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Preoperative Neutrophil / Lymphocyte ratio (NLR) as a prognosticator in upper tract urothelial carcinoma (UTUC) patients treated conservatively: A retrospective evaluation

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Objectives

•To evaluate the potential prognostic value of neutrophil / lymphocyte ratio (NLR - an expression of the involvement of systemic inflammation in neoplastic growth + progression) in conservatively treated UTUC patients.

Materials and Methods

•130 consecutive patients who underwent ureteroscopy and RIRS (retrograde intra renal surgery) for UTUC, were retrospectively evaluated.
 •From patient records, the following values (performed preoperatively): white blood cells (WBC), platelet (PLT), neutrophil (N), lymphocyte (L) counts, were collected for post-hoc analysis. NLR was derived by dividing N by L counts.
 •These data were compared with tumor characteristics: stage (Ta vs. T1), grade (G1 vs. ≥G2), focality (single vs. multiple), site (ureter vs. kidney vs. kidney+ureter), and size (≤1cm vs. >1 cm).
 •The endpoints were: recurrence at first follow-up, multiple recurrences during follow-up, and progression (Grade+/-Stage).
 •They were stratified by the NLR cut-off point, according to the receiver operating characteristic analysis.
 •T-test and chi-square test were used to evaluate parametric and non parametric variables. Statistical significance was considered at $p < 0.05$.

Results

•The mean NLR value was **3.48 1.92**.
 •Significantly higher NLR values were observed in patients with ≥pT1 (**p=0.0001**), HG (**p=0.0009**), multifocality (**p=0.028**), >1 cm tumor (**p=0.0001**).
 •The optimum cut-off value for NLR was **3** for all endpoints.
 •Patients with NLR >3, exhibited significantly higher; risk of recurrence at first follow-up (**p=0.007**, **OR 2.94**); risk of multiple recurrences (**p=0.006**, **OR 1.54**); and risk of disease progression (**p=0.04**, **OR 5.00**).

Tumor characteristics	NLR	P value
Ta	3.25 (1.72)	0.0001
T1	4.52 (2.39)	
Single	3.35 (1.60)	0.028
Multifocal	3.69 (2.33)	
Low grade (LG)	3.04 (1.68)	0.0009
High grade (HG)	4.27 (2.07)	
< 1 cm	2.87 (1.67)	0.0001
> 1 cm	3.96 (1.98)	
Ureter	3.35 (1.64)	0.57
Kidney	3.53 (2.16)	
Kidney+Ureter	3.85 (2.16)	

NLR cut-off >3

	p value	OR	AUC	IC 95%	Sensitivity	Specificity
Recurrence at 1st follow up	0.007	2.94	0.552	0.454-0.650	57.8%	52.6%
Multiple recurrences during follow up	0.006	1.54	0.642	0.529-0.755	61.7%	62.5%
Elective radical surgery after endo-diagnosis	0.01	3.06	0.701	0.572-0.830	86.9%	53.2%
Disease progression	0.04	5.00	0.690	0.464-0.915	71.4%	66.7%

Conclusions

•The preoperative evaluation of NLR provides valuable prognostic information for the selection and clinical management of conservatively treated UTUC patients.
 •These data show that NLR >3 was associated with higher recurrence and progression rates.
 •It may identify those needing more frequent and endoscopic follow-up with biopsies, and lower thresholds to conversion to more aggressive surgical strategies except in imperative situations. Prospective multicenter studies with larger study populations are needed to validate the role of NLR >3, as a prognosticator of recurrence and progression in patients with UTUC treated conservatively, before incorporation into international practice guidelines.