


Case Report

Perineal urethrostomy with combined buccal mucosal graft and skin flap after complete loss of anterior urethra

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Abbreviations & Acronyms

BMG = buccal mucosal graft
PSF = perineal skin flap

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Introduction: We report a novel perineal urethrostomy procedure for complete loss of anterior urethral tissue.

Case presentation: A 74-year-old man had complete necrosis of the corpus spongiosum and corpora cavernosa after repeated transurethral surgical procedures. He had been managed with a suprapubic cystostomy tube for 10 years. A perineal urethrostomy was performed, and a posterior wall with an inverted U-shaped perineal skin flap and an anterior wall with a buccal mucosal graft were created. Five months later, an internal urethrotomy was required for mild anastomotic stenosis. Thereafter, an indwelling Foley catheter was used for urine drainage at night to prevent restenosis of the neourethra and avoid excessive nocturia due to low capacity of the long-time disused bladder, and the patient became catheter-free during the daytime.

Conclusion: The method presented here is a reasonable option for patients lacking whole anterior urethral tissue.

Key words: buccal mucosa, bulbar necrosis, perineal urethrostomy.

Keynote message

Reported here is a novel method for creating a perineal urethrostomy in a challenging case in which the whole anterior urethra had disappeared, along with the corporal body of the penis. A tube was created using a PSF, and a BMG was used for the posterior and anterior walls.

Introduction

For treatment of a complicated urethral stricture, three major options are a skin flap, BMG, and perineal urethrostomy.¹ Herein we report a case in which the anterior urethra distal to the external sphincter had completely disappeared. Spontaneous urination was recovered by use of a novel procedure in which those three options were combined.

Case presentation

A 74-year-old man had complete necrosis of the corpus spongiosum and corpora cavernosa after repeated transurethral surgical procedures. Previously, urologist attempted to create a perineal urethrostomy, though that failed because the urethral stump could not be identified intraoperatively. After management with a suprapubic cystostomy tube for 10 years, the patient came to us with hope for restoration of micturition.

Magnetic resonance imaging showed atrophy of the entire corpus spongiosum and corpora cavernosa (Fig. 1a). We performed an antegrade cystoscopy via the suprapubic tract and identified a normal external sphincter, though obliteration of the urethra beyond that was also noted. Using X-ray imaging, the distance from the urethral stump to perineum was determined to be 2.5 cm (Fig. 1b).

We planned to create a perineal urethrostomy using only substitution tissue. Intraoperative transrectal ultrasound findings identified the urethral stump location, as noted in our previous report,² and a perineal incision was made to create an inverted U-shaped flap (Fig. 2a). Next,

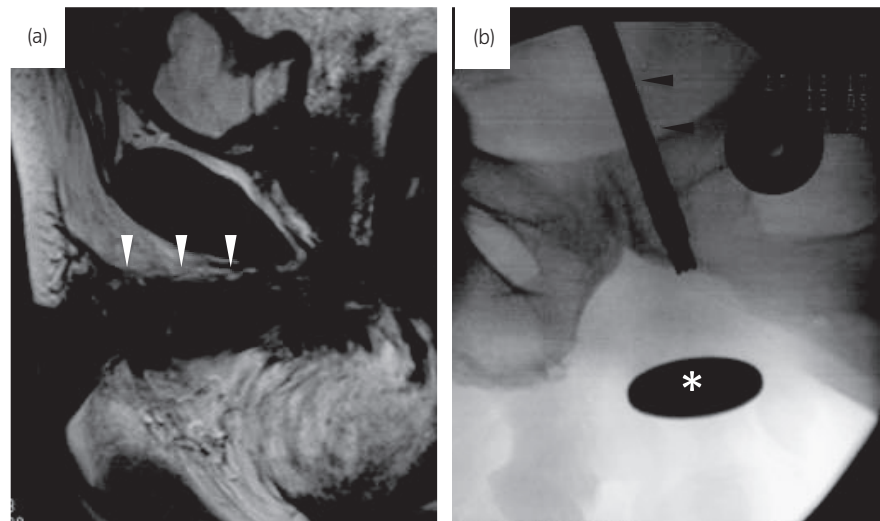


Fig. 1 (a) Magnetic resonance imaging findings showing complete loss of the corpus spongiosum and atrophic corpora cavernosa (white arrowheads). (b) Fluoroscopic X-ray image obtained in oblique position showing an approximate distance of 2.5 cm from the urethral stump, indicated by inserted endoscope tip (black arrowheads), to the perineum, indicated by marker coin placed on perineal skin (*diameter = 2.65 cm).

