

Distal Hypospadias and Urethral Mobilization Technique: A Prospective Study

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ABSTRACT: Hypospadias is the most common genetic anomaly of the urethra affecting living male childbirths globally. Successful hypospadias repair should not only provide a functional penis adequate for sexual intercourse, but also provide the ability to void comfortably, and a satisfactory cosmetic result. In this study, we obtained total 30 patients with distal hypospadias who were operated on using the urethral mobilization and advancement technique. It was a prospective study conducted on 30 patients admitted during the period from July 2017 to December 2018 at Department of Pediatric Surgery, Gonoshasthaya Samaj Vittik Medical College, Savar, Dhaka, Bangladesh. Among 30 patients the mean age was 57.15 ± 38.73 months and mean duration of catheterization was 3.75 ± 1.23 days. The mean length of hospital stay was 2.83 ± 1.33 . We found that 3 folds urethral length mobilization allows tension free urethral anastomosis. The most common immediate postoperative complication was hematoma seen in five (8.3%) cases; all patients with hematoma were managed conservatively. Only one patient had wound infection. Four (6.6%) patients had narrow urinary stream and labeled as stenosis. Although perhaps only useful in our technique seems to be a good method with satisfactory cosmetic and functional results with minimal complications. Postoperative management is simple and a brief hospital stay is sufficient.

KEYWORDS: Distal Hypospadias, Urethral Mobilization Technique.

I. INTRODUCTION

Current hypospadiology has significantly advanced since the 1980s but significant challenges remain like regulating the supervision with the evidence-based protocols and the assessment of longer-term consequences. The noticeable facts from this update have been classified in terms of level of evidence and grade of reference as projected by the Centre for Evidence Based Medicine.¹ Hypospadias is the most communal hereditary deviation of the urethra affecting 1:300 live male childbirths globally. The existence is on the rise with the growing ecological pollution as the suspected cause.² Refurbishment of a normal appearing effective penis, negligible surgical bother and disquiet for the patient, and a rate of obstacle close to nil are the goals of modern "hypospadiology".³ Effective hypospadias repair should not only provide a purposeful penis adequate for sexual interaction, but also provide the ability to void contentedly, and a pleasing cosmetic outcome. Proceeding the urethra for hypospadias restoration was first introduced in 1898 by Beck,⁴ with notable success. In the year of 1977,

Belman reported on a method for hypospadias restoration which involved wide urethral mobilization and improvement.⁵

By meatal position hypospadias is classified as anterior (glanular and sub-coronal), mid penile (distal penile, mid shaft, and proximal penile), and posterior (penoscrotal, scrotal, and perineal) accounting for 50%, 30%, and 20%, respectively.⁶ Those cases in which multiple procedures are performed with suboptimal results are termed "crippled"

ed cases".⁷ The majority of cases are distal hypospadias with an incidence of 75%.⁸ Several techniques have been reported in the last two decades, most of them for anterior defects.⁹⁻¹¹ The advantage of this technique is the decreased incidence of development of urethra-cutaneous fistula. We account 30 patients with distal hypospadias who were operated on using the urethral mobilization and advancement technique.

II. METHODOLOGY

Study Design

It was a prospective study conducted on 30 patients admitted during the period from July 2017 to December 2018 at Department of Pediatric Surgery, Gonoshasthaya Samaj Vittik Medical College, Savar, Dhaka, Bangladesh after approval from the ethical committee.

Selection Criteria

Patients with 4 types of hypospadias (glanular, coronal, subcoronal, and distal penile hypospadias) were selected for this study. But, recurrent cases of anterior, fresh, or recurrent proximal hypospadias cases were not taken for this study.

Data Collection Technique

A self-structured proforma was used to collect the data such as demographic details, perioperative assessment, intraoperative complications, and postoperative period including complications after procedure and on follow-up. Duration of catheterization and hospital stay were also recorded.

Data Analysis Technique

An informed written consent was taken from the parents of all patients included in the study. All the patients were followed up in the outpatients' clinic and continued for 3 months to record any complications. The collected data was entered and analyzed by using SPSS version 26.

