

# Scoping Hypospadias in a Tertiary Pediatric Government Hospital: A Retrospective study in Nepal

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## ABSTRACT

### Background

Hypospadias is one of the commonest congenital penile deformities with wide range of problems. There is wide range of complications associated with hypospadias repair worldwide. The main purpose of this study aimed to evaluate the geographical distribution, patterns of hypospadias, and outcome of hypospadias repair.

### Methods

A retrospective study of all patients who underwent hypospadias repair at a single unit of Kanti Children's Hospital between Baisakh 2079 and Chaitra 2080 was performed. Demographic data, age at surgery, variant of hypospadias, and postoperative outcomes were analyzed.

### Results

A total of 103 patients were studied, among those patients the mean age at surgery was 4.99 years, and the 38(36.82%) were of school-going age and from the Terai region of Nepal (60.19%). 41 (39.8%) patients had proximal hypospadias, 17 (16.5%) had mid penile and distal hypospadias was seen in 43 patient (41.7%). Urethroplasty was performed in 80 (77.6%) patients, and 23 patients (22.33%) underwent orthoplasty. Periurethral leakage 18(17.4%) followed by thrombophlebitis 10(9.7%) was seen immediately in postoperative period. Urethro-cutaneous fistula 33(41.3%) was the most common complication in urethroplasty.

### Conclusion

This study demonstrated that fistulas were the most common, irrespective of the type of surgical repair, while wound dehiscence the least common. Meatal stenosis was one of the risk factor for urethro-cutaneous fistula which was seen in this study.

**Keywords:** Hypospadias, meatal stenosis, peri-urethral leakage, urethra-cutaneous fistula, wound dehiscence.

## Introduction

Hypospadias is the second most common congenital anomaly among males after undescended testis<sup>1</sup>. In about 70% of cases urethral meatus is present at distal portion which is considered to be mild (distal hypospadias) while remaining 30% are present proximally and often more complex in nature (Proximal hypospadias). There are several unknown aspects regarding the etiology and development of this malformation<sup>2,3</sup>. Similarly, its prevalence is still unknown and varies from country to country<sup>4,5</sup>.

Surgical repair of hypospadias is always challenging, especially proximal variant which needs multiple

stage procedures. There are hundreds of surgical repair techniques for different types of hypospadias and often have mixed outcomes<sup>6</sup>. Urethro-cutaneous fistulas, meatal stenosis, urethral stenosis and dehiscence are among the most common complications following primary repair of hypospadias<sup>7,8</sup>.

This study aims to evaluate the spectrum of hypospadias, its' geographical distribution in Nepal

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Received: 19 May 2025

Accepted: 23 June 2025

DOI: <https://doi.org/10.3126/gmj.v5i1.81761>

and outcomes of different variant of hypospadias repair.

## Materials and methods

This retrospective descriptive study enrolled 103 children with hypospadias admitted at Kanti Children's Hospital, Nepal between Baisakh 2079 and Chaitra 2080. Out of those 103, 78 patients had definitive urethroplasty and 25 patients had undergone first stage Orthoplasty. The patients admitted at a single unit of surgery department were evaluated. All cases were operated by a single pediatric surgeon. All variants of hypospadias who underwent definitive urethroplasty were included. Re-do surgeries of previously complicated hypospadias repair was not included in this study. However, children above 14 years, children who were lost on follow up for 1 year of duration were excluded.

The following variables were collected which includes demographic data, age at surgery, anatomical location of the meatus and post-operative complications. According to the preoperative evaluation of urethral opening hypospadias was classified into: proximal (penoscrotal, scrotal and perineal), mid-penile and distal (glandular, coronal and sub-coronal). MAGPI, TIP urethroplasty, staged tubularized autograft (STAG), were amongst the commonly performed surgery. Inner preputial free graft and tunica vaginalis flaps were commonly used. Appropriate size feeding tubes were used in all cases. Fine 6/0 absorbable sutures were used in Urethroplasty. Vicryl 5/0 was used to approximate the glans and vertical mattress suturing using vicryl 6/0 was used to approximate the margin of glans. To prevent meatal stenosis, slit like meatus was created by sewing with neourethra at midpoint of tip of glans and corona. Postoperative complications were analyzed using Clavien-Dindo score. Functional outcome was assessed using Hypospadias outcome score evaluation (HOSE) score. All data were collected from hospital's medical records. Statistical analysis was done using Microsoft excel and IBM SPSS v24.

## Results

This study evaluated 103 children with hypospadias. Mean age at surgery was 4.99 years (1 year to 14 years), and 38 patients (36.82%) were of >5 years of old (Figure 1) and 62 (60.19%) patients were from Terai region of Nepal (Table 1).

