Dichotomous Sized-Based Clinical Staging of Localized Renal Masses Affects Management but Not Clinical Outcomes

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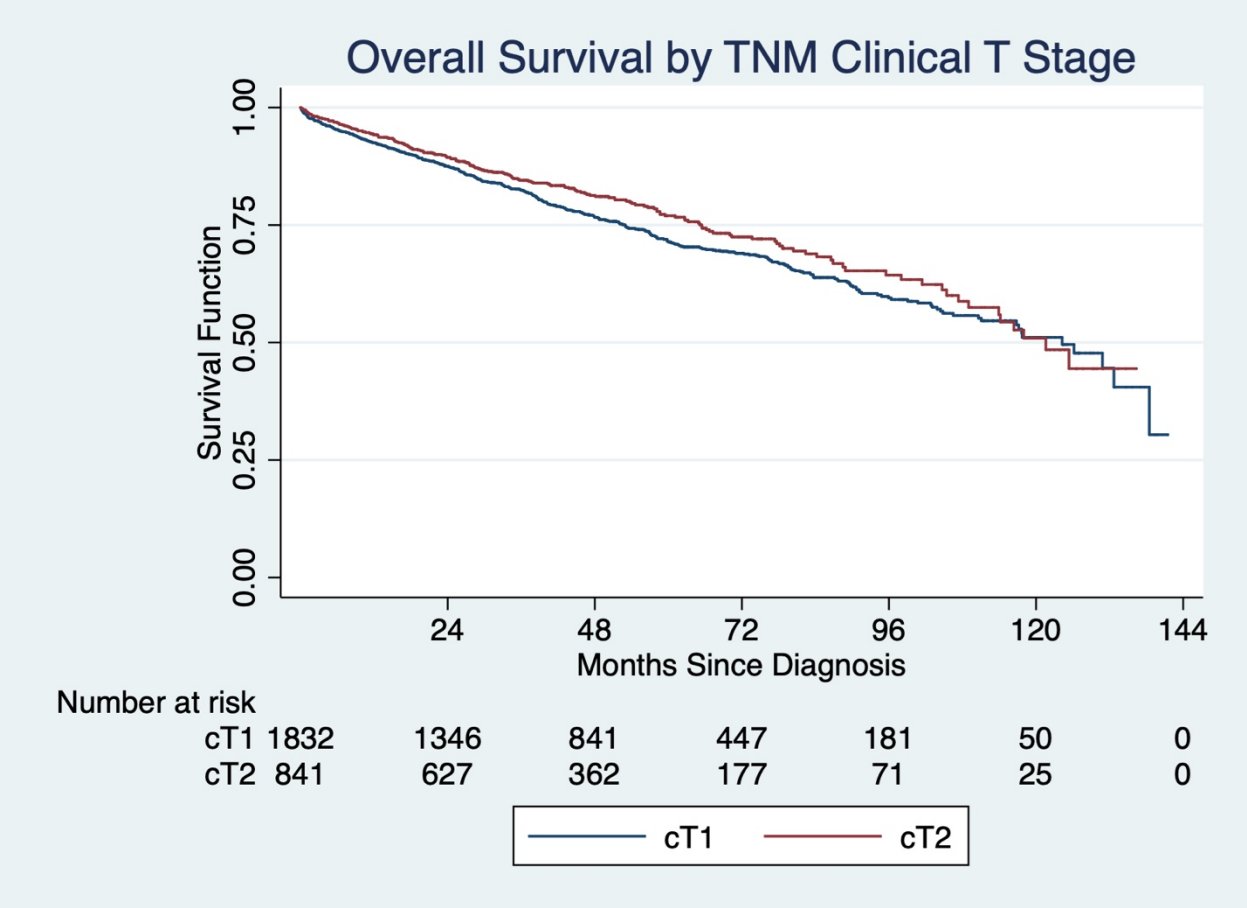
Introduction: Clinical staging of localized renal masses is assigned according to radiographic tumor diameter cut-offs, with T1 masses defined as 7cm or less compared to T2 masses. However, it is unknown if tumors with infinitesimal size differences exhibit oncologic behavior to warrant different surgical management. Arbitrarily dichotomizing otherwise similar tumors to different stage groups may inappropriately influence the management of renal tumors, which may affect patient outcomes. We evaluated differences in management and clinical outcomes in otherwise similarly sized tumors among patients that differ only in clinical T stage.

Methods: Data from the National Cancer Center Database was extracted on all patients with a diagnosis of clear cell renal cell carcinoma (RCC) of stage T1 or T2. Data on tumor size was specifically extracted for tumors on the cusp of T1/T2 staging to include: 69mm, 70mm, and 71mm. Clinical data were compared and Kaplan-Meier and Cox proportional hazards survival modeling were performed.

Results: A total of 2815 patients were included in the analysis. There were 1882 tumors classified as T1 and 933 tumors classified as T2; there were no differences in demographics or comorbidity scores. Of 171 tumors reported to be 69mm, 132 (77.2%) were staged as T1. Of 2339 70mm tumors, 1686 (72%) were staged as T1. Of 305 71mm tumors, 64 (21%) were staged as T1. For management, 11.7% of T1 masses were treated with partial nephrectomy vs 7.3% of T2 masses and 75.8% of T1 masses were treated with radical nephrectomy vs 80.7% of T2 masses ($p<0.001$). T2 masses were more likely to have lymph node dissection than T1 masses (15.1% vs 9.9%, $p<0.001$), but pathologic N and M staging was similar. On Kaplan-Meier survival analysis, there was no difference in survival between T1 and T2 masses.

Discussion: In this analysis, tumors of similar size but different clinical stage exhibited similar survival, yet were managed differently according to assigned clinical T stage. Patients with large T1 or small T2 masses may be managed inappropriately if the treatment is based on dichotomized clinical staging alone. When possible, risk calculation using precise parameters such as tumor size as part of a prediction model is preferable to dichotomized rules of thumb when determining optimal treatment courses.

Figure 1.


Overall Survival by TNM Clinical T Stage
Survival Function
0.00
0.25
0.50
0.75
1.00
24
48
72
96
120
144
Months Since Diagnosis
Number at risk
cT1 1832 1346 841 447 181 50 0
cT2 841 627 362 177 71 25 0
cT1
cT2