Is a urethral stent necessary after tubularized incised-plate urethroplasty for primary distal hypospadias repair: initial experience?

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Background
Distal hypospadias can be treated successfully with Snodgrass [tubularized incised-plate urethroplasty (TIPU)] urethroplasty usually with a postoperative urethral stent for about 7 days. However, these stents have their morbidity and complications. Previous researches negated the negative impact of early stent removal on TIPU outcomes. In this study, we tried to determine the safety of distal penile hypospadias repair using nonstented TIPU.
Patients and methods
A prospective case study included a total of 30 children aged between 6 and 72 months with primary distal hypospadias. They were managed by standard TIPU by the same surgeon with no urethral stent. The incidence of urine retention, meatal stenosis, and urethrocutaneous fistula were used as primary outcomes, while secondary outcomes included operative time and hospital stay along with other complications.
Results
Mean age was 21.7 months. Surgical-site infection was encountered in one case, acute urine retention was in two cases, meatal stenosis in two cases, and fistula in two cases.
Conclusion
Despite the limited number of cases, it appears that the absence of a stent in TIPU procedure does not have a significant negative impact on the postprocedural outcomes. Although nonstented TIPU is associated with prolonged hospitalization, it is associated with a significant decrease in postoperative pain with no risks of stent-related complications. Acute urine retention was a possible complication after nonstented TIPU. However, it can be reduced by applying light dressing while the stent is in place and removing it after completion of the dressing with proper analgesia.

Keywords:
distal hypospadias, meatal stenosis, nonstented, tubularized incised-plate urethroplasty, urethrocutaneous fistula

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Introduction

Tubularized incised-plate urethroplasty (TIPU), originally described by Snodgrass 1994 for surgical correction of hypospadias [1], has become the most frequently performed operation for pediatric cases with primary distal hypospadias [2,3]. Its use has been also extended to involve proximal, mid-shaft, and recurrent cases [4].

In his first description of the method, Snodgrass applied a urethral stent for ~1 week [1]. In most published series, a urethral stent is left for 5–7 days to prevent complications, such as meatal stenosis (MS), urethrocutaneous fistula (UCF), and urine retention.

However, stent-related complications, including pain, bladder spasms, infection, limited mobility, and more analgesic requirements together with increased parent anxiety, have prompted some surgeons to consider stent-free repair. Hafez *et al.* [5] in an experimental study on a rabbit model of hypospadias repaired by TIPU reported that stenting was not necessary and confirmed that the presence of a stent has no impact on the healing process, as normal uroepithelial regeneration was noted into the depth of the incised plate. Also, normal urine flow prevents adhesion and stricture formation between the separated edges of the incised plate.

Herein, the author reports his experience regarding the short-term postoperative outcomes of the nonstented TIPU.

Patients and methods

This prospective study was conducted at the Pediatric Surgery Unit, Tanta University Hospitals, over 2 years starting from June 2018 to December 2020. A total of 30 patients were included between 6 months and 6 years of age, diagnosed with primary distal hypospadias. Calculated sample size via the IBM SPSS Sample Power, version 3.0.1 (IBM Corp., Armonk, New York, USA) taking into account that the primary outcomes were incidence of postoperative urine retention, UCF, and MS. Proximal hypospadias, disorders of sexual development, bleeding diathesis, and recurrent cases were excluded.

The study was approved by the local ethical committee and Institutional Review Board (IRB) of Tanta University, Faculty of Medicine. Moreover, informed written consent was obtained from the patients' parents/guardians after a complete explanation of the benefits and drawbacks of the approach.

After careful clinical examination of the external genitalia to define the type of hypospadias with the exclusion of other genital anomalies, cases were prepared for surgery. All cases were subjected to standard TIPU repair under general anesthesia with penile block only, without caudal or epidural analgesia to avoid postoperative urine retention. Urethral-plate width and length were measured before starting surgery. Based on Snodgrass recommendation, the first layer of urethroplasty should end in a mid-glans position while the glanuloplasty will complete the urethral repair keeping in mind to leave the neomeatus sufficiently wide to avoid MS with subsequent increased risk of urine retention, MS with subsequent UCF, or glanular disruption. The repair was done over an 8–10-Fr catheter, depending on patients' age, and the stent was kept in place till the end of the surgical procedure and complete dressing and then removed. Special attention to control any bleeding points during the surgical maneuver to avoid reactionary bleeding or hematoma and a light dressing were performed using either 3 M Tegaderm Transparent Film Dressing adhesive dressing (a thin polyurethane membrane coated with a layer of an acrylic adhesive) or ordinary dressing with minor compression to avoid retention (Figs 1–4a,b).