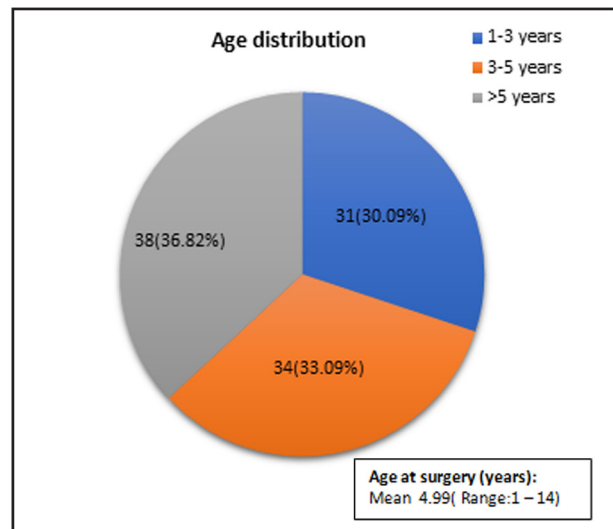


Figure 1: Age distribution of children with Hypospadias (N= 103)

Table 1: Geographical distribution of Hypospadias (N=103)

Geographical places	Number	Percentage
Terai	62	60.19%
Hilly	35	33.98%
Mountain	6	5.83%
<b>Total</b>	<b>103</b>	<b>100</b>

Out of those 103, 78 patients (75.7%) had definitive urethroplasty. Among these 78 patients, 60 (58.3%) underwent single stage urethroplasty and 18 (17.4%) underwent second stage urethroplasty (previously orthoplasty was done) and the remaining 25 patients (24.3%) underwent orthoplasty using Staged tubularised autograft technique (Table 2).

Pattern of hypospadias along with the various surgical techniques employed is presented in Table 3. Proximal hypospadias was seen in 41 cases (39.8%), 17 cases (16.5%) had mid-penile and distal hypospadias was observed in 43 (41.7%). Chordee without hypospadias was seen in two patients (1.9%). 27 patients underwent TIP Urethroplasty using dartos flap while 29 patients underwent TIP Urethroplasty using ventral flap. Out of 41 proximal hypospadias, orthoplasty using staged tubularised autograft was performed in 25 patients whereas 18 patients underwent second stage definitive urethroplasty using Bracka and STAG II techniques.

**Table 2: Stage operation of Hypospadias (N= 103)**

Stage operation		Number		Percentage
Definitve Urethroplasty	Single stage urethroplasty	60	58.3%	75.7%
	Second stage urethroplasty	18	17.4%	
Orthoplasty (STAG I)		25		24.3%
<b>Total</b>		<b>103</b>		<b>100</b>

**Table 3: Pattern of Hypospadias (N=103).**

Type of Hypospadias	Sub-type	Name of operation	Use of Flap/Graft	Number of patients	Total (percentage %)
Distal Penile Hypospadias	MIP	Glansplasty	-	1	0.9
	Glanular	MAGPI	-	3	2.9
	Coronal	TIP Urethroplasty	Dorsal dartos	3	2.9
			Ventral dartos	3	2.9
	Distal Penis	TIP Urethroplasty	Dorsal dartos	16	15.5
			Ventral dartos	17	16.4
Mid-penile Hypospadias		TIP Urethroplasty	Dorsal dartos	8	7.8
			Ventral dartos	9	8.8
Proximal Hypospadias	Proximal penis	STAG-I	Preputial free graft	8	7.8
		STAG-II	Tunica vaginalis	7	6.8
		Bracka	Byar's flap	3	2.9
	Penoscrotal	STAG-I	Preputial free graft	14	13.9
		STAG-II	Tunica vaginalis	7	6.8
	Scrotal	STAG-I	Preputial free graft	1	0.9
		STAG-II	Tunica vaginalis	1	0.9
Chordee without Hypospadias	-	Orthoplasty with Nesbit Plication	-	2	1.9

**Abbreviations:** MAGPI: Meatal advancement glansplasty incorporate; TIP: Tubularised Incised Plate; STAG-I: Staged tubularised Autograft stage I, ; STAG-II: Staged tubularised Autograft stage II.

