"Hanging" of the Buccal Mucosal Graft for Urethral Stricture Repair After Failed Hypospadias

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Purpose: Urethral stricture is the second most common complication of hypospadias repair after urethrocutaneous fistula. Usually more than 1 procedure is needed for correction due to a lack of available tissue after previous repairs. We evaluated 1-stage urethral stricture management after hypospadias repair using a ventral buccal mucosal graft. We describe the importance of graft hanging and coverage.

Materials and Methods: From August 2004 to April 2009, 15 patients 9 to 17 years old underwent urethral stricture repair after failed hypospadias surgery. Mean time after primary surgery was 7.2 years (range 4 to 13). Vascularized periurethral tissue around the stenotic part of the neourethra was dissected. The urethra was opened ventrally and a buccal mucosal graft of appropriate size was inserted to allow urethral augmentation. Using several U stitches the graft was anchored to the surrounding periurethral tissue to prevent its folding and retraction. Recurrent chordee in 12 patients and secondary vesicoureteral reflux in 3 were also corrected at this time.

Results: Mean followup was 37 months (range 17 to 73). Successful results were confirmed in all patients by urethrography and uroflowmetry. One urethral fistula was corrected 3 months later by minor surgery. Recurvature did not develop in this group. There was no recurrent reflux in endoscopically treated patients.

Conclusions: Ventral buccal mucosal grafting is a simple, safe option for urethral stricture repair. Hanging the graft to periurethral tissue is important for its survival and to prevent postoperative folding and retraction.

Key Words: urethra, urethral stricture, hypospadias, mouth mucosa, transplants

URETHRAL stricture is 1 of the most common complications after severe hypospadias repair. It can develop many years after initially successful surgery. Strictures presenting after hypospadias repair are fundamentally different than strictures caused by trauma or an inflammatory process in a previously healthy male urethra. Previous surgeries followed by extensive scar formation and the lack of genuine spongy tissue are risk factors for radical urethral reconstruction after hypospadias repair.

The buccal mucosal graft has been the gold standard for urethral reconstruction.[1–4] The main problems are insufficient vascular supply and deficient spongiosal tissue to support graft survival in hypospadias cases. As recommended by Barbagli et al,[5] lifting the neourethra and placing the graft dorsal are also difficult and carry a high risk of urethral damage. Ventral grafting is disputable due to insufficient usable skin, scarring and associated poor vascularization.

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We evaluated our experiences with urethral stricture management after hypospadias repair in children using a ventral buccal mucosal graft combined with periurethral tissue coverage and graft hanging.

MATERIALS AND METHODS

From August 2004 to April 2009, 15 patients 9 to 17 years old (mean age 13) underwent urethral stricture repair after failed hypospadias surgery. Initially hypospadias was distal in 3 patients, at the mid shaft in 5 and proximal in 7. Six and 9 patients had undergone 1 and 2 or more surgical procedures for hypospadias repair, respectively. Mean time after primary surgery was 7.2 years (range 4 to 13).

Preoperatively all patients underwent imaging, including retrograde urethrogram and antegrade voiding cystourethrogram, to determine the accurate length and site of the urethral stricture. Strictures were present at different sites along the penile urethra. Mean stricture length was 2.6 cm (range 3 to 5.5). Three patients had fistulas, including 1 missing the glanular urethra. Residual ventral curvature and subsequent vesicoureteral reflux were observed in 12 and 3 patients, respectively (fig. 1, *A*).

Surgery was performed with the patient positioned supine since all strictures were in the penile urethra. A suprapubic catheter was placed for bladder drainage. A subcoronal circumferential incision was made and the penis was degloved to avoid injury to the skin blood vessels (fig. 1, *B*). The technique was done during erection physiologically induced by prostaglandin E1, which enabled precise correction of penile recurvature, adequate measurement of stricture length and suitable graft shaping with maximally stretched cavernous bodies. Ventral curvature was corrected by dorsal plication of the tunica albuginea. The neurovascular bundle was lifted from the bodies and moved lateral in cases of severe and marked curvature, respectively. In cases of unsuccessfully treated chordee the bundle was mobilized lateral and the penis was straightened by 2 parallel plications. In other cases of iatrogenic chordee due to inadequate surgeries the bundle was completely lifted and curvature was repaired. Periurethral tissue formed after the previous urethroplasty was dissected and mobilized from the stenotic urethra. The urethra was opened ventrolateral over a bougie and the stricture was laid open. No attempt was made to mobilize the urethra from the corporeal bodies. The incision was carried into the healthy urethra for about 1 cm proximal and distal.