Pain assessment after the operation was controlled either by oral paracetamol and/or diclofinac suppositories. Patients were usually discharged after assuring passage of adequate urine frequently either on the same day or the next day following surgery. Regular follow-up visits were scheduled as follows: at 1 week, 2 weeks postoperatively, monthly for the next 3 months, and finally after 6 months. All cases underwent meatal calibration 2 weeks after surgery and dilatation was

Figure 1

After completing TIPU before skin closure. TIPU, tubularized incised-plate urethroplasty.

Figure 2

Lateral view after complete repair before dressing and stent removal.

done for cases with MS. Further visits were arranged when required.

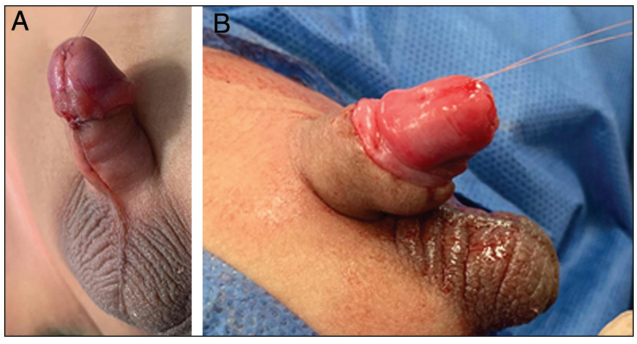
The incidence of postoperative complications, including urine retention, bleeding, hematoma, surgical-site infection (SSI), MS, and UCF, was noted and recorded. Criteria of success included a straight penis with a vertically slit-like meatus located on the tip of the glans with a single and forwardly directed urinary stream of adequate force and caliber.

Our primary outcome was the incidence of postoperative urine retention, MS, and UCF, while secondary outcomes included hospital stay, bleeding, hematoma, and SSI.

Figure 3

Ventral view after TIPU before stent removal. TIPU, tubularized incised-plate urethroplasty.

Figure 4



(a, b) Final results before dressing: (a) front view, (b) lateral view.

Results

Thirty cases were included in this study, the mean age was 21.7 months with a range of 6–72 months. Toilet-trained children represented 10% of cases. Regarding disease criteria, the subcoronal type was the most encountered (43.4% of cases), followed by the coronal, distal penile, and finally glanular types (Table 1).

There were no intraoperative complications. Postoperative hospital stay ranged from 4 to 24 h with mean of 10 h, bleeding from the glanular-suture line occurred in one (3.3%) case 1 h after discharge from OR, the dressing was removed under sedation and minimal compression by using saline adrenaline (1/100 000) soaked gauze for 10 min till bleeding stops, and then a light dressing was reapplied.

Penile hematoma was detected in only one (3.3% of cases) case related to the ventral aspect of phallus and was treated conservatively with no need for evacuation. SSI occurred in one (3.3% of cases) case and was treated by both local and systemic antibiotics with no further morbidity. Acute urine retention was encountered in two (6.7%) cases, and they were successfully managed by removal of the dressing and adequate pain control with no need for catheterization. UCF was encountered only in two (6.7%) cases and it was managed by stent placement for 2 weeks. This was followed by fistula closure with no need for further surgery in one case and the other-case surgical closure was done 6 months later with good results (Fig. 5a, b). MS was encountered in two (6.6%) cases, and was managed by regular dilatation weekly, which led to a significant improvement after 3 months. Table 2 summarizes these data.

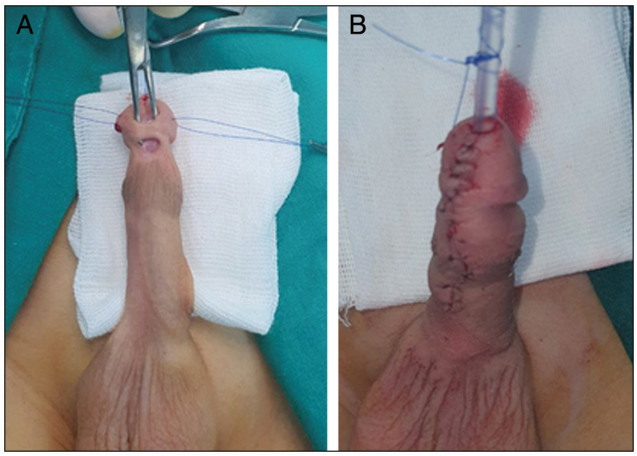
Discussion

TIPU has been favored by many surgeons due to its satisfactory outcomes. However, the use of or omitting urethral stents following that procedure has been a matter of debate. Indwelling stents have been linked with postoperative problems related to their

