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Clinical Influences in the Multidisciplinary Management of Small Renal Masses at a Tertiary Referral Center

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Abstract

Introduction: We designed a multidisciplinary Small Renal Mass Center to help patients decide among treatment options and individualize therapy for small renal masses. In this model physicians and support staff from multiple specialties work as a team to evaluate and devise a treatment plan for patients at the same organized visit.

Methods: We retrospectively reviewed the records of 263 patients seen from 2009 to 2014. Monitored patient characteristics included age, Charlson comorbidity index, body mass index, nephrometry score, tumor size and estimated glomerular filtration rate. Univariate and multivariate analyses were performed to identify patient characteristics associated with each treatment choice.

Results: Of the cohort 88 patients elected active surveillance, 64 underwent ablation and 111 were treated with surgery, including partial and radical nephrectomy in 74 and 37, respectively. There were significant associations between treatment modality and age, Charlson comorbidity index, tumor size and estimated glomerular filtration rate. Mean patient age at presentation was 61.1 years. Patients with a high Charlson comorbidity index score (greater than 5) or a decreased estimated glomerular filtration rate (less than 60 ml/minute/1.73 m^2) were more likely to undergo active surveillance (41.6% and 35%) and ablative therapy (29.6% and 34%) vs partial nephrectomy (10.6% and 9%, respectively, each $p < 0.001$). On multivariable analysis age, tumor size and estimated glomerular filtration rate remained significantly associated with modality after adjustment for all other factors (each $p < 0.001$).

Conclusions: The Small Renal Mass Center enables patients to assess the various treatment modalities for a small renal mass in a single setting. By providing simultaneous access to the various specialists it provides an invaluable opportunity for informed patient decision making.

Abbreviations and Acronyms

AS = active surveillance

BMI = body mass index

CCI = Charlson comorbidity index

CKD = chronic kidney disease

eGFR = estimated glomerular filtration rate

SRM = small renal mass

SRMC = SRM Center

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Renal cancer is the third most common urological cancer. SRMs, defined as those less than 4 cm in diameter, are an increasing subset.[1] The continued increase in imaging has led to an increase in incidentally detected SRMs.[2] While the resolution of cross-sectional imaging has steadily improved, it is still challenging to confidently differentiate benign vs malignant masses of this size.[3] Percutaneous renal mass biopsy has long been put forward as a means of obtaining diagnostic data on these masses.[4] However, because there has been a history of indeterminate results with these methods, the practice has not been generally used. Thus, for many patients with SRMs treatment decisions are still made without a clear diagnosis of malignancy.

The overarching goal of treatment for SRMs is the preservation of functional outcomes while addressing the tumor. CKD is an indicator of morbidity, end stage renal disease and even mortality.[5] A high prevalence of CKD has been documented in patients with localized SRMs with some series suggesting that 25% of patients have CKD III or greater.[6] Therefore, the nephron sparing partial nephrectomy procedure has been recommended. It is now considered the gold standard treatment of these masses,[7] particularly since the publication of several series suggesting worsening CKD and in some cases the new development of CKD after radical nephrectomy compared to partial nephrectomy.[5] While emerging data question whether extirpative management causes persistent subsequent CKD,[8,9] there is nonetheless concern that more aggressive management may have undesirable sequelae in certain patients.

Other treatment modalities have also proved successful in some patients.[10] Thermal ablation has been particularly useful in older or infirm patients.[11] Cryoablation, a form of thermal ablation in which the target tumor and surrounding parenchymal margins are frozen to critically low temperatures, likely has lower major complication rates than surgery.[10] However, the short-term rates of treatment failure may be greater than those of surgical management.[10] A third treatment option is AS. This was initially described as a means of treating patients with SRMs who were not surgical candidates due to comorbidities or age.[12] AS is becoming increasingly adopted by physicians as a treatment plan for more patients.

In recent years all therapeutic options have increasingly been offered to patients by physicians. Choosing can be an overwhelming experience for some individuals. The multidisciplinary SRMC of Sidney Kimmel Cancer Center at Thomas Jefferson University Hospital was developed based on a previous model for prostate cancer that was first developed at this institution.[13,14] The goal of this clinic is to provide patients with all appropriate options such that patients are able to decide on an appropriate plan for management (see figure).

Methods

Clinic Format

This concept was a spin-off from our successful Multidisciplinary Genitourinary Oncology clinic established at Thomas Jefferson University Hospital in 1996 to provide more focused attention on this group of patients.[13] The SRMC comprises physicians and support staff from the Department of Urology (Urologic Oncology) and the Division of Interventional Radiology, Department of Radiology in close collaboration with additional physicians from the Departments of Radiology and Pathology. Patients are referred by the local provider or from the Department of Urology at Thomas Jefferson University Hospital. A navigator evaluates each patient to obtain the basic history and ensure that imaging is available the day of the visit. The SRMC team meets prior to each clinic session to review the records of the patients presenting for evaluation later that day. Radiology films are assessed along with available patient history and tentative treatment plans are discussed.

Patients are subsequently evaluated. History intake and physical examinations are performed separately by members of the urological and interventional radiology teams. Patients are then presented to the entire team. The final joint consultation is performed by the attending physicians of both teams together with the patient.

Patient Treatment

Pathology data were obtained on all patients who underwent partial or radical nephrectomy. Renal mass biopsies were performed at the beginning of all cryoablation procedures starting in 2011. A total of 48 needle biopsies were performed during the study period. Patient education includes discussion of SRM likely outcomes, metastasis and growth rates using data from the literature. Patients who have undergone surgery or thermal ablation are subsequently followed every 4 months for the first year, every 6 months for year 2 and every 12 months thereafter. Patients on the active