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Outcome of Classical Tubularized Incised-Plate Urethroplasty (TIP) for Primary Anterior Hypospadias Repair: 5 Years' Experience

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Abstract

Introduction: Classical Tubularized Incised-plate Urethroplasty (TIP) is a surgical procedure used to repair hypospadias, which is a birth defect in which the opening of the urethra located on the underside of the penis rather than at the tip. ***Aim of the Study:*** The aim of this study was to evaluate the surgical outcome of classical tubularized incised plate (TIP) urethroplasty. ***Methods:*** This retrospective study was conducted in the Department of Pediatric Surgery, Bangladesh Shishu Hospital & Institute, Dhaka from July 2017 to June 2022. Total 53 patients were included in this study. ***Result:*** In the current study, the mean age of participants was 43.08±21.72 months where the minimum age was 12 months and maximum age was 103 months. The mean weight of participants was 19.25±7.78 kg. The mean penile length of participants was 35.9±8.05 mm. The mean operation time was 73.24±4.80 minutes. Mean operation cost was 277.50±40.46 US$. Mean hospital stay was 10.7±0.75 days. In our study, 15.09% had UC fistula, 5.66% had wound infection and 7.54% had meatal stenosis. Follow up period was 7.9±2.1 months. In this study, more than half (50.94%) had distal penile hypospadias, 28.30% had coronal hypospadias and 20.75% had sub-coronal hypospadias. ***Conclusion:*** According to the findings of our study, Tubularized Incised-plate (TIP) urethroplasty is found to be a safe and reliable technique for hypospadias repair. The rate of complications was found low in TIP urethroplasty.

Keywords: Classical Tubularized Incised-plate Urethroplasty (TIP), and Primary Anterior Hypospadias.

I. INTRODUCTION

An anomaly of the anterior urethral and penile development is called hypospadias in which the urethral entrance is ectopically situated towards the tip of the glans on the ventrum of the penis [1]. Hypospadias is one of the most common congenital anomalies, occurring approximately 1 in 200 to 1 in 300 live births [2]. The care of various kinds of hypospadias underwent a revolution when Snodgrass introduced tubularized incised plate (TIP) urethroplasty in 1994 [3- 8]. Several writers have reported more experience with the TIP urethroplasty approach for more proximal and distal lesions [5, 9]. Re-operative and sophisticated hypospadias repairs have also been completed successfully with TIP urethroplasty [10-13]. The goal of hypospadias repair is to create a urethra and a penis that is suitable for sexual activity and has a satisfying aesthetic outcome [14]. Hypospadias repair is difficult since there are more complications with this treatment than with other reconstructive surgeries. The two most important procedures in this repair technique are making a relaxing incision at the base of the urethral plate and covering the neourethra with a dartos flap for stability [3, 5]. The efficacy of this approach for proximal instances has been demonstrated in several published publications, despite the fact that it is used for distal hypospadias [15]. The most frequent side effects of hypospadias surgery are urethrocutaneous fistula (U-C fistula), urethral stricture, and meatal stenosis [16]. The fistula development may be caused by the absence or insufficiency of the healing components present on the ventral side of the penis [17]. In order to resolve these issues, Snodgrass cut through the urethral plate to lessen the strain on the urethral tube, but a fistula still develops. With vicryl 6-0 continuous subcuticular suture, the urethral plate was tubularized above newborn feeding tube no.7fr during the Snodgrass surgery [18]. Around the world, many surgeons choose the TIP method [22]. However, there are still questions about whether it can be utilized in cases with recurring urethrocutanious fistula or failed urethroplasty. Finding a suitable tissue to cover the repair site in the absence of

an appropriate prepuce and the preceding TIP technique's contraindication are two additional crucial considerations.

II. OBJECTIVES

The aim of this study was to evaluate the surgical outcome of classical tabularized incised plate (TIP) urethroplasty.

III. METHODOLOGY & MATERIALS

This retrospective study was conducted in the Division of Pediatric Surgery, Bangladesh Shishu Hospital & Institute, Dhaka Dhaka from July 2017 to June 2022. Hospital records of 53 Patients with primary anterior hypospadias, admitted for urethroplasty and operated were evaluated and included in this study. The following investigations were done preoperatively: Hematological examination (Complete blood count, Blood grouping, Bleeding time, Clotting time, Prothrombin time). Other investigations included urine routine microscopic examination, urine culture sensitivity test, serum creatinine and ultrasonography of KUB region. Patient who was operated during COVID 19 pandemic period had done RT – PCR test prior to the surgery.