Surgical Technique

All the operations were performed under general anesthesia with caudal block by a pediatric surgeon who is experienced in hypospadias surgery. At the beginning of the operation, incision lines were outlined and marked. A tourniquet was employed. A traction suture was placed through the glans, and a 6–8-Fr catheter was passed into the bladder. A circular incision was made dorsally at 3mm proximal to the corona. Ventrally, the opening was made proximal to the urethral meatus. The penile skin was degloved down to the penoscrotal junction, liberating any cutaneous chordee. An artificial erection test was conducted to see if there is any residual chordee. The urethral meatus was circumscribed by means of sharp

dissection and mobilization started. The ventral glans was slit deeply into the corpora cavernosa followed by excision of excess mucosa on both sides and the glans wings were mobilized laterally. The glandular bed was prepared and then the mobilized urethra was placed in it. The dorsal lip of the urethra was sutured to the glans tip with interrupted 6/0 polyglactin sutures. The two glans wings were approximated over the urethra with 6-0 PDS sutures. The meatal anastomosis was accomplished by introduction ventral lateral sutures. The excess penile skin was resected. The skin was re-approximated with 6-0 absorbable sutures, and dressing was applied around the penis. The catheter was protected with a glanular suture. The dressing was removed after 3 days. Antibiotic ointment was applied to the penis for 2 weeks.

III. RESULTS

A total of 30 male patients of anterior & distal penile hypospadias were selected for this study. The age of the patients was between 16 and 144 months, and the mean age was 57.15 ± 38.73 months (Table 1). The mean duration of catheterization was 3.75 ± 1.23 days (Table 1). The mean length of hospital stay was 2.83 ± 1.33 (Table 1). We found 52.50% were subcoronal, 40% were distal penile type, only 7.50% cases were of glandular type. Each patient was assessed perioperative after the induction of anesthesia. We found that 3 folds urethral length mobilization allows tension free urethral anastomosis. Complications were divided into perioperative and postoperative. The most common immediate postoperative complication was hematoma seen in five (8.3%) cases; all patients with hematoma were managed conservatively. Only one patient had wound infection. After 2–3 weeks of surgery, four (6.6%) patients had narrow urinary stream and labeled as stenosis; these patients were managed with urethral dilatation weekly for 2 to 3 weeks. At 3 months follow-up, 93.3% patients had slit-like meatus and good urinary stream (Table 2).

IV. DISCUSSIONS

Hypospadias is classified in various types on the basis of meatus location, i.e., glanular, subcoronal, coronal, distal, mid-penile, proximal, penoscrotal, scrotal, and perineal.¹⁵ Many techniques have been described to correct anterior hypospadias, like Mathieu procedure¹⁴ and its modifications,¹⁵⁻¹⁶ they have the drawback of precarious blood supply and breakdown of this repair must occur occasionally.^{17,18} Primary drawbacks of original meatal advancement and glanuloplasty (MAGPI)¹⁷ are meatal regression¹⁹

and stenosis⁹. Tubularization techniques like glans approximation procedure Tubularized incised plate urethroplasty (TIP)¹⁹ repair gained popularity for correction of anterior hypospadias; however, its results depend upon the characters of urethral plate, together with an incidence of, disruption, fistula and meatal stenosis.⁹ The patients with anterior hypospadias were aged between 16 and 144 months. Hammouda et al. corrected the anterior hypospadias in a similar age group. We found the mean time for removal of catheter as 3.75 ± 1.23 days, and the results were comparable with Hammouda et al. as they kept the catheter for 24 h after urethral mobilization.⁹ However, Hashish et al. reported that they removed the catheter immediately after surgery. The result of the present study showed that the mean hospital stay was 2.83 ± 1.33 , while Hashish et al. mentioned that the hospital stay was 2 to 10 days.³ Urethral mobilization should begin proximally, where the urethra is completely surrounded by spongiosal tissue, and not distally, where the spongiosal tissues splay away laterally.²⁷

