ONE-STAGE CIRCUMFERENTIAL BUCCAL MUCOSA GRAFT URETHROPLASTY FOR BULBOUS STRicture REPAIR

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ABSTRACT

A one-stage onlay urethroplasty, using a buccal mucosa graft, is presented for patients with bulbous strictures in whom the urethral mucosa is seriously involved in the disease. Of 40 patients who underwent a dorsal buccal mucosa graft urethroplasty for bulbous urethral strictures, 5 required complete removal of the urethral mucosa and its replacement by a buccal mucosa graft. All these patients had undergone previous urethrotomy with a false passage inside the bulbous urethra and had a suprapubic tube in place. The goal of removal and replacement of the urethral mucosa in each case was to create a new, wide urethral mucosal bed to promote successful one-stage reconstruction. All patients voided spontaneously without problems after removal of the catheter. After 4 months, the mean peak flow was 21 mL/s. After 6 months, urethroscopy did not show any stricture recurrence. None of the patients required instrumentation or dilation. In patients with bulbous urethral strictures and false passage into the mucosa and spongiosum tissues, the complete removal and replacement of the urethral mucosa using a circumferential buccal mucosa graft promotes successful one-stage urethral reconstruction.

The use of a buccal mucosa graft for one-stage bulbar urethroplasty has become a preferred method for reconstruction of strictures longer than 3 cm in adults. The graft may be used in the ventral or dorsal urethral surface, according to surgeon experience and preference. However, in patients with severe urethral strictures, it may be useful to remove the urethral mucosa involved in the disease completely, especially when the urethral plate is unserviceable for graft augmentation urethroplasty. The objective of this report was to describe the complete removal of the urethral mucosa and its replacement with a circumferential buccal mucosa graft as an adjunct to dorsal onlay urethroplasty.

MATERIAL AND METHODS

From 1994 to January 2001, 40 patients underwent a dorsal buccal mucosa graft according to our standard technique. Of

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FIGURE 1. Voiding urethrography showing stricture and false passage into the bulbar urethra.
these 40 patients, 5 had the urethral mucosa completely involved in the disease and false passage into the spongiosum tissue. All 5 patients had undergone previous urethrotomy for bulbous urethral strictures ranging in length from 2 to 4.5 cm. In all patients, the urethrotomy was unsuccessful and complicated by false passage into the corpus spongiosum. Three patients reported serious urethrorrhagia at the time of the previous operation, and all patients had a suprapubic tube in place. Before urethroplasty, all 5 patients underwent retrograde and voiding urethrography that depicted the stricture and false passage into the bulbar urethra well (Fig. 1). In all 5 patients, the preoperative urethroscopy using a flexible instrument was unsuccessful, because the urethral lumen was narrow and did not allow the instrument to go beyond the stricture.

To perform the procedure, the patient is placed in the normal lithotomy position, and a midline perineal incision is made. The bulbocavernous muscles are separated, the bulbar urethra is freed for its entire length, and the stenosis is identified and underlined (Fig. 2A). The urethra is opened by a ventral midline incision, and the mucosa is identified and fully evaluated (Fig. 2B). The urethral mucosa is circumferentially removed, leaving in place a thin sleeve of the corpus spongiosum, and the distal and proximal mucosal edges are spatulated (Fig. 2C). A buccal mucosa graft is harvested from the cheek and tailored according to the area of the removed tissues. The graft is sutured and quilted circumferentially over the spongiosum tissue using 6-0 interrupted stitches (Fig. 2D). A 16F Foley silicone catheter is inserted, and the corpus spongiosum is largely closed and tubularized over the graft using 4-0 interrupted sutures (Fig. 2E,F). The bulbocavernous muscles are sutured over the urethra, and a small suction drainage is left in place for 1 day. The catheter is left in place for 4 weeks.
RESULTS

All 5 patients were followed up with voiding cystourethrography 4 weeks after surgery (Fig. 3A), and with uroflowmetry, urine culture, and urethrography after 6 months (Fig. 3B). Uroflowmetry and urine culture were repeated every 4 months during the first postoperative year and yearly thereafter. Radiologic studies were repeated when uroflowmetry was less than 14 mL/s. The clinical outcome was considered a failure if at any time postoperative instrumentation was needed, including dilation. Follow-up ranged between 12 and 58 months (mean 38). The peak flow rate ranged between 18 and 29 mL/s (mean 21). All patients continued to void without difficulty, and none of them required additional instrumentation or dilation. In all patients, urethroscopy was performed 6 months after surgery, showing a good urethral lumen and a normal aspect of the mucosa that was replaced by the buccal mucosa graft. In 1 patient, the urethroscopy clearly showed the distal and proximal line of the suture between the graft and the urethral mucosa, without obstruction.

COMMENT

In the bulbar urethra, anastomotic urethroplasty,8 augmented anastomotic urethroplasty,9 and buccal mucosa graft urethroplasty1–7 provide excellent results in most patients with uncomplicated urethral strictures ranging in length from 1 to 6 cm. In patients with locally adverse conditions or complex urethral strictures, the use of two-stage procedures is advisable.10,11 Morey12 suggested that urethral plate replacement may be necessary in a minority of complex, long, severe strictures, and he described a new penile urethroplasty using a graft flap-combined procedure.

In our 5 patients with false passage in the spongiosum tissue, the urethral mucosa was damaged for 5 to 6 cm in length and was unserviceable for augmentation urethroplasty. We preferred to open the urethra ventrally and remove the urethral mucosa, leaving in place a thin sleeve of the spongiosum tissue over the corpora cavernosa. Wide, new, urethral mucosa was created by using a circumferential buccal mucosa graft that was fixed to the underlying corpus spongiosum. In these circumstances, a flap or graft-tubed urethroplasty could be suggested, but tubularization has proved to be a poor solution in similar cases.12 In our technique, the buccal mucosa graft is not a tubed graft, but it will become a tube over an indwelling catheter left in place for an adequate period. Moreover, the graft is spread fixed so that in “tubularizing” the spongy tissue the lumen is not decreased in caliber by folding the graft on itself (Fig. 2E).

The complete removal of the mucosal tissues involved in the false passage was useful and probably avoided recurrence of the stricture over time.

The great elasticity and handiness of the buccal mucosa may increase the rising of numerous new surgical techniques arranging the graft in an original fashion. The armamentarium of the reconstructive urethral surgeon is a continuously evolving process and requires great familiarity with new concepts and concerns.13,14

A wide and homogeneous series of patients with adequate follow-up are necessary to confirm our preliminary results obtained in this series of five severe bulbar urethral strictures.

CONCLUSIONS

The removal of the urethral mucosa, and its complete replacement with a buccal mucosa graft in superficial bulbous mucosal strictures with minimal spongiosum fibrosis and associated with a false passage, facilitates one-stage urethral reconstruction. Additional experience is needed to determine
the long-term results and attrition rate over time and other potential applications of our original technique.

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REFERENCES