

Figure S1 Flowchart of the patient selection and recruitment process.

Table S1 Tumor characteristics of patients

Variables	Value
Surgical approach	
Partial nephrectomy	235 (60.9)
Radical nephrectomy	151 (39.1)
Tumor side	
Right	204 (52.8)
Left	182 (47.2)
Maximum tumor diameter (cm)	3.5 (2.5–5.0)
Growth pattern	
Endophytic	71 (18.4)
Exophytic	315 (81.6)
Tumor volume (cm ³)	29.39 (11.27–73.71)
Tumor location	
Upper pole	107 (27.7)
Middle pole	138 (35.8)
Lower pole	141 (36.5)
WHO/ISUP grading	
High grade (Grade 3–4)	95 (24.6)
Low grade (Grade 1–2)	291 (75.4)
Intratumoral hemorrhage	
Yes	91 (23.6)
No	295 (76.4)
Tumor necrosis	
Yes	65 (16.8)
No	321 (83.2)
Cystic degeneration	
Yes	54 (14.0)
No	332 (86.0)

Data are presented as n (%) or median (IQR). IQR, interquartile range; WHO/ISUP, World Health Organization/International Society of Urological Pathology.

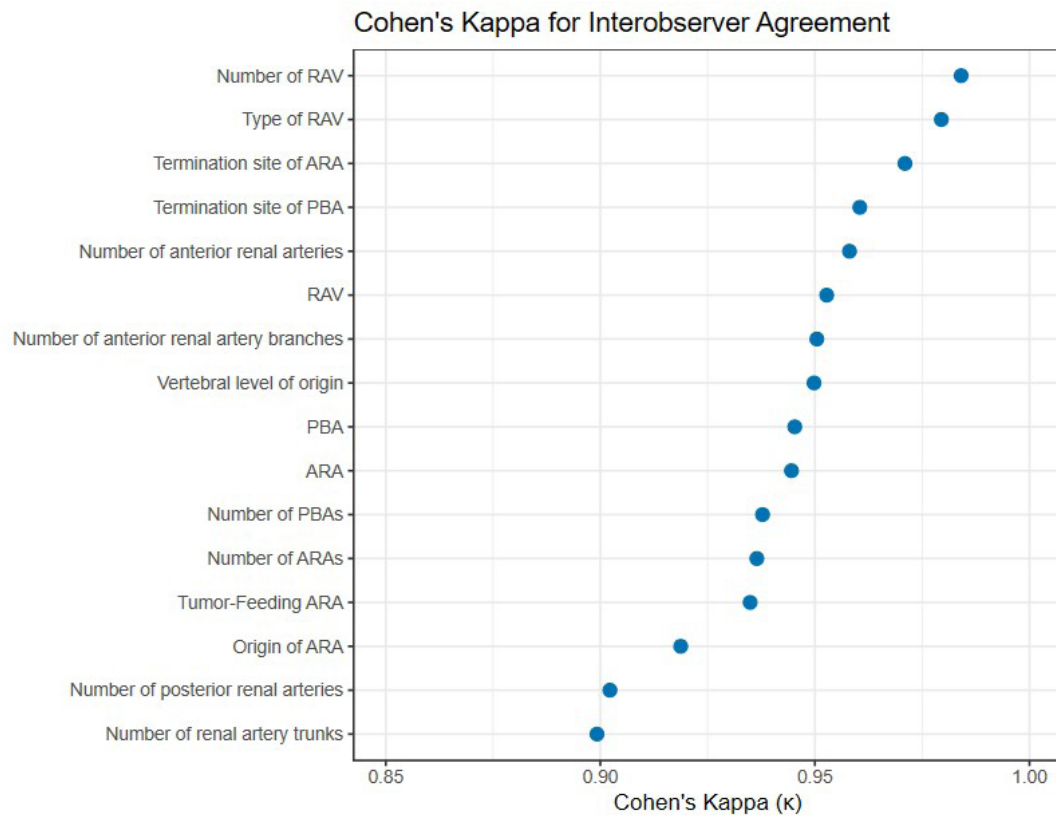


Figure S2 Inter-observer reproducibility of RAV classification and measurements. The x-axis represents the Cohen's Kappa value, and the y-axis lists the specific parameters assessed. RAV, renal artery variation.

Table S2 Incidence, number, and distribution patterns of PBAs

Group	Contralateral (healthy) side	Tumor-affected side	χ^2 value	P value
PBA				
Absent	258 (66.8)	241 (62.4)	1.638	0.201
Present	128 (33.2)	145 (37.6)		
Number of PBAs				
1	111 (86.7)	129 (89.0)	0.323	0.570
≥2	17 (13.3)	16 (11.0)		
Termination site of PBA				
Upper pole	82 (55.4)	86 (52.4)	1.204	0.548
Middle pole	52 (35.1)	56 (34.1)		
Lower pole	14 (9.5)	22 (13.4)		

Data are presented as n (%). PBA, prehililar branching artery.

Table S3 Univariate and multivariate Cox proportional hazards regression analyses of prognostic factors associated with OS

Variables		Univariate analysis			Multivariate analysis		
		HR	95% CI	P value	HR	95% CI	P value
ARA	Absent	1	–		1	–	
	Present	15.35	1.94–121.60	0.01**	6.72	0.77–58.23	0.084
Age		1.10*	1.02–1.19	0.016	1.06	0.97–1.16	0.179
Sex	Male	1	–				
	Female	0.69	0.20–2.37	0.56			
BMI		0.96	0.81–1.13	0.611			
Hypertension	No	1	–				
	Yes	1.95	0.57–6.67	0.289			
Cardiovascular disease	No	1	–		1	–	
	Yes	6.07	1.25–29.50	0.025*	2.82	0.53–15.08	0.225
Cerebrovascular disease	No	1	–				
	Yes	1.18	0.15–9.59	0.878			
Surgical approach	Partial nephrectomy	1	–				
	Radical nephrectomy	0.31	0.07–1.46	0.138			
Tumor location	Upper pole	1	–				
	Middle pole	1.15	0.26–5.14	0.857			
	Lower pole	1.1	0.25–4.93	0.9			
Tumor side	Right	1	–				
	Left	0.98	0.30–3.24	0.979			
Intratumor hemorrhage	No	1	–				
	Yes	2.61	0.79–8.62	0.116			
Tumor necrosis	No	1	–		1	–	
	Yes	10.69	3.11–36.84	<0.001***	1.84	0.29–11.57	0.514
Cystic degeneration	No	1	–				
	Yes	1.01	0.13–7.91	0.995			
WHO/ISUP grading	Low grade	1	–		1	–	
	High grade	10.84	3.13–37.56	<0.001***	2.51	0.46–13.78	0.288
Maximum tumor diameter		1.36	1.18–1.58	<0.001***	1.09	0.89–1.34	0.398

Values in **italized** indicate statistical significance ($P < 0.05$). *, $P < 0.05$; **, $P < 0.01$; ***, $P < 0.001$. ARA, accessory renal artery; BMI, body mass index; CI, confidence interval; HR, hazard ratio; OS, overall survival; WHO/ISUP, World Health Organization/International Society of Urological Pathology.