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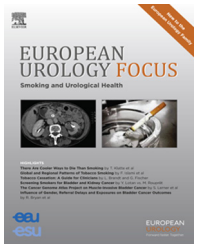

Review – Kidney Cancer

Active Surveillance in Small Renal Masses in the Elderly: A Literature Review

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Abstract

Context: Small renal masses have become increasingly common due to widespread imaging; however, optimal management of these lesions in the elderly can be complex due to the competing risks of intervention, natural history of disease, patient comorbidities, and expectations. In the properly selected elderly patient, active surveillance remains an accepted and attractive treatment approach.

Objective: We completed a literature review of small renal masses (enhancing, <4 cm, T1aN0M0 disease) in the elderly, aged ≥70 yr, aimed at identifying the utility of active surveillance in this population. The primary outcomes were conversion to active treatment while on active surveillance and cancer-specific mortality. Secondary outcomes included predictors of treatment, type of treatment performed (partial nephrectomy, radical nephrectomy, and ablation), progression to metastases, all-cause mortality, tumor growth rate, and demographic data including age and Charlson Comorbidity Index.

Evidence acquisition: A comprehensive search of electronic databases (e.g., MEDLINE, EMBASE, SCOPUS, Web of Science, and the Cochrane Library) using search terms "small renal mass" OR "SRM", AND "elderly," "senior," "aging," "geriatric," OR "octogenarian" was completed. All randomized controlled trials, nonrandomized comparison studies, and case series were included and screened by the reviewers. All comparison studies included in the systematic review were assessed for methodological quality using the Cochrane Risk of Bias tools.

Evidence synthesis: Seventeen primary studies including 36 495 patients met the inclusion criteria for the systematic review. All studies were retrospective institutional chart or the Surveillance, Epidemiology, and End Results database reviews. There was a low (4–26%) rate of conversion to active treatment for active surveillance in the identified studies over a follow-up interval of up to 91.5 mo. Overall mortality was substantial in this elderly cohort, with 15–51% of patients being deceased over the course of study follow-up; however, there was minimal cancer-specific mortality due to patients succumbing to alternative comorbid disease. In the future, patient comorbidity and biological age versus the natural history of the individualized tumor biology may play an increasing role in the discussion regarding treatment options and consideration of active surveillance.

Conclusions: Active surveillance is an effective management strategy in the elderly population. Few patients required the conversion to active treatment and there was low cancer-specific mortality. The majority of patients who expired over the course of the identified studies succumbed to alternative disease. The goal of treatment strategies should include weighing patient-specific prognosis relative to their competing health risks and treatment goals against the natural history of disease and risks of intervention.

Patient summary: In this review article, the authors examined the utility of active surveillance in the setting of a small localized renal mass in the elderly population. Despite being on surveillance, we found that cancer-specific outcomes were excellent, and overall mortality was often a result of comorbid disease. However, there is significant heterogeneity among elderly patients, and treatment approaches should be focused around patient-centered goals and prognosis.

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1. Introduction

Small renal masses (SRMs), defined as incidentally discovered enhancing renal masses <4 cm in maximal diameter with imaging consistent with T1aN0M0 disease, have become increasingly common due to widespread imaging [1,2]. Owing to the variable natural history of renal tumors based on histology and size, SRMs represent a clinically diverse spectrum of disease [3,4]. As the availability and access to renal tumor biopsy (RTB) continues to improve, increased prognostication of these lesions may also improve [5–8]. Numerous treatment approaches including extirpative surgery (ie, partial or radical nephrectomy), tissue ablation (ie, cryotherapy and radiofrequency ablation), and active surveillance have all been proved to be effective in the management of SRMs [9–13].

However, in elderly patients, the optimal management strategy can be a challenging therapeutic dilemma. This represents the competing risks of intervention versus the natural history of the disease, increased incidence of comorbid conditions (ie, cardiovascular, pulmonary, nephrological, and neurological conditions), frailty and altered physiology (ie, wound healing, Eastern Cooperative Oncology Group performance status, and mobility), medications (ie, anticoagulation and nephrotoxic medications), life expectancy, and goals of care directives within this demographic relative to their younger counterparts [14–18]. Given these additional considerations, careful review of each patient case and patient-centered discussions are critical prior to selecting a therapeutic approach.

In a significant number of cases, active surveillance remains an important therapeutic alternative within this patient population and is well accepted as an initial treatment approach in management guidelines worldwide [9,11,19,20]. We therefore aimed to evaluate the efficacy of an active surveillance approach to SRMs in the elderly by systematically reviewing the existing literature.

2. Evidence acquisition

2.1. Search methodology

A comprehensive search of electronic databases (eg, MEDLINE, EMBASE, SCOPUS, Web of Science, and the Cochrane Library) using search terms “small renal mass” OR “SRM”, AND “elderly,” “senior,” “aging,” “geriatric,” OR “octogenarian” was completed. Years of publication included studies published within the last 10 yr from July 2007 until July 2017. Conference proceedings and abstracts were also searched and reviewed, but not included in the final systematic review. All randomized controlled trials, nonrandomized comparison studies, and case series were included. All human studies that were published in English language were included. Reference lists of included studies were also checked to identify missing studies in the primary search. In the case of duplicate or overlapping study series/cohorts, the most recent publication cohort was used.

The reviewers screened abstracts, reviewed full-text versions of all studies, and classified and extracted data. All comparison studies included in the systematic review were assessed for methodological quality using the Cochrane Risk of Bias tools. Disagreements were resolved by further group review.

2.2. Assessment of study eligibility

We systematically reviewed each study according to the following criteria: (1) there were no study format restrictions for the systematic review; (2) patients had an SRM defined by the criteria listed above (enhancing, <4 cm in maximal diameter, and imaging consistent with T1aN0M0 disease; where studies included patients with larger renal masses, wherever possible, only the subset with T1aN0M0 disease was included and/or reflected in our manuscript); (3) average (mean or median) patient age was ≥70 yr and/or the study cohort contained a subset of patients ≥70 yr old (where studies included patients aged <70 yr, wherever possible, only the subset >70 yr of age was included and/or reflected in our manuscript); (4) the study enrolled at least 10 patients; (5) the study reported follow-up data on the incidence of active treatment if on surveillance or treatment comparison, cancer-specific mortality, and/or all-cause mortality; (6) the study was completed within the last 10 yr; (7) conference proceedings and abstracts were excluded; and (8) the study was published in English.

2.3. Outcomes of interest

The primary outcomes of interest were requirement for active treatment on active surveillance and cancer-specific mortality. Secondary outcomes included predictors of treatment, type of treatment performed (partial nephrectomy, radical nephrectomy, ablation), progression to metastases, all-cause mortality, tumor growth rate, and demographic data including age and Charlson Comorbidity Index. Owing to the heterogeneity of the data, a meta-analysis could not be run.

2.4. Study review

A total of 4277 studies were identified using our search criteria for screening (Fig. 1). All studies were screened based on their titles, and 113 studies were advanced to abstract screening. Once duplicates, conference proceedings and abstracts, and non-English texts were removed, 76 abstracts were reviewed according to basic data requirements applying to SRMs in the elderly and 27 proceeded to full-text review.

Of the 27 remaining for review, 10 were excluded based on failure to meet the eligibility criteria defined above. Thus, a total of 17 studies (n = 36 495 patients) were identified, which met our inclusion criteria for the systematic review (Table 1) [21–37]. All studies were retrospective institutional chart or the Surveillance, Epidemiology, and End Results (SEER) database reviews. No randomized controlled trial was included.

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