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 ureterorenoscopy 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 (≤1 cm 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).

NLR cut-off >3

<table>
<thead>
<tr>
<th>Endpoint</th>
<th>NLR</th>
<th>p value</th>
<th>OR</th>
<th>AUC</th>
<th>IC 95%</th>
<th>Sensitivity</th>
<th>Specificity</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recurrence at 1st follow up</td>
<td>3.25 (1.72)</td>
<td>0.0001</td>
<td>2.94</td>
<td>0.552</td>
<td>0.454-0.650</td>
<td>57.8%</td>
<td>52.6%</td>
</tr>
<tr>
<td>Multiple recurrences during follow up</td>
<td>4.52 (2.39)</td>
<td>0.0009</td>
<td>1.54</td>
<td>0.642</td>
<td>0.529-0.755</td>
<td>61.7%</td>
<td>62.5%</td>
</tr>
<tr>
<td>Elective radical surgery after endo-diagnosis</td>
<td>3.35 (1.60)</td>
<td>0.0001</td>
<td>1.57</td>
<td>0.572</td>
<td>0.464-0.915</td>
<td>71.4%</td>
<td>66.7%</td>
</tr>
<tr>
<td>Disease progression</td>
<td>3.69 (2.33)</td>
<td>0.0009</td>
<td>1.54</td>
<td>0.642</td>
<td>0.529-0.755</td>
<td>61.7%</td>
<td>62.5%</td>
</tr>
</tbody>
</table>

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.