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A Single Center Study of Short and Long Term Complications in Hypospadias Surgery at BRD Medical College, Gorakhpur (UP)

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Abstract

Hypospadias is caused by abnormal penile development that leaves the urethral meatus proximal to its normal glandular placement, which can occur anywhere along the scrotum, perineum, or penile shaft. It is frequently linked to a number of short- and long-term consequences. The objective of the present study was to carry out a thorough analysis of hypospadias surgery, assessing both short- and long-term consequences and showing various surgical methods and their associated results. The present study was an ambispective research conducted at the Department of General Surgery at BRD Medical College Gorakhpur, UP, from March 2023 and March 2025 (n=84). Postoperative complications affected 27.4% of patients in the present study, with the most common early complication being urethrocutaneous fistula (14.3%) and the most common late complications was a thin urinary stream (63.6%). Compared to proximal hypospadias, distal hypospadias produced good results. TIP repair was the most popular and commonly successful procedure. To increase success, customized surgical methods and ongoing observation are essential. Standardized post-operative protocols, multicentric trials with larger cohorts, and the use of advanced diagnostic methods such as routine uroflowmetry should be a primary focus for future research.

Keywords: Complications, Hypospadias, Surgery

Introduction

Hypospadias represents one of the most prevalent congenital conditions among men. Penile curvature, proximal displacements of the urethral opening, and a

ventrally deficient hooded foreskin are the typical characteristics of this condition (Van der Horst & De Wall 2017). After undescended testicles, hypospadias is the second most prevalent congenital abnormality in newborn males (Bouty et al., 2015). Hypospadias can be detected by the "blunt tip" appearance of the penis on ultrasonography, which indicates abnormal tapering of the distal phallus (Sparks & SMFM 2021).

Hypospadias might be caused by four primary factors i.e., (1) the mother, (2) the placenta, which is crucial for the masculinization window (6-16 weeks of gestation), (3) the child's genetics and hormonal system, and (4) the environment, which may contain hormone disrupting chemicals (Mouriquand et al., 2023). There is no standard approach for surgically repairing hypospadias. The most common outcome metric is the rate of reoperations within 6-12 months following the original surgery (Ceccarelli et al., 2021). One important phenotypic abnormality linked to hypospadias is penile curvature, which can influence post-operative results for hypospadias correction as well as the patient's long-term quality of life and psychosexual health (Abbas 2022).

Despite major advancements in surgical management of hypospadias, problems still occur in around one out of every four patients (Snodgrass et al., 2011). Wound care is very important for positive outcomes. Apart from wound care, a number of factors influence the outcome of a hypospadias surgery. These include factors related to the patient, such as age, the type of hypospadias, the presence and severity of penile chordee, the condition and width of the urethral plate, and the use of pre-procedural hormones; and factors related to the surgery, such as the type of suture used, the suture technique, the use of magnification during the procedure, the flap status, the type of dressing applied, and the size and type of the catheter used. One of the most common side effects after surgery for hypospadias is glomerular dehiscence (GD) (Karabulut et al., 2022).

The objectives of the study were to detect and assess acute post-operative complications, such as hematoma, wound dehiscence, infection, flap/skin necrosis, and urethral fistula formation, as well as to investigate long-term complications, such as urethral stricture and urethrocutaneous fistula formation.

Material and Methods

The current study was an ambispective research that was carried out from March 2023 to March 2025 at the Pediatric Surgery Unit of the Department of General Surgery at B.R.D. Medical College Gorakhpur, Uttar Pradesh.

Sample size

The sample size for the present research was 84.

Inclusion criteria

1. Individuals who have been diagnosed with hypospadias.
2. Patients whose deformity was corrected at B.R.D. Medical College, Gorakhpur, either all at once or in stages during the specified timeframe.

Exclusion criteria

1. Patients or their parents who refuse to give their consent.
2. Individuals who are mentally impaired or incapable of taking part in the study.

Procedure

Patient demographics, surgical specifics (surgeon expertise, technique), immediate postoperative problems, and long-term results (urethral strictures, fistula development) were among those variables recorded. In cases where patient-reported outcomes were available, psychosocial factors were evaluated. All

eligible participants who had surgery in accordance with recognized clinical procedures were added to the study after receiving ethical approval and informed consent. A pre-validated data collecting form was used to help gather information. Objective evaluations, medical record checks, and in-person patient interviews have been used in the data collecting process.

