

**Objectives**

- Surgical approaches, such as transperitoneal approach (TP) and retroperitoneal approach (RP), in robot-assisted laparoscopic partial nephrectomy (RAPN) are selected according to the tumor's position or surgeons' preference.
- In our institution, TP and RP are adopted for anterior and posterior tumors, respectively.
- However, we sometimes hesitate over the appropriate approach for lateral renal tumors.
- In the present study, we compared outcomes of RAPN for lateral tumors between TP and RP.

**Methods**

**Patient selection**

- Patients who underwent RAPN for lateral renal tumors between 2013 and 2019.

**Definition of lateral tumors**

- X of A factors in the RENAL nephrometry score

**Propensity score matching**

- age, sex, body mass index (BMI), American Society of Anesthesiologists (ASA) score, preoperative estimated glomerular filtration rate (eGFR), tumor size, and RENAL nephrometry score.

**Results**

**Patient Characteristics**

	Pre-matching			Post-matching		
	TP (290)	RP (48)	p	TP (48)	RP (48)	p
Age (years), mean (SD)	57 ± 14	57 ± 14	0.7443	55 ± 12	55 ± 14	0.3462
Sex, male, n (%)	219 (76)	32 (67)	0.1939	36 (75)	32 (67)	0.3691
BMI (kg/m <sup>2</sup> ), mean (SD)	25 ± 4.1	24 ± 3.7	0.9682	25 ± 4.0	24 ± 3.7	0.5504
Preop eGFR (mL/min/1.73 m <sup>2</sup> ), mean (SD)	67 ± 17	69 ± 18	0.6837	68 ± 17	69 ± 18	0.846
ASA, n (%)			0.8049			0.7097
	1	8 (17)		6 (13)	8 (17)	
	2	204 (70)		36 (75)	36 (75)	
	3	29 (10)		6 (13)	4 (8)	
Tumor complexity, n (%)			0.9898			0.34
	Low (4-6)	119 (41)		19 (40)	20 (42)	
	Intermediate (7-9)	130 (45)		26 (54)	21 (44)	
	High (10-12)	41 (14)		3 (6)	7 (15)	
Tumor size (mm), mean (SD)	32 ± 14	30 ± 12	0.2452	31 ± 13	30 ± 12	0.405
R, n (%)			0.3265			0.7892
	1	214 (74)		39 (81)	40 (83)	
	2	73 (25)		9 (19)	8 (17)	
	3	3 (1)		0	0	0.9324
E, n (%)			0.4609			0.4932
	1	81 (28)		8 (17)	10 (21)	
	2	160 (55)		36 (75)	31 (65)	
	3	49 (17)		4 (8)	7 (15)	
N, n (%)			0.0525			0.7165
	1	117 (40)		11 (23)	13 (27)	
	2	42 (15)		11 (23)	13 (27)	
	3	130 (45)		26 (54)	22 (46)	
L, n (%)			0.3258			0.3287
	1	116 (40)		28 (58)	22 (46)	
	2	76 (26)		14 (29)	15 (31)	
	3	98 (34)		6 (13)	11 (23)	

**Surgical Outcomes**

	Pre-matching			Post-matching			
	TP (290)	RP (48)	p	TP (48)	RP (48)	p	
Preop eGFR (mL/min/1.73 m <sup>2</sup> ), mean (SD)	67 ± 17	69 ± 18	0.6837	68 ± 17	69 ± 18	0.846	
Early postop eGFR (mL/min/1.73 m <sup>2</sup> ), mean (SD)	62 ± 19	65 ± 18	0.4889	65 ± 17	65 ± 18	0.7444	
Change in early postop eGFR (%), mean (SD)	-7.8 ± 15	-5.7 ± 12	0.2882	-4.7 ± 16	-5.7 ± 12	0.8374	
3-6 month postop eGFR (mL/min/1.73 m <sup>2</sup> ), mean (SD)	63 ± 17	65 ± 16	0.7974	66 ± 16	65 ± 16	0.5214	
Change in 3-6 month postop eGFR (%), mean (SD)	-5.1 ± 11	-4.5 ± 12	0.9143	-3.2 ± 10	-4.5 ± 12	0.2765	
OT (min), mean (SD)	166 ± 44	124 ± 29	< 0.0001	151 ± 34	124 ± 29	0.0002	
Console time (min), mean (SD)	118 ± 38	74 ± 24	< 0.0001	110 ± 35	74 ± 24	< 0.0001	
Ischemia time (min), mean (SD)	19 ± 9.3	14 ± 5.2	0.0002	17 ± 5.4	14 ± 5.2	0.0343	
EBL (ml), mean (SD)	76 ± 114	33 ± 55	< 0.0001	52 ± 45	33 ± 55	0.0002	
SM positive, n (%)	3 (1)	2 (4)	0.0959	0	2 (4)	0.153	
Perioperative complications, n (%)							
	Overall	43 (15)	2 (4)	0.044	6 (13)	2 (4)	0.1396
	Clavien 1-2	30 (10)	2 (4)		5 (10)	2 (4)	
	Clavien 3	13 (4)	0		1 (2)	0	
PLOS (day), mean (SD)	4.2 ± 1.8	3.3 ± 0.7	< 0.0001	4.0 ± 1.2	3.3 ± 0.67	< 0.0001	

**Pathological Findings**

Pathology	Pre-matching			Post-matching		
	TP (290)	RP (48)	p	TP (48)	RP (48)	p
Malignant, n (%)	268 (92)	42 (88)	0.2526	46 (96)	42 (88)	0.1396
	Clear cell	212 (79)	33 (79)	44 (96)	33 (79)	
	Papillary	24 (9)	1 (2)	0	1 (2)	
	Chromophobe	22 (8)	3 (7)	2 (2)	3 (7)	
	Others	11 (4)	5 (12)	1 (2)	5 (12)	

**Conclusion**

RP approach had better surgical outcomes, including shorter operation time, lower EBL, and shorter PLOS for lateral renal tumors, which may suggest that RP approach is the optimal approach for selected lateral renal tumors.