

Impact of Partial Nephrectomy on Kidney Function in Patients with Renal Cell Carcinoma

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Introduction: This study aimed to compare the changes in kidney function and the association of tumor size and renal outcomes between patients with renal cell carcinoma (RCC) who underwent radical nephrectomy (RN) and those who underwent partial nephrectomy (PN).

Methods: A retrospective cohort study was conducted for 557 patients [mean age, 61±12 years; baseline estimated glomerular filtration rate (eGFR), 82±17 mL/min/1.73m²] with an RCC ≤7 cm in diameter and normal contralateral kidney function who underwent PN or RN. PN was performed for 218 (39%) patients. Renal outcomes included the incidence of acute kidney injury (AKI), new-onset chronic kidney disease (CKD, an eGFR <60 mL/min/1.73m² 3 months after the operation), and a ≥25% decline in eGFR 1 year after surgery.

Results: Serial changes in eGFR were compared during the 3 years of follow-up. Postoperative eGFR was significantly lower in patients undergoing RN than in those undergoing PN. The incidence of AKI and new-onset CKD was significantly higher in patients after RN (70.1% vs. 24.3%, respectively; p<0.001) than after PN (55.7% vs. 6.2%, respectively; p<0.001). According to the multivariable logistic regression analysis, RN was an independent risk factor for a ≥25% decline in kidney function after 1 year regardless of the tumor size, even after adjusting for various covariates (i.e., tumor size ≤4 cm, odds ratio [OR]=31.9, 95% confidence interval [CI]=15.5-65.5; and 4 cm <tumor size ≤7 cm, OR=12.7, 95% CI=1.45-110.7).

Conclusions: Compared to PN, RN for even a moderate sized RCC leads to an increased incidence of AKI and new-onset CKD, and is a significant risk factor for kidney function decline. Therefore, PN should be considered as the choice of surgical treatment for RCCs that are ≤7 cm in diameter in order to preserve renal function postoperatively.

Key Words: Nephrectomy, RCC, GFR