The used technique brings the urethra deeper inside the glans with wide slit-like (elliptical) orthotopic meatus. We found that 3 folds urethral length mobilization allows tension free urethral anastomosis in case of anterior hypospadias. Atala et al.⁹ described 4-5 folds urethral mobilization to gain tension free urethral anastomosis. The extent of advancement of the urethra within its corpus ranged from 0.6 to 2.1 cm, in agreement with other reports where the maximum length for urethral advancement was 1.5¹⁹ and 2.5 cm²⁰ respectively. In our study, hematoma was seen in three (7.5%), and wound infection in one patient. Atala also operated with a similar technique and found hematoma in one patient and urethral retraction in two patients; however, infection rate was not mentioned.⁹ We saw no urethra-cutaneous fistula or urethral stricture after UMA procedure, and our results were comparable with various authors.^{9,20-25} Proper urethral mobilization, deep inter-balanitic incision and wide dissection of the glans laterally are essential to avoid complications such as chordee, glanular disruption and meatal retraction or stenosis. Fine interrupted sutures between tunica albuginea of corpus spongiosum to that of both corpora cavernosa will contribute to urethral stability.²⁶

V. CONCLUSIONS

Although perhaps only useful in Anterior and distal hypospadias repairs, the Mobilization and Advancement of urethra technique seems to be

a good method with satisfactory cosmetic and functional results, avoiding the need for a second layer of tissue covering during repair with no chance for development of urethra-cutaneous fistula. About 3-fold urethral mobilization length is adequate to prevent chordee and achieve tension-free urethra-glanular anastomosis. Postoperative management is simple and a brief hospital stay is sufficient.

REFERENCES

- [1] Phillips B, Ball C, Sackett D, et al. Oxford Centre for Evidence-based Medicine—levels of evidence. 2009. <http://www.cebm.net/oxford-centre-evidence-based-medicine-levels-evidence-march-2009/>.
- [2] N. Djakovic, J. Nyarangi-Dix, A. Ozturk, and M. Hohenfellner, “Hypospadias,” *Advances in Urology*, vol. 2008, Article ID 650135, 7 pages, 2008.
- [3] Paolocaione, Nicola Capozza, and Alberto Lais, et al. Long term results of distal urethral advancement glanuloplasty for distal hypospadias, *the journal of urology*.1997,158: 1168-1171.
- [4] Beck C.: A new operation for balanitic hypospadias. *NY Med. J.*, 67: 147, 1898.
- [5] Belman A.B.: Urethroplasty. *Society for Pediatric Urology Newsletter*, December 28, 1977.
- [6] A. Bhat, “General considerations in hypospadias surgery,” *Indian Journal of Urology*, vol. 24, no. 2, pp. 188–194, 2008.
- [7] S. L. Baskin, “Hypospadias, anatomy, embryology and reconstructive techniques,” *Brazilian Journal of Urology*, vol. 26, pp. 621–629, 2000.
- [8] Alkan M, Oguzkurt P, Ezer SS, Ince E, Hicsonmez A. Evaluation of the results of eccentric circummeatal-based flap with combined limited urethral mobilization technique for distal hypospadias repair. *J PediatrUrol* 2008; 4:206-9. [CrossRef]
- [9] Atala A. Urethral mobilization and advancement for midshaft to distal hypospadias. *J Urol* 2002; 168 (Pt 2):1738–1741. discussion 1741.
- [10] Baran NK. Urethral advancement for distal hypospadias repair in circumcised patients. *PlastReconstr Surg* 1982; 70:496–504.
- [11] Wishahi MM, Wishahy MK, Kaddah N. Urethral advancement technique for repair of distal hypospadias. *Eur Urol* 1990; 17:40–42.

