

EAU GUIDELINES ON PRIMARY URETHRAL CARCINOMA

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Epidemiology

Primary Urethral Carcinoma (PUC) is a rare cancer, accounting for < 1% of all genitourinary malignancies. The age-standardised ratio is 4.3/million in males and 1.5/million in females, with a male to female ratio of 2.9 to 1.

Aetiology

Predisposing factors in males include urethral strictures, chronic irritation after intermittent catheterisation/urethroplasty, external beam irradiation therapy, radioactive seed implantation, chronic urethral inflammation following sexually transmitted diseases (especially human papilloma virus) and lichen sclerosus. In females, urethral diverticula and recurrent urinary tract infections have been associated with the development of PUC.

Staging and grading systems

The 2025 Tumour, Node, Metastasis (TNM) classification (9th edition) is used for the staging of urethral carcinoma (Table 1). Of note, a separate staging system exists for urothelial carcinoma (UC) of the prostatic urethra.

Table 1: TNM classification (9th edition) for urethral carcinoma

T - Primary tumour	
TX	Primary tumour cannot be assessed
T0	No evidence of primary tumour
Urethra (male and female)	
Ta	Non-invasive papillary, polypoid, or verrucous carcinoma
Tis	Carcinoma in situ
T1	Tumour invades subepithelial connective tissue
T2	Tumour invades any of the following: corpus spongiosum, prostate, periurethral muscle
T3	Tumour invades any of the following: corpus cavernosum, beyond prostatic capsule, anterior vagina, or bladder neck (extraprostatic extension)
T4	Tumour invades other adjacent organs (invasion of the bladder)
Urothelial carcinoma of the prostate and prostatic urethra	
Tis pu	Carcinoma <i>in situ</i> , involvement of prostatic urethra
Tis pd	Carcinoma <i>in situ</i> , involvement of prostatic ducts
T1	Tumour invades subepithelial connective tissue (for tumours involving prostatic urethra only)
T2	Tumour invades any of the following: prostatic stroma, corpus spongiosum, periurethral muscle
T3	Tumour invades any of the following: corpus cavernosum, beyond prostatic capsule, or bladder neck (extraprostatic extension)
T4	Tumour invades other adjacent organs (invasion of the bladder or rectum)

N - Regional lymph nodes	
NX	Regional lymph nodes cannot be assessed
N0	No regional lymph node metastasis
N1	Metastasis in a single lymph node
N2	Metastasis in multiple lymph nodes
M - Distant metastasis	
M0	No distant metastasis
M1	Distant metastasis

Histopathology

Urothelial carcinoma of the urethra is the predominant histological type in males with PUC followed by squamous cell carcinoma (SCC) and adenocarcinoma (AC). In females, studies report higher rates of adenocarcinoma, followed by SCC rather than UC. Specimen handling should follow the general rules as published by the International Collaboration on Cancer Reporting.

Recommendation for staging and classification systems	Strength rating
Use the 2025 Tumour, Node, Metastasis classification and 2022 WHO grading system for pathological staging and grading of primary urethral carcinoma.	Strong

WHO = World Health Organisation

Diagnosis

Diagnosis of PUC is based on clinical examination, urinary cytology, urethroscopy with biopsy and cross-sectional imaging for the assessment of the primary tumour, lymph nodes (LNs) and distant organs. Patients with clinically enlarged inguinal or pelvic LNs often exhibit pathological LN metastasis.

Recommendations for diagnostic evaluation and staging	Strength rating
Use urethroscopy with biopsy and urinary cytology to diagnose urethral carcinoma.	Strong
Assess the presence of distant metastases by computed tomography of the thorax and abdomen/pelvis.	Strong
Use pelvic magnetic resonance imaging to assess the local extent of urethral tumour and regional lymph node enlargement.	Strong

Prognosis

The majority of patients are diagnosed late with local symptoms due to advanced disease and the prognosis is poor. Risk factors for survival include age, sex, ethnicity, tumour stage and grade, nodal stage, presence of distant metastasis, histological type, tumour size, tumour location, concomitant bladder cancer and type and modality of treatment. In locally advanced UC and SCC of the urethra, treatment in academic centres improves overall survival (OS).