**Table 4: Post operative Complications (Clavien-Dindo Score)**

Claviendindo Score	Diagnosis/treatment	No. of patients	Percentage %
I	Periurethral leakage of urine	18	17.4
II	Febrile UTI	5	4.8
	Thrombophlebitis	10	9.7
	Urethral stent blockage (flushing and aspiration of clot)	9	8.7
	Graft rejection	1	0.9
IIIa	Urethral stent blockage (suprapubic aspiration and re-insertion of urethral stent)	1	0.9
IIIb	Surgical site infection (wound dehiscence)	2	1.8
IV	None		-
	<b>Total:</b>	<b>46</b>	<b>44.6%</b>

### Postoperative complications:

Clavien-Dindo (CD) score was seen in 46 (44.6%) patients (Table 4). Periurethral leakage could be due to feeding tube blockage which was treated with regular irrigation and squeezing of tube. In addition to that periurethral leakage was also seen while passing stool but less frequently. Some of the patient experienced bladder spasm and leakage due to irritation to trigone which was treated with oxybutynin. A patient experienced two CD complications; a urethral stent blockage which required suprapubic aspiration and re-insertion under anesthesia on 2<sup>nd</sup> postoperative day. Five patients (4.8%) developed febrile UTIs which resolved with upgraded antibiotics. They didn't experience any febrile issues later. Surgical

site infection with wound dehiscence was seen in 2 (1.8%), and this was treated with cleansing and drainage of pus.

Those who underwent definitive urethroplasty procedure, for distal or mid-penile hypospadias and second stage urethroplasty for proximal hypospadias, HOSE scoring system was used to evaluate the long term outcomes. Urethro-cutaneous fistulas was present in 33 patients (42.3%), 8 patients (10.3%) had circular meatus which caused meatal stenosis and 4 patients developed spraying of urine.

### Discussion

Hypospadias is commonest congenital penile deformity. There is no ideal age for its reconstruction, but many surgeons prefer to repair all the stages of surgery before child joins school. The current guidelines recommend an optimal age of hypospadias repair anywhere between 9 and 18 months depending on the severity<sup>10,11</sup>. This study demonstrated that the mean age at surgery was 4.99 years. It may be due to lack of awareness of problem or due to the awaiting schedule for surgery in single most pediatric government hospital. Majority of patients were from the Terai region and the reason for this high prevalence in terai region is not known.

The most common type seen was distal hypospadias, and unsurprisingly, the finding was similar to other study<sup>9</sup>.

Correcting hypospadias is challenging because of high incidence of postoperative complications, particularly urethro-cutaneous fistulas. In one study conducted by **Ceccarelli.et.al** urethro-cutaneous fistulas were most common which is also similar to our findings, however meatal stenosis was second most common but surprisingly was contrary to this study<sup>7</sup>. The cause of fistulas may imply to the surgical techniques and use of flaps, however there are little to no robust cause that are described in the literature. The exact cause of fistulas isn't known and therefore it is the most challenging amongst surgeons. Different surgical techniques were used for different variant of hypospadias to achieve the better outcomes. However, none have an excellent outcome. Use of different sutures, correction of chordee, techniques of tubularization of urethra, application of flaps over urethroplasty are basic principle of hypospadias repair. Amongst them, TIP urethroplasty and STAG procedure were most

**Table 5: Hypospadias objective score evaluation (HOSE Score) among single stage hypospadias repair (N= 78)**

HOSE Variable	HOSE Score	Number of patients, n (%)
A. Meatal location		
Tip of glans	4	78 (100%)
Proximal glans	3	0
Coronal	2	0
Shaft	1	0
B. Meatal shape		
Vertical slit	2	70(89.7%)
Circular	1	8(10.3%)
C. Urinary stream		
Single stream	2	74(94.8%)
Spray	1	4(5.2%)
D. Erection		
Straight	4	78 (100%)
Mild angulation	3	0
Moderate angulation	2	0
Severe angulation	1	0
E. Fistula		
None	4	45 (57.7%)
Single subcoronal/ distal	3	26 (33.4%)
Single proximal	2	6 (7.6%)
Multiple	1	1 (1.3%)

popular<sup>2,5,7-13</sup>. Dartos flap and preputial graft was commonly used during repair<sup>12</sup>. These procedures were performed in majority of patients in our settings.

The Clavien-dindo scoring system showed periurethral leakage as the most common immediate postoperative complication. It may be due to trigonal irritation by urethral tubes or sometimes inappropriate tube size. Because of prolong hospital stay in urethroplasty, prolonged indwelling urethral stents; possibility of hospital acquired infection and stent-related complications are high. We also encounter this Clavien-dindo complications in 45 patients (43.3%). Hypospadias objective scoring evaluation (HOSE) assess the long term functional outcomes. Based on meatal location, meatal shape, urine stream, erection and presence of fistulas, each variables are given certain points; score  $\geq 14$  is defined as normal<sup>7,13</sup>. Urethro-cutaneous fistula incidence was high but its prevalence is similar with other studies<sup>7,9,11,13</sup>. Robust evidence- based large trials and a better surgical approach would improve the overall outcomes of hypospadias in the future.

## Conclusion

Hypospadias is one of the most common congenital penile deformities. Surgical repair is quite challenging because of high complication rate. Precise surgical technique, use of flaps and grafts, and at appropriate age group will aid in improving outcomes.

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