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Original Research Article

Outcomes of different types of urethroplasty in children with hypospadias: a prospective observational study

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ABSTRACT

Background: Hypospadias is a common congenital anomaly of the male urethra, requiring surgical correction to restore function and appearance. Multiple urethroplasty techniques are used, with outcomes depending on anatomical severity and surgical expertise. Objectives were to assess and compare the outcomes and complications of various urethroplasty techniques performed for different types of hypospadias in children.
Methods: A prospective observational study was conducted over five years (2019-2025) at a tertiary care teaching hospital in Ratlam, Madhya Pradesh. Ninety-two children (<15 years) undergoing hypospadias repair were included. Data on demographics, hypospadias type, surgical technique, and postoperative complications were analyzed using SPSS.
Results: The majority of patients were aged 3-5 years (26%), with distal and mid-penile types being most frequent. The most commonly performed procedure was TIP urethroplasty (45.5%), followed by onlay (22.5%) and two-stage repairs (20%). Postoperative complications were observed in 25% of cases, with urethrocutaneous fistula (10%) and meatal stenosis (5%) being most frequent.
Conclusions: The TIP (Snodgrass) technique remains the preferred procedure for distal and mid-penile hypospadias due to favorable functional and cosmetic outcomes and low complication rates. Two-stage repairs are suitable for proximal and chordee-associated cases. Early surgery and meticulous technique are key to optimal results.

Keywords: Hypospadias, Urethroplasty, TIP repair, Pediatric surgery, Postoperative complications, Two-stage repair

INTRODUCTION

Hypospadias is one of the most common congenital anomalies of the male urethra, characterized by an ectopic ventral urethral meatus, ventral curvature, and incomplete foreskin development. The global incidence is approximately 1 in 250-300 live male births.[1] Surgical correction aims to achieve a straight penis with a terminal meatus, providing normal voiding and sexual function later in life.[2]

Multiple urethroplasty techniques have been developed over the years, including TIP urethroplasty, Mathieu, MAGPI, Onlay flap, and two-stage Bracka repair.[3-5] The TIP (Snodgrass) procedure is widely accepted as the standard for distal hypospadias due to its reproducibility and excellent cosmetic results.[1,6,7]

Despite advances in surgical techniques, postoperative complications such as fistula, meatal stenosis, and repair breakdown remain significant challenges, particularly in proximal variants.[3,4,8] The success of repair depends on multiple factors including age at surgery, severity of chordee, and tissue quality.

This study evaluates and compares outcomes of different urethroplasty techniques performed at a tertiary care teaching hospital, focusing on postoperative complications and surgical success.

METHODS

This prospective observational study was conducted from January 2019 to January 2025 at Government Medical College and Hospital, Ratlam. Institutional ethical approval was obtained prior to commencement.

Inclusion criteria

Children <15 years with hypospadias, patients undergoing primary urethroplasty and parents/guardians providing written informed consent were included in study.

Exclusion criteria

Previous hypospadias surgery, severe associated anomalies requiring staged corrections outside protocol, circumcised children lacking adequate preputial flap tissue and patients lost to follow-up before 6 months were excluded from the study.

Sampling technique

Consecutive sampling was used. All eligible patients presenting during the study period were included. No formal sample size calculation was performed. Data included age, meatal location, degree of chordee, associated anomalies, and type of repair performed (TIP, MAGPI, Onlay, Mathieu, or two-stage repair).

Follow-up

Patients were followed at one week, fifteen days, one month, three months, and six months to assess cosmetic and functional outcomes and identify complications such as fistula, stenosis, hematoma, recurrence, or repair breakdown.

Statistical analysis

Data were analyzed using SPSS software with descriptive statistics, and comparisons were made across procedure types with a significance level of $p<0.05$.

RESULTS

The largest proportion belonged to the 3-5-year age group (26.1%), indicating that most children underwent surgery at the recommended early age.

Table 1: Age distribution of hypospadias patients.

Age group (in years)	N	Percentage (%)
0-1	16	17.4
1-3	21	22.8
3-5	24	26.1
5-10	17	18.5
10-15	14	15.2

TIP urethroplasty was the most commonly performed procedure (45.5%), followed by Onlay flap repair (22.5%) and two-stage repair (20%)

Table 2: Distribution according to operative procedure performed.