Disease management

Primary disease in males

Distal urethral tumours exhibit significantly improved survival rates compared with proximal tumours. Therefore, optimizing treatment of distal (penile urethra and fossa navicularis) urethral carcinoma has become the focus of clinicians to improve functional outcome and quality of life, while preserving oncological safety. Penile-preserving surgery for tumours confined to the corpus spongiosum (stage \leq T2) using various reconstructive techniques has been investigated. In distal urethral tumours performing a partial urethrectomy with a minimal safety margin does not increase

the risk of local recurrence when complete circumferential assessment of the margins shows no evidence of disease.

Recommendations for the treatment of primary urethral carcinoma in males	Strength rating
Offer distal urethrectomy as an alternative to penile amputation in localised distal urethral tumours if negative surgical margins can be achieved intra-operatively.	Weak
Ensure complete circumferential assessment of the proximal urethral margin if penile preserving surgery is intended.	Strong

Localised primary disease in females

In females with distal tumours, urethra-sparing surgery and local radiotherapy (RT) present alternatives to primary urethrectomy but are associated with increased risk of tumour recurrence and local toxicity.

Recommendations for the treatment of localised primary urethral carcinoma in females	Strength rating
Offer radical urethrectomy unless specific criteria for organ preservation are met.	Strong
Offer urethra-sparing surgery as an alternative to primary urethrectomy to females with distal urethral tumours if negative surgical margins can be achieved intra-operatively.	Weak
Offer local radiotherapy as an alternative to urethral surgery to females with localised urethral tumours but discuss local toxicity.	Weak

Multimodal therapy in advanced disease in both males and females

Multimodal therapy in PUC consists of definitive surgery plus chemotherapy with the option of additional RT. Multimodal therapy is often underutilised in locally advanced disease. It confers an OS benefit in PUC of urothelial origin.

Recommendations for multimodal treatment in advanced urethral carcinoma in both males and females	Strength rating
Refer patients with advanced urethral carcinoma to academic centres.	Strong
Discuss treatment of patients with locally advanced urethral carcinoma within a multidisciplinary team of urologists, radiation oncologists, and oncologists.	Strong
Determine perioperative treatment according to histology in locally advanced urethral carcinoma treated with curative intent.	Weak
Follow the European Association of Urology Guidelines on Muscle-invasive and Metastatic Bladder Cancer for the use of perioperative systemic therapy in patients with locally advanced urethral urothelial carcinoma.	Weak
Offer the combination of curative radiotherapy (RT) with radiosensitising chemotherapy for definitive treatment and genital preservation in locally advanced squamous cell carcinoma (SCC) of the urethra.	Weak

