Treating small renal masses: Costing it out

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The best surgical treatment for small renal masses (SRMs) has been the focus of much debate over the past decade. Few studies, however, have approached it from a cost-utility standpoint. Studies of this nature provide important tools and a unique vantage point to assist clinicians and patients navigate through various treatment options in this increasingly common scenario. Such guidance is necessary in a healthcare system with limited resources, where appropriate allocation is an essential component of every medical decision.

Klinghoffer and colleagues tackled this important question by comparing the cost-utility of laparoscopic radical nephrectomy (LRN), laparoscopic partial nephrectomy (LPN) and open partial nephrectomy (OPN) using a Markov decision analytic model, while specifically addressing the impact of treatment-induced chronic kidney disease (CKD).[1] Assuming a healthy 65-year-old patient with a small renal mass (<4 cm), normal contralateral kidney and normal preoperative serum creatinine, they identified PN (laparoscopic or open) as the preferred treatment compared to LRN. LPN offered the greatest quality-adjusted life years (QALYs) compared to OPN, but at an additional cost. Importantly, LRN was more expensive and resulted in lower QALYs than LPN. In health economics this is often referred to as LRN was *dominated* by LPN, meaning that the LRN strategy was inferior to LPN both from a cost and a QALY perspective.

These findings, however, must be interpreted cautiously within the context of several important limitations. First, as the authors acknowledge, the quality and validity of a model's conclusions are only as good as the data utilized to develop the model. Estimates of cost, utilities and transitional probabilities have been based largely on retrospective studies from single institution and tertiary care centres.[2,3] These previously published series are plagued by issues of selection bias and confounding, which in turn are translated into the current model. Prospective data regarding the development of CKD, in particular the development of end-stage renal disease, in this population are lacking. Furthermore, the authors make assumptions regarding the linear risks over time for the development of CKD. Such a pattern of onset may not actually be the case given recent knowledge of the differential impact of surgically versus medically induced CKD.[4] The detrimental impact of RN on the development of CKD may not be as pronounced if risks of CKD do not develop in a linear manner.

Another concern with this study and with cost-utility modelling in general is that it oversimplifies clinical complexity and may fall short of fully capturing the health benefits or detrimental impact of various treatments modalities. The impact of the development of CKD on QALYs is addressed in the model, yet the authors fail to address other outcomes that clearly affect patient utility. Absent is an explicit consideration of the only randomized study, which demonstrates an overall survival benefit for RN compared to PN.[5] These findings significantly impact the cost-utility equation and must be acknowledged in any such model. Important transitions involving disease recurrence, progression to metastatic disease, and potential subsequent therapies (local or systemic) are also absent. Furthermore, QALYs allow for direct comparisons of quality and quantity of life, but remain far from perfect as attempts are made to apply a number to an individual patient's quality of life. Questions also arise as to the most appropriate method of capturing utility, such as whether assessment should be performed by the clinician or the patient and whether disease-specific or general measures should be utilized. These authors attempted to translate a generic quality of life measure (SF-36) into a utility using an equation with only moderate validity. Ideally, directly elicited utilities from the population in question are needed.

A final thought when evaluating conclusions from this study is to realize that this question remains a moving target. As our knowledge improves and data mature, new information needs to be integrated into existing models, such as the one by Klinghoffer and colleagues.[1] The true impact of PN on outcomes of CKD is still heavily debated and more information may be provided as long-term renal functional results from the randomized trial are reported.[5] Newer treatment options are also changing the landscape of the management of SRMs.[6,7] Ablative therapies and active surveillance protocols have rapidly moved to the forefront and have the potential to shift the cost-utility balance, especially within specific subgroups (e.g., the elderly). These treatment options will play an increasingly important role, yet are not addressed in the current model. Other decision-analytic studies have integrated these treatment strategies into their models, demonstrating a beneficial role for both modalities in specific subgroups.[8] These decisions ultimately require a complex discussion to evaluate and include individual patient's comorbidities and personal preferences. Regardless, findings from this study remain relevant and important, though work must continue in this rapidly changing field.

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