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Introduction & Objectives: In comparison with radical nephrectomy, partial nephrectomy (PN) is considered a better option for renal tumour treatment, because of optimal kidney tissue removal. Intraoperative hypotension (IOH) and blood loss during the PN can have significant impact on postoperative renal function and increase the risk of chronic kidney disease (CKD).

Materials & Methods: Prospective observational study was conducted in Vilnius University Hospital Santaros Klinikos between January 2018 and December 2019. The study was approved by the Vilnius Regional Biomedical Research Ethics Committee (approval number 158200-16-882-389) and the State Data Protection Inspectorate. The study was conducted in accordance with the Declaration of Helsinki. First part of this study analysed acute kidney injury (AKI) risk factors. Study population consisted of 91 individuals, who were performed PN with warm ischemia with estimated preoperative glomerular filtration rate (eGFR) ≥ 60 ml/min and without abnormal albuminuria.

Results: 14 (15.4%) patients were with developed postoperative CKD after 6 months follow up. After 12 months - were 15 (16.5%) CKD patients: 14 - with stage 3 and 1 - with stage 4. All this patients had AKI. The median (IQR) age of patients with CKD was 73.0 (70.0; 75.0) years. The median preoperative eGFR of CKD patients was lower than in non-CKD, 69.0 (64.5; 72.5) vs 91.0 (85.8; 97.0) ml/min 1.72m^2 , $p < 0.001$. There were more CKD group patients with Charlson comorbidity index (5.0 (5.0; 6.0) vs 4.0 (3.0; 5.0), $p = 0.001$, metabolic syndrome (14 (93.3%) vs 44 (57.9%), $p = 0.008$), estimated blood loss during PN (510.0 (430.0; 550.0) vs 300.0 (200.0; 402.5) ml, $p < 0.001$), longer ischemia (20.0 (17.0; 21.0) vs 14.0 (10.0; 18.0), $p = 0.002$) and IOH time (40.0 (40.0; 47.5) vs 0.0 (0.0; 26.2) min, $p < 0.001$). Also, higher volume of resected kidney part tumour and removed parenchima were in CKD group patients. Clinical pathological analysis showed that CKD patient removed kidney tissue have significant more glomerulosclerosis amount, 73.3% vs 14.5%, $p = 0.009$. With kidney resected part volume (OR 1.05, 95% CI 1.05–1.10, $p = 0.033$) and IOH time (OR 1.11, 95% CI 1.03–1.19, $p = 0.005$), it was evident that estimated blood loss > 500 ml during PN was the major risk factor of CKD development (OR 11.13, 95% CI 1.88–65.92, $p = 0.008$). In ROC analysis, estimated blood loss more than 500 ml, kidney resected part volume with IOH were the significant independent predictor ($p < 0.0001$) for postoperative CKD with an area under the ROC curve of 0.960 (95% CI = 0.921 to 0.999; sensitivity = 73.3%, specificity = 96.1%).

Conclusions: Patients after PN due to tumours are at increased risk of CKD development. Postoperative CKD occurs most commonly in the first 6 months after PN and appears stable after 12 months of follow up. Kidney resected part volume, estimated blood loss more than 500 ml and intraoperative hypotension during PN are predictors for postoperative CKD.