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Frequency of urethrocutneous fistula following snodgrass repair for distal penile hypospadias in children

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Abstract---Objective: To determine the frequency of urethra-cutaneous fistula during three months following Snodgrass repair for distal penile hypospadias in children. Methods and Material: This Descriptive Cross Sectional study included 135 Children with distal penile hypospadias without chordee and was conducted at Department of Pediatric Surgery, Khyber Teaching Hospital, Peshawar from 15 Jan, 2021 to 14 Jan, 2023. All patients underwent Snodgrass repair for distal penile hypospadias. Patients were followed for 3 months for fistula formation. Results: Sixty (44.17%) patients were recorded in 4-8 years age group whereas 76 (55.88%) patients were recorded in 9-14 years age group. As per frequencies and percentages for urethrocutaneous fistula, 09 (6.6%) patients were recorded with urethrocutaneou fistula. Conclusions: for the management of distal hypospadias, TIP urethroplasty is simple, single stage operation and has good functional and low complication rate.

Keywords---hypospadias, urethrocutaneous fistula, snodgrass tubularized incised plate (TIP) urethroplasty.

Introduction

As known, Hypospadias is a by birth defect resulting from incomplete tubularization of the uretheral plate leading to abnormal location of the meatus

anywhere along the ventral aspect of penis and down to the perineum. Distal penile hypospadias is the commonest type of hypospadias in children.[1] This condition occurs in approximately 1 in 150 to 300 males, making Hypospadias the second most common birth defect in boys after cryptorchidism. In majority (over 80%) of cases the meatus is located distal to midshaft.[2] Patients experiences varying degree of functional disability depending upon the severity of Hypospadias. The stream may be deflected ventrally. Sexually the dystrophic meatus may cause psychological problems and by causing difficulty in semen delivery can affect fertility.[3]

Surgical reconstruction is the only method of treating hypospadias.[4] More than 200 methods of repair have been introduced throughout the 125 years history of hypospadias repair.[5] Snodgrass repair has become a preferred method for repairing distal hypospadias because of it's versatility to correct different meatal variants. Snodgrass repair also called tubularized incised plate urethroplasty was introduced in 1992. It relies on using the natural tissues of penis on the underside for making a new urinary passage. The basic concept is midline incision of the open urethra from the urinary opening till the head of penis. This expands the urethral plate and allows it rolled into a new urethral tube which can heal very well. The simplicity of the operative technique, low complication rate and reliable creation of a normal appearing glanular meatus, (a vertical slit like normal appearing meatus) making Snodgrass a preferred method for repairing distal penile hypospadias.[6,7,8] This procedure allows construction of neo-urethra from existing urethral plate without additional skin flps[9]. The goal of modern hypospadias repair is to achieve functionally as well as cosmetically normal looking glans, meatus and phallus.[10]Urethrocutaneous fistula being the most frequent complication ranging from 2-16%.[9,11,12] following Snodgrass repair. It can be avoided by interposition of a vascularized dartos flap between neourethra and overlying skin.[13] In a study by Uzair M[1] et al, overall rate of urethrocutaneous fistula was 9.6% Snodgrass Tubularized Incised Plate (TIP) urethroplasty for hypospadias repair. We conducted this study to determine the frequency of urethrocutaneousfistula during three months following Snodgrass repair for distal penile hypospadias in children.

Material and Methods

This Descriptive Cross Sectional study was conducted at Department of Pediatric Surgery, Khyber Teaching Hospital from 15 Jan, 2021 to 14 Jan, 2023. This study included 135 patients with distal penile hypospadias without chordee, between 2 years and 14 years of age. Children who had previous repair for hypospadias, Children with severe chordee (Muscle chordee) and Patients operated outside our unit were excluded from the study.Patients with torsion anomalies were also excluded The study was approved from Ethical & Research Committee of CPSP and hospital. Each patient was thoroughly re-examined by taking history, complete clinical examination, routine investigation i.e Hb%, HBSAg, Anti HCV, antibodies and other relevant investigation if necessary was also done in each patient pre operatively.

