.27%)
STAG repair	3 (6.38%)
Meatal advancement	2 (4.25%)

spraying in 7 patients, urethrocutaneous fistula in 2 patients, and meatal stenosis in 3 patients.

Bracka's repair, performed in 10 patients (21.27%), resulted in 13 different complications. Despite chordee correction, residual curvature was reported by the parents of the patients. Other complications included urethrocutaneous fistula, urine dribbling, and urine deviation.
STAG repair was conducted in 3 patients, with one patient developing a fistula and another experiencing urine dribbling.

Table 3. Complication observed during follow-up

Complications	Total [n]	TIP repair	Bracka repair	STAG repair
Spraying of urine	4	3	1	0
Urine deviation	4	2	2	0
Dribbling	2	0	1	1
UTI	3	0	2	1
Residual curvature	4	0	3	1
Skin surplus	5	4	1	0
Fistula	5	2	2	1
Meatal stenosis	4	3	1	0
Total	**31**	**14**	**13**	**4**

Discussion

Hypospadias repair is prone to various complications, ranging from meatal stenosis to urethrocutaneous fistulas. Assessing long-term outcomes, especially regarding micturition, copulatory function, and cosmetic appearance in adulthood, remains challenging. This analysis covers hypospadias repairs performed from June 2016 to June 2023.

Complications depend on factors such as the urethral opening location, degree of chordee, abnormalities of the corpus spongiosum, urethral plate quality, surgical technique, and surgeon experience.[15] Our success rate was 72%, based on observations from parents and the surgeon, as our patients had not yet reached sexual maturity. Success rates in the literature vary widely from 75% to 90% due to the heterogeneity of case morphologies.[16-18]

In our study, 90% of repairs were for mid-penile or distal hypospadias, with 10% for proximal cases. TIP repairs were performed in 32 out of 47 patients. Meatal stenosis was the most common complication, managed with regular urethral dilation. This aligns with the study by Hayrettin et al, where meatal stenosis was also frequently observed.[19,20] Despite this, Snodgrass, who developed the TIP repair, reported a lower incidence of this complication, attributing it to a lack of liberal incision of the urethral plate.[21]

Urethrocutaneous fistulas were observed in 5 patients, 2 of whom had undergone TIP repair. Factors contributing to this complication include glans size, urethral plate quality, surgical technique, and suture material, as noted by Feng et al.[22,27] Urinary spraying and stream deviation were noted in 5 patients, often associated with meatal stenosis, and improved after meatal dilation.

Assessing the cosmetic appearance of the penis is subjective and best judged by the patients themselves. We noted surplus skin affecting cosmetic appearance in four patients. Initially, our focus was on the voiding pattern and urinary stream, often overlooking cosmetic aspects.

Proximal hypospadias repairs have higher complication rates and lower success rates. In the study by Christopher et al, the complication rate after the first repair was 62% and after a second procedure, it was 49%.[23] Snodgrass et al reported a success rate of 98% after second surgery, attributed to high case volumes and experienced surgeons.[24] Our limited experience with proximal hypospadias cases resulted in challenges, such as graft issues in Bracka repairs and recurrent chordee, prompting a shift to STAG repair, which we found technically challenging. Continuous improvement in technique and consistent application are essential for the best outcomes.

Although proximal hypospadias constituted only 10% of cases, complications were more frequent, consistent with other studies like Pippe Salle, which reported higher complication rates for proximal hypospadias.[23] Factors such as tissue hypoplasia, inadequate tissue, and severe chordee contribute to these complications.[25]

A major strength of our study is the consistency provided by a single surgeon performing all surgeries and mid-term follow-up. However, limitations include a heterogeneous patient group, a small sample size, and variable follow-up periods. The use of multiple surgical techniques may have affected the determination of success rates. The growing experience of the surgeon likely influenced outcomes, and there may be bias from both the surgeon and parents in reporting complications. The success rates presented reflect only the perspectives of parents and doctors, lacking the patient's own opinion.

Despite over 200 techniques designed for hypospadias repair, no perfect technique for every defect has been established.[26] There remains significant room for improvement in surgical techniques and protocols. Emphasis should be placed on patient-centered outcomes, particularly as patients reach adulthood. The psychological aspects of hypospadias repair need considerable attention as children approach their teenage years.

Conclusion

Hypospadias repair is a complex procedure with variable complication rates depending on the defect's morphology. Proximal hypospadias is particularly challenging to manage. Regular follow-up is essential to identify and manage complications as the child grows. Further research, technological advancements, and a holistic approach to patient care are crucial for improving outcomes for patients with hypospadias.

