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**Introduction & Objectives:** Horseshoe kidney (HSK) is the most common renal fusion anomaly. It is frequently associated with pelvi-ureteric obstruction, urolithiasis and renal tumours. Anatomical variations including vascular anomalies, ectopia and malrotation, make surgery challenging. Minimally invasive surgery is commonplace in the context of pyeloplasty, however, partial nephrectomy is generally performed as an open procedure. We share our experience of robotic-assisted partial nephrectomy (RAPN) in HSK patients at a large tertiary referral centre.

**Materials & Methods:** Three patients (2 female, 1 male) have undergone RAPN for a HSK mass at our centre between June 2017 and September 2018. We adopted the use of three-dimensional (3D) reconstruction of CT imaging to identify tumour location and clarify vascular and collecting system anatomy. Patient demographics, tumour characteristics and surgical outcomes were reviewed.

**Results:** Median age was 53 years (range 43-80) and all had a BMI of 25. Median tumour size was 43 mm (range 17-50 mm). The tumours were of low or intermediate complexity according to the PADUA classification. Mean surgical time was 234 min (range 170-300 min) with a corresponding console time of 187 min (range 120-250 min). Mean blood loss was 317 mls (range 150-500 mls). Mean pre-operative eGFR was 77 ml/min/1.73 m<sup>2</sup> (range 51-90 ml/min/1.73 m<sup>2</sup>) with a mean post-operative eGFR of 70 ml/min/1.73 m<sup>2</sup> (range 31-90 ml/min/1.73 m<sup>2</sup>). There were no surgical complications noted based on Clavien-Dindo classification  $\geq 2$ . All patients had a hospital length of stay of 2 days.

**Conclusions:** RAPN in this patient cohort is not widely reported. The limited mobility related to renal fusion and complicated vascular anatomy makes this procedure challenging. Our case series, although small, demonstrates the feasibility of performing RAPN safely in patients with HSK masses. The use of 3D imaging is an invaluable adjunct in surgical planning.