
Zero-ischemia robotic partial nephrectomy: Striving for the trifecta

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Introduction and Objectives: Minimizing complications, preserving oncological outcomes and maximizing renal function is the trifecta we strive for in renal surgery. We report our outcomes in patients undergoing our novel technique of zero-ischemia robotic partial nephrectomy (PN).

Methods: Between December/10 and December/11, 48 patients underwent zero-ischemia robotic PN. The technique involves control of specific tertiary and quaternary renal segmental branches supplying the tumor. Hilar cross clamping is avoided and therefore normal perfusion continues to the remainder of the kidney. We report our peri-operative, pathologic and functional outcomes.

Results: Mean patient age was 60 years (17 – 88), tumor size was 3.6 cm (1.0 – 9.0) and baseline estimated glomerular filtration rate (eGFR) was 80.1ml/min/1.73m² (24.3–162.6). 14 patients (29%) had an absolute indication for PN (solitary kidney n=5, bilateral masses n=9). All patients successfully underwent zero-ischemia robotic PN, with no conversions to clamped PN, open PN or radical nephrectomy. Median operative duration was 305 min, blood loss was 200 ml and hospital stay was 3 days.

8 patients encountered a complication (16.7%) of which 6 were grade 1 or 2 (Clavien-Dindo classification). One patient had a grade 3a complication (urine leak requiring percutaneous urinoma drainage) and one patient had a grade 3b complication (pulmonary embolism necessitating placement of an IVC filter). No grade 4 or 5 complications occurred.

Malignancy was confirmed in 36 cases (75%). All surgical margins were negative for cancer with a median margin of 2 mm at the deepest aspect of the resection.

Post-operative renal function parameters were excellent with a mean eGFR at 1 month of 76.1 ml/min/1.73m². This reflects a mean decrease in eGFR of only 5%.

Conclusions: Our zero-ischemia robotic PN technique aims to maximize renal function outcomes by eliminating global ischemia. At the same time oncological integrity is maintained and complications are kept to a minimum. Trifecta: tick, tick, tick!