Introduction

- Renal cell carcinoma (RCC) accounts for 2-3% adult malignant tumors
- Solitary kidney → golden standard = partial nephrectomy
- Generates higher quality of life and survival compared to hemodialysis
- In cases where in situ resection is deemed impossible, extracorporeal tumor excision and re-implantation can be considered
- Minimal invasive surgery is preferred when technically feasible without compromising oncological outcomes

Objective

We aim to demonstrate the feasibility of extracorporeal robot-assisted kidney autotransplantation (eRAKAT) with tumor excision on the bench in an oncological setting.

Methods

The case:
- 59 year old woman, solitary left kidney
- Routine CT scan for uncontrolled hypertension
- Incidental diagnosis of RCC

Work up
- Biopsy: Fuhrman grade 2 clear cell RCC
- CT: cT2aN0M0 Ø 88mm
- Lab: eGFR 63 mL/min
- Four phasic CT with digital 3D modelling for preoperative planning

Treatment
- Neo-adjuvant axitinib-pembroliuzumab for 6 months
- Partial nephrectomy: given the size and need for prolonged cold ischemia → eRAKAT with extracorporeal tumor enucleation

Results

- Tumor Ø 88mm at diagnosis
- Reduced to Ø 74mm pre-operatively after neo-adjuvant therapy
- Total surgery time: 11 hours 20 minutes
- Warm ischemia time: 7 minutes
- Cold ischemia time: 3 hours 53 minutes
- Rewarming ischemia time: 48 minutes
- Clavien-Dindo grade II post-operative complication: 2 units packed cells
- Total hospital stay: 12 days
- Creatinine peak at day 2 (3.40 mg/dL)
- Spontaneous decrease after 3 weeks to normal preoperative range
- Pathology: clear cell ypT2b N0

Conclusion

✓ First case of eRAKAT in an oncological setting
✓ Complete tumor resection
✓ Preserved quality of life and kidney function
✓ Dialysis and allograft kidney transplantation was avoided

This technique is only recommend in very select RCC cases by experienced surgeons in a adequate center

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