Operative Technique

All the procedure was done under caudal anesthesia. A 5–0 polypropylene suture is place into the glans for traction and to later secure the urethral stent. Longitudinal incisions are made along the visible junction of the glans wings to the urethral plate. Then a midline incision of the urethral plate given. A silastic stent is passed into the bladder and secured to the glans traction suture. Then the urethral plate is tubularized beginning at the neo-meatus, using 6–0 polyglactin atraumatic suture. The first suture is placed through the epithelium at a point just distal to the midglans so that the meatus has an oval, not rounded, configuration. Tubularization is completed with a interrupted one-layer sub epithelial closure, turning all epithelium into the neourethral lumen. Interrupted suture will be given 2-3 mm apart. A dartos pedicle flap is dissected from the preputial hood and dorsal shaft skin in patients undergoing circumcision, then button-holed and transposed ventrally to cover the entire neourethra. Glanuloplasty & skin closure done with 6-0 polyglactin atraumatic suture.

Post-Operative Treatment

Intravenous Antibiotics Cephradine (50 mg/kg/day-6 hourly) and Flucloxacillin (50 mg/kg/day-6 hourly) were given for first 7 days. Then oral Syrup Cephradine (50 mg/kg/day-6 hourly) up to 14 days. Analgesics used for the patients less than one year suppositories Paracetamol (20 mg/kg/dose-8 hourly) per rectally until pain subsided and for the patients more than one-year, injection Pethidine (1.5 mg/kg/dose IM - 6 hourly) for 1st 24 hours then Suppositories Diclofenac sodium 1.5 mg/kg/dose per rectally - 8 hourly until pain subsided. Check dressing was done at 5th POD, if patient with no complain (Dressing socked, Wound infection). Catheter removed on 7th POD and all the patients were discharged from the hospital if they did not have any significant pain, have a healthy wound and were able to void spontaneously. All the patients were advised to followed up on 14th post-operative day,1 month after operation, 3 months after operation, 6 months after operation. On each follow up, following were done and recorded: - meatal/ urethral dilatation regularly, check for urethrocutenious fistula and meatal stenosis.

IV. RESULT

Table I demonstrates the baseline information of the study subjects. In the current study, the mean age of participants was 43.08±21.72 months where the minimum age was 12 months and maximum age was 103 months. The mean weight of participants was 19.25±7.78 kg. The mean penile length of participants was 35.9±8.05 mm. Table II shows the complications and outcome of the study subjects. The mean operation time was 73.24±4.80 minutes. Mean operation cost was 277.50±40.46 US$. In our study, we used 6/0 polyglactin atraumatic suture on all patients. Mean hospital stay was 10.7±0.75 days. In our study, 15.09% had UC fistula, 5.66% had wound infection and 7.54% had meatal stenosis. Follow up period was 7.9±2.1 months. Figure 1 shows the types of Hypospadias among study subject. In this study, more than half (50.94%) had distal penile hypospadias, 28.30% had coronal hypospadias and 20.75% had sub-coronal hypospadias.

Table-I: Baseline information of the study subjects (N=53)

Variables	Mean ± SD	Range
Age (Months)	43.08±21.72	12-103
Weight (kg)	19.25±7.78	10.6-35.50
Penile length (mm)	35.9±8.05	27-48

Table-II: Complications and outcome of the study subjects (N=53)

Variables		n	%
Operation time (minutes)	Mean ± SD	73.24±4.80	
Operation cost (US$)	Mean ± SD	277.50±40.46	
Hospital stay (Days)	Mean ± SD	10.7±0.75	
Complications	Wound infection	3	5.66
	UC fistula	8	15.09
	Meatal stenosis	4	7.54
Follow up (months)	Mean ± SD	10.4±3.5	

