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Grafted tubularised incised-plate urethroplasty: An objective assessment of outcome with lessons learnt from surgical experience with 263 cases

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KEYWORDS

Inlay graft;
Urethroplasty;
Primary hypospadias

ABBREVIATIONS

HOSE, Hypospadias Objective Scoring Evaluation;
(G-)TIP, (grafted) tubularised incised-plate urethroplasty;
MIUP, midline incision of the urethral plate;

Abstract ***Objective:*** Snodgrass urethroplasty remains the preferred technique in primary distal hypospadias but development of meatal stenosis often limits distal extension of the midline incision of the urethral plate (MIUP), which remains a limiting factor in reconstructing an apical neomeatus (NM). We here-in assess the cosmetic and functional outcome with distal extension of the MIUP in grafted tubularised incised-plate urethroplasty (G-TIP) repair.

Patients and methods: This prospective study included the surgical experience of 263 cases of primary hypospadias operated upon between 2012 and 2015. The G-TIP technique included standard steps of Snodgrass urethroplasty, including degloving and harvesting of glans wings, followed by MIUP that was extended distally beyond the margins of the urethral plate (UP) into the glans. The incised bed was grafted with a free preputial skin graft and fixed to the bed with polydioxanone 7-0 suture. The UP was tubularised and the suture line reinforced with a Dartos flap. The urethral catheter was removed at 7–10 days after the repair and the outcome was assessed at follow-up using the Hypospadias Objective Scoring Evaluation (HOSE) system.

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NM, neomeatus;
UCF, urethrocutaneous fistula;
UP, urethral plate

Results: An apical NM was achieved in 96% of the patients with a 3.7% incidence of urethrocutaneous fistula. The presence of suture tracks and graft at the margins of the NM were seen in the initial 4% and 5% of cases, respectively. Acceptable cosmetic results, with objective HOSE scores of >14, were achieved in 96% of cases.

Conclusion: The G-TIP repair is a straightforward and feasible technique facilitating reconstruction of an apical NM, with an optimum outcome based on HOSE scoring. However, multicentre data are needed for undertaking comparative analysis and to assess the universal applicability of this technique in primary hypospadias.

Introduction

Tubularised incised-plate urethroplasty (TIP) repair is the universally accepted reconstructive procedure in primary distal and even proximal hypospadias, with excellent cosmetic and functional outcomes in most cases. The deep midline incision of the urethral plate (MIUP) remains a key to its success but still its distal extension into the glans is not universally recommended owing to the chance of meatal stenosis. This often remains a limiting factor for reconstructing the neomeatus (NM) at the tip of the glans. Thus, grafting of the incised urethral plate (UP) has been used with the aim of reducing the complications associated with distal extension of the MIUP and in cases with a narrow urethral plate. But to date, there has been a paucity of published surgical experiences with large series of cases highlighting graft-specific complications along with outcomes.

In the present study, we assess the cosmetic and functional outcome with distal extension of the MIUP in grafted TIP (G-TIP) repair. The critical steps potentially resulting in complications are analysed to highlight the simplicity and feasibility of G-TIP repair in achieving a more anatomical NM and reducing complications, e.g. meatal stenosis, which are reported with Snodgrass urethroplasty.

Patients and methods

The prospective case series included evaluation of surgical experience with G-TIP as the only procedure performed between 2012 and 2015 in 263 patients with primary hypospadias. The G-TIP technique included penile skin degloving with circumferential incision extending in a U-shaped fashion around the hypospadias meatus. The glans wings are mobilised and the MIUP, starting from level of the hypospadias meatus and extending distally beyond the margins of the UP into glans for 3–4 mm, was performed thus relaxing the UP (Fig. 1a). The incised bed was grafted with a preputial skin-free graft (Fig. 1b). The UP was tubularised with 7-0 polydioxanone suture and reinforced with either a single or double layered dartos flap. The urethral stent was removed on seventh postoperative day in cases of distal and tenth postoperative day in cases of proximal hypospadias due to the long grafted bed. The objective outcome was assessed at a minimal follow-up of 3 months by an independent urologist for meatal location, shape, penile angulation, urethrocutaneous fistula (UCF), and urinary steam. There was moderate penile angulation (10–30°) in six patients with mid-penile and proximal hypospadias. The outcome was assessed using the 'Hypospadias Objective Scoring Evaluationb' (HOSE) system.

Results

The native meatus was coronal in 81 (30.7%), subcoronal in 113 (43%), distal penile in 40 (17%), mid-penile in 23 (8.7%), and proximal penile in six (2.2%) patients. Amongst 88 (33%) patients with penile chordee, 34 required modified Nesbit plication. The median (range) age of repair was 15 (11–72) months. Over a median (range) follow-up of 17 (6–22) months a slit-like apical meatus was achieved in 252 (96%) patients (Fig. 2a). The presence of suture tracks and graft at the margins of the slit-like meatus occurred in the initial 12 (4%) and 17 (5%) cases, respectively, which was subsequently avoided by quilting an adequate small graft with subcuticular sutures taking the inner margins of the glans and UP. Among 10 (3.7%) patients with UCF, two had spontaneous closure, six underwent successful fistula closure in the presence of a wide apical NM, and two required a staged repair. The urine steam was single and straight in 252 (96%) of the patients and one had a very thin steam of urine 6 weeks postoperatively. Retrograde urethrography which was performed only in this case, showed localised urethral stricture (Fig. 2d). Cystoscopy revealed stricture at the site of the urethrocutaneous anastomosis, probably resulting from extension of the MIUP and grafting into normal urethra. Endoscopic internal urethrotomy was successful without recurrence on follow-up at 8 months. There was moderate penile angulation (10–30°) in seven patients that had