Endoscopic Management of Upper Tract Urothelial Cancer: Kidney Sparing at What Cost?

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Introduction

Endoscopic treatment of upper tract urothelial cancer (UTUC), originally intended for single kidney UTUC, is increasingly used for elective indications.

Objectives

- To compare outcomes for endoscopic and radical treatment of UTUC.
- To provide information for shared decision making.

Methods

- Retrospective study
- patients diagnosed with **low grade** unilateral UTUC in 2000-2018
- Comparison of patients managed endoscopically using repeated ureteroscopies (**URS**) to patients elected for radical nephroureterectomy (**RNU**).
- We used life tables and Kaplan-Meier curves to analyze survival and compared surgical and oncological outcomes, renal function, and durations of anesthesia and hospitalization.
- We excluded patients with a single kidney or high stage/grade disease.

Results

61 patients were diagnosed with low-grade UTUC: 24 underwent URS and 37 underwent RNU. Baseline characteristics were similar except for tumor maximal length (12.5±4.8 mm in the URS group and 27.3±13.7 mm in the RNU group p<0.0001). (table 1)
During a mean follow up of 4.9±3.4 years, there were no significant differences in overall survival (p=0.76), metastasis free survival (p=0.99) or need for chemotherapy (p=0.32).
Four (17%) of the patients in the URS group underwent RNU due to disease progression or a ureteral stricture with kidney function loss.

Table 1. Patient Characteristics

	Overall	RNU	URS	p=
n=	61	37	24	
Age	71.1±9.6	71.5±10.2	70.7±8.7	0.754
Male Female	44 (72%) 17 (28%)	28 (76%) 9 (24%)	16 (67%) 8 (33%)	0.443
Baseline GFR*	66.6±22.4	65.3±23.2	69.0±21.2	0.554
ASA I II III missing	 4 (6%) 26 (43%) 29 (48%) 2 (3%)	 3 (8%) 17 (46%) 17 (46%) 0	 1 (4%) 9 (38%) 12 (50%) 2 (8%)	0.761
Charlson 0-2 3-4 5+	 14 (23%) 30 (49%) 17 (28%)	 6 (19%) 17 (46%) 13 (35%)	 7 (29%) 13 (54%) 4 (17%)	0.740
Size (cm)**	2.16±1.33	2.73±1.37	1.25±0.48	**<0.0001**
Unifocal Multifocal	31 (65%) 17 (35%)	18 (58%) 13 (42%)	13 (77%) 4 (24%)	0.202

* data for n=58, **data for n=44

Fig 1. Survival

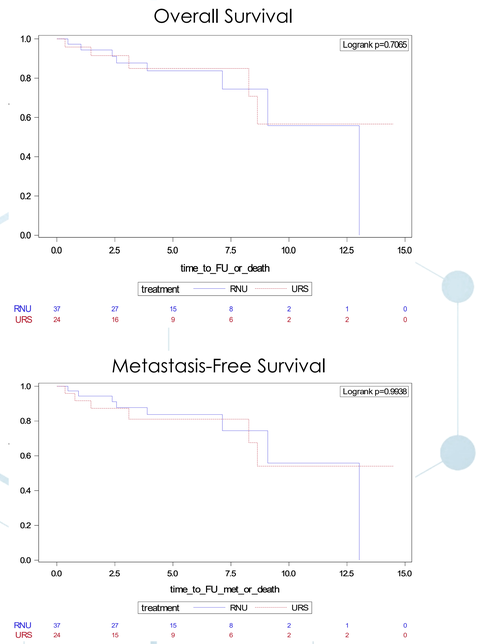


Table 2. Oncological, surgical and medical outcomes

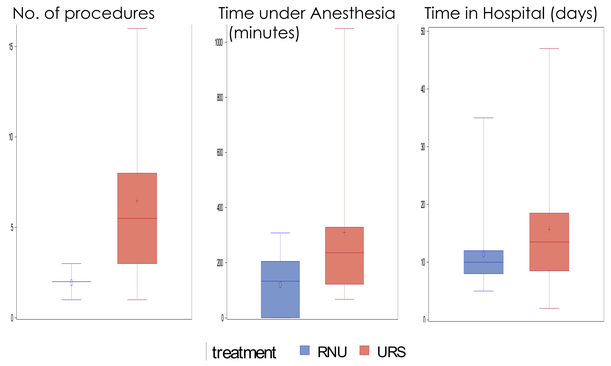
	Overall	RNU	URS	p=
n=	61	37	24	
Follow up (years)	4.86±3.43	4.75±3.12	5.02±3.92	0.76
overall survival (years):				
mean±SE 5-yr rate	9.99±0.76 84%	9.99±1.06 84%	7.57±0.61 85%	0.707
metastasis free survival (years):				
mean±SE 5-yr rate	9.82±0.76 83%	9.99±1.06 84%	7.26±0.66 81%	0.994
Received chemotherapy	3 (5%)	1 (3%)	2 (8%)	0.320
patients with complications	17 (28%)	9 (24%)	8 (33%)	0.443
Clavien ≥3 complications	2 (3%)	1 (4%)	1 (3%)	0.754
GFR at FU*	52.8±22.2	49.2±22.1	58.7±21.5	0.115
CV events	4 (7%)	2 (5%)	2 (8%)	0.652

* data for n=59

Table 3. Procedure Burden (mean ± SD)

	Overall	RNU	URS	p=
n=	61	37	24	
No. procedures	3.7±3.5	1.9±0.4	6.5±4.4	<0.0001
Time under anesthesia (min)	198±204	120±101	317±261	0.0015
Time hospitalized (days)	13.3±8.6	11.5±6.0	16.2±11.8	0.082

Fig 2. burden of treatment(mean, median, IQR, range)



Results

Renal function at the end of follow up was marginally and non-significantly better for the URS group (mean CPK-EPI calculated GFR was 58.7±21.5 for the URS group and 49.2±22.1 for the RNU group, p=0.12). Cardiovascular event rate was similar (8% in the URS group vs 5% in the RNU group, p=0.56).
In the RNU group, 9 (24%) patients had 11 postoperative complications, 1 of them was Clavien Dindo grade 3 (requiring surgical intervention), while in the URS group, 8 (33%) patients had 13 complications, 1 was Clavien Dindo grade 3 (p=0.44 overall, p=0.75 grade 3).
Patients in the URS group underwent a mean of 6.5±4.4 procedures with an overall anesthesia time of 344±286 minutes and overall hospitalization time of 16.2±11.8 days, compared with the RNU group who underwent 1.9±0.4 procedures (p<0.0001), under 213±52 minutes of anesthesia (p=0.036) and hospitalization time of 11.5±6.0 days (p=0.082).

Conclusions

In this study, a patient referred to endoscopic management of UTUC benefited from an **83% chance to preserve their kidney and 81% 5-years metastasis free survival** (for a mean follow up of 4.8±3.4 years), **at the cost of 4.6±0.9 more operations** than if they were referred to RNU. The oncological outcomes were similar to those of RNU, while the kidney sparing approach translated to a marginal, statistically insignificant advantage in renal function.

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