Ethical Considerations

This study complied with applicable institutional review board (IRB) norms and ethical principles, guaranteeing patient privacy. Since the study was retrospective in nature and all data was anonymised to preserve patient privacy, informed permission was not required.

Results

In the present study, most of participants (47.6%) were between the ages of 6-10, 40.5% were between the ages of 0-5, and 11.9% were between the ages of 11-15. In respect to socioeconomic status, 14.3% were middle-class and 85.7% were low-class. Hindus represented 91.7% of the study population, and Muslims accounted 8.3%.There were 27.4% from urban areas and 72.6% from rural areas.

The prevalence of distal hypospadias was 54.7%, proximal hypospadias was 15.4%, mid-penile hypospadias was 16.6%, glandular hypospadias was 5.95%, coronal hypospadias was 4.8%, and penoscrotal hypospadias was 2.4% (Figure 1). Table 1 represents the distribution of participants based on type of hypospadias surgery.

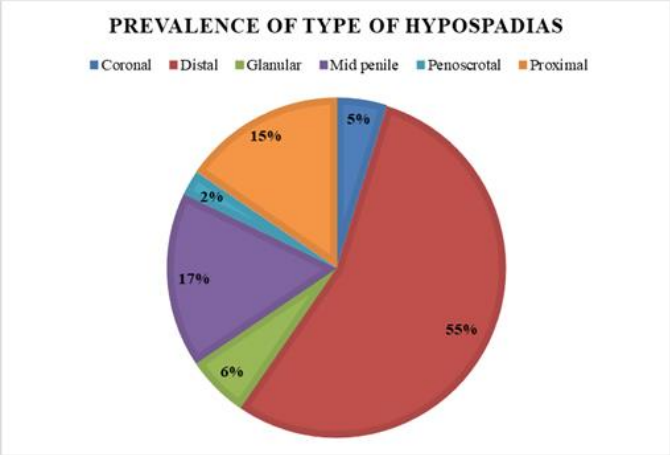

Figure 1: Distribution of participants based on type of hypospadias

Table 1: Distribution of participants based on type of hypospadias surgery

Sn.	Types of surgery	Frequency (N=84)	Percentage (%)
1	BYARS	8	9.5
2	Chordee correction with mid line figure 8 suturing with tip	1	1.2
3	DRAG	19	22.6
4	LDIF	1	1.2
5	MP	7	8.3
6	TD	4	4.8
7	TIP	43	51.1
8	Transverse preputial island flap	1	1.2

Following surgery, 72.6% did not have any complications, whereas 27.4% experienced complications. Of those, 85.7% did not experience any early issues whereas 14.3% reported early complication. The incidence of urethrocutaneous fistula as an early complication was 14.3% (Figure 2).In contrast to 13.1%

patients reported late complications, 86.9% of patients had no problems. Among the late complications, Chordee was present in 27.3% of cases, thin stream in 63.6%, and torsion with 9.1% (Figure 3). There were 70.8% with a maximum flow of urine 10-20 ml/sec, 15.4% with a maximum flow of 20-30 ml/sec, and 13.8% with a maximum flow of 0-10 ml/sec. Table 2 represents the distribution of participants based on average flow of urine.

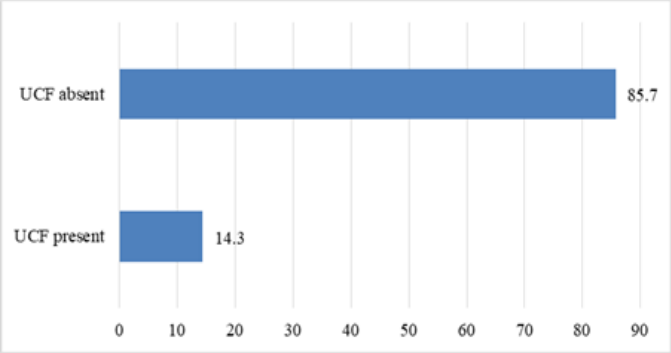

Figure 2: Distribution of participants based on early complications of Urethro cutaneous fistula (UCF %)