The buccal mucosal graft was harvested from the inner cheek. The submucosal region was previously infiltrated with a solution of 0.25% bupivacaine in 1:200,000 epinephrine to minimize bleeding at the donor site. Graft length depended on the distance between the distal and proximal healthy urethral ends. The graft was harvested to be approximately 20% larger to allow expected postoperative retraction.

The donor site was examined for bleeding and closed with a running suture. The graft margins were anchored to the edges of the incised urethra with 5-zero interrupted polyglactin sutures over a 10Fr to 12Fr stent without tension (fig. 2, *A*). The periurethral tissue previously dissected from the stenotic urethra was used to provide additional support to the graft. The graft was further anchored to the periurethral

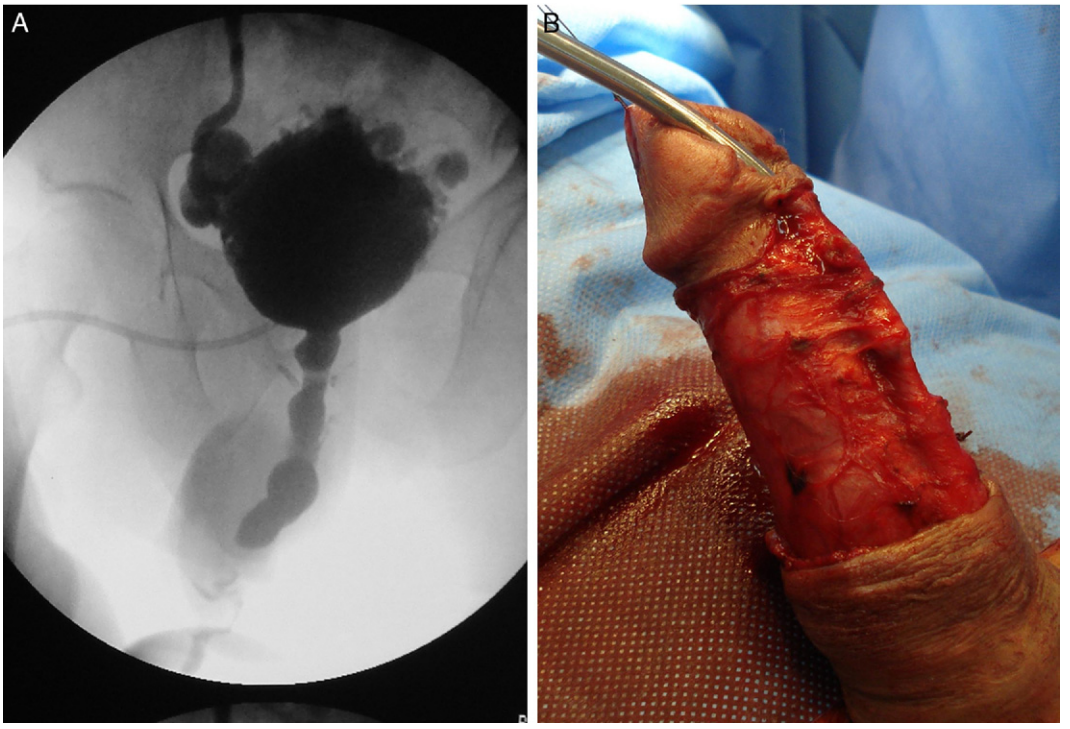

Figure 1. *A*, preoperative voiding cystourethrogram reveals anterior urethral stricture with unilateral vesicoureteral reflux and bladder diverticula. *B*, penile appearance after degloving with anterior urethral stricture and missed distal urethra.