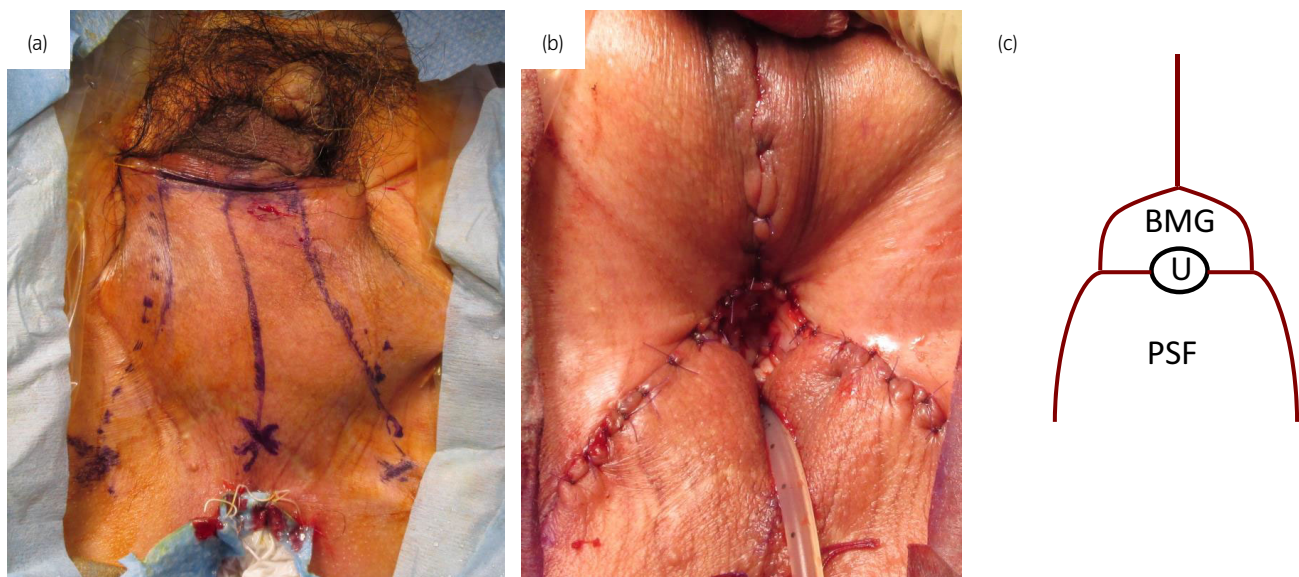


Fig. 2 (a) Initial skin design of inverted U-shaped flap. The location of the urethral stump was identified by transrectal ultrasound and marked (cross) with a pen. (b, c) The anterior wall was created by use of a BMG and the posterior wall by a PSF anastomosed to the urethral stump (U).

a transvesical endoscopic light was positioned at the urethral stump and used for guidance for creating exposure. The mobilized skin flap was sutured to the posterior half of the urethral stump with a 4-0 poliglecaprone suture. Subsequently, a BMG, 2 × 4 cm, was harvested from the inner cheek, then anastomosed to the anterior half of the urethral stump and quilted onto the remnant corpora cavernosa. Both sides of the anterior buccal mucosa and posterior skin flap were sutured together in a running fashion to form a neourethral lumen (Fig. 2b,c).

Three weeks after surgery, the urethral catheter was removed and the patient was able to urinate. However, an internal urethrotomy was required for mild anastomotic stricture 5 months later. Finally, the patient became catheter free during the daytime and an indwelling Foley catheter was used only at night for urine drainage, which helped to avoid

excessive nocturia due to polyuria and the long-time disused bladder. One year after surgery, cystoscopy findings showed that the anastomotic site was without stricture, with the mucosa and skin intact (Fig. 3). Uroflowmetry demonstrated a maximal flow rate of 22.8 mL/s with a voided volume of 232 mL and a minimal amount of residual urine. Presently, micturition has been maintained postoperatively for 2.5 years.

