


## Case Report

# Penile-preserving surgery for male distal urethral carcinoma followed by buccal mucosa urethroplasty

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### Abbreviations & Acronyms

BMG = buccal mucosa graft  
MRI = magnetic resonance imaging  
PET-CT = positron emission tomography-computed tomography  
PUC = primary urethral carcinoma  
QOL = quality of life  
SCC = squamous cell carcinoma

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**Introduction:** We report a case of distal urethral carcinoma treated with segmental urethral excision and reconstruction by staged buccal mucosa urethroplasty.

**Case presentation:** A 60-year-old man presented with difficulty urinating and a palpable mass on the ventral side of his penis. He was diagnosed as having localized distal urethral carcinoma (cT2N0M0) and underwent penile-preserving surgery with staged urethroplasty using buccal mucosa as substitute tissue. The pathological diagnosis was squamous cell carcinoma of the urethra (T2) with negative surgical margin. At 2 years of follow-up, there was no recurrence or metastasis, he could void in a standing position with an acceptable urinary stream, and he found the appearance of his external genitalia acceptable.

**Conclusion:** In cases of distal primary urethral carcinoma, urethroplasty using buccal mucosa graft could be alternative treatment option providing a better postoperative quality of life.

**Key words:** buccal mucosa graft, squamous cell carcinoma, urethral carcinoma, urethroplasty.

## Keynote message

Segmental urethral resection in combination with staged buccal mucosa urethroplasty could be an alternative treatment for distal localized PUC.

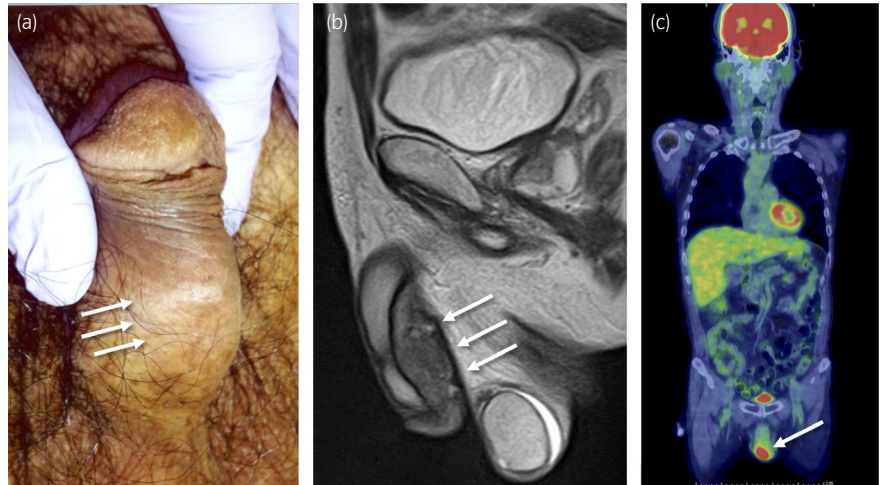
## Introduction

PUCs are rare diseases, comprising <1% of urological malignancies.<sup>1</sup> The standard treatment is therefore not well established because of the case series is small. Distal PUC, in bulbar or penile urethra, tends to have a better prognosis than proximal PUC (in membranous or prostatic urethra) partly because it can be noticed as a palpable penile mass.<sup>2</sup> Surgical excision is the mainstay of PUC treatment, and partial penectomy has been selected in many cases with distal PUC, resulting in negative QOL impacts related to appearance and to sexual and urinary function. We herein report a case of distal PUC who underwent penile-preserving tumor excision and urethral reconstruction by buccal mucosa urethroplasty and established both cancer control and acceptable voiding and sexual-related QOL.

## Case presentation

A 60-year-old man presented with difficulty urinating and a palpable penile mass extending 3 cm in the ventral side of the penis (Fig. 1a). A 17-Fr cystoscope could not be passed through the penile urethra because the lumen was constricted by the surrounding mass. He had an elevated serum SCC antigen level of 1.9 ng/mL and urine cytology was class V, suggesting SCC. Enhanced pelvic MRI showed a distal urethral tumor without extension into corporal cavernosa (Fig. 1b) and PET-CT showed tracer accumulation only in the penis (Fig. 1c). Based on these examinations, he was diagnosed as having localized distal PUC

**Fig. 1** Gross appearance of the penis and radiological findings. (a) Palpable firm mass on ventral side of penis. (b) T2-weighted MRI in the sagittal plane showed a low-intensity tumor in the penile urethra without extension into the corpora cavernosa. (c) Tracer accumulation on PET-CT was observed only in the penis.