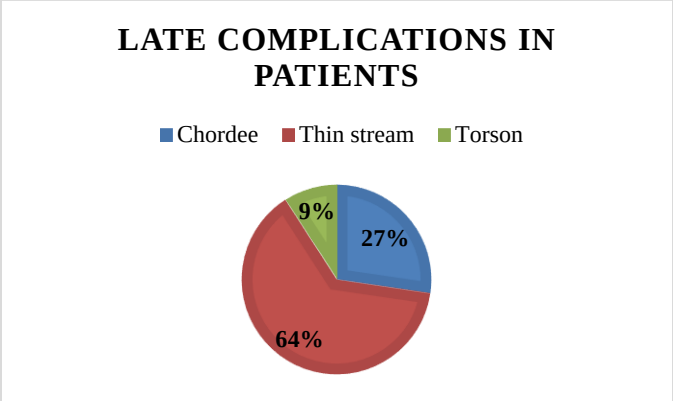

Figure 3: Distribution of participants based on late complications

Table 2: Distribution of participants based on average flow of urine

Sn.	Average flow category (ml/sec)	Frequency (N=84)	Percentage (%)
1	0-5	4	6.2
2	5-10	34	52.3
3	10-15	2	3.1
4	15-20	25	38.5

Table 3 represents the distribution of study participants based on Voiding volume. 75% of the participants had a voiding time of 10-20 seconds, 20.3% had a voiding time of 20-30 seconds, and 4.7% had a voiding time of 0-10 seconds.

Table 3: Distribution of participants based on voiding volume

Sn.	Voiding volume category (ml)	Frequency (N=84)	Percentage (%)
1	0-100	5	7.7
2	100-200	39	60
3	200-300	21	32.3

Discussion

The final outcome of hypospadias surgery can only be evaluated after the patient has reached adulthood (Nuininga et al., 2005). Early treatment of the condition is recommended between the ages of 6 and 18 months and has good success rates, however post-operative issues are always possible (Chen et al., 2022). The present study found most prevalent type of hypospadias was distal (54.7%), followed by proximal (15.4%) and mid-penile (16.6%). Similarly, 77.2% of the patients with distal penile hypospadias was reported by Spinoit et al. (2013). Patients with proximal hypospadias experienced more issues with ejaculation and erection (Liu et al., 2006).

The majority of issues are related to the urethra and include meatal stenosis, meatal regression, urethral stricture, and urethrocutaneous fistulae. Urethral strictures, make up 53 to 72% of all complications (Chen et al., 2022). Present study found urethrocutaneous fistula (14.3%) as an early complication and Chordee (27.3%) of cases, thin stream (63.6%), and torsion (9.1%) as late complications. Morrison et al. (2018) reported penile urethral stricture was the most prevalent symptom.

Many doctors think that a child with hypospadias should have surgery before the child becomes 12 months old. Carefully assessing the advantages of surgery against the risk of complications is necessary (Win et al., 2012). The most commonly used method in the present study was TIP repair (51.1%), which was followed by DRAG (22.6%), BYARS (9.5%), MP (8.3%), and TD (4.8%). While Chordae correction with mid line figure 8 suturing with tip, LDIF, and Transverse preputial island flap represented 1.2% each. 27.4% of the patients experienced complication in present study while 56% complications were reported by Long et al. (2017). Ceccarelli et al. (2021) reported that after the repair, 24.6% of patients experienced at least one problem, with a median elapsed duration of 11.5 months (6.5-22.5). Morrison et al. (2018) stated that age, length of stricture, hair present during repair, number of stages, or need to remove the urethral plate were not associated with complications or recurrence.

In order to improve surgical methods for this complex condition, boys must be monitored from adolescence into adulthood and truthful reporting of results must be explored (Long & Canning 2016). Clinicians and surgeons should require a standardized strategy to repair and follow-up since they should be aware of the long-term outcomes after hypospadias surgical correction (Ceccarelli et al., 2021). This study emphasizes that hypospadias repair outcomes are highly technique- and patient-specific. TIP repair is linked to increased rates of voiding dysfunction, despite the fact that it produces good cosmetic results.

Conclusion

The findings from the study indicate that although the majority of patients experience positive results following the treatment of hypospadias, urethrocutaneous fistulas and urine flow abnormalities are frequently observed. The most common and generally successful surgery was the TIP repair. Personalized surgical techniques and long-term monitoring are crucial for improving success. Future studies should concentrate on adopting standardized post-operative protocols, conducting multicentric trials with larger cohorts, and incorporating sophisticated diagnostic techniques like routine uroflowmetry. These actions could enhance surgical methods may be improved and patients with

hypospadias could notice improvements in their functional and cosmetic outcomes.

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