Discussion

Various techniques can be used for a bulbar urethroplasty. For a short stricture in the proximal bulbar urethra, excision and primary anastomosis is the gold standard,^{3,4} while substitution urethral tissue is required for longer strictures, such as a skin flap, with BMG usage also possible. Fuchs *et al.* examined the cases of urethral reconstruction for a

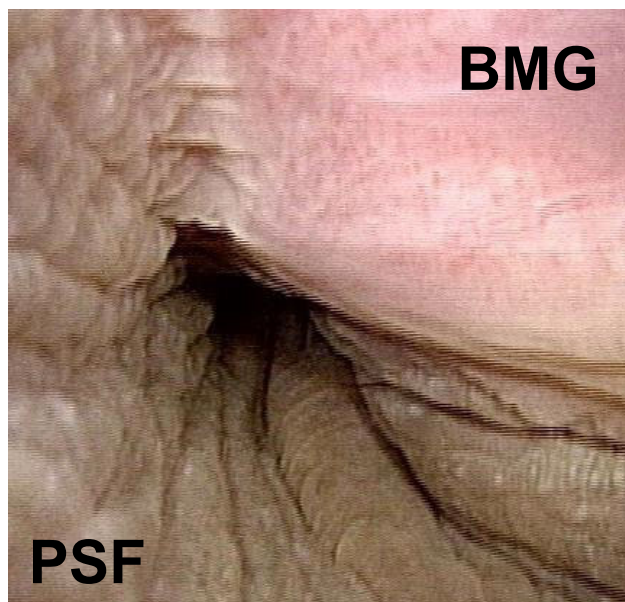


Fig. 3 Endoscopy findings obtained 1 year postoperatively showing a neourethra created by an anterior BMG and PSF.

complicated urethral stricture over a 10-year period, and reported an increasing tendency for a perineal urethrostomy as compared to total urethral reconstruction, which was particularly useful in elderly patients.¹ Their findings indicated that for patients with advanced age, multiple comorbidities, or multiple failed procedures as well as hypospadias cripples, a perineal urethrostomy should be offered.

DeLong *et al.* reported that when a stricture continues into the proximal bulbar urethra or membranous urethra, a perineal urethrostomy with a BMG is a viable option.⁴ They reported 44 cases in which the urethral plate was utilized as a posterior wall and buccal mucosa as an anterior wall, though avoided using a PSF as a posterior wall. A total urethral substitution using a skin flap and BMG has not been reported, because total loss of the anterior urethra, as encountered in the present case, is an extremely rare condition.

Other studies have demonstrated a reduced success rate (68%) for a perineal urethrostomy in patients with panurethral stricture disease, as well as those who have undergone multiple procedures (43%).^{5,6} A previous repair likely contributes to increased risk of failure by disrupting the blood supply and inducing scarring, resulting in poor tissue quality. A perineal urethrostomy with a tubularized flap alone is a risky procedure, as blood supply for the flap is not reliable or robust. In the present case, creation of a tube using buccal mucosa alone was also considered to be very risky, since the

corpora cavernosa was also shrunken, and there was no reliable vascular bed for securing the graft (Fig. 1a). Consequently, we lowered the risk of anastomotic stricture by combining two materials, a BMG and PSF which maintained blood supply, for the anterior and posterior walls. To the best of our knowledge, creation of a perineal urethrostomy entirely comprised of these two substitution materials has not been reported. It should be noted that this case was not considered to be a clear success, since postoperatively our patient required a transurethral incision and is now maintained with an indwelling catheter at night, which should serve for passive dilation. Nonetheless the result has been definite relief from the inconvenience and discomfort of a suprapubic tube, and establishment of micturition during the daytime.

Another option for providing a complete urethral substitution is utilization of the digestive tract, which is not without risk of anastomotic stricture and also has far greater morbidity for harvesting donor tissue.⁷ In comparison to that, less invasive techniques were used in the present case and an acceptable outcome was obtained. A continent catheterizable stoma was not feasible in this patient, because the bladder had become too contracted by the time of surgery.

Conclusion

In patients lacking a whole anterior urethra, dividing risk of stenosis by either buccal mucosa or skin flap alone is considered to be a reasonable option.

Conflict of interest

The authors declare no conflict of interest.

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