References

1. Adams J, Bracka A. Reconstructive surgery for hypospadias: A systematic review of long-term patient satisfaction with cosmetic outcomes. Indian J Urol. 2016;32(2):93-102.
2. American Academy of Pediatrics. Timing of elective surgery on the genitalia of male children with particular reference to the risks, benefits, and psychological effects of surgery and anesthesia. Pediatrics. 1996 Mar;97(3):413-6.
3. Arya MC, Singh S, Gupta R, Kumar M, Gupta V, Gupta R. Patient Perspectives and Outcomes in Adult Hypospadias Repair. Cureus. 2023 Feb;15(2):e35579.
4. Babu R, Chandrasekharam VVS. A meta-analysis comparing dorsal plication and ventral lengthening for chordee correction during primary proximal hypospadias repair. Pediatr Surg Int. 2022 Apr;38(4):389-398.
5. Bhatia VP, Hilliard ME, Austin PF, Mittal AG. Evaluating quality of patient-reported outcome measures in patients with hypospadias. J Pediatr Urol. 2021 Feb;17(1):50-58.
6. Borkar N, Tiwari C, Mohanty D, Baruah TD, Mohanty M, Sinha CK. Post urethroplasty complications in hypospadias repair: a systematic review and meta analysis comparing polydioxanone and polyglactin sutures. World J Pediatr Surg. 2024 Mar 1;7(1):e000659.
7. Castagnetti M, El-Ghoneimi A. The influence of perioperative factors on primary severe hypospadias repair. Nat Rev Urol. 2011 Apr 1;8(4):198-206.
8. Cemil Uygur M, Ünal D, Tan MÖ, Germiyanoğlu C, Erol D. Factors affecting outcome of one-stage anterior hypospadias repair: analysis of 422 cases. Pediatr Surg Int. 2002;18(2-3):142-6.
9. Dayanç M, Tan MÖ, Gökalp A, Yildirim I, Peker AF. Tubularized incised plate urethroplasty for distal and mid-penile hypospadias. Eur Urol. 2000;37(1):102-5.
10. El-Karamany TM, El-Bendary MA, El-Mokhtar MM, El-Kassaby AM, El-Haggar SM, Abdelaziz AT. A Critical Analysis of Stented and Unstented Tubularized Incised Plate Urethroplasty Through a Prospective Randomized Study and Assessment of Factors Influencing the Functional and Cosmetic Outcomes. Urology. 2017 Sep;107:202-208.
11. Feng J, Long Y, Lu B, Zhao X, Zeng W, Long Y. Risk Factors for Urethrocutaneous Fistula Repair After Hypospadias Surgery: A Retrospective Study. Ann Plast Surg. 2017 Sep;79(3):e41-e44.
12. Halaseh SA, Halaseh S, Ashour M. Hypospadias: A Comprehensive Review Including Its Embryology, Etiology and Surgical Techniques. Cureus. 2022 Jul 2;14(7):e26521.
13. Hensle TW, Tennenbaum SY, Reiley EA, Pollard J. Hypospadias repair in adults: adventures and misadventures. J Urol. 2001 Jan;165(1):77-9.
14. Long CJ, Swan R, Nadler EP, Cuda S, Hsieh MH. Intermediate-Term Followup of Proximal Hypospadias Repair Reveals High Complication Rate. J Urol. 2017 Apr;197(4):852-858.
15. Manasherova D, Manasherov V, Biniaminov A, Binyaminov S, Elashnikov I, Sorokin O. Bracka's Method of Proximal Hypospadias Repair: Preputial Skin or Buccal Mucosa? Urology. 2020;138:138-143.
16. Orkiszewski M. A standardized classification of hypospadias. J Pediatr Urol. 2012 Jun;8(3):410-4.
17. Ozturk H, Onen A, Otçu S, Kaya M, Ozturk H. The outcome of one-stage hypospadias repairs. J Pediatr Urol. 2005 Apr;1(2):261-6.
18. Papeš D, Bracka A. Two-Stage Repair for Severe Proximal Hypospadias Using Oral Mucosal Grafts: Combination of a Modified Bracka Method and a Modified Byars Flap Method: Should Local Flaps be Used for Urethral Reconstruction in Hypospadias Repair? Ann Plast Surg. 2015 Dec;75(6):686-7.
19. Retik AB, Atala A. Complications of hypospadias repair. Urol Clin North Am. 2002 May;29(2):329-39.
20. Snodgrass W. Tubularized incised plate (TIP) hypospadias repair. Urol Clin North Am. 2002 May;29(2):285-90.
21. Snodgrass W, Bush N. Primary hypospadias repair techniques: A review of the evidence. Urol Ann. 2016 Oct-Dec;8(4):403-8.
22. Snodgrass W, Bush N. Staged Tubularized Autograft Repair for Primary Proximal Hypospadias with 30-Degree or Greater Ventral Curvature. J Urol. 2017 Sep;198(3):680-686.
23. Springer A, van den Heijkant M, Baumann S. Worldwide prevalence of hypospadias. J Pediatr Urol. 2016 Apr;12(2):152.e1-7.
24. van der Horst HJR, de Wall LL. Hypospadias, all there is to know. Eur J Pediatr. 2017 Apr;176(4):435-441.
25. Wilkinson DJ, Farrelly P, Kenny SE. Outcomes in distal hypospadias: a systematic review of the Mathieu and tubularized incised plate repairs. J Pediatr Urol. 2012 Jun;8(3):307-12.
26. Wu Y, Zheng C, Li Y, Hu J. Repair of proximal hypospadias with single stage (Duckett's method) or Bracka two stage: a retrospective comparative cohort study. Transl Pediatr. 2023 Feb;13(2):387-395.
27. Borkar N, Tiwari C, Mohanty D, Baruah TD, Mohanty M, Sinha CK. Post urethroplasty complications in hypospadias repair: a systematic review and meta analysis comparing polydioxanone and polyglactin sutures. World J Pediatr Surg. 2024 Mar 1;7(1):e000659.