

Original Research Article

A study on complications and outcome of hypospadias repair at tertiary care hospital

Achyuth A. Shivapur^{1*}, Advait A. Shivapur², Ravinda Khasnis³

¹Department of Pediatric Surgery, KAHER, J, N, Medical College, Belagavi, Karnataka, India

²Gadag Institute of Medical Science, Gadag, Karnataka, India

³Karnataka Institute of Medical Sciences, Hubballi, Karnataka, India

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*Correspondence:

Dr. Achyuth A. Shivapur,

E-mail: Achyuthphoton72@gmail.com

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ABSTRACT

Background: The surgical procedure used to treat hypospadias varies widely in clinical practice due to several considerations. In light of this, we assessed the risks and results of many surgical techniques for correcting hypospadias.

Methods: It was a prospective hospital-based study done for a period of 1 year. All patients with age greater than 12 months who underwent hypospadias repair in the surgery department of PMSSY super speciality hospital (KIMS, Hubballi) from January 2022 to December 2023 were included in the study. Approval from institutional ethical committee was taken before initiation of the study. Written informed consent was taken from the parents of the study participants. Total 42 patients with hypospadias were included in the present study.

Results: The most common type of hypospadias was distal seen in 67% of patients among distal the most common site of urethral opening was distal penile in 43% followed by mild penile in 40%. Proximal type was second most common type seen in 24% and 7% were granular. TPIF repair was the most common choice of operation among surgeons in distal and proximal hypospadias due to ease of application and less complications and it was statistically significant followed by Snodgrass repair mostly seen in distal hypospadias.

Conclusions: In this study, distal type hypospadias was the most prevalent form. Roughly one-third of the patients received TPIF surgery, whereas the same percentage had Snodgrass repair for their hypospadias.

Keywords: Hypospadias, TPIF repair, Lateral base repair, MAGPI, Snodgrass repair, Urethral fistula

INTRODUCTION

One of the most prevalent congenital abnormalities affecting the external male genitalia is hypospadias. Approximately 1 in 250 male babies have it, while the prevalence appears to be rising. An inadequate development of the ventral foreskin and urethral fold, with or without penile curvature, is known as hypospadias. Anywhere between the tip of the penis and the perineum is where you can find the urethral opening more proximally.¹

Three categories-distal or anterior hypospadias with the meatus on the glans penis, at the corona, or subcoronal-are used to categorize hypospadias based on the location of the meatus. A urethral opening on the proximal, midshaft, or distal penile shaft is indicative of mid-penile hypospadias. The placement of the urethral meatus might be penoscrotal, scrotal, or perineal in cases of proximal or posterior hypospadias. In the West, distal hypospadias is the most typical finding. More proximal versions have been seen throughout Asia.^{2,3}

There are various methods for correcting hypospadias that have been described. No urethroplasty procedure seems to be clearly better than another, according to extensive, comprehensive examinations of numerous approaches to hypospadias repair. Furthermore, difficulty in comparing series within literature stems from unreliability in reporting results, thus complicating process of developing universal recommendations. Indeed, upon initial assessment, proximal hypospadias transform into mid-penile status following dissection.⁴

The placement of the native meatus, the size and curvature of the penile appendage, and the aspect of the ventral skin both before and after development will all be taken into consideration when choosing the repair approach intraoperatively.⁵

One may say that there are as many reconstructive approaches and variations on them as there are surgeons who do hypospadias correction when attempting to characterize these techniques. As a result, it is hard to reach an agreement based on results and offer recommendations. A number of factors, such as "personal taste, upbringing, situational preference, training, experience, and personal success," come into play while choosing a surgical technique in clinical practice.⁶

The rationale behind the study was to assess various methods of surgical repairs of hypospadias with their complications and outcomes.

