VE13 Intracorporeal renal hypothermia with ice slush for robot-assisted partial nephrectomy in a highly complex renal mass

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Introduction & Objectives: To report our step-by-step technique for robotic partial nephrectomy using intracorporeal renal hypothermia in a highly complex renal mass. The application of robotic technology in partial nephrectomy has allowed surgeons to recreate the principles of open surgery in a minimally invasive approach. With increasing experience, larger deeply infiltrative tumors can be treated with this technique. In complex cases, when a long warm ischemia time is expected, intracorporeal renal hypothermia can be useful to prevent permanent renal function loss.

Materials & Methods: A 69 years old male was found an incidental large right renal mass. Past medical history included: hypertension, non-insulin dependent diabetes, urolithiasis and chronic kidney disease with an atrophic left kidney. Past surgical history accounted: appendectomy, multiple ureteroscopys and a right ureteral reimplant due to an ureteral stenosis. The preoperative computed tomography scan showed a right posterior renal mass, 8.5 cm in diameter, cT2a, RENAL score 11 and several retroperitoneal lymph nodes <1 cm. Neoadjuvant therapy with tyrosine kinase inhibitors (TKI) and subsequent partial nephrectomy was recommended by the Urologic Oncology tumor board. No tumor shrinkage was evident in the control imaging. Thus the patient underwent a robot-assisted partial nephrectomy with intracorporeal renal hypothermia.

Results: Operative time including robot's docking was 185 min. Cold ischemia time was 49:50 min. Average kidney temperature was 24.3ºC. Blood losses were negligible and no postoperative complications appeared, allowing discharge on 4th postoperative day with a eGFR: 14 ml/min/1.73 m^2. Final pathology revealed a clear cell renal cell carcinoma, pT3aN0, ISUP grade 3, involving the sinus fat. Surgical margins were negative.

Conclusions: Robotic partial nephrectomy with intracorporeal renal hypothermia using ice slush is simple, highly reproducible and may improve postoperative renal function in the short term. Consistent experience is needed before embarking on this surgery. Reports on long term oncological outcomes for such lesions are awaited.