Novel treatment (new drug/intervention; established drug/procedure in new situation)

Dorsolateral onlay urethroplasty for pan anterior urethral stricture by a unilateral urethral mobilisation approach

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Summary

The preferred management of urethral strictures involving long segments of anterior urethra is dorsal onlay buccal mucosa augmentation urethroplasty. This requires circumferential mobilisation of the urethra, which might cause ischaemia of the urethra in addition to chordee. The authors managed a pan anterior urethral stricture, applying a dorsolateral free graft by unilateral urethral mobilisation through a perineal approach. This is a recently described surgical technique which preserves the lateral vascular supply on one side thereby minimising ischaemia. Since circumferential mobilisation of urethra is not carried out in this technique, there are no chances of developing a chordee. Entire procedure is carried out by a perineal incision and no incision is made on the penis except for meatotomy. The pendulous urethra is accessed by penile eversion through the perineal wound. Obviating penile incisions minimises chances of wound infection and fistula formation.

BACKGROUND

Conventionally, when buccal mucosa free graft is applied on the dorsal aspect of a pan urethral stricture, it requires a circumferential mobilisation of urethra. This compromises the vascularity and may result in a chordee.

We have highlighted a surgical technique in which the urethra is mobilised unilaterally thus preserving lateral

vascular supply on one side thereby minimising ischaemia and eliminating any chances of developing a chordee. Moreover, the pendulous urethra is accessed by penile eversion through the perineal wound and no incision is made on the penis except for meatotomy, this minimises chances of wound infection and fistula formation.

Figure 1 Preoperative retrograde urethrogram.

Figure 2 Pendulous urethra accessed by penile eversion through the perineal wound.

Figure 3 Urethra mobilised unilaterally on left side.

Figure 4 Anterior urethra up to distal bulb opened on the dorsolateral aspect.

Figure 5 Meatotomy done.

This is a minimally invasive approach for management of pan anterior urethral strictures.

CASE PRESENTATION

A 22-year-old unmarried Muslim male presented with voiding difficulty since 6 years. He complained of severe obstructive urinary symptoms. On examination, he was

circumcised, had severe meatal stenosis and entire anterior urethra was indurated.

There was no history of sexual exposure or urethral instrumentation. There was no significant medical or family history.

A provisional diagnosis of balanitis xerotica obliterans (BXO) was made.

Figure 6 Free graft sutured to the opened urethral edge and graft quilted on the ventral tunica of the corporal bodies.

Figure 7 Free edges of graft and opened urethra being closed over a 14 Fr silicone catheter.

Figure 8 Completed closure.

INVESTIGATIONS

Uroflowmetry parameters were a peak flow rate of 6 ml/s and an average flow rate of 3 ml/s for a voided volume of 180 ml voided in 155 s. Retrograde urethrogram (RGU) demonstrated an anterior urethral stricture extending from meatus to distal bulbar urethra (figure 1). Cystourethroscopy with a 9.5 Fr paediatric sheath confirmed the RGU findings.

TREATMENT

We decided to perform a buccal mucosa dorsolateral onlay urethroplasty by a unilateral urethral mobilisation approach.

The patient was subjected to general anaesthesia by nasotracheal intubation in lithotomy position. A midline perineal incision was made and a team working simultaneously harvested buccal mucosa from both cheeks. The graft harvest site on left side was sutured whereas left open on the right side.

The pendulous urethra was accessed by penile eversion through the perineal wound (figure 2). The urethra was not separated from the corporal bodies on one side and was only mobilised from the midline on the ventral aspect to beyond the midline on the dorsal aspect (figure 3). Entire anterior urethra up to distal bulb was opened on the dorsolateral aspect (figure 4) and a generous meatotomy was done (figure 5). The free graft was sutured to the opened

urethral edge and graft was quilted on the ventral tunica of the corporal bodies by vicryl 4-0 (figure 6). Thereafter, the free edges of graft and opened urethra were closed over a 14 Fr silicone catheter (figures 7 and 8).

OUTCOME AND FOLLOW-UP

Liquid diet was started on the first postoperative day (POD) with the help of straw and semisolid diet was started on the third POD. In the immediate postoperative period, the patient complained of a greater discomfort on the left side where the graft harvest site was sutured. The patient was ambulated the very next day of surgery. Intravenous antibiotics were administered for 3 days followed by oral antibiotics. Stitches were removed on seventh POD and the patient was discharged on low-dose oral antibiotics with suprapubic catheter (SPC) and per urethral catheter (PUC).

The SPC was changed after 3 weeks of surgery and the PUC removed after 6 weeks of surgery followed by a RGU (figure 9). The patient voided with good flow. After 1 week of PUC removal the patient continued to void with satisfactory flow rates and SPC was also removed. The uroflowmetry at this point demonstrated a peak flow rate of 13 ml/s. At 3 months follow-up the patient does not have any urinary complaints and has erections with no complaint of chordee either.

Figure 9 Postoperative retrograde urethrogram.

DISCUSSION

Postinflammatory strictures involving long segments of urethra should undergo substitution urethroplasty. Various tissues have been used to repair the damaged urethra as either pedicled flaps or as free tissue grafts. The most common graft materials in use today are buccal mucosa, preputial skin (when available) and penile and preputial skin flaps with their own blood supply. The most favoured tissue to augment the diseased urethra particularly in the presence of BXO is buccal mucosa. The use of buccal mucosa in urethral surgery was first described by Humby in 1941¹; no reports followed until the late 1980s. Since then it has gained favour as a versatile graft material well suited to repair the urethra.^{2–5}

Buccal mucosa also has a dense submucosa with a dense capillary network, which facilitates the early imbibition of nutrients from the wound bed as well as early inosculation of neovasculature.^{2–6} In our experience, leaving the graft harvest site unsutured results in less discomfort to the patient.⁷

For the management of long segment anterior urethral stricture, dorsal, ventral or lateral onlay urethroplasty may be employed as a single-stage procedure.⁸ Out of these dorsal onlay urethroplasty is currently the most favoured.⁹

Conventional dorsal onlay urethroplasty requires circumferential mobilisation of the urethra, which might cause ischaemia of the urethra in addition to chordee. We performed a dorsolateral onlay urethroplasty by a unilateral urethral mobilisation approach.^{10 11} This is a recently described surgical technique which preserves the lateral vascular supply on one side, thereby minimising ischaemia. Since circumferential mobilisation of urethra is not carried out in this technique, there are no chances of developing

a chordee. Entire procedure is carried out by a perineal incision and no incision is made on the penis except for meatotomy and the pendulous urethra is accessed by penile eversion through the perineal wound. Obviating penile incisions minimises chances of wound infection and fistula formation.

The preservation of the one-sided vascular supply to the urethra should represent a slight but significant step towards perfecting the surgical technique of urethral reconstruction using a minimally invasive approach.

Learning points

- ▶ Postinflammatory strictures involving long segments of urethra should undergo substitution urethroplasty
- ▶ Whenever available, buccal mucosa is the material of choice
- ▶ Unilateral mobilisation of urethra not only preserves the urethral blood supply but also eliminates any chances of chordee
- ▶ Performing a substitution urethroplasty for a pan anterior urethral stricture through a perineal incision minimises chances of wound infection and fistula formation.

Competing interests None.

Patient consent Obtained.

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