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How I do it

One-stage repair of proximal hypospadias with severe chordee by in situ tubularization of the transverse preputial island flap

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Summary

Introduction
To investigate a modified transverse preputial island flap repair which is performed in an attempt to reduce the complications following one-stage repair of proximal hypospadias with chordee.

Methods
Briefly, the two ends of the flap were trimmed into V shape and anastomosed with the spatulated urethra proximally and urethral plate distally before tubularization. Then the in situ tubularization of the flap was performed. The procedure was performed in our hospital on 32 patients (mean age = 11 months). They were followed for 12–38 months.

Results
The length of the urethral defect ranged from 4.0–6.0 cm after chordee correction. Urethrocutaneous fistulae occurred in 6 (18.7%) cases. No urethral strictures or meatal stenoses were observed. 29/32 families were satisfied with the cosmetic results.

Conclusion
This procedure seems straightforward and reliable, leading to good result after a short-term follow-up.

Introduction

Proximal hypospadias with severe chordee is the most challenging variant of hypospadias to repair. Since Duckett described the transverse preputial island flap (TPIF) repair in 1980 [1], it has proven to be an efficient one-stage urethroplasty to correct this situation. However, as the overall complication rate is relatively high at ~37.9% [2], surgeons are still making efforts to optimize the procedure [3,4]. In this study, we describe a modified TPIF repair with a novel in situ tubularization of the flap.

Technique

A circumcising incision preserving the urethral plate (UP) was initially performed. The penis was extensively degloved along Buck's fascia, ventrally to the penoscrotal junction and dorsally to the penopubic junction. In all cases, the chordee was severe enough to require transection of the UP at the point of the maximal curvature (Fig. 1D–E). The distal and proximal UPs were then dissected away from the corpora cavernosa. Any fibrous bands tethering the penis were removed. If the slight curvature remained, dorsal midline plication was performed.

Next, the native meatus was spatulated ventrally to the normal corpus spongiosum. The length of the urethral defect was calculated. A TPIF was harvested from the dorsal prepuce with a width of 1.6 cm. The flap was transposed on the ventral surface of the penis. The proximal end of the flap was trimmed into an inverted V shape and anastomosed with the native meatus (Figs. 1A, 2A–C). An 8 Fr feeding tube was applied as a template. The flap was trimmed and tubularized from proximally to distally to construct a neourethra that reached the coronal sulcus (Fig. 1B). Two deep parallel incisions were made on the glans along the distal UP. The UP was then aligned and anastomosed with another V shaped incision at the distal end of the flap (Figs. 1C, 2A–C). The remaining flap was further tubularized to the tip of the glans (Fig. 2D).

Subsequently, the bilateral glanular wings were aggressively dissected and re-approximated using two layers of sutures to cover the

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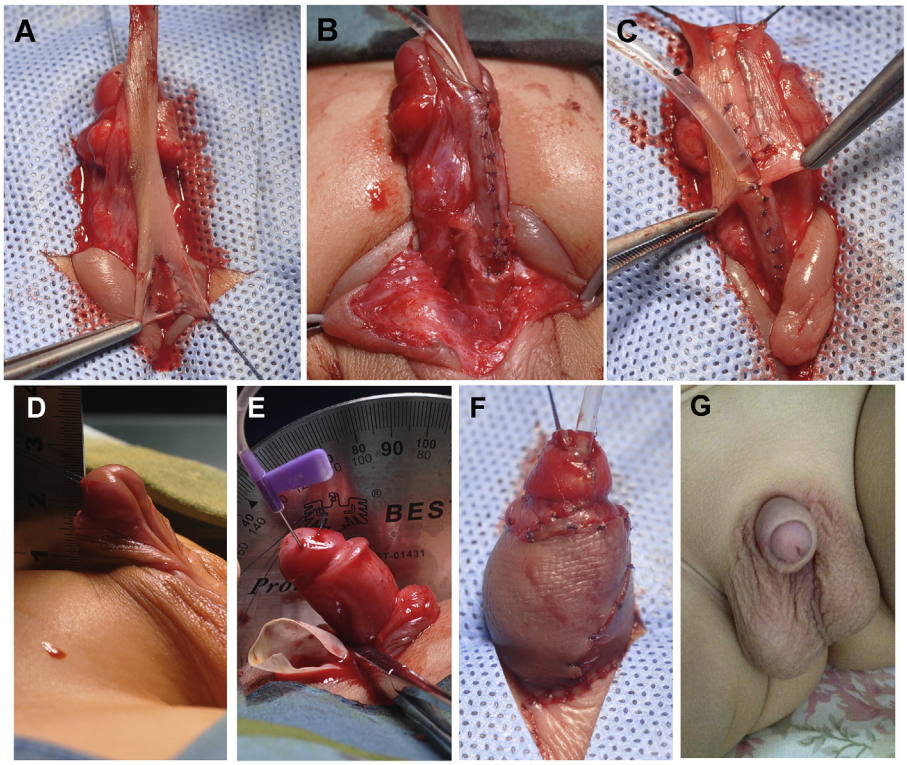

