



Original Research Article

Demography and spectrum of male and female hypospadias among the children: A single centre experience

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Abstract: Background: In the congenital urogenital cases female hypospadias or “hypospadias feminis” is a rare anomaly than the male hypospadias and this is not mentioned in the many textbooks.

Repair of hypospadias usually changes the anatomy, so penis looks normal and allows normal micturition. “American Academy of Paediatric” is recommended for surgery in between (6 to 18) month of age. So, the aims of this study was to identify the demography and spectrum of male and female hypospadias among the children in the single centre, Dhaka, Bangladesh. **Methods and Materials:** 328 children who underwent hypospadias repair in our centre from 1st Jan’2016 to 31st Dec’2023, were retrospectively analysed. Data was collected for presenting age of patients during surgical correction, spectrum of male and female hypospadias, variant of hypospadias, associated deformities and anomalies, surgical techniques. **Results:** Among the 328 patients, 322 (98.2%) were male child and 6 (1.8%) were female child. Male: Female was 53.7: 1. The mean age of patients at the time of first surgery was (6.3 ± 3.33) years. Age range was (0.75-16) years. Most (73.2%) of the patients was (>3-12) year group came for surgery. Distal penile hypospadias was the most (25%) common type in male patients in this study. Most (41.3%) of the male patients had mild chordee, and among the associated anomalies, UDT was the most common (13.7%). Repair of hypospadias was performed in 125 (38.8%) male patients by Snodgrass (TIP) procedure. **Conclusion:** Like the previous literature, our study also showed the very rarity of female hypospadias. The Snodgrass (TIP) procedure was the preferred technique.

Keywords: Male and Female Hypospadias, Children.

INTRODUCTION

Hypospadias is the most common urogenital anomalies in male with an incidence of 1 in 300 live births¹.

Female hypospadias is extremely rare in compare to male hypospadias and showed very minimal existing in previous literature^{2,3}.

Male hypospadias is a congenital defect where the urethral opening situated in the ventral surface of penis rather than the tip of glans. This anomaly also associated with arrested development of the

spongiosum, ventral skin and ventral curvature⁴.

Most of the surgeons use the term ‘hypospadias’ and urogenital sinus in case of female child interchangeably.

When the common channel is only (0.5-1.5) cm long, that is ‘very low anomaly’ some consider this as ‘female hypospadias’. But many of them consider when the urethral opening is located on the anterior vaginal wall just above the introitus up to the vaginal fornix⁵.

Male hypospadias classified on several methods. Based on location of urethral opening, hypospadias is classified into anterior (glandular, coronal), mid-penile (distal, midshaft and proximal) and posterior (penoscrotal, scrotal, perineal)⁶.

Solov'ev⁷ classified the FH into three types, namely vestibular (partial), vestibulo- vaginal (subtotal) and vaginal (total).

On the basis of anatomy, Derevianko and his colleagues classified the FH into low -vaginal ectopic, high-vaginal ectopia androgenital fusion of the bladder neck with vagina (vesicovaginal)³ and urovaginal (vesicovaginal).

Megameatus intact prepuce (MIP) is the rare variant of male hypospadias. At birth, this type may be missed to diagnosed and may be noted during circumcision.

Common associated anomalies of hypospadias are undescended testis, inguinal hernia, hydrocele, persistent mullarien structures, pelviureteric junction obstruction, vesicoureteric reflux⁸.

No techniques for hypospadias repair still now not recommended as “gold standard” because no evidences have been found the superiority of one technique over another⁹.

In many studies, showed the repair of distal hypospadias in single stage. Tubularized incised plate (TIP). Mathieu, Onlay island flap are the mostly used techniques for distal hypospadias⁸. Nevertheless, there is ‘two school thought’ for surgical correction of proximal variety. One group favour one stage procedure such as inlays preputial flap, while other groups choose to perform two stage procedure^{10,11}.

So, this study aimed to show the demography, spectrum of male and female hypospadias, associated

deformities, anomalies and surgical techniques.

Methods and Materials:

This retrospective study was conducted in the paediatric surgery department of Bangladesh Medical University (BMU), Dhaka, Bangladesh. The study covered the 8-years period, from Jan'2016 to Dec'2023

Child with hypospadias was all admitted into paediatric surgery ward for repair through outdoor clinic. Majority of patients were not circumcised. After admission, routine investigations like Complete blood count (CBC), Blood creatinine, Urine: R.M.E and C/ S and x-ray chest, USG of KUB region of all patients were performed. Only for posterior type of hypospadias MCU was done for excluding dilated prostatic utricle.

Patients who previously underwent hypospadias surgery in another hospital (Government and Private) and glanular hypospadias with no associated deformity (stenosis/ glans tilt/chordee) were excluded in this study.

