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Abstract no.: PR. 9

Initial Experience of 3D Reconstruction of Renal Vascular and Tumor Anatomy Before Nephron Sparing Nephrectomy

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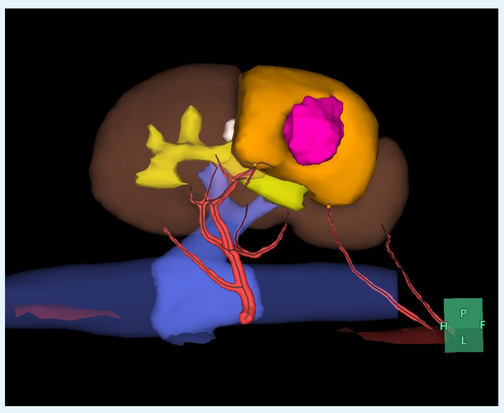
Objective

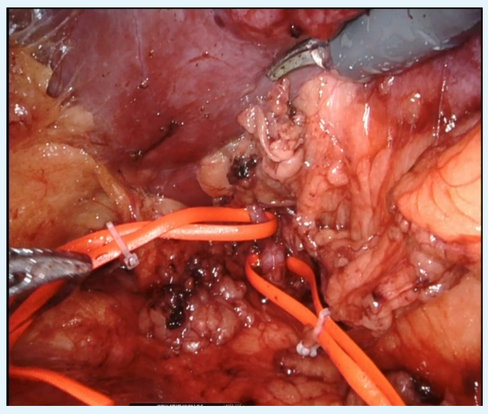
- Partial nephrectomy preserved renal function with comparable oncological outcome but has increased risk of bleeding or urinary leakage.
- Aim: To review the perioperative outcome of 3D reconstruction of renal vascular and tumor anatomy before nephron sparing nephrectomy.

Patients & Methods

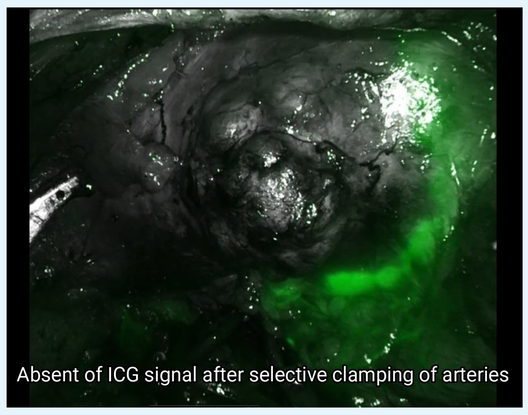
- 6 patients received preoperative 3D reconstruction of renal vascular and tumor anatomy before nephrectomy
- Indications of partial nephrectomy and demographics data, and surgical outcomes including operative approach, pathology and complications were reviewed.

Results



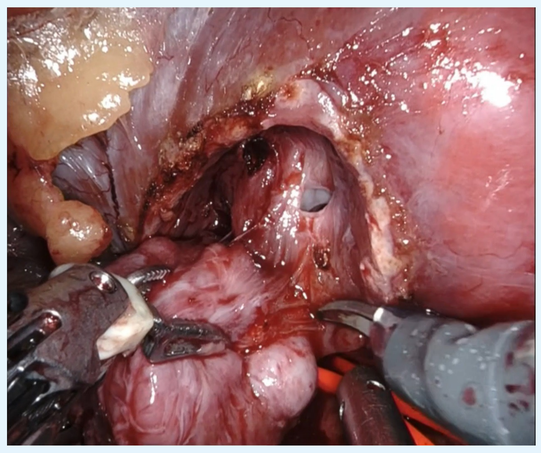


3D reconstruction aids understanding of the configurations of the renal artery and its branches for better preoperative planning

