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Research Article

Regular Dilatation is Not Necessary to Prevent Fistula Formation after Tubularized Incised-Plate Urethroplasty in Hypospadias Repair

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Abstract

Background: After tubularized incised plate (TIP) urethroplasty meatal and urethral calibration is a common practice. There are some complication of urethral calibration like urethral bleeding, urethral perforation and creating a false passage. Moreover, calibrate the urethra regularly is physically or psychologically painful both for the child and the parents.

Materials and Methods: This study was a prospective, comparative study performed in Dhaka Shishu (Children) Hospital from July 2017 to June 2019. Total 40 respondents were participated in this study with maintain inclusion criteria. Respondents with primary distal and mid-shaft hypospadias where TIP urethroplasty was indicated, admitted in Dhaka Shishu Hospital during study period were included. Group A was assigned non calibration group and Group B was assigned to regular urethral calibration group after TIP urethroplasty. Fistula formation was compared between two groups. Informed written consents were taken from legal guardians. Data were analyzed by SPSS Program.

Results: In this study there was no significant difference of ages between two groups. In Group B 15% (3) respondents developed urethrocutaneous fistula. On the other hand in Group A 10% (2) respondents developed urethrocutaneous fistula.

Conclusion: There was no significant difference in fistula formation in between regular urethral calibration group and non-calibration group after TIP urethroplasty.

Keywords: *TIP; Hypospadias; Calibration*

Introduction

Hypospadias can be defined as an arrest in normal development of the urethra, foreskin and ventral aspect of the penis [1]. Hypospadias is one of the most common congenital anomalies, occurring in approximately 1 in 250 newborns, or roughly 1 in 125 live male births [2].

Hypospadias is classified by the location of the urethral meatus after release of chordee into anterior, middle and posterior groups. Anterior group includes Glandular, Coronal, Distal penile shaft and Middle group include Middle penile shaft [3]. In this study we have included anterior and middle group of hypospadias.

The main goal of hypospadias surgery are orthoplasty (straightening), urethroplasty, meatoplasty and glanuloplasty, scrotoplasty, and skin cover [1]. The success of operation is determined by excellent cosmetic appearance and normal voiding in a straight forward direction from the tip of the glans [1,4].

Almost all cases of urethroplasty, fistula as the most common complication. The other main complications are meatal stenosis, residual chordee, dehiscence and diverticulum [5].

Tubularized incised plate (TIP) urethroplasty is a popular method to treat hypospadias. After TIP urethroplasty meatal and urethral calibration is usually done. There are some complication of urethral calibration like urethral bleeding, urethral perforation, creating a false passage, UTI [6]. Moreover, calibrating the urethra regularly is physically or psychologically painful both for the child and the parents. Different studies showed that patients without calibration has much less complication than the patient undergoing regular calibration.

So, we want to check role of regular urethral dilatation after TIP urethroplasty to prevent fistula formation.

Materials and Methods

This is a Prospective, comparative study which was done on Division of Pediatric Surgery Dhaka Shishu (Children) Hospital from July 2017 to June 2019.Study subject were admitted patient with mid and distal penile hypospadias where TIP was indicated. Patients with hypospadias were allocated in two groups by random sampling. Parents were informed regarding the surgical procedures and written consent was taken:

- Group-A: 20 patient who were operated TIP urethroplasty with regular urethral calibration.
- Group-B: 48 patient who were operated TIP urethroplasty without regular urethral calibration.

Selection criteria

All patients were included with primary distal and middle hypospadias, ranges from 1 year to 18 year, where TIP urethroplasty is indicated admitted in Dhaka Shishu Hospital during study period. Patients with H/O previous hypospadias surgery, circumcised hypospadias patient and Chordee more than 30º were excluded in this study.

Data collection

Data were collected in a pre-designed, semi-structured questionnaire, after taking consent from guardians in the consent form. The questionnaire was prepared by using the selected variables according to the objectives. Detailed information was collected from patient's mother or accompanying guardian or also from patients in older age group. All the information's were gathered symmetrically and put into the questionnaire. On admission and after obtaining detailed history of each patient, they were thoroughly examined and diagnosis was confirmed by clinical examination and relevant investigations.