Different surgeons repaired male hypospadias by their preferable different techniques. Vaginal flap urethroplasty was performed for reconstructed female hypospadias. Pyramid procedure was preferable techniques for MIP. Admission registry and Operation theatre registry from 2016 to 2023 were checked for spectrum of male and female hypospadias, variant of hypospadias, age of repair, different techniques for repair, associated deformities and anomalies.

Follow-up of individual patients could not be included as these were not properly recorded.

For data entry and analysis, using Statistical Package for Social Sciences (SPSS) version 26. Data was expressed by percentage, mean and range.

RESULTS

Out of 328, 322(98.2%) patients were male and 6 (1.8%) patients were female.
M:F= 53.7:1.

Demographic profile of the study patients (n=328)

Sex	No of patients	(%)
Male	322	98.2
Female	6	1.8
Total	328	100.0
Male: Female ratio	53.7: 1	

Female Hypospadias



73.2% patients belong to (>3-12) years at the time of surgery.

Age at Presentation (n=328)

Age group (years)	No of patients	Percentage (%)
0.5 to 1	3	0.9
>1-3	68	20.7
>3-12	240	73.2
>12-16	17	5.2
Total	328	100.0
Mean±SD	6.3±3.33	
Range (min – max)	(0.75 – 16) years	

In male hypospadias, 25% patients were distal penile variety.

In female hypospadias, most (1.5%) patients were total (vaginal) type.

Rare hypospadias variant (MIP) was 2.1% of patients.

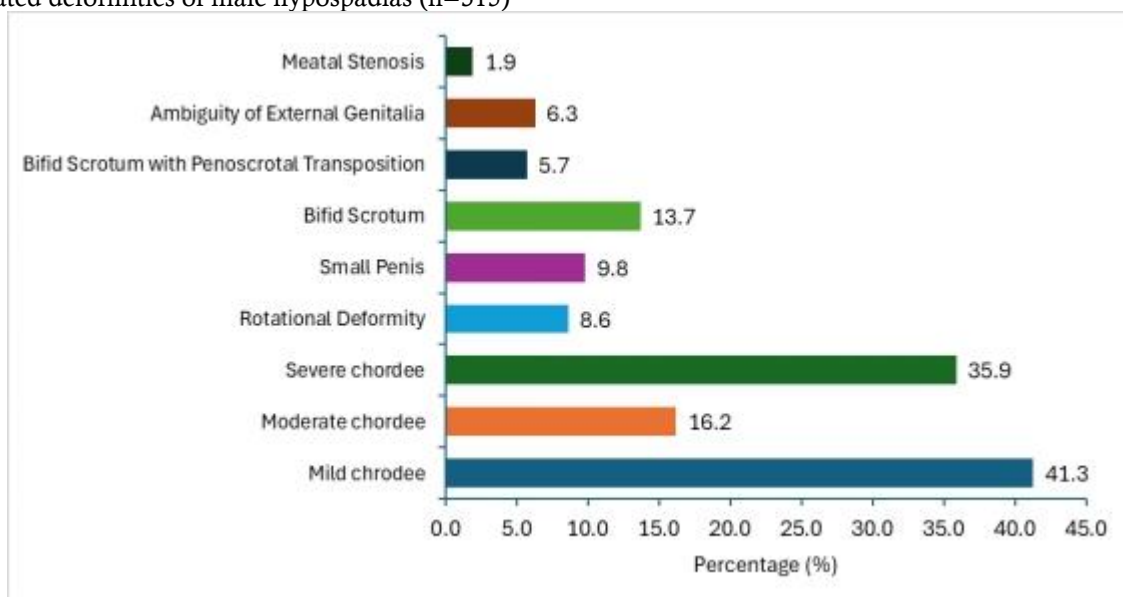
Types and variant of Hypospadias (n=328)

Type	Gender		No of patients	Percentage (%)
	Male	Glandular	15	4.6
		Coronal	58	17.7
		Subcoronal	20	6.1
		Distal Penile	82	25.0
		Mid Penile	28	8.5
		Scrotal	17	5.2
		Penoscrotal	62	18.9
		Perineal	33	10.1
Variant				
MIP (Megameatus intact prepuce)	Male		7	2.1
Type	Female	Partial (vestibular)	1	0.3
		Total (vaginal)	5	1.5

Mild chordee was seen in 41.3%, moderate chordee was in 16.2% and severe chordee was in 35.9% of male hypospadias.

Meatal stenosis was seen in 1.9% of cases.

Associated deformities of male hypospadias (n=315)



Among the associated anomalies, in male hypospadias 13.7% patients had UDT

Associated anomalies of male hypospadias (n=315)

Associated anomalies	No of patients	Percentage (%)
Undescended testes (UDT)	43	13.7
Hernia	13	4.1
Hydrocele	9	2.8
Others (ARM anorectal malformation)/ hydronephrosis	6	1.9

DISCUSSION

Hypospadias is a Greek word, 'Hypo' means 'under' 'spadon' means a 'rent' or 'fissure'¹²

Formation of hypospadias occur by incomplete virilization of the genital tubercle, so developing an ectopic urethral opening on the ventral surface of penis. This opening may be located from the glans penis to the perineum with or without ventral preputial defect and curvature⁶.

