Editorial Commentary

Percutaneous ablation for renal masses

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Provenance: This is an invited article commissioned by the Section Editor Dr. Xiao Li (Department of Urology, Jiangsu Cancer Hospital, Jiangsu Institute of Cancer Research, Nanjing Medical University Affiliated Cancer Hospital, Nanjing, China).

Comment on: Andrews JR, Atwell T, Schmit G, *et al.* Oncologic Outcomes Following Partial Nephrectomy and Percutaneous Ablation for cT1 Renal Masses. Eur Urol 2019;76:244-51.

Submitted Jul 19, 2019. Accepted for publication Jul 26, 2019.

doi: 10.21037/atm.2019.07.96

View this article at: http://dx.doi.org/10.21037/atm.2019.07.96

Technological advancements and improvement in accuracy of various diagnostic imaging modalities have resulted in an increased incidence of small renal masses (SRM) in the last decade (1). Partial nephrectomy (PN) is the gold standard for the treatment of cT1a renal cell carcinoma (RCC) and is the standard alternative to radical nephrectomy (RN) for cT1b RCC (2,3). Both PN and RN are major surgical endeavors and associated with significant complications. The invasive nature of these surgeries, coupled with increasing age and comorbidities among patients with SRMs have led to increasing interest in less invasive therapeutic modalities for both cT1a and cT1b tumors. The most common among these minimally invasive modalities are thermal ablation (TA) including cryoablation (CA), and radiofrequency ablation (RFA). Recent American Association of Urology (AUA) guidelines [2017] recommend TA (preferably through a percutaneous approach) as an alternate management option for renal masses less than 3 cm in size.

However, most studies on these approaches have a limited follow up ranging from 3–5 years. These studies report similar metastases free survival (MFS) and cancer specific survival (CSS) among patients undergoing either PN or TA (4). However, the median local recurrence free survival (RFS) significantly favors PN over a single setting of TA, though the difference no longer remains statistically significant following a repeat TA (4). In a recent network meta-analysis, PN was superior in terms of RFS and overall survival but the CSS was similar in both groups (5). The data was, however, limited by a possible selection bias. Most of the studies in the analysis were retrospective in nature and the follow up ranged from 3 to 82 months.

Andrews *et al.* (6) have attempted to address this issue in their retrospective analysis of a prospectively maintained database, comparing oncologic outcomes following PN and TA for cT1 renal masses, presenting a longer follow up of previously published data from their institution (7). The authors present data on 1,798 patients with cT1N0M0 renal masses treated between 2000 and 2011. The median follow up for 1,422 cT1a patients undergoing PN (n=1,055), RFA (n=180) and CA (n=187) was 9.4, 7.5 and 6.3 years respectively and the median follow up for 376 cT1b patients undergoing PN (n=324) and CA (n=52) was 8.7 and 6 years respectively. Patients undergoing PN were significantly younger with fewer comorbidities. In line with their previous report, the authors found a similar 5-year local RFS between PN, RFA and CA for cT1a masses and between PN and CA for cT1b masses (including documented RCC). The authors attribute this finding to the expertise of their interventional radiologists. This report is significant as it differs from the existing literature.

One of the challenges of achieving good results with these modalities is the need for expertise, something the authors acknowledge in their manuscript. It would be useful to know the number of technical failures and number of patients requiring multiple TA settings, as this may have an impact on the overall efficacy of therapy. Another issue with these modalities is identification of patient and tumor characteristics that may impact outcomes. The authors performed RFA only for patients with smaller (<3 cm) and peripheral tumors. CA was used for larger masses and for masses located centrally, anteriorly or near

the ureter. Addition of data on renal complexity scores, like the RENAL nephrometry score (8), might help to identify possible reasons for technical failures or local recurrence. This may be important for selection of the most appropriate treatment option for a given patient, including decision regarding the choice between laparoscopic and percutaneous TA or between PN and TA.

For a tumor like RCC where late recurrence and metastasis beyond 10 years are well known, it is unclear how long a follow-up is long enough for assessing efficacy (9). In the absence of measured data for most modalities other than RN, and PN to some extent, we rely on statistical modelling such as the Kaplan-Meir model to assume outcomes. These models are undoubtedly robust and time-tested but are influenced heavily by the denominator. A larger denominator (subjects with actual data) means greater reliability. In this report, despite being possibly the largest of its type, the denominator among the three groups is extremely different and relatively much smaller for the RFA and CA groups. While assessing 5-year CSS rates for T1a disease, there were only 39 patients at risk in the RFA group and 60 in the CA group compared to 688 in the PN group. This stems, partly, from the older patients with greater comorbidities in the RFA/CA group who died of other causes, possibly before disease recurrence or cancer related mortality could occur. This assumption is supported by the lower follow-up in both these groups (7.5 y, 6.3 y) compared with 9.4 y for the PN group and higher 5-year overall-mortality of these two groups (28%, 23%) compared with the PN group (8%). Forty-seven percent of patients from the RFA group and 40% from the CA group died during the study period compared with 22% in the PN group. Similar differences exist in the data between CA and PN for T1b disease. Finally, although grade of tumor is not described as a selection criterion, a higher proportion of tumors in the RFA/CA were of lower grade than in the PN group, contributing to heterogeneity between the two groups.

Despite the limitations in comparing two varied groups in a retrospective analysis, the authors should be commended for undertaking the first large comparison for long tern oncologic outcomes following PN and percutaneous TA. This should encourage establishment of prospective randomized trials which could provide level-1 evidence for determining the validity of this data.

Acknowledgments

None.

Footnote

Conflicts of interest: The authors have no conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

References

1. Hollingsworth JM, Miller DC, Daignault S, et al. Rising incidence of small renal masses: a need to reassess treatment effect. J Natl Cancer Inst 2006;98:1331-4.
2. Yan S, Yang W, Zhu CM, et al. Comparison among cryoablation, radiofrequency ablation, and partial nephrectomy for renal cell carcinomas sized smaller than 2cm or sized 2-4cm: A population-based study. Medicine (Baltimore) 2019;98:e15610.
3. Campbell S, Uzzo RG, Allaf ME, et al. Renal Mass and Localized Renal Cancer: AUA Guideline. J Urol 2017;198:520-9.
4. Pierorazio PM, Johnson MH, Patel HD, et al. Management of Renal Masses and Localized Renal Cancer: Systematic Review and Meta-Analysis. J Urol 2016;196:989-99.
5. Uhlig J, Strauss A, Rücker G, et al. Partial nephrectomy versus ablative techniques for small renal masses: a systematic review and network meta-analysis. Eur Radiol 2019;29:1293-307.
6. Andrews JR, Atwell T, Schmit G, et al. Oncologic Outcomes Following Partial Nephrectomy and Percutaneous Ablation for cT1 Renal Masses. Eur Urol 2019;76:244-51.
7. Thompson RH, Atwell T, Schmit G, et al. Comparison of partial nephrectomy and percutaneous ablation for cT1 renal masses. Eur Urol 2015;67:252-9
8. Bertolo R, Pozzi L. From PADUA to R.E.N.A.L. Score and Vice Versa: Development and Validation of a Mathematical Converter. J Urol 2019;201:674-5.
9. Miyao N, Naito S, Ozono S, et al. Late recurrence of renal cell carcinoma: retrospective and collaborative study of the Japanese Society of Renal Cancer. Urology 2011;77:379-84.

Cite this article as: Bansal D, Kumar R. Percutaneous ablation for renal masses. Ann Transl Med 2019;7(Suppl 6):S174. doi: 10.21037/atm.2019.07.96