Operative technique

After brief discussion of the procedure, informed written consent will be taken from the legal guardian for operation. All the patients were operated under general anaesthesia with caudal epidural block with bupivacaine. A glans traction suture of 4/0 plain catgut is fixed; a circumferential incision is made 2 mm proximal to the hypospadiac orifice and the penis partially degloved. Two parallel longitudinal incisions are made to separate the lateral borders of the urethral plate from the rest of the glans. Two glanular wings are dissected and reflected dorsally. A midline incision is made in the urethral plate extending from the hypospadiac meatus to 1 - 2 mm proximal to the tip

of the glans. The incised urethra plate is tubularized over a stent using interrupted and subcuticular 6/0 vicryl. Glans wing are also approximated using 6/0 vicryl. Circumcision is performed and the penile skin closed in the midline ventrally. The stent is used as a urethral catheter and left in place for 7 days.

Post-operative follow up and care:

- In the post-operative ward patients were routinely observed for haemorrhage, urinary retention and control of pain.
- Post-operative analgesia was maintained by per rectal Diclofenac Sodium suppositories, Paracetamol Syrup and Injection Pethidine and also by the effect of caudal anaesthesia.
- All patients were followed up daily till discharge for fever, bleeding, stent blockage, control of pain and other complaints.
- Dressing was chequed on 5th post-operative day. Details of healing pattern and other findings like wound infection, wound dehiscence were noted.
- Stent was removed on 7th post-operative day on both the group. After voiding information about urinary stream, direction and urethrocutaneous fistula were noted.
- All the patients were followed up on 14th POD following urethroplasty when shape of the meatus, size and shape of the glans, persistent chordee, urethrocutaneous fistula and urinary problem were evaluated. The meatus and urethra of a boy under 1 year should accept a feeding tube of 6 Fr, between 1 to 3 years below 8 Fr, 4 to 10 years 8 Fr and 11 to 12 years of age 10 Fr (Anderson 2003, Hadidi 2004).
- Then monthly follow up will be given, up to 6 months.
- On each follow up we will check meatal size, urethral calibration by introducing appropriate size BMI feeding tube according to age.
- After 3 month of surgery, we will do a urethrogram to see any neourethral stenosis.
- In Group A: Regular urethral calibration is not done.
- In Group B: Urethral calibration started on 14th POD with appropriate size tube according to age with local anaesthetic gel. Urethral calibration should be done two times daily and kept *in situ* for five minutes for each attempt.
- When in Group A age related feeding tube passed too tightly or failed to pass, meatal stenosis was detected and advised for regular meatal dilatation at home with age appropriate BMI feeding tube initially twice daily for first 2 months then once daily for next 1 month, twice a week for 1 month, once a week for next 1 month, Once a month for last 1 month.

Data analysis

The data were collected in a preformed proforma. Statistical analyses were performed with SPSS 25.0 (Statistical Software Package for Social Sciences, SPSS Inc, Chicago, IL, USA) software system and were expressed in the text and tables as Mean ± SD (Standard deviation). For qualitative data comparison between 2 groups was obtained by Pearson Chi Square test. P value of < 0.05 was taken as minimum level of significance. And for quantitative data unpaired t-test was done and P value of < .05 was taken as significant.

Ethical consideration

Parents of all the patients were explained about the study and were duly informed about the treatment procedure, known merits and demerits, expected results and possible complications. The study did not involve any additional investigative procedure or significant risk and did not impose any extra economic burden upon the parents. Moreover, BICH thesis committee has approved this study protocol.

Results

Obtained data was analyzed digitally with SPSS 25 (Social Package Statistical Service). Quantitative data was expressed as Mean ± SD. Results of the study can be expressed by the following table.

Variables	Group A (without calibration)	Group B (calibration)	P value
Age distribution	56.6 ± 34.9 months	52.75 ± 30.74 months	>.05
Weight	16.98 ± 8.39 kg	16.93 ± 8.08 kg	>.05
UC fistula	2	3	>.05

Table 1*: Showing outcome of the study (n = 40).*

Types of hypospadias	Number of patient
Glanular	2
Coronal	24
Distal penile	6
Mid penile	8

Table 2: *Type of hypospadias among the study subjects.*
Total patients (n) = 40.

U C Fistula	Group A (n = 20)	Group B (n = 20)	P value
	2	3	> .05
	10%	15%	

Table 3: Occurrence of urethrocutaneous fistula among the study groups.

2 patients in group A and 3 patients in group B developed Urethrocutaneous fistula. Here test statistic (0.228) is less than critical value (3.84); so P > 0.05. Result is not statistically significant.

Pearson Chi-Square test.

P < 0.05 = significant.

