

Correlation between tumour characteristics and perioperative outcomes in Nephron Sparing Surgery.

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INTRODUCTION

Partial Nephrectomy (PN) is considered the reference treatment for patients with T1a renal cell carcinoma (figure 1). It provides equivalent oncological, functional and overall survival outcomes compared to radical nephrectomy (RN). It is associated with lower risks of developing chronic kidney disease (CKD) and long-term cardiovascular diseases. The use of such a conservative approach in patients with large or anatomically complex masses could potentially increase the oncological risk in comparison to a more radical technique.



Examples of different complexity of renal masses

AIM OF THE WORK

To evaluate the correlation between renal masses' characteristics and functional/oncological outcomes in a cohort of patients treated with Nephron Sparing Surgery (NSS).

RESULTS

MATERIALS AND METHODS

208 patients admitted for the treatment of kidney cancer. Approach: laparoscopic or open. 92 (44%) pts were submitted to conservative surgery for anatomically complex renal masses. Baseline tumour stage was: 38 (41.3%) cT1a, 43 (46.7%) cT1b, 11 (12%) cT2. Median (IQR) RENAL score was: 6 (4, 7) for the multiple masses (MM) group, 8 (6, 10) for the single renal unit (SU) group and 9 (8, 11) for the complex masses (CM) group. Pre-operative renal function impairment was staged according to estimated glomerular filtration rate (eGFR): median (IQR) values were lower in the single kidney unit 51.4 (44, 73) and in the multiple renal masses groups 73 (52, 89) compared to the complex masses group 82 (61, 101) (p=0.01). Chronic renal failure (CRF) was defined as an eGFR value lower than 60 mL/min/1,73m² and present in 22 (23.9%) pts with complex renal masses.

DISCUSSION

- in chronic renal function impairment is mandatory to maximize the preservation of healthy renal parenchyma
- NSS for complex masses, multifocal masses or in single renal unit expose to higher rates of perioperative complications and oncological risks
- MIC score is a tool that can be used to identify those patients who achieved an optimal outcome after PN
- Transfusions were significantly higher in the complex masses group when compared to the non-complex one
- The median operative time was significantly longer in the multiple masses and single unit subgroups than in the complex masses group

CONCLUSIONS

In our experience, stratifying patients selected for PN according to tumour's characteristics allows a better prediction of the surgical outcome.

1. Kim SP, Thompson RH, Boorjian SA, et al. Comparative effectiveness for survival and renal function of partial and radical nephrectomy for localized renal tumors: a systematic review and meta-analysis. J Urol 2012;188:51-7.
2. Joniau S, Vander Eeck K, Sringam SJ, Van Poppel H. Outcome of nephron-sparing surgery for T1b renal cell carcinoma. BJU Int 2009;103:1344-8.
3. Buffi N, Lista G, Larcher A, et al. Margin, Ischemia, and Complications (MIC) Score in Partial Nephrectomy: A New System for Evaluating Achievement of Optimal Outcomes in Nephron-sparing Surgery. Eur Urol 2012;62:617-618.