Procedure	N	Percentage (%)
TIP (Snodgrass)	42	45.5
MAGPI	9	10.0
Onlay	21	22.5
Mathieu	2	2.0
Two-stage repair	18	20.0

Urethrocutaneous fistula was the most common complication (10%), followed by meatal stenosis (5%) and repair breakdown (5%).

Table 3: Postoperative complications.

Complication	N	Percentage (%)
Hematoma	2	2.5
Meatal stenosis	5	5.0
Urethrocutaneous fistula	9	10.0
Recurrent curvature	2	2.5
Repair breakdown	5	5.0

DISCUSSION

This study demonstrates that TIP urethroplasty is the most frequently and successfully used technique for distal and mid-penile hypospadias, consistent with previous findings reporting superior cosmetic and functional outcomes.[1,6,7]

The overall complication rate of 25% aligns with previously published reports indicating rates of 20-30%, particularly in proximal variants.[3,4,8] Urethrocutaneous fistula remains the most common postoperative complication across most techniques. Factors associated with higher complication rates include proximal meatus, severe chordee, and two-stage reconstruction.

Early repair between 1-3 years is associated with better healing and psychological outcomes.[9] In our study, the majority were repaired before age 5, correlating with improved success. Adequate tissue handling, tension-free closures, and postoperative care significantly influence outcomes.

Limitations

This study was conducted at a single tertiary center and involved a relatively small sample size. Follow-up was limited to 6 months; hence late complications such as urethral stricture or long-term functional outcomes were not assessed. Surgeon-dependent variability may also have influenced outcomes.

CONCLUSION

TIP urethroplasty remains the gold-standard technique for distal and mid-penile hypospadias due to its low complication rate and excellent cosmetic results. Two-stage repair is preferable for severe proximal cases with significant chordee. Early surgery and meticulous operative technique are critical for achieving optimal outcomes.

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Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Snodgrass W. Tubularized incised plate urethroplasty for distal hypospadias. J Urol. 1994;151(2):464-5.
2. Duckett JW. Hypospadias. Pediatr Rev. 1992;13(11):398-404.
3. Bhat A, Mandal AK. Acute postoperative complications of hypospadias repair. Indian J Urol. 2008;24(2):241-8.
4. Braga LH, Lorenzo AJ, Salle JL. Complications of primary and reoperative hypospadias repair: predictors, prevention and management. J Pediatr Urol. 2017;13(4):361.e1-361.
5. Baskin LS, Ebbers MB. Hypospadias: anatomy, etiology, and technique. J Pediatr Surg. 2006;41(3):463-72.
6. Elbakry A. Complications of hypospadias repair: analysis of 220 cases. Int J Urol. 2001;8(12):682-5.
7. Retik AB, Keating MA. Complications of hypospadias repair. Urol Clin North Am. 1988;15(2):223-36.
8. Warren J, Nguyen T, Snodgrass W. Long-term functional outcomes following Snodgrass tubularized incised plate urethroplasty. J Pediatr Surg. 2019;54(8):1656-62.
9. Subramaniam R, Spinoit AF, Hoebeke P. Hypospadias surgery: current trends and future perspectives. J Indian Assoc Pediatr Surg. 2017;22(4):207-13.
10. Hadidi AT, Azmy AF. Hypospadias Surgery: An Illustrated Guide. Berlin: Springer. 2004.
11. Mouriquand PDE, Persad R, Sharma S. The future of hypospadias repair. Eur Urol. 2020;78(4):545-53.
12. Gorduza DB, Demede D, Hoebeke P. Reoperations for failed hypospadias repair: an international multicenter experience. J Pediatr Urol. 2016;12(5):273.e1-273.e8.
13. Singh RB, Pandey S, Tiwari A. Comparative study of tubularized incised plate (Snodgrass) and Onlay flap techniques in distal hypospadias. Indian J Urol. 2018;34(2):130-5.
14. Manzoni G, Bracka A, Palminteri E, Marrocco G. Hypospadias surgery: current concepts and future perspectives. BJU Int. 2004;94(7):1032-5.
15. Kureel SN, Gupta A, Sharma RK, Singh U. Long-term results and complications of urethroplasty in hypospadias: a single-center experience of 500 cases. Indian J Plast Surg. 2013;46(2):298-306.

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