Editorial Commentary



# Predicting renal function after kidney cancer surgery: a tool for clinical decision making

**Natalie R. Swavley, Alessandro Veccia, Riccardo Autorino**

Division of Urology, VCU Health System, Richmond, Virginia, USA

*Correspondence to:* Riccardo Autorino, MD, PhD, FEBU. Division of Urology, VCU Health System, 1200 East Broad St., Richmond, VA, USA. Email: ricautor@gmail.com.

*Provenance:* This is an invited article commissioned by the Section Editor Peng Zhang, MD, PhD (Department of Urology, Zhongnan Hospital of Wuhan University, Wuhan, China).

*Comment on:* Bhindi B, Lohse CM, Schulte PJ, *et al.* Predicting Renal Function Outcomes After Partial and Radical Nephrectomy. Eur Urol 2018. [Epub ahead of print].

Submitted Feb 06, 2019. Accepted for publication Feb 22, 2019.

doi: 10.21037/atm.2019.02.42

**View this article at:** http://dx.doi.org/10.21037/atm.2019.02.42

The surgical climate continues to evolve with the advent of more advanced technology and the ability to perform increasingly complex operations through a minimally invasive approach. This paradigm shift can be encountered in the decision process that leads to perform a partial nephrectomy (PN) versus a radical nephrectomy (RN) for patients presenting with a renal mass. There are several variables the urologist considers when counseling such patients, including overall health status, oncologic outcome, possible perioperative complications, and long-term renal function (1,2).

For T1a renal tumors, PN has shown equivalent oncological outcomes with improved preservation GFR and therefore it is recommended as the surgical treatment of choice whenever feasible (1). Significantly decreased post-operative renal function yields a few sequalae with increased risk cardiovascular disease and decreased survival seen in patients with chronic kidney disease (3,4). More recently, it was postulated that preserving nephrons could translate into a better oncological outcome (5). Thus, PN has been advocated also for larger renal masses based on the rationale of maximizing renal function preservation (6).

Undoubtably, post-operative renal function is a summation of several variables (2). This study contributes to the ongoing debate by offering a practical "ready-to-use" predictive tool that is based on widely available preoperative data. Notably, the study is based on the analysis of a large sample of >3,000 cases and >30,000 eGFR values from a single institution prospectively maintained database. The authors looked at what—we agree—are two "clinically" relevant outcomes, namely the "immediate" (before postop day 30) postoperative renal failure and long term (after postop day 30) eGFR. The mean follow-up time in their study population was about 5 years for both RN and PN. As the authors recognize, omission of tumor complexity and ischemia time in the equation represents a limitation of the study, these variables could have offered additional insight and understanding to practitioners who are attempting to balance surgical difficulty with the expected benefit of preserved renal function. Using this modeling might offer potential improvement in pre-operative patient counseling, as it might help elucidate the patient in which a PN will offer little advantage in terms of GFR preservation.

Others have recently investigated this intriguing subject, which is the prediction of postoperative renal function in patients undergoing kidney cancer surgery. Rha *et al.* studied 348 cases to determine the correlation of preoperatively calculated volume of nephron loss (defined as "resected and ischaemic volume") with postoperative renal function decline after minimally invasive PN (7). More recently, Martini *et al.* used a multi-institutional dataset to develop a nomogram (including age, sex, Charlson comorbidity index, baseline renal function and RENAL nephrometry score) to predict a 25% postoperative decline of renal function (8).

All the above studies, including the present one by Bhindi *et al.* (9), are based on similar factors, which are those

readily available when assessing a patient with renal mass. While commending these authors for their contribution to the ongoing debate, and while waiting for an external validation of their and other predictive models, we embrace the concept that maximal preservation of renal function remains a priority goal of kidney cancer surgery (10). Future investigations on factors involved in long-term renal function will aid in clinical decision making for patients with renal mass.

## Acknowledgements

None.

## Footnote

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

## References

1. Campbell S, Uzzo RG, Allaf ME, et al. Renal Mass and Localized Renal Cancer: AUA Guideline. J Urol 2017;198:520-9.
2. Mir MC, Autorino R, Porpiglia F. Ischemia time and beyond: the concept of global renal damage. Minerva Urol Nefrol 2018;70:447-9.
3. 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.
4. Sun M, Trinh QD, Bianchi M, et al. A non-cancer-related survival benefit is associated with partial nephrectomy. Eur Urol 2012;61:725-31.
5. Antonelli A, Minervini A, Sandri M, et al. Below Safety Limits, Every Unit of Glomerular Filtration Rate Counts: Assessing the Relationship Between Renal Function and Cancer-specific Mortality in Renal Cell Carcinoma. Eur Urol 2018;74:661-7.
6. Mir MC, Derweesh I, Porpiglia F, et al. Partial Nephrectomy Versus Radical Nephrectomy for Clinical T1b and T2 Renal Tumors: A Systematic Review and Meta-analysis of Comparative Studies. Eur Urol 2017;71:606-17.
7. Rha KH, Abdel Raheem A, Park SY, et al. Impact of preoperative calculation of nephron volume loss on future of partial nephrectomy techniques; planning a strategic roadmap for improving functional preservation and securing oncological safety. BJU Int 2017;120:682-8.
8. Martini A, Cumarasamy S, Beksac AT, et al. A Nomogram to Predict Significant Estimated Glomerular Filtration Rate Reduction After Robotic Partial Nephrectomy. Eur Urol 2018;74:833-9.
9. Bhindi B, Lohse CM, Schulte PJ, et al. Predicting Renal Function Outcomes After Partial and Radical Nephrectomy. Eur Urol 2018. [Epub ahead of print].
10. Swavely NR, Anele UA, Porpiglia F, et al. Optimization of renal function preservation during robotic partial nephrectomy. Ther Adv Urol 2019;11:1756287218815819.

**Cite this article as:** Swavley NR, Veccia A, Autorino R. Predicting renal function after kidney cancer surgery: a tool for clinical decision making. Ann Transl Med 2019;7(Suppl 1):S45. doi: 10.21037/atm.2019.02.42

 