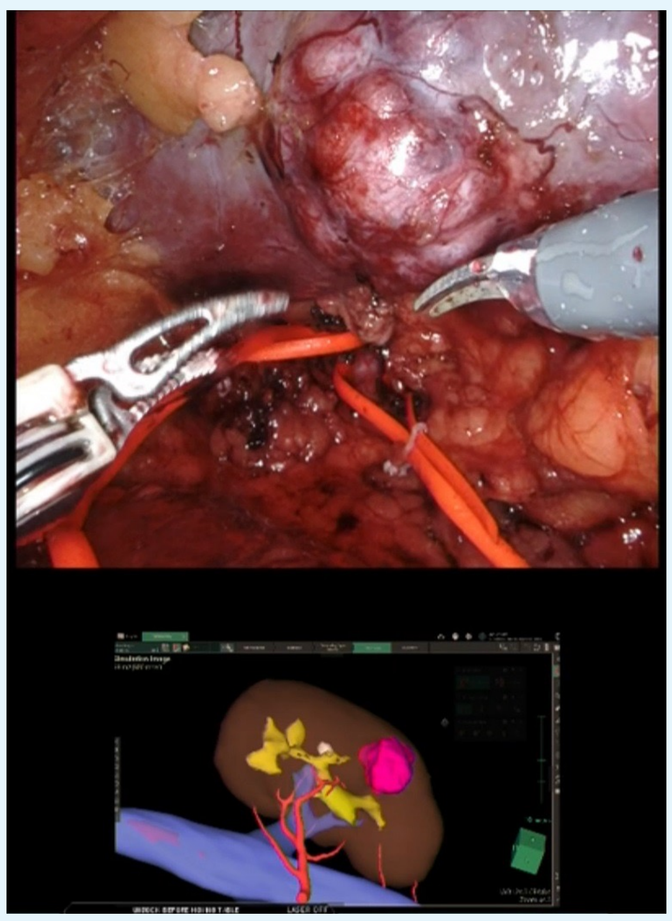


Absent of ICG signal after selective clamping to the tumor territory

- Of total 6 patients, three presented with left renal mass and three presented with right renal mass. Median age and tumour size were 59 (range 40-72) years and 2.8 (range 2.2-5.9) cm respectively. Detailed baseline and intraoperative data are listed in the table below.
- No intraoperative or postoperative complications, such as transfusion, open conversion, fistula, pseudoaneurysm, hematoma, urine leakage, or infection, were noted.
- Renal function was preserved in all six patients.



Relatively bloodless field during resection of the renal tumor



The 3D reconstruction images can be displayed in the Da Vinci robotic surgical system for intraoperative guidance

Case	Age/ Sex	Laterality	Size (cm)	Renal score	Surgical approach	Clamping method	Warm ischaemic time (min)	Operative time (min)	Length of stay (day)	Entry to calyceal system	Pathological T staging	Histological diagnosis
1	40/M	Right	2.8	7p	Robotic retroperitoneal	Selective	16	190	5	Yes	1a	Chromophobe renal cell carcinoma, grade 1
2	66/M	Left	3.7	6p	Open transperitoneal	Selective	16	166	8	Yes	1a	Clear cell renal cell carcinoma, grade 3
3	52/M	Right	2.5	5a	Robotic transperitoneal	Selective	18	212	3	No	1a	Clear cell renal cell carcinoma, grade 2
4	72/M	Right	2.2	9p	Robotic retroperitoneal	Selective	48	224	4	Yes	1a	Chromophobe renal cell carcinoma, grade 2
5	70/M	Left	5.9	9p	Robotic transperitoneal	Global	30	327	7	Yes	1b	Clear cell renal clear cell carcinoma, grade 3
6	47/M	Left	2.8	5p	Retroperitoneoscopic	Selective	27	125	3	No	1a	Clear cell renal clear cell carcinoma, grade 2

Conclusion

3D reconstruction of renal vascular and tumor anatomy provides an enhanced visualisation of the renal vessels and allows better understanding of the tumour anatomy. This allows better pre-operative surgical planning and facilitates selective renal artery clamping during operation to minimise blood loss and other surgical complications.