

Does the surgical technique impact the oncologic outcomes after partial nephrectomy?: A comparison between open, laparoscopic and robotic approach in a single high-volume tertiary center

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Bianchi L., Chessa F., Borghesi M., Bianchi L., Pultrone C.V., Ercolino A., Piazza P., Di Fresco S., Casablanca C., Guerra M., Barbaresi U., Schiavina R.

Global Robotics Institute, Dept. of Urology, Celebration, Italy

Introduction & Objectives: To compare the oncologic outcomes of patients who underwent Open partial nephrectomy (OPN), Laparoscopic partial nephrectomy (LPN) and Robotic partial nephrectomy (RPN) at mid-long term follow up.

Materials & Methods: Patients were stratified according to the surgical technique: OPN vs LPN vs RPN. Differences in categorical and continuous variables were analyzed using the chi-squared test and the Mann-Whitney U-test, respectively. Outcomes of interest: Disease free survival (DFS) and cancer-specific survival (CSS) were plotted using Kaplan-Meier survival curves. The predictors of DFS and CSS were assessed using a univariable and multivariable Cox proportional hazard models.

Results: Out of 547 patients who underwent PN, 293 (54%), 153 (28%) and 101 (19%) underwent OPN, LPN and RPN, respectively. RPN was associated with high PADUA risk compared to OPN and LPN (19% vs 12% vs 10%; $p=0.03$), longer median operative time (218 min vs 130 min vs 136 min $p<0.001$). Patients in the OPN group had longer median follow-up compared to those in the LPN and RPN groups (75 months vs 43 months vs 26 months; $p<0.001$) and higher recurrence rate (10% vs 6% vs 3%; $p=0.048$). OPN was associated with higher cancer related death rates compared to LPN and RPN (4% vs 1% vs 1%; $p=0.03$; Table 1). However, DFS rates and CSS rates are comparable between the three surgical techniques (Figure 1 and 2) at median follow up of 45 months. At multi-variable analysis, high tumor grade (odds ratio OR=11.1; $p<0.001$), pathologic stage $>pT1$ (OR=11.1; $p<0.001$), intermediate/high PADUA risk (OR=2.1; $p=.0.1$) and PSM (OR=12.7; $p<0.001$) were independent predictors of any recurrence, PSM (OR=60.8; $p<0.001$) was the only predictor of local recurrence, intermediate/high PADUA risk (OR=4.2; $p=0.007$), pathologic stage $>pT1$ (OR=7.7; $p<0.001$) and high tumor grade (OR=8.495%; $p<0.001$) were independent predictors of distant recurrence and high tumor grade (OR=4.2; $p=0.02$) was the only independent predictor of CSS.

Conclusions: OPN, LPN and RPN provides comparable oncologic outcomes. DFS is mainly affected by high tumor grade, pathologic stage, positive surgical margins and Padua risk.