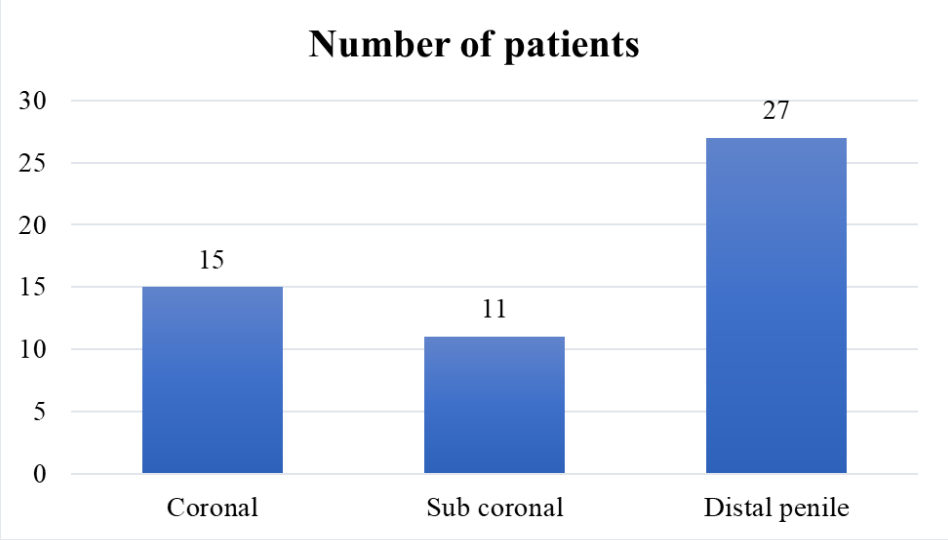

Figure-1: Types of Hypospadias among study subject (N=53)

V. DISCUSSION

To this day, hypospadiology is considered to be a developing and growing field of study [23]. Although numerous surgical techniques have been documented, treating hypospadias surgically remains difficult [24]. The precise contributions that each of these elements made to the success of hypospadias correction are yet unknown [25]. The ideal time to correct hypospadias is between 6 and 18 months [26]. In the current study, the mean age of participants was 43.08±21.72 months where the minimum age was 12 months and maximum age was 103 months. In the study of Osama Sarhan OM *et al.*, [27], the mean age was 6 years which is lower compared to our study. The mean operation time was 73.24±4.80 minutes. Mean operation cost was 277.50±40.46 US$. In our study, we used 6/0 polyglactin atraumatic suture. Ulman *et al.*, [28] compared subcuticular suturing using 7-0 polydioxanone to using 6-0 polyglactin in a single layer, full thickness and unbroken way. In comparison to full-thickness suture urethroplasty, they discovered that the use of a subcuticular 7-0 continuous suture was linked with a decreased incidence of problems [28]. Suturing method was identified by El-Sherbiny *et al.*, [29] as a major risk factor that might have an impact on the success of hypospadias correction in univariate analysis. On a univariate analysis, they discovered that compared to interrupted suturing (9%), the use of a running suture was significantly related with a greater fistula rate (23%). Comparing hypospadias surgery to other reconstructive procedures, complications are more common [30, 31]. The success rate for Snodgrass repair is equivelent to 90% [32, 33]. Utilizing polydioxanone sutures during urethroplasties can lower the incidence of problems [28]. In our study, 15.09% had UC fistula, 5.66% had wound infection and Meatal stenosis had 7.54%. Follow up period was 7.9±2.1 months. In this study more than half (50.94%) had distal penile hypospadias, 28.30% had coronal hypospadias and 20.75% had sub-coronal hypospadias. Summary findings of published studies on 328 patients who had TIP urethroplasty for primary hypospadias correction showed 5.5% complication rate [3, 4, 6, 9, 34-36]. The reported rate of fistula development ranges from 0% to 10% [3, 4, 6, 7, 9, 34-37]. In 3% (0–14%) of patients, meatal stenosis developed [3, 4, 6, 7, 9, 34–38]. UCF is the most frequent side effect following hypospadias repair, despite the fact that certain studies have found no influence of the suture method on the success of TIP urethroplasty [7, 39]. According to Chung and colleagues' publication, the incidence rate of UCF was observed to be 7% in patients with distal hypospadias who underwent TIP urethroplasty and 13.5 in those who underwent suture urethroplasty. Some author noted that meatal stenosis most often indicates a technical error, including tubularization of the urethral plate too far distally [5]. Attention to put not more than one stitch beyond middle glanular level avoids meatal stenosis and fisula [6]. Most hypospadias procedures are criticised for being difficult to learn; in contrast, the TIP

repair has the advantage of technical simplicity [3, 40, 41]. The findings of our study show effective result of continuous suture in case of tubularised incised plate (TIP) urethroplasty. Further studies with larger sample sizes are required to support these findings.

VI. *Limitations of the Study*

The sample size was small and no control group for comparison. Study population was selected from one center in Dhaka city, so may not represent wider population. Follow up schedule could not maintain for COVID 19 pandemic situation.

VII. CONCLUSION AND RECOMMENDATIONS

According to the findings of our study, Tubularised Incised-plate (TIP) urethroplasty is found to be a safe and reliable technique for hypospadias repair. The rate of complications was found low in TIP urethroplasty. Further study with large sample size should be performed to have better understanding.

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