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Introduction & Objectives: To develop a predictive model for the achievement of Trifecta in patients treated with open, laparoscopic and robotic partial nephrectomy (PN) for localized renal masses (\leq cT2).

Materials & Methods: We retrospectively evaluated 560 consecutive patients who underwent open (OPN: 270), laparoscopic (LPN: 182) and robotic (RAPN: 108) partial nephrectomy (PN) for clinically localized renal cell carcinoma (RCC) at single tertiary center between March 2000 and February 2019. Trifecta was defined as the achievement of warm ischemia time (WIT) \leq 20 min, absence of positive surgical margins (PSM) and absence of any kind of postoperative complication. First, we compared clinical, pathologic and perioperative outcomes within the three surgical approaches. Second, multivariate logistic regression was performed to identify which co-variates (including Age, American Society Anesthesiologist [ASA] score, clinical size of the tumor, urinary collecting system [UCS] involvement and surgical approach) independently predict the Trifecta achievement.

Results: The three cohorts were comparable in terms of demographics and clinical characteristics (Table 1). Overall, WIT \leq 20 min was achieved in 230 (85.1%), 144 (79.1%) and 96 (88.8%) patients undergoing OPN, LPN and RAPN, respectively ($p < 0.001$). Positive surgical margins rate was 11.5%, 18.1% and 6.5% after OPN, LPN and RAPN, respectively ($p = 0.01$). Postoperative complications rate was significantly higher in patients treated with OPN (34.8%) compared to LPN (19.2%) and RAPN (16.7%; $p < 0.001$; Table 2). Trifecta has been achieved in 48.5%, 53.3% and 73.1% of patients undergoing OPN, LPN and RAPN, respectively ($p < 0.001$). At multivariate analysis, ASA score (Odd Ratio [OR]: 0.72), Clinical size of tumor (OR 0.86), and robotic approach (OR 2.88) were independent predictors of Trifecta achievement (all $p \leq 0.04$; Table 3).

Conclusions: RAPN allowed to obtain higher rates of Trifecta achievement in patients treated with PN. Clinical size of tumor, ASA score and the surgical technique were independent predictors of Trifecta achievement.