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Minimal modifications could decrease fistula rate during tubularized incised plate procedure in distal hypospadias repair

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KEYWORDS

Hypospadias;
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Dartos;
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Subepithelial;
Distal

Abstract *Aim:* To report outcome of technical modifications to minimize fistula after TIP procedure.

Patients and methods: 369 boys presenting with distal hypospadias were divided into two groups. In group 1, 196 underwent the standard TIP procedure. In the 173 patients in group 2, several modifications were incorporated into the TIP repair: 1) the first proximal suture was U-shaped subepithelial, 2) dartos flap was created on ventral aspect of penis to cover the proximal suture, and 3) the midline release incision was done as a first step. Patients were monitored prospectively for fistulae, chordee, meatal position, stenosis, and evaluated post-operatively at regular intervals.

Results: 362 patients had a good cosmetic appearance with slit-shaped meatus. Urethrocutaneous fistula was seen in 9 (4.6%) in group 1 and 4 (2.3%) in group 2. Urinary streams were of good quality and without fistula in 187 in group 1 and 169 in group 2. Glans dehiscence was seen in 7 (4 in group 1 and 3 in group 2), meatal stenosis and new urethral stricture in 15 (6 in group 1 and 9 in group 2). Glanular appearance was excellent except in those 7 patients who had glans dehiscence, and the phallus was straight in all.

Conclusion: The Snodgrass repair has revolutionized the treatment of hypospadias. These technical modifications combined with careful patient selection achieved a low fistula rate.

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Introduction

The Snodgrass hypospadias repair is fast becoming the procedure of choice for distal hypospadias at many centers. Multiple series document excellent cosmetic outcome in conjunction with low complication rates. Modifications to the original procedure may further limit the risk of complications.

Hypospadias is a fairly common congenital abnormality characterized by the site of the urethral meatus being on the ventral surface of the penis [1]. Distal hypospadias, a condition in which the meatus is glanular, coronally or subcoronally located, accounts for 65–70% of all cases [2]. A lot of surgical procedures have been developed for hypospadias repair, with varying degrees of success [3]. The aims of these procedures include minimizing the rate of postoperative urethrocutaneous fistula, a straight phallus, a glanular located urethral opening, and finally an adequate urinary conduit with good cosmetic appearance of the penis [4]. The occurrence of urethrocutaneous fistulae precludes the successful outcome of hypospadias surgery [5]. Dartos flaps have been used for both the primary waterproofing of hypospadias repairs and fistula repair [6]. In 2001 Shanberg et al. [7] developed surgical principles for ideal hypospadias repair to avoid urethrocutaneous fistula, including good tissue handling, inversion subepithelial suture, a multilayer closure, avoiding overlapping sutures, use of nonabsorbable suture materials, a tension-free closure, use of optical magnification and finally use of needle-point cautery for coagulation. However, postoperative fistula and/or new urethral dehiscence is still the most troublesome complication, causing great difficulty during redo surgery where reconstruction of a new urethra is needed with minimal or no penile foreskin for repair. In this prospective series, we made some new technical modifications to the classic tubularized incised plate (TIP) repair during treatment of distal hypospadias to minimize this complication.

Patients and methods

From August 2006 to December 2011, 369 male patients presented at the Urology Department of Minia University Hospital with distal hypospadias and were divided into two groups. The control group 1 included 196 patients with a mean age of 7 years in whom the TIP procedure was done with the classic dartos flap interposition and spongioplasty. Group 2 included 173 patients with a mean age of 7 ± 2 years in whom the repair incorporated several modifications: 1) most importantly, the first suture to tubularize the urethral plate incision was in the form of a U-shaped subepithelial suture at the native opening instead of the classic straight one used in TIP repair; 2) the dartos flap was created from the subcoronal penile shaft in the ventral aspect of the penis to cover the first U-shaped suture; and 3) the midline release incision was done as a first step in the procedure, in addition to the usual preputial dartos flap and spongioplasty.

Our inclusion criteria were distal hypospadias in pediatric candidates for TIP repair, and minimal or no chordee. Our exclusion criteria were deficient ventral penile skin and/or thin shiny distal urethra.

In all children in group 2, we made the first U-shaped suture of closure start longitudinally from distal to proximal subepithelially at the left side of the urethral plate incision, then pass transverse to the base of the urethral plate, and then return longitudinally on the right side of the incision parallel to the first one (see Figs. 1–3). The second modification in this series was to preserve a dartos layer proximal to the native opening on the ventral surface during ventral penile degloving to be mobilized later to cover the first suture (proximal 3–5 mm of the repair). The third modification was making the midline release incision first, followed by completion of the U-shaped incision and penile degloving.

In all patients, interposition of a dartos barrier flap and spongioplasty were utilized. We used urethral stents for only 4 days in all boys in this series. No child underwent suprapubic urinary diversion. All were discharged from hospital on the first postoperative day, and parenteral antibiotics were given for 48 h postoperatively. Patients in both groups were evaluated postoperatively at 2 weeks and 6 weeks for urethrocutaneous fistula as a primary end point of the study. They were then evaluated monthly for other complications like infection, meatal stenosis, new urethral stricture and penile straightening.

Statistical analysis

Data recorded were inserted in a database. Z test (test of proportion) and chi square test were used for statistical analysis. *P* value < 0.05 was considered significant.

Results

At follow-up ranging up to 5 years, out of 369 hypospadiac boys included in this series, 362 had a good cosmetic appearance with slit-shaped meatus located normally at

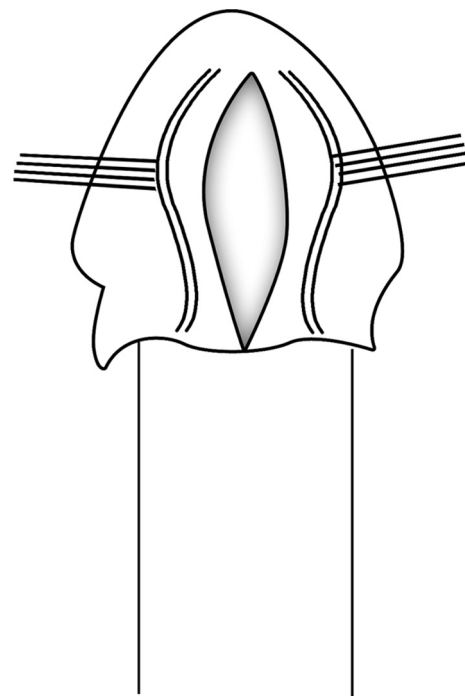


Figure 1 Midline release incision.

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