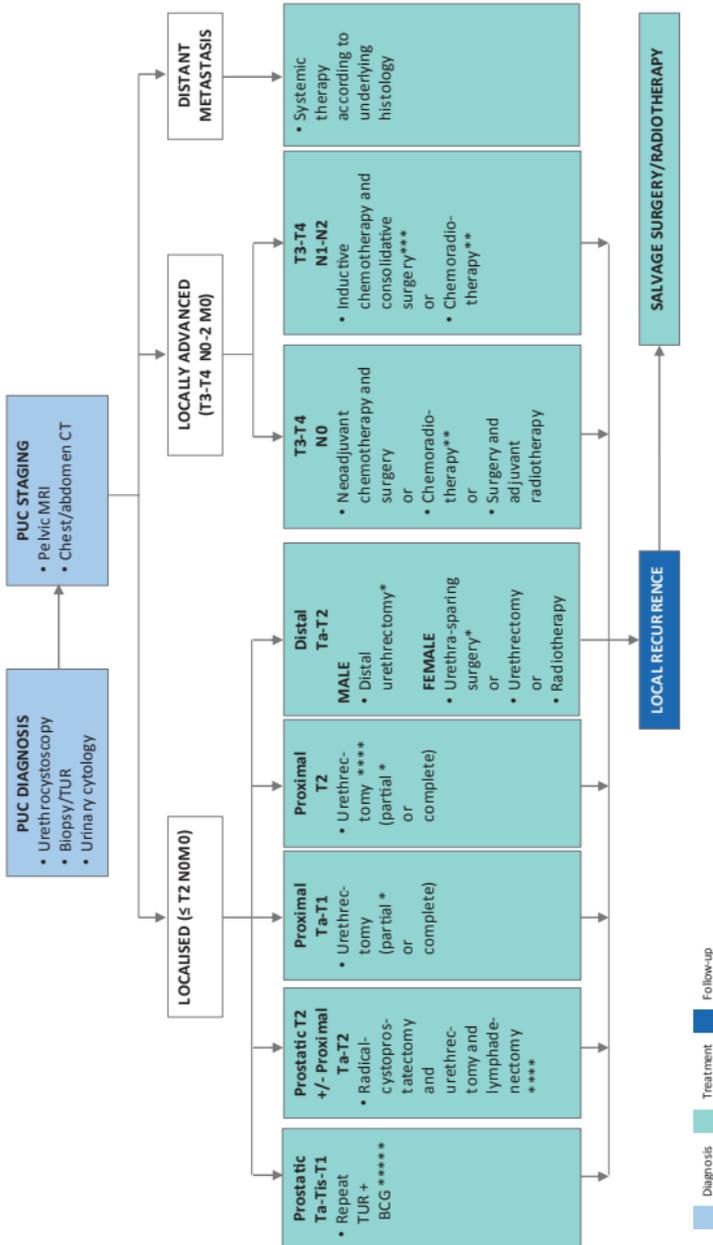
Offer salvage surgery or RT to patients with urethral recurrence after primary treatment.	Weak
Offer inguinal lymph node (LN) dissection to patients with LN-positive urethral SCC when all involved inguinal LNs are macroscopically resectable.	Weak

Treatment of urothelial carcinoma of the prostate

Local conservative treatment with extensive transurethral resection and subsequent bacillus Calmette-Guérin (BCG) instillation is effective in patients with Ta or Tis prostatic urethral carcinoma. Patients treated with transurethral resection of the prostate before BCG show superior complete response rates compared to those who are not.

Recommendations for the treatment of urothelial carcinoma of the prostate	Strength rating
Offer a urethra-sparing approach with transurethral resection and bacillus Calmette-Guérin (BCG) to patients with non-invasive urethral carcinoma or carcinoma <i>in situ</i> of the prostatic urethra and prostatic ducts.	Strong
In patients not responding to BCG, or in patients with ductal or stromal involvement, perform a cystoprostatectomy with extended pelvic lymphadenectomy.	Weak

Figure 1: Management of primary urethral carcinoma



- * Ensure complete circumferential assessment if penile-preserving/urethra-sparing surgery or partial urethrectomy is intended.
- ** Squamous cell carcinoma.
- *** Regional lymphadenectomy should be considered in clinically enlarged lymph nodes.
- **** Consider neoadjuvant chemotherapy.
- ***** In BCG-unresponsive disease: consider (primary) cystoprostatectomy +/- urethrectomy + lymphadenectomy.

BCG = bacillus Calmette-Guérin; CT = computed tomography; MRI = magnetic resonance imaging; PUC = primary urethral carcinoma; TUR = transurethral resection.

Follow-up

Given the low incidence of PUC, follow-up has not been systematically investigated. Therefore, it seems reasonable to tailor surveillance regimens according to patients' individual risk factors. In patients undergoing urethra-sparing surgery, it seems prudent to advocate a more extensive follow-up with urinary cytology, urethrocystoscopy and cross-sectional imaging despite the lack of specific data.

*This short booklet text is based on the more comprehensive EAU Guidelines accessible on the website:
<http://www.uroweb.org/guidelines/>.*