Figure 1: *Meatal opening after 6 months of TIP urethroplasty.*

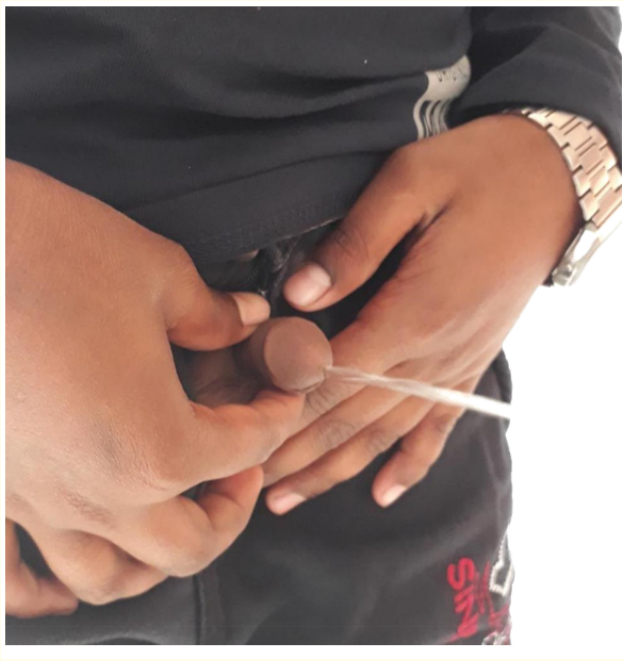

Figure 2: *Urinary stream and direction 6 months after TIP urethroplasty.*

Discussion

This prospective comparative study was conducted in the Department of Paediatric Surgery, Dhaka Shishu Hospital, Dhaka during the period of July 2017 to July 2019.

40 patients with distal hypospadias in whom the meatuses were located from glans penis to mid shaft proximally before operation were included by systematic randomized sampling to form study sample volume. These 40 patients were grouped into: Group-A included 20 patients who were operated TIP urethroplasty without regular urethral dilatation and in Group-B included 20 patients who were operated TIP urethroplasty with regular urethral calibration.

In this study, surgical complications and outcome between the two groups were compared. In our study age range of the patients were 18 months to 144 months with the mean age 54.66 months. The mean ages of Group - A and Group B were 56.6 ± 34.9 months and 52.75 ± 30.74 months. There was no significant difference (P value > .05) between the mean ages. Schultz and colleagues pointed out that an ideal age might be 6 to 18 months to minimize the emotional effect of this traumatic experience [7].

The consensus statement on the timing of genital surgery from the American Academy of Pediatrics also supports early surgery before 18 months of age [8]. So, the mean age of urethroplasty in both the group is higher than the afore mentioned reference.

After preoperative evaluation hypospadias was corrected with TIP urethroplasty in all 40 patients. 20 patients of Group A were not calibrate urethra regularly and in 20 patients of Group B who were calibrate urethra regularly upto 6 months. As per reference of Murphy 2005 age appropriate PVC BMI feeding tube was kept in situ for 7 days [9]. All the patients were followed up daily after urethroplasty till discharge from the hospital and after discharge at 2nd, 4th, 8th and 12th weeks and 6th month following operations.

Urethrocutaneous fistula was the problem to concern as it needs reoperation. In our study 2 patient in Group A developed Urethrocutaneous fistula and 3 patients in Group B developed Urethrocutaneous fistula. This result is similar to result of Redwan., *et al*. 2012 and Xu., *et al*. 2013 studies [10,11]. Fistula of 3 patients was located on the corona and 2 on the distal penile shaft. 3 fistulas were evident on the 8th and 9th Post-operative day and 2 were evident on 1st follow up on 2nd week.

The mean age of the patients with fistula was 58.4 moths which is more than the mean age of the patients in Group B. Regarding Urethrocutaneous fistula in Group A the rate of fistula is 10% and in Group B is 15% which is within the range of other studies like Redwan., *et al*. and Xu., *et al*. [10,11]. But fistula rate higher in comparison to the study Snodgrass., *et al*. 2010 where the fistula rate was only 1.6%. Single experienced Surgeon and state of the art meticulous instrument might be the key to the less fistula rate of Snodgrass [12].

In Dhaka Shishu Hospital, Dhaka Urethrocutaneous fistula topped the list of various complications; 40% [13], 34.4% [14], 25% [15], 14.29% [16] and in BSMMU, Dhaka 33.3% [17].

These results are near similar to our study.

Conclusion

There is no difference of fistula formation between regular calibration and without calibration after TIP urethroplasty in the treatment of distal and mid penile hypospadias. But without calibration is comfortable for patient both mentally and physically. Routine calibration is not necessary to prevent urethrocutaneous fistula in patient after TIP urethroplasty for mid and distal penile hypospadias.

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