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**INTRODUCTION & OBJECTIVES:** The aim of this study is to analyse the intra and postoperative complications and the predictive factors of Trifecta outcome in patients submitted to ERASE and OSE for clinical T1 renal masses.

**MATERIAL & METHODS:** Overall 634 cases treated with OSE (n=290) and ERASE (n=344) were prospectively recorded in our department between 2006 and 2014. Trifecta was defined as simultaneous ischemia time <25 min, no surgical complication and negative surgical margin. A univariate analysis and multivariate logistic regression were performed for Trifecta.

**RESULTS:** The two groups were comparable for BMI, comorbidity, tumor side, clinical T score, tumor diameter, surgical indication, preoperative renal function, preoperative hemoglobin and hematocrit.

A significant difference was found between the OSE and the ERASE groups in operative time (115 (96-130) vs 150 (120-180) minutes,  $p<0.0001$ ), pedicle clamping (93.8% vs 69.2%,  $p<0.0001$ ), estimated blood loss (EBL) (150 (100-200) vs 100 (100-143) cc,  $p<0.0001$ ) and intraoperative complications (3.4% vs 1.7%,  $p=0.02$ ). The two groups were comparable for WIT  $\geq 25$  min.

A significant difference was found between OSE and ERASE in overall (16.6% vs 5.5%,  $p<0.0001$ ), Clavien 2 (11.7% vs 4.4%,  $p=0.02$ ) and Clavien 3 (3.1% vs 1.7%,  $p=0.04$ ) postoperative surgical complications, length of stay (6.0 (5.0-7.0) vs 5.0 (4.0-6.0) days,  $p<0.0001$ ), preoperative -1<sup>st</sup> day delta creatinine (0.3 (0.2-0.4) vs 0.15 (0.1-0.2) mg/dL,  $p<0.0001$ ), positive surgical margins (2.1% vs 1.5%,  $p=0.04$ ), and Trifecta achievement (73.8% vs 85.5%,  $p<0.0001$ ).

At univariable analysis, a higher median clinical diameter, a higher mean age, a higher median Charlson comorbidity index (CCI), endophytic tumor growth pattern, renal sinus and caliceal dislocation of the tumor, a higher median PADUA score and OSE were predictive factors of Trifecta achievement.

At multivariable analysis, CCI lost significance ( $p=0.26$ ), while age (OR: 1.02, IC95%:1.00-1.04,  $p=0.001$ ), clinical diameter (OR: 1.22, IC: 1.05-1.42,  $p=0.008$ ), PADUA score (OR: 1.23, IC: 1.07-1.41,  $p=0.004$ ) and OSE (OR: 1.74, IC: 1.13-2.68,  $p=0.01$ ) were confirmed predictive factors for Trifecta failure.

**CONCLUSIONS:** The ERASE is a feasible and safe technique, which shows a comparable WIT, together with a significantly lower EBL, surgical complications rate, length of stay and a significantly higher Trifecta achievement compared to OSE. Age, comorbidity, tumor diameter and PADUA score, in association with surgical approach represent significant predictive factors of Trifecta failure.