Variables	Overall population (n=208; 100%)	Multiple Masses (n=10; 5%)	Single Renal Unit (n=12; 6%)	Complex Lesions (n=92; 44%)	p
Post-Op eGFR, mL/min/1,73m ²	80 (62, 99)	68 (46, 89)	41.5 (33, 55)	78 (56, 96)	0.002
CKD grade Post-OP					
I	77 (37 %)	2 (20%)	1 (8.3%)	33 (35.9%)	0.001
II	83 (39.9%)	4 (40%)	/	35 (38%)	
III	35 (16.8%)	3 (30%)	10 (83.3%)	18 (19.6%)	
IV	7 (3.4%)	1 (10%)	1 (8.3%)	5 (5.4%)	
V	2 (1%)	/	/	1 (1.1%)	
CKD impairment					0.9
Yes	42 (20.2%)	2 (20%)	4 (33.3%)	20 (21.8%)	
No	166 (79.8%)	8 (80%)	8 (66.7%)	72 (78.2%)	
EBL, ml	200 (100, 328)	265 (188, 375)	200 (100, 300)	250 (103, 398)	0.5
Ischemia					0.02
Yes	69 (33.2%)	5 (50%)	1 (8.3%)	38 (41.3%)	
No	139 (66.8%)	5 (50%)	11 (91.7%)	54 (58.7%)	
WIT, min	8 (0, 14)	8 (4, 12)	5 (0, NA)	9 (0, 14)	0.4
OT, min	125 (95, 150)	150 (139, 225)	176 (125, 208)	130 (103, 165)	0.02
Pathologic T stage					0.001
pT1a	133 (64.0%)	8 (80%)	10 (83.3%)	17 (18.5%)	
pT1b	59 (28.3%)	2 (20%)	1 (8.3%)	59 (64.1%)	
pT2a	10 (4.8%)	/	1 (8.3%)	10 (10.9%)	
pT2b	2 (1.0%)	/	/	2 (2.2%)	
pT3a	4 (1.9%)	/	/	4 (4.3%)	
Surgical margins					0.8
Negative	188 (90.4%)	10 (100%)	11 (91.7%)	85 (92.4%)	
Positive	20 (9.6%)	0 (0%)	1 (8.3%)	7 (7.6%)	
MIC Score					0.5
Yes	156 (75.5%)	9 (90%)	11 (91.7%)	73 (79.3%)	
No	51 (24.5%)	1 (10%)	1 (8.3%)	19 (20.7%)	
LOS, days	5 (4, 6)	5 (4, 7)	5 (4, 7)	5 (4, 7)	0.2
Post-Op Clavien Dindo					0.7
No	174 (83.7%)	8 (80%)	11 (91.7%)	75 (81.5%)	
I	14 (6.7%)	1 (10%)	1 (8.3%)	4 (4.3%)	
II	12 (5.8%)	1 (10%)	/	9 (9.8%)	
III	4 (1.9%)	/	/	2 (2.2%)	
IV	4 (1.9%)	/	/	2 (2.2%)	

Variables	Overall population (n=208; 100%)	Multiple Masses (n=10; 5%)	Single Renal Unit (n=12; 6%)	Complex Lesions (n=92; 44%)	p
Perioperative Blood Transfusion, units					0.02
No	184 (88.5%)	9 (90%)	10 (83.3%)	77 (83.7%)	
I	17 (8.2%)	/	2 (16.7%)	12 (13.0%)	
II	5 (2.4%)	/	/	2 (2.2%)	
III	1 (0.5%)	/	/	/	
IV	1 (0.5%)	1 (10%)	/	1 (1.1%)	
Intra-Op Complications					0.001
No	191 (91.8%)	9 (90%)	7 (58.3%)	84 (91.3%)	
Urinary Tract Lesion	6 (2.9%)	/	4 (33.3%)	4 (4.3%)	
Pleural Lesion	3 (1.4%)	/	1 (8.3%)	1 (1.1%)	
Intestinal Lesion	1 (0.5%)	/	/	/	
Liver Lesion	1 (0.5%)	/	/	/	
Spleen Lesion	6 (2.9%)	1 (10%)	/	3 (3.3%)	
Haemostatic Agents					0.3
No	89 (42.8%)	4 (40%)	9 (75%)	37 (40.2%)	
Floseal	84 (40.4%)	6 (60%)	3 (25%)	39 (42.4%)	
Surgiflow	6 (2.9%)	/	/	2 (2.2%)	
Tachosil	29 (13.9%)	/	/	14 (15.2%)	
Urethral catheter					0.8
Yes	34 (16.3%)	2 (20%)	3 (25%)	17 (18.5%)	
No	174 (83.7%)	8 (80%)	9 (75%)	75 (81.5%)	
Conversion RN					0.001
Yes	4 (1.9%)	0 (0%)	0 (0%)	4 (4.3%)	
No	204 (98.1%)	10 (100%)	12 (100%)	88 (95.7%)	