- [12] Hussam Hassan et al, Urethral mobilization and advancement for distal hypospadias. *Annals of Pediatric Surgery* • October 2015
- [13] Caione P., Capozza N., De Gennaro M., Creti G., Zaccara A. and Lais A.: Distal hypospadias repair by urethral sliding advancement and Y-V glanuloplasty. *J. Urol.*, 146: 644, 1991.
- [14] Mathieu P.: Traitement en un temps de l'hypospadias balanique et juxta balanique. *J. Chir.*, 39: 481, 1932 (Cited by J. Barcat).
- [15] Mustarde J.C.: One-stage correction of distal hypospadias and other people's fistulae. *Br. J. Plast. Surg.*, 18: 413, 1965.
- [16] Barcat J.: Current concepts of treatment. In Horton C.E. (ed.): *Plastic and Reconstructive Surgery of the Genital Area*. Boston, Little Brown and Co., 1973.
- [17] Duckett J.W.: MAGPI (Meatoplasty and Glanuloplasty) a procedure for subcrotal hypospadias. *Urol. Clin. North Am.*, 8: 513, 1981.
- [18] Meyer-Junghanel L., Petersen C. and Mildenerger H.: Experience with repair of 120 hypospadias using Mathieu's procedure. *Eur. J. Pediatr. Surg.*, 5: 355, 1995.
- [19] Unluer E.S., Miroglu C., Ozdiler E. and Ozturk R.: Long term results of the MAGPI (meatal advancement and glanduloplasty) operations in distal hypospadias. *Int. Urol. Nephrol.*, 213: 581, 1991. for distal hypospadias. *J. Urol.*, 151: 464, 1994.
- [21] Hammouda H.M., El-Ghoneimi A., Bagli D., McLorie G. and Khoury A.E.: Tubularized Incised Plate Repair: Functional outcome after intermediate follow-up. *J. Urol.*, 169: 331, 2003.
- [22] Hashish MS, Elsawaf MI, Moussa MA. Urethral advancement procedure in the treatment of primary distal hypospadias: a series of 20 cases. *Ann Pediatr Surg*. 2017; 13(1):29–37.
- [23] Hamdy H, Awadhi MA, Rasromani KH. Urethral mobilization and meatal advancement: a surgical principle in hypospadias repair. *Pediatr Surg Int*. 1999 May; 15(3–4):240–2.
- [24] Gite VA, Nikose JV, Bote SM, Patil SR. Anterior urethral advancement as a single-stage technique for repair of anterior hypospadias: our experience. *Urol J*. 2017; 14(4):4034–7.
- [25] Chakraborty AK, Majumdar SK, Zahid MK, and Biswas I, Palit P. Limited urethral mobilization technique in distal hypospadias repair: an overview. *Chatt Maa Shi Hosp Med Coll J*. 2017; 16(1):37–41.
- [26] Hassan HS, Almetaher HA, Negm M, Elhalaby EA. Urethral mobilization and advancement for distal hypospadias. *Ann Pediatr Surg*. 2015; 11(4):239–43.
- [27] Youssef salehassen, and Atef mohamedabdelateef, New Concept in Urethral Advancement for Anterior Hypospadias, Egypt, *J. Plast. Reconstr. Surg.*, Vol. 32, No. 2, July: 223-227, 2008
- [28] Yerkes E.B., Adams M.C., Miller D.A., et al.: Y-to-I wrap: Use of the distal spongiosum for hypospadias repair. *J. Urol.*, 163: 1536, 2000.

TABLES

Table1:
Showing mean age, duration of catheterization, and length of hospital stay of patients (N=30)

	Mean±SD
Age(months)	57.15±38.73
Duration of catheterization(days)	3.75 ±1.23
Length of hospital stay(days)	2.83 ±1.33

Table2: Complications and findings on follow-up

N=30		
Preoperative	Excessive Bleeding	0(0%)
	Urethral Injury	1(1.6%)
	Failure of urethral advancement	0(0%)
Postoperative	Wound site infection	1(1.6%)
	Stenosis	4(6.6%)
	Hematoma	5(8.3%)
	Retraction	0(0%)
	Urethral Fistula	0(0%)

	Chordae	0(0%)
	Torsion	0(0%)
	Urethralischemia	0(0%)
	Meatus Shape	
Follow-upat3 months	Slit-like	28(93.3%)
	Narrow	2(6.6%)
	UrinaryStream	
	Good	28(93.3%)
	Poor	2(6.6%)