



ONCOLOGY/RECONSTRUCTION  
ORIGINAL ARTICLE

# Transurethral resection versus open bladder cuff excision in patients undergoing nephroureterectomy for upper urinary tract carcinoma: Operative and oncological results



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## KEYWORDS

Upper tract;  
Transitional cell carcinoma;  
Nephroureterectomy;  
Distal ureter;  
Bladder cuff

## ABBREVIATIONS

CSS, cancer-specific survival;  
(O) NU, (open) nephroureterectomy;  
UUT-TCC, upper urinary tract TCC

**Abstract Objectives:** To evaluate the impact of distal ureter management on oncological results after open nephroureterectomy (ONU) comparing transurethral resection of the intramural ureter to conventional open excision, as controversy still exists about the method of choice for managing the distal ureter and bladder cuff during ONU.

**Patients and methods:** We retrospectively collected data from 378 patients who underwent ONU for upper urinary tract transitional cell carcinoma (UUT-TCC) from 1988 to 2009. Patients were divided into two subgroups according to the type of operation performed. Group A comprised 192 patients who had ONU with open resection of the bladder cuff from 1988 to 1997. Group B comprised 186 patients in whom transurethral resection of the intramural ureter plus single incision ONU was performed between 1998 and 2009. The mean operative time, hospital stay, duration of catheterisation, bladder recurrence rates, and cancer-specific survival (CSS) were assessed.

**Results:** The total operative time was statistically significantly less in the endoscopic group (Group B). For catheterisation, patients treated with an open approach

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(Group A) had a statistically significantly shorter duration of postoperative catheterisation. There was no statistical difference between Groups A and B for the bladder recurrence rate (Group A 24% vs 27% in Group B,  $P = 0.51$ ). There was no difference in CSS at the 5-year follow-up.

**Conclusions:** ONU with transurethral resection of the intramural ureter up to the extravescical fat followed by ureter extraction is an oncologically safe and technically feasible operation.

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## Introduction

Upper urinary tract TCC (UUT-TCC) is a rare malignancy representing only 5% of all urothelial cancers with the vast majority located in the pelvicalyceal system [1]. UUT-TCC is frequently multifocal and usually diagnosed at a more advanced tumour stage than bladder TCC. The most common symptom is macroscopic or microscopic haematuria in 70–80% of patients [2]. High-risk disease with invasion of the muscle wall is associated with very poor prognosis, and stage, grade, and lymphovascular invasion are recognised prognostic factors [3]. Therefore, the standard treatment for patients with high-risk UUT-TCC and a normal contralateral kidney is open nephroureterectomy (ONU) with ipsilateral bladder cuff excision regardless of tumour location [4]. Currently, laparoscopic and robot-assisted NU are considered as alternative approaches to ONU for low-stage disease, with equivalent oncological results [5].

Nevertheless, controversy still exists concerning the method of choice for managing the distal ureter and bladder cuff during NU. Open resection of the bladder cuff is the ‘gold standard’ against which all other techniques are compared. An endoscopic alternative is transurethral resection of the intramural ureter deep up to extravescical fat, followed by extraction of the ureter from above the ‘pluck’ technique [6,7].

The aim of the present study was to evaluate the impact of distal ureter management on the oncological results after ONU, comparing transurethral resection of the intramural ureter to conventional open excision of the bladder cuff.

## Patients and methods

In a retrospective single-centre analysis, we collected data from 498 patients who were treated in our Department for UUT-TCC from 1988 to 2009. Patients with previous or synchronous bladder cancer ( $n = 26$ ), as well as patients in whom nephron-sparing surgery was performed (laser ablation or segmental ureterectomy,  $n = 78$ ) were excluded. Patients who were lost during follow-up ( $n = 16$ ) were also excluded. In all, 378

patients were finally evaluated. The patients were divided into two subgroups according to the type of operation performed: Group A, comprised 192 patients who had ONU with open resection of bladder cuff from 1988 to 1997; and Group B, comprised 186 patients in whom transurethral resection of the intramural ureter plus single incision ONU was performed between 1998 and 2009 (Table 1). In 1998, the surgical technique performed was altered to a less invasive novel approach for intramural ureter management. This was independent of tumour location. In the endoscopic approach, the patient was placed in lithotomy position. Cystoscopy was then performed, followed by resection of the intramural ureter with a 24-F monopolar resectoscope. We did not place any ureteric catheters. We treated the ureteric orifice and intramural ureter as we would have done in resecting a bladder tumour. The key point was to reach the level of the perivesical fat, considering that ureter is approximately displaced from under the bladder. During the endoscopic approach the bladder was not fully distended in order to prevent extravasation during the procedure. After catheterisation of the bladder and applying slight irrigation, the patient was repositioned for ONU. Before nephrectomy we dealt with

**Table 1** The patients’ characteristics.

Variable	Group A	Group B
Number of patients	192	186
Age, years, median	69.2	68.7
Male/female, %	65/35	66/34
<i>n/N (%)</i> :		
pT Stage		
Ta-T1	92/192 (48)	84/186 (45)
T2	38/192 (20)	39/186 (21)
T3	54/192 (28)	56/186 (30)
T4	8/192 (4)	7/186 (4)
pN+	21/192 (11)	22/186 (12)
Primary tumour location		
Renal pelvis	127/192 (66)	125/186 (67)
Ureter	65/192 (34)	61/186 (33)
Tumour Grade		
I	15/192 (8)	13/186 (7)
II	48/192 (25)	43/186 (23)
III	129/192 (67)	130/186 (70)

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