Surgery is the only treatment for hypospadias. In the first and second century AD, the two Alexandrian surgeons, Heliodorus and Antyllus, first to describe, classify, and define the pathophysiology and the treatment of hypospadias¹³. Repair of hypospadias is important for cosmesis and good functional restoration of the penile structure¹⁴

In our study, most of the child seeks for medical advised beyond the recommended age. In low-income countries, age of presentation for hypospadias repair is higher than in developed countries due to ignorance, poverty and illiteracy¹⁵ In addition, in our institution, most of the surgeons preferred to operate the child at school going age due to inadequate nursing facilities.

In our study, the mean age was 6.33 years for hypospadias repair. Hoag CC and his colleagues¹⁶ showed in their studies mean age for hypospadias repair was 1.97 year. The recommended age for surgery is (6-18) month¹⁷. At the 6 months of age, is the good tolerance of surgery and anaesthesia. At the age of 18-month, child is aware about his genitalia and achieve some toilet training.

In our eight- years retrospective study (Jan'2016 to Dec'2023), there were 6(1.8%) female hypospadias out of 328 patients with male: female- 53.7:1.

On the other hand, Bhat A and his colleagues⁵ showed in their retrospective study since 1991, four female hypospadias out of 600 male hypospadias patients with male: female:150:1.

MadhusoodananS and his colleagues¹⁸, also reported five female hypospadias in their 10 years retrospective study.

In our study, distal penile hypospadias was more (25%) than the other types and next was penoscrotal variety, which was 13.0%. Different study showed

different results regarding types of hypospadias. Gabra A and his colleagues¹⁹ showed in their study 23.5% was coronal and 12. 6% was scrotal variety, which was more common than the other variety, in their study. Other studies ^{20,21} also showed mostly coronal hypospadias.

Megameatus Intact Prepuce (MIP) is a clinically rare and unique variant of hypospadias, that accounts for 1% to 3% of hypospadias cases^{13,14} MIP detection is rising due to increase of physical examination of the patient²². In our study 7 (2.1%) patients had MIP out of 328 hypospadias repair cases from 2016 to 2023. But Cendron M23 reported in their study period from 2007 to 2017, MIP patients were 21(5%) out of 481 hypospadias cases

Inguinal hernia, hydrocele and cryptorchidism are more common associated anomalies of hypospadias patients ²⁴

In our study, undescended testes (cryptorchidism) were found in 13.7% of patients. On the other hand, Kolon TF and his colleagues²⁵ showed 7% and Ceccarelli and his colleagues²⁶ showed 5.4% cryptorchidism of hypospadias patients in their studies.

Chordee is the most common associated deformity in hypospadias. It usually noticeable during an erection. In our study, mild chordee with hypospadias patients 41.3%, which was higher than moderate (16.2%) and severe (35.9%) variety of chordee with hypospadias. Aslam OM²⁷ and Duarsa GWK and his colleagues²⁸ showed the moderate chordee with hypospadias 40.6% and 69.4% respectively, which was higher than the mild and severe variety of chordee in their studies. Variation of this result in different literature may be type of hypospadias patients in different country.

Principles of hypospadias repair included penile degloving, orthoplasty, urethroplasty, glanuloplasty and cosmosis. Correction of Hypospadias are performed either by tubularization, augmentation or replacement method.

Duplay and TIP procedure based on tubularization technique. Snodgrass, Mathieu and Duckett repair based on augmentation technique. Replacement technique used in proximal hypospadias where urethral plate is poorly developed and require two

stage urethroplasty (Koyanagi, Bracka, STAG)29.

For achieving the sufficient widening of the urethral plate, a midline incision was given in the distal urethral plate during reconstructing the neourethra. This tubularization method of urethral plate described in the year 1987. But, Snodgrass in the year 1994, tubularized the neourethra with well vascularized strip by incised the entire length of urethral plate at its midline. Snodgrass (TIP) procedure became very popular among the surgeons due to low complication rate as well as its simplicity and cosmosis30.

In our study, 38.8% cases TIP (Snodgrass) procedure was performed in hypospadias repair, which was comparable to other studies 31-33

In case of proximal hypospadias, where mild chordee present and requiring minimal dissection, TIP procedure was preferred by surgeons due to unsatisfying cosmetic results34.

Conclusion: Over the last 50 years there had been many studies with contradictory results. Age of repair in our centre was much higher than the recommended age. Like the previous literatures, our study also showed the very rarity of female hypospadias. Procedure choice was different according to the type of hypospadias and preference of surgeons.

Limitations: First, our study was mainly retrospective as well as single centre study.

Second, In this centre no universal standard protocol for follow up. So, sufficient outcome data after hypospadias repair not properly recorded.

Finally, in this centre no comparative studied mentioned regarding the procedures performed by the different consultants.

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