Surgical technique

All patients were operated under general anesthesia by a consultant pediatric surgeon with atleast 2 years post fellowship experience. A tourniquet was applied to maintain a bloodless field. A 3/0 silk stay suture taken into glans for traction and later to secure the urethral stent. A U shaped incision was made extending along the edges of the urethral plate to healthy skin 2 mm proximal to the meatus. Flaps were mobilized for a tension free repair. The urethral plate were then incised in midline from the hypospadias meatus distally. Incised plate were then tubularized over a 6F or 7 F stent using interrupted Vicryl (6/0) suture. Neourethra were then covered with a vascularized dartos flap harvested from subcutaneous tissue of dorsal prepucial skin. All patients were maintained on antibiotics prophylaxis. Urethral stent were removed on 10 postoperative day. Operative time was calculated for each repair.

Patients were followed for 3 months with their first visit commencing at the tenth day postoperatively for the removal of stent in the outpatient department. The next visit was scheduled on first month post operatively and final visit on the completion of the third month in outpatient department all patients were followed for fistula formation in the predesigned proforma. All data was analyzed by using SPSS Version 22. Mean and SDs were calculated for numerical variables like age, Duration of Symptoms and duration of surgery. Frequencies and percentages were calculated for categorical variables like Urethrocutaneous Fistula.

Results

Mean age of patients was 8±1.50 years and 60 (44.17%) patients were recorded in 4-8 years age group whereas 76 (55.88%) patients were recorded in 9-14 years age group. Mean duration of Symptoms of hypospadias is was 3±1.05 months. The mean operative time was 60±2.02 min. Urethrocutaneousfistula during three months following Snodgrass repair for distal penile hypospadias in children was reported in 09 (6.6%) patients. Stratification of urethrocutaneous fistula with age, Duration of Symptoms and duration of surgery are present at Table I.

Table I
Stratification of Urethrocutaneous Fistula (n=136)

Variables		Urethrocutaneous Fistula n(%)		*p*-value*
		Yes	No	
Age (years)	04-08	04 (02.96%	56 (41.17%	0.983**
	09-14	05 (03.67%	71 (52.20%	
Duration of symptoms	< 02 Months	03 (02.20%	47 (34.55%	0.825**
	> 02 Months	06 (04.41%	80 (58.82%	
Operative	< 58 minutes	03 (02.20%	36	0.749**

time			(26.47%	
	> 58 minutes	06 (4.41%	91 (66.91%	

* Chi-Square test
** Not Significant

Discussion

Hypospadias is a congenital defect and Distal penile hypospadias is the most common type of hypospadias in children.[1] The goal of modern hypospadias repair is to achieve functionally as well as cosmetically normal looking glans, meatus and phallus.[10] Mean age of patients in our study was 8±1.50 years and 44.17% patients were young children whereas 55.88% patients were older children. However, in a descriptive study by Uzair M[1] et al, the mean age of patients were 3.9±1.86 years and all patients were in the range of 2 to 10 years. Similar to our study, mean age of patients was 7 years in a study by Akmal M [15] et al. Mean duration of Symptoms of hypospadias in our study was 3±1.05 months. The mean operative time in our study was 60±2.02 min. Similarly, in a descriptive study by Uzair M[1] et al, Mean operative time was 57.52 minutes.

Urethrocutaneous fistula during three months following Snodgrass repair for distal penile hypospadias in children was reported in 6.6% patients in our study. However, a higher rate i.e 9.6% of urethrocutaneous fistula after Snodgrass Tubularized Incised Plate urethroplasty for hypospadias repair was reported in a study by Uzair M[1] et al. Cheng EY[14] et al, Javanthi VR[15] and Ikramuddin [16] et al reported low frequencies of urethrocutaneous fistula i.e. 0.24%, 1% and 2%, respectively. However, Akmal M [17] et al, Ahmad K[18] and Zhou Y [19] et al reported higher frequencies of urethrocutaneous fistula i.e. 10%, 11.8% and 12.5%, respectively.

We stratified the data with age, duration of symptoms and operative time and found that higher rate of urethrocutaneous fistula post Snodgrass repair i.e. 03.67%, 04.41% and 4.41% was observed in older children, patients with long duration of symptoms and longer operative time, respectively. However results was not statistically significant ($p>0.05$). In contrary to our study, high frequency of urethrocutaneous fistula i.e. 5.8% was reported in younger children in a study by Uzair M[1] et al. Single center study is the limitation of this study. Moreover, this requires a larger sample size.

Conclusion

It is concluded that TIP ure throplasty is simple, single stage operation in the management of hypospadias and has good functional and low complication rate. Although, higher rates of urethrocutaneous fistula post Snodgrass repair were observed in older children, patients with long duration of symptoms and longer operative time, but the results was not statistically significant ($p>0.05$).

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