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Tubularized incised plate urethroplasty for the treatment of penile fistulas after hypospadias repair

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Abstract *Objective:* Urethrocutaneous fistula is the most common complication of hypospadias repair. Tubularized incised plate urethroplasty (TIPU) has been used for the management of distal fistulas. This study reports the usage of TIPU in the treatment of large penile fistulas.
Materials and methods: Between April 2002 and September 2012, 15 patients with large penile fistulas who were managed with TIPU were included in the study. The fistulas were sited along the penile shaft from proximal to distal penile localization. Glanular and coronal fistulas were excluded. The surgical technique was completed according to the standard TIPU technique. The surrounding scar tissue of the fistula was circumferentially excised, and the urethral plate at the level of the fistula was incised to provide performance of loose urethral tubularization. A urethral stent was kept for 5—7 days.
Results: The mean age of the patients was 7.3 ± 3.1 years. Primary operation of these patients was tubularized preputial island flap ($n = 6$), on-lay preputial island flap ($n = 4$), and TIPU ($n = 5$). The sites of the hypospadias fistulas were as follows; penoscrotal (three), mid-penile (eight) and subcoronal (four). Fistulas recurred in two patients after fistula repair. The postoperative follow up of the patients was 12.4 ± 7.7 months.
Conclusion: TIPU may be used safely for the treatment of fistulas after hypospadias repair.

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Introduction

Despite recent refinements in hypospadias surgical techniques, the occurrence of urethrocutaneous fistula is still the most common complication of hypospadias repair [1,2]. Several methods have been described for fistula repair [1,3]. However, surgical treatment of the urethrocutaneous fistulas, especially large fistulas, is still problematical for surgeons and patients [4,5].

Tubularized incised plate urethroplasty (TIPU) is the most popular method for the management of mid penile and distal hypospadias [6]. Urethral plate incision without preparing cutaneous flaps also makes TIPU convenient for the management of hypospadias fistulas. TIPU has also been used for the management of redo hypospadias repairs [2,7—10]. Although usage of TIPU for the repair of non-glanular urethrocutaneous large fistulas has been reported, studies are scarce and more experience is needed to support the usage of TIPU for this purpose [11]. We herein report our experience with TIPU for the treatment of large hypospadias fistulas.

Materials and methods

Between April 2002 and September 2012, 15 patients with large hypospadias fistulas who were treated with TIPU were included in the study. A large penile fistula is defined as a fistula that is larger than 4 mm at its longest diameter [12]. The fistulas were sited along the penile shaft from proximal to distal penile localization. Glanular and coronal fistulas were excluded.

Surgical technique was based on the same principles in all patients. The condition of the distal urethra and meatus was evaluated by calibrating urethral sounds. Diluted methylene blue was injected into the meatus to detect any small or missing fistulas. Briefly, after the exclusion of the multiple fistula and distal urethral stenosis, the surrounding scar tissue of the fistula was circumferentially excised. The urethral plate at the roof of the fistula was incised, according to TIPU principles, to provide performance of loose urethral tubularization (Fig. 1). The urethra was tubularized over a 6- or 8-F silicone tube with a continuous subepithelial 7/0 polydioxanone suture. Suture line coverage was applied with paraurethral dartos fascia as the second layer and with skin flaps as the third layer in all patients. Great care was made to avoid the opposition of the suture lines in the second layer's sutures.

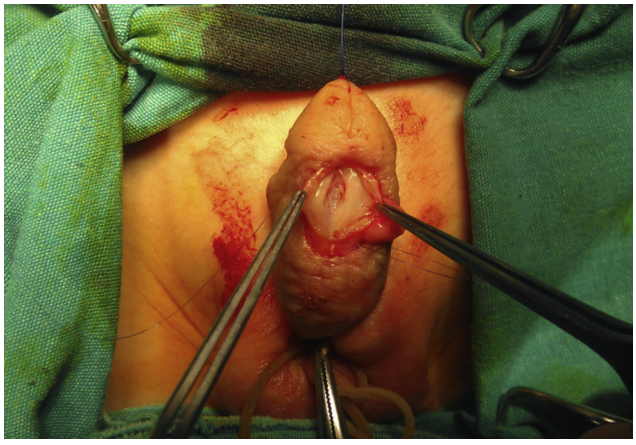

Figure 1 The urethral plate at the roof of the fistula was incised according to tubularized incised plate urethroplasty principles.

A urethral stent was kept for 5—7 days. Prophylactic antibiotics and anticholinergics were administered until the removal of the catheter. The compressive dressing was removed the following day and the patients were discharged 2 days after surgery. All patients were examined at 1 and 3 months. Patients were followed-up for at least 6 months.

Results

The mean age of the patients was 7.3 ± 3.1 years (range, 1.5—13.0 years). Primary operation of the patients was tubularized preputial island flap ($n = 6$), on-lay preputial island flap ($n = 4$) and TIPU ($n = 5$). The characteristics of the hypospadias fistulas are shown in Table 1. All of the TIPU cases that underwent fistula repair had only undergone a single TIPU procedure prior to the fistula repair; thus, we did not encounter scarred urethral plates in these cases.

Fistulas were successfully repaired with no recurrences in 13 patients. Small fistulas recurred in two patients. The primary surgeries of the two recurrent fistula patients were tubularized preputial island flap and TIPU. The recurrent fistulas were successfully repaired by simple closure with one or two layers of subcutaneous coverage. The postoperative follow-up of the patients was 12.4 ± 7.7 months (range, 5—30 months).

Discussion

The methods of fistula repair differ according to the localization and the size of the fistula [1]. The fistulas localized in the glanular or coronal area can be repaired by converting the fistulas to distal hypospadias [8,10]. Small fistulas localized in the penile shaft can be repaired using simple closure techniques with one or two layers of subcuticular tissue coverage. However, in large fistulas, enough urethral plate for tubularization may not be left after the excision of perifistular scar tissue [1,12]. Buccal or bladder mucosal grafts, and dartos fascial flaps have been used for the closure of such large fistulas [1,4,12]. The morbidity of these methods is high; therefore, they are not widely accepted. However, in large fistulas, simple closure is not reasonable in all cases. Difficulties encountered during the treatment of such large fistulas motivated us to change the surgical techniques that we used. We considered the application of TIPU to the cases with large penile fistulas and we published our preliminary results of TIPU application in large fistulas together with application in glanular and coronal fistulas [13]. Following this, Shehata's article [11] appeared in the literature and encouraged us to pursue the method. Shehata [11] stated the importance of accumulation of the experience with this technique. For this reason, we think that adding more cases to the initial results of Shehata [11] is worthy to support the usage of TIPU principles in hypospadias surgery.