**Fig. 2** Excision of the urethral tumor and grafting BMG on the corpora cavernosa. (a) Design of tumor excision. (b) The tumor was excised en bloc with the tunica albuginea of corpora cavernosa. (c) BMG harvested from left inner cheek was quilted onto the corpora cavernosa. Gross appearance (d) and microscopic findings (e) of the resected tumor.



(cT2N0M0). He did not accept undergoing partial penectomy because he expected it to reduce his QOL, so we proposed an alternative option that is penile-preserving excision of a distal urethra segment in combination with staged urethroplasty using BMG as substitute tissue. We thoroughly explained the accompanying risk of recurrence in the preserved penis and the necessity of penectomy when recurrence occurred during follow-up and he accepted our proposal. A midline incision was made in the ventral side of the penis and intraoperative cystoscope showed no other mass in the urethra or in the bladder. The tumor was excised with 5 mm of resection margin laterally and en bloc with the tunica albuginea of corpora cavernosa (Fig. 2a,b). An intraoperative frozen section showed no marginal tumor cells. A 3×4 cm piece of buccal mucosa was harvested

from the left inner cheek and grafted on the surface of the corpora cavernosa (Fig. 2c). The dressing had been kept untouched for 7 days to minimize hematoma formation and to achieve secure adaptation. The pathological diagnosis was SCC of the urethra (T2) with negative surgical margin (Fig. 2d,e). After 1 year of follow-up, no recurrence or metastasis had developed and the BMG had been tubularized to form neourethra (Fig. 3). The postoperative urethrogram showed a wide urethral lumen (Fig. 4a). Uroflowmetry 6 months after second surgery showed a normal flow pattern and acceptable stream ( $Q_{\max}$  28.8 mL/s, Fig. 4b). The neourethra had a lumen large enough for passage of a 17-Fr flexible cystoscope (Fig. 4c). No recurrence or metastasis had developed and the patient was satisfied with the clinical course and the appearance of his penis (Fig. 4d).





**Fig. 3** Urethral tubularization. The edge of the grafted BMG was incised (a,b) and tubularized to create the neourethra (c,d).

