CLASSIFICATION OF RENAL TUMOURS ACCORDING TO RENAL AND THEIR RELATION TO PERIOPERATIVE RESULTS IN ROBOT ASSISTED PARTIAL NEPHRECTOMY

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INTRODUCTION

Recent development in preoperative staging and surgical methods have enabled nephron-sparing surgery a more viable option than radical nephrectomy in some cases. The RENAL scoring system was introduced in 2009. The system allowed standardised reporting of renal tumour size, depth and location. It acts as a way to classify renal tumours preoperatively, and can be used in conjunction with other diagnostic methods to determine surgical plans and outcomes.

https://www.mdcalc.com/renal-nephrometry-score, cit.06/04/22

AIM OF STUDY

Our aim was to analyse data from patients who have undergone robot assisted partial nephrectomy and to see exclusively if the RENAL score can be used to predict perioperative outcomes. We were hoping to utilise the data to determine if we can reduce predicted perioperative complications through better planning.

MATERIALS AND METHODS

323 cases of robot assisted partial nephrectomy were observed between October 2009 to June 2021, from the Olomouc Faculty Hospital and evaluated. Tumours with a RENAL score of 4-6 points were classified as 'low complexity' (group A), and lesions with 7-12 points as 'intermediate to high complexity' (group B). We believed it was best to group 'intermediate' and 'high' complexity tumours together because they exhibited similar characteristics. Perioperative variables including operative times, estimated blood loss, ischemia time, histological findings, surgical complications, and functional outcomes were compared (% of patients with a decrease in glomerular filtration rate at CKD-EPI by 30% and more).

Table 1: the RENAL nephrometry scoring system

RENAL	1pt	2pts	3pts
Radius (maximum diameter in cm)	≤4	› 4 but ‹ 7	≥7
Exophytic/endophytic	≥ 50% Exophytic	‹ 50% Endophytic	Entirely Endophytic
Nearest, sinus or collecting system (mm)	≥7	› 4 but ‹ 7	≤4
Anterior/Posterior	Nonnumerical suffix a, p , x , h.		
Location, Polar lines	Entirely above or below the polar lines	The lesion crosses the polar lines	›50% of the mass crosses the polar line or the mass is located entirely between the polar lines

https://epos.myesr.org/poster/esr/ecr2013/C-2372, cit.25/04/22

Table 2: a comparison between how we classified malignant renal cell carcinomas (RCC) and benign tumours into group A (low complexity) and group B (intermediate to high complexity).

Fisher- Exact Test: p=0,000			
histologie	low	Interm.+high	Row
RCC	121	130	251
Column %	69,94%	86,67%	
Row %	48,21%	51,79%	
Total %	37,46%	40,25%	77,71%
benign	52	20	72
Column %	30,06%	13,33%	
Row %	72,22%	27,78%	
Total %	16,10%	6,19%	22,29%
Totals	173	150	323
Total %	53,56%	46,44%	100,00%
OR+95%CI	0,358	0,202-0,634	p=0,000

Table 3: the statistical analysis of data collected

variable	Low							Intermediate+High							Fisher-Exact Test	
	Valid N	Mean	Median	Minimum	Maximum	25% q.	75% q.	Valid N	Mean	Median	Minimum	Maximum	25% q.	75% q.	p-value	p-value
age	173	62,83	64,00	30,00	83,00	58,00	71,00	150	61,37	62,50	32,00	82,00	54,00	70,00	0,235730	0,236
OP time	173	101,18	95,00	34,00	223,00	77,00	120,00	150	103,50	100,00	29,00	175,00	82,00	125,00	0,204470	0,204
velikost (mm)	173	26,20	25,00	5,00	75,00	18,00	32,00	150	30,69	30,00	8,00	86,00	22,00	37,00	0,000156	0,000
KZ	173	141,45	90,00	0,00	1000,00	20,00	200,00	150	168,93	100,00	0,00	2000,00	30,00	200,00	0,229268	0,229
ischemie	93	17,01	17,00	6,00	45,00	12,00	20,00	122	17,79	18,00	6,00	35,00	13,00	21,00	0,334302	0,334
Charleson	150	3,37	3,00	0,00	7,00	2,00	5,00	173	4,09	4,00	0,00	10,00	3,00	5,00	0,001231	0,001

RESULTS

173 (53.6%) patients were classified in group A and 150 (44.6%) patients in group B. The median age from groups A and B (64 vs. 62.5, p = 0.236), the operating time (95 vs. 100 minutes, p = 0.204), the median estimated blood loss (90ml vs. 100ml, p = 0.229) and median warm ischemia time (17 minutes vs. 18 minutes, p = 0.334) did not differ significantly. The rate of decline in renal function (16.2% vs. 18.7%, p = 0.056), and the rate of perioperative complications (9.3% vs. 14.7%, p = 0.166) also displayed insignificant differences.

Benign lesions were more prevalent in group A (OR 0.358, 95% CI 0.202-0.634, p <0.001). Positive surgical margins (OR 0.370, 95% CI 0.154-0.887, p <0.022) were more frequently seen in malignant lesions from group A, but renal ischemia was less frequently required during resection (OR 3.654, 95% CI 2.196-6.08, p <0.001) in this group.

Chart 1: the ratio of benign to malignant in low complexity tumours

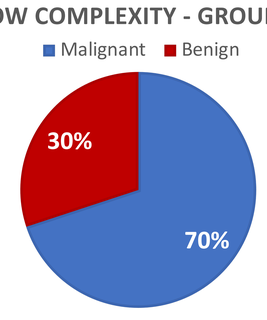
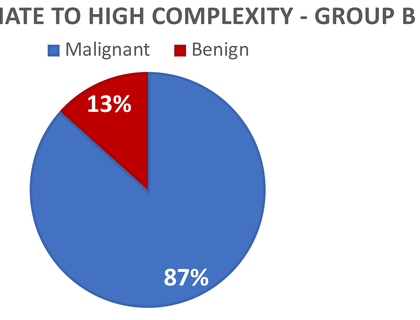


Chart 2: the ratio of benign to malignant in intermediate-high complexity tumours



CONCLUSION

From the results, we were able to draw two conclusions. We discovered that the only significant values were amongst pre-operative data. *Chart 1* and *chart 2 confirms that the* RENAL score can indicate that tumours classified as group A are more likely to be benign than tumours classified as group B.

Regarding peri-operative data, no significant differences were found between tumours in group A and group B. In conclusion it is difficult to predict the perioperative outcomes of robot assisted partial nephrectomy with the RENAL nephrometry score alone.