METHODS

It was a prospective hospital-based study done for a period of 1 year. All patients with age greater than 12 months who underwent hypospadias repair in the surgery department of PMSSY super speciality hospital (KIMS, Hubballi) from January 2023 to December 2023 were included in the study. Approval from institutional ethical committee was taken before initiation of the study. Written informed consent was taken from the parents of the study participants. Total 42 patients with hypospadias were included in the present study. Patients with hemoglobin less than 9 gm%, patients having any other associated anomaly which required treatment on a priority basis and patients with proven or suspected intersex state were excluded from the study. According to anesthesia fitness, hemoglobin levels, routine urine and microbiological examination, renal function test, X-ray chest, and USG abdomen for related abnormalities screening, all patients had routine examinations.

Every patient's operation time, complications during and immediately following procedure, and length of hospital stay were documented. Following discharge, all patients were monitored for 1 week, 1, 3 and 6 months, at which time problems were noted. When the boy had glanular meatus, single forward stream, unhindered voiding, healthy cosmoeses, and no need for more urethra surgery, results were deemed adequate.

Statistical analysis

The statistical analysis was performed using SPSS for windows version 22.0 software (Mac, and Linux). The findings were present in number and percentage analyzed by frequency, percent. Chi-square test was used to find the association among variables. The critical value of p indicating the probability of significant difference was taken as <0.05 for comparison.

RESULTS

The socio-demographic characteristics of the study subjects are given in Table 1. The mean (SD) age of study population was 8 months with 1.5 years. Most of patients belonged to completed 1 years around 60% but less than 2 years. About 72% of the study populations parents' education were above high school. About 62% of study population's father didn't have any smoking history, 81% mother had conception age below 40 years and 65% had parity of single child.

As per Table 2 most common type of hypospadias was distal seen in 67% of patients among distal most common site of urethral opening was distal penile in 43% followed by mild penile in 40%. Proximal type was second most common type seen in 24 and 7% were granular.

As per Table 3 TPIF repair was the most common choice of operation among surgeons in distal and proximal hypospadias due to ease of application and less complications and it was statistically significant followed by Snodgrass repair mostly seen in distal hypospadias. Stage 1 and stage 2 repair are mostly done in proximal type while lateral base repair and MAGPI were choice in granular hypospadias but they were not significant.

Table 1: Demographic details of study participants, (n=42).

Variables	Numbers	Percentage (%)
Age (in years)		
1	25	60
1-2	14	33
>2	03	7
Education of parents		
<High school	12	28
>High school	30	72
Smoking of father		
Yes	16	38
No	26	62
Maternal age at conception (in years)		
<40	34	81
>40	08	9
Number of parity of mother		
1	27	65
2	12	28
3	03	7

Table 2: Type of hypospadias and urethral opening, (n=42).

Type	Urethral opening	N (%)
Granular	Granular	3 (7)
	Coronal	6 (14)
	Distal penile	12 (29)
Distal	Mid penile	10 (26)
	Proximal	7 (15)
Proximal	Penoscrotal	3 (7)
	Perineal	1 (2)

As per Table 4 the most common immediate complication based on surgical repair was skin necrosis seen in 24% followed by wound infection in 17%, bleeding in 15% and urethral fistula. Skin necrosis was most common in Snodgrass repair seen in 64% of patients.

As per Table 5 very minimal delayed complications were seen after surgical repair among them urethral stricture, meatal stenosis and penile torsion were seen single cases in stage 1 repair, lateral base repair and MAGPI and it was not significant.

Table 3: Association between type of hypospadias and choice of operation, (n=42).

Operation choice	Granular, (n=3)	Distal, (n=28)	Proximal, (n=11)	P value
TPIF repair	1	14	5	0.01
Snodgrass repair	0	12	4	0.06
Stage 1 repair	0	0	1	0.11
Stage 2 repair	0	0	1	0.11
Lateral base repair	1	1	0	0.13
MAGPI	1	1	0	0.34

Table 4: Immediate complications of surgical repair.

Surgical repair	Wound infection	Bleeding	Oedema	Skin necrosis	Urethral fistula
TPIF repair	1	0	0	1	0
Snodgrass repair	1	2	2	7	0
Stage 1 repair	1	1	1	0	0
Stage 2 repair	1	0	0	0	2
Lateral base repair	2	2	2	2	2
MAGPI	1	2	0	0	2

Table 5: Delayed complications of surgical repair.

