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Nephron sparing surgery decreases other-causes mortality relative to radical nephrectomy only in specific subgroups of patients with renal cell carcinoma

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INTRODUCTION & OBJECTIVES: Although an established protective effect on chronic kidney disease and cardiovascular event for patients treated with nephron sparing surgery (NSS) relative to their radical nephrectomy (RN) counterparts, there is no consensus regarding a consequential protective effect on mortality due to cause other than cancer (OCM). The aim of the study was to test whether the protective effect of NSS on OCM is universal or present only in specific sub-groups of patients.

MATERIAL & METHODS: A collaborative database of 5 European Centres was queried to evaluate 1,783 patients without chronic kidney disease and with a clinical T1a-bN0M0 renal mass treated with NSS or RN. Multivariable Cox regression analysis (MVA) assessed the impact of NSS vs. RN on OCM after adjustment for age, BMI, gender, CCI, hypertension (classified as no hypertension vs. hypertension controlled by therapy vs. hypertension uncontrolled by therapy), diabetes (classified as present vs. absent), clinical tumour size (largest tumour diameter in millimetres) and year of diagnosis. Cox regression-derived coefficients were used to estimate the 10-years OCM-free survival probability. Locally weighted scatterplot smoothing method was used to graphically explore the probability of 10-years OCM-free survival after NSS or RN according to patient baseline characteristics (e.g. CCI).

RESULTS: The 10-years OCM-free survival rates were 90 and 88% after NSS and RN, respectively. In the overall cohort of patients, RN was not associated with an increased risk of OCM at MVA (Hazard ratio: 0.91; 95% Confidence interval: 0.60-1.38; p=0.6) when compared to NSS. The interaction tests for the hypotheses that the impact of surgery type on OCM varies according to age, BMI, gender, presence and type of hypertension, presence of diabetes, tumour size and year of diagnosis were all not statistically significant (p>0.05). Conversely, the interaction test for the hypothesis that the impact of surgery type on OCM varies according to patient baseline CCI was statistically significant (p=0.001). For a patient with CCI=0, the probability of 10-years OCM free survival was 95% after NSS and 94% after RN. Conversely, for a patient with CCI=4, the probability of 10-years OCM free survival was 86% after NSS and 60% after RN (Figure 1).

CONCLUSIONS: Although the already established benefits in terms of chronic kidney disease and cardiovascular events, the impact of nephron-sparing surgery on the risk of OCM is not equal in all patients diagnosed with a cT1 renal mass. Specifically, in healthier patients without comorbidities, NSS surgery does not invariably decrease the risk of OCM relative to RN. Conversely, in sicker patients with relevant comorbidities, NSS decreases the risk of OCM relative to RN.