Table 1 Demographic and preoperative data

	Cases (*N*=30)
Age (months)	
Mean	21.7
Range	6–72
Toilet-trained [*n* (%)]	3 (10)
Site of the meatus [*n* (%)]	
Subcoronal	15 (50)
Coronal	9 (30)
Distal penile	4 (13.3)
Glanular	2 (3.7)

Figure 5



(a) UCF during repair, (b) after complete closure. UCF, urethrocutaneous fistula.

Table 2 Postoperative complications

Complications	*N*=30 cases [*n* (%)]
Bleeding from glanular-suture line	1 (3.33)
Hematoma	1 (3.33)
Acute urine retention	2 (6.66)
Surgical-site infection	1 (3.33)
UCF	2 (6.66)
Meatal stenosis	2 (6.66)

UCF, urethrocutaneous fistula.

use, including pain, bladder spasm, infection, limited mobility, and more analgesic requirements together with increased parent anxiety. While proponents of stent usage report that they decrease the incidence of postoperative complications and preserve the urethral repair. Few studies compared stented and nonstented TIPU in primary distal hypospadias repairs [6]. El-Kamarany *et al*. [7], in a prospective randomized study, reported no significant difference in the occurrence of early and late postoperative complications, Karakaya *et al*. [8] reported similar results in their retrospective comparative study. This study was conducted to evaluate the postoperative outcomes of nonstented TIPU in the repair of primary distal hypospadias.

In this study, acute urine retention was detected in two (6.66%) cases and they were managed by removal of the dressing and adequate pain control with no need for catheterization. Of course, the presence of stents is a protective factor against that complication. El-Karamany and colleagues reported that postoperative acute urine retention was detected in six (13%) out of the nonstented 47 cases. Four cases were managed by urethral catheter insertion, whereas the remaining two cases were managed by suprapubic catheter insertion [7]. Almusafer *et al*. [9] reported two cases of acute urine retention out of 25 nonstented repairs with an incidence of 8% in nonstented cases. We thought that it is important to apply a light dressing while the stent is still in place and remove it after completion of the dressing. This might reduce the incidence of this stressful complication.

SSI occurred in one (3.33%) patient and was managed by both systemic and local antibiotics with no further morbidity. Almusafer *et al*. [9] reported in their prospective cross-sectional study a significant difference between both stented and nonstented TIPU in both SSI and UTI, SSI occurred in 0% of cases in the nonstented group and 1% SSI in the stented group, while urinary-tract infection occurred in 12% in stented group and 8% in nonstented group.

In this study, MS has occurred in two (6.66%) cases. MS may occur after any hypospadias repair because of individual differences in wound healing or technical faults or advancement of the neomeatus to the tip of glans. Almusafer *et al*. [9] reported 4% of cases in the nonstented group (1/25 cases) and 4% (1/25 cases) of the stented group. Karakaya *et al*. [8] had a 5.2% incidence of MS (2/38 cases) in stented group and 3.5% of the nonstented group (1/28 cases) with no significant difference and they suggest that the presence or absence of urethral stents is not responsible for the occurrence of MS. UCF was found in two (6.66%) cases in this study. Almusafer *et al*. [9] reported an incidence of UCF 4% (1/25) and 8% (2/25) in the stented and nonstented groups, respectively, with no significant difference between both groups. Karakaya *et al*. [8] also reported a UCF in only two (2/28) (7.2%) cases in the nonstent group and only one (1/38) (2.63%) case in the stented group. They conclude no significant difference between both stented and nonstented TIPU regarding functional and cosmetic results. However, stent-related complications were avoided in nonstented repair types.

Conclusion

It appears that the absence of a stent in TIPU procedure does not have a significant negative impact on the postprocedural outcomes, but nonstented TIPU is associated with prolonged hospitalization. Acute urine retention is a possible complication after nonstented TIPU and can be managed conservatively. A larger-number, comparative studies are still needed to validate these results.

Limitation of the study

This is an initial single-center study. Also, the included sample size was relatively small and it is a noncomparative study.

Conflicts of interest

There are no conflicts of interest.

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