Surgical repair	Urethral stricture	Meatal stenosis	Penile torsion	Diverticulum
TPIF repair	0	0	0	0
Snodgrass repair	0	0	0	0
Stage 1 repair	1	0	0	0
Stage 2 repair	0	0	0	0
Lateral base repair	0	1	0	0
MAGPI	0	0	1	0

Table 6: Complications of hypospadias repair in follow up period.

Period	Wound infection	Bleeding	Oedema	Skin necrosis	Urethral fistula	Meatal stenosis	Penile torsion
1 month	0	0	0	0	0	0	0
3 months	0	0	0	0	1	0	0
6 months	0	0	0	0	0	0	1

As per complications during follow up the delayed complications like urethral fistula and penile torsion were mainly seen during 3 months and 6 months follow up period. After surgical repair 39 (96%) patients had satisfactory shape of penis while 3 (4%) patients had sub-optimal cosmetic result. Out of 42 patients, 41 (98%) patients had straight orientation of the penis after operation but 1 (2%) patient developed penile torsion.

DISCUSSION

Because hypospadias correction has high rate of complications, it is one of the most difficult cases for operating surgeons. Since none of existing techniques, even in greatest of hands, are without difficulties, technique for correcting hypospadias has continued to evolve. Shape of glans and meatus, degree of penile

curvature that goes along with it, and mostly surgeon's preference all influence procedure that is chosen to treat hypospadias.^{7,8}

The final cosmetic outcome is a significant concern in hypospadias surgery. The goals of hypospadias surgery must be met with a precise surgical technique, a thorough pre-operative examination, and suitable post-operative care. The meatus's original placement is the basis for the most widely used classification of hypospadias; however, this does not always indicate the severity of condition.⁹

After chordee repair, severity of hypospadias should be categorized based on new location. Comparing our study of 42 patients to Bhat, found that 35 (37.4%), 49 (52%) of patients had meatus at mid-penile/proximal penile region and subcoronal/distal penile region, respectively, indicates that 6 (19%) of patients with hypospadias had meatus at mid-penile region in both groups.¹⁰

In this study, 17% of patients who underwent surgery experienced acute problems such wound infections. In groups, 4% of patients experienced penile torsion, 15% developed urethral fistulas, and 3% developed meatal stenosis following hypospadias correction surgery. Penile appearance of patients was observed in our study during ward post-operative time and the outpatient department follow-up period. After surgical repair 39 (96%) patients had satisfactory shape of penis while 3 (4%) patients had sub-optimal cosmetic result. Out of 42 patients, 41 (98%) patients had straight orientation of the penis after operation but 1 (2%) patient developed penile torsion.

In our study, wound infections occurred in 25% of operated patients, a significantly higher rate than in Bhat (TPIF repair), where wound infections occurred in 3% of the patients.¹⁰ However, only 15% of patients in our study experienced fistula formation after surgery, which is significantly less than 20% of patients in other study.¹¹ This could be due to smaller sample size and factors such as meticulous pre-op evaluation, exact surgical technique, and appropriate post-op care.¹⁰ The 15% of patients in our study underwent surgery to form fistulas, which is slightly more than the 5.4% of the patients in a study by Ahmed et al that found 3% of the patients had meatal stenosis, 3% of patients had penile torsion, and 2.7% of patients in that study experienced fistula formation.¹²

Our study has few limitations. The study is monocentric hospital-based study so the sample is relatively small could be considered not sufficient to fully elucidate the long-term consequences. External validity of the study is limited to critically ill patients.

CONCLUSION

Study shows distal type hypospadias was most prevalent form. Roughly 1/3rd of patients received TPIF surgery,

whereas same percentage had Snodgrass repair for their hypospadias. Early hypospadias repair complications that were most frequently encountered skin necrosis and wound infection. Most concerning post-op complication is still urethral fistula, 1 technique that lowers risk of problems, particularly for urethra-cutaneous fistulas, with good esthetic results is TPIF repair.

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

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