Figure 1 Our modified transverse preputial island flap repair maneuver. (A) Anastomosis of the proximal end of the flap with the native urethra. (B) In situ tubularization of the flap. (C) Anastomosis of the distal end of the flap with the urethral plate on the glans. (D) Proximal hypospadias before surgery. (E) Curvature after degloving. (F) Cosmetic result right after the surgery. (G) Cosmetic result after 12 months.

neourethra without tension (Fig. 2E). The 8 Fr tube was replaced by a 6 Fr feeding tube. The flap pedicle was then draped over the ventral aspect of the urethra and tacked in place covering the urethral suture line (Fig. 2E). The preputial skin was tailored to provide adequate skin coverage as in all hypospadias repairs (Fig. 1F). The penis was covered with a bio-occlusive dressing for 3 days. Prophylactic antibiotics were administered until the feeding tube was removed at 14 days postoperatively.

Results

Thirty-two patients, ranging in age from 7 to 23 months (mean age 11 months) were included in this series. After chordee correction, the length of the urethral defect ranged from 4.0 to 6.0 cm (mean 5.2 cm), with 21.9% meatus located on the penoscrotum, 75% on the scrotum, and 3.1% on the perineum.

Patients were followed for 12—38 months (mean 23 months). Urethral strictures have not been identified based on the symptoms of stranguria, urinary retention, or recurrent urinary tract infection. Urethrocutaneous fistulae occurred in 6/32 patients (18.7%) (5 on the penile shaft and 1 at the coronal sulcus) within 1 month after surgery. They were successfully repaired by surgery after 1 year. All penises were successfully straightened, and all meatuses were located at the glans. To date, no other complications such as diverticulum formation, glans dehiscence, or meatal stenosis have been observed. Twenty-nine of 32 families reported satisfaction with the cosmetic results at follow-up (Fig. 1G). The main complaint of the other three families was small penis.

Discussion

TPIF appears to have a high overall complication rate [2], although in skilled hands, it can be as low as 14.6% [5]. In addition, several authors have made modifications to the TPIF and successfully reduced the incidences of complications such as urethral diverticulum formation and meatal stenosis [3,4,6]. Nevertheless, these reports have seldom focused on strategies to reduce the incidence of urethral stricture formation, which may require an urethrostomy followed by a second urethroplasty. The urethral strictures could occur inside the neourethra or at its junction to the native urethra. Cutting a wedge and a V shaped suture at the ends of the flap could help prevent any circumferential suture line. It is important in terms of avoidance of proximal anastomotic stricture and distal meatal stenosis [6]. In this study, we modified the TPIF by performing straightforward and reliable in situ tubularization of the flap. This maneuver may potentially increase the risk of urethrocutaneous fistula as the suture line is on the ventral side. However, our results are encouraging. In a series of