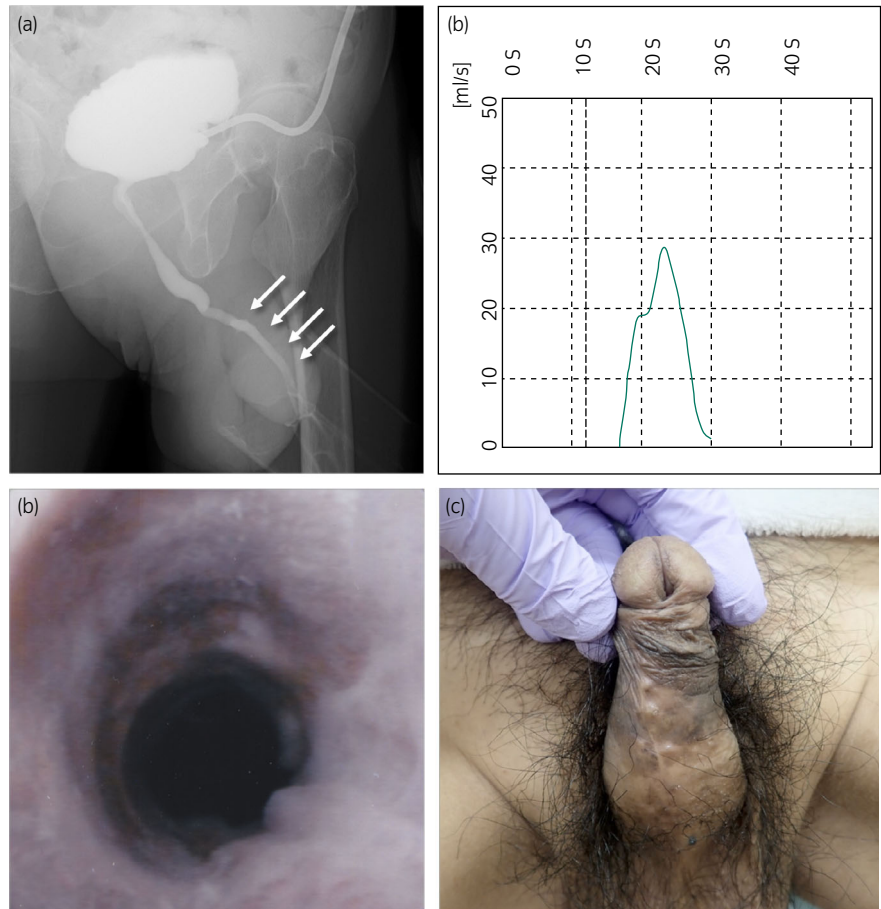
## Discussion

PUCs are rare diseases, comprising <1% of urological malignancies. SCC is the most common type, amounting to more than 60% of PUCs.<sup>3</sup> Patients with PUC frequently present with hematuria or bloody urethral discharge. As the tumor grows it can become palpable and obstruct urine flow. The standard treatment of distal PUC in men is total or partial penectomy, but penile deficiency causes extreme mental distress associated with loss of esthetic acceptability and loss of sexual and urinary function. Distal PUC (in bulbar or penile urethra) tends to have a better prognosis than proximal PUC (in membranous or prostatic urethra). Optimizing the treatment of distal PUC, therefore, focuses on improving functional outcome and QOL while preserving oncological safety.<sup>4</sup>

Twenty-six cases of male anterior PUC have ever been reported, and various types of urethral diversion and replacement were performed. In cases of superficial (Ta, T1) distal PUC in men ( $n = 6$ ), the glans and corpora cavernosa and thus the main components and function of the penile organ were preserved while a midshaft artificial hypospadias was

created, allowing uninhibited voiding.<sup>4,5</sup> In some of the T1 cases in glans ( $n = 4$ ), a two-stage distal urethroplasty with BMG was used.<sup>4</sup> In cases of infiltration of the glans penis ( $\geq T2$ ,  $n = 9$ ), glansectomy with artificial hypospadias and partial-thickness skin grafting is a good modification.<sup>4</sup> For large pendulous urethral carcinoma or multifocal disease ( $n = 7$ ), anterior urethrectomy with perineal urethrostomy was performed.<sup>4,6–8</sup> Using urethroplasty with BMG to treat a large pendulous urethral carcinoma, like the one in this case, had not been reported. Even if the PUC is in pendulous urethra, urethroplasty with BMG after partial urethrectomy could be an alternative option as long as the PUC does not infiltrate the corpus cavernosum (T1–T2) and the patient accept the possible risk of recurrence in the preserved penis.

To minimize the risk of recurrence, the excision in this case included the tunica albuginea of corpora cavernosa to make certain of negative tumoral margin, resulting in direct exposure of cavernous tissue. In order to prevent hematoma formation and to achieve secure graft intake, we placed dressing materials untouched for 7 days, which is longer than that in conventional staged BMG urethroplasty (5 days). This case needed wide and circumferential repair of the urethra, so we



**Fig. 4** Postoperative examinations. (a) Postoperative voiding cystourethrogram demonstrated wide urethral patency in the reconstructed urethra. (b) The findings of uroflowmetry, (c) cystoscopy at the reconstructed urethra, and (d) gross appearance of the penis at 6 postoperative months are shown.

used two-stage urethroplasty with BMG.<sup>9,10</sup> If the intraoperative tumoral margin had been positive, we would have performed partial penectomy. At 6 postoperative months, the patient was without recurrence of PUC and could void through the urinary meatus. In conclusion, in cases of distal PUC, especially localized T1–T2, urethroplasty using BMG is a treatment option controlling cancer and preserving lower urinary tract function.

## Conflict of interest

The authors declare no conflict of interest.

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