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Contemporary Management of Small Renal Masses by Urologic Oncologists: A 2022 Korean Renal Cancer Study Group Practice Pattern Survey

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Purpose: Increased abdominal imaging brought about an explosive increase in the incidental detection of small renal masses (SRMs). In the absence of optimal guidelines for health screening, as well as subsequent diagnostic and therapeutic action plans, incidentally detected SRMs may likewise increasingly become a dilemma, especially in an aging society. In the current study, we aimed to describe the current practice patterns for incidentally detected SRMs among urologic oncologists and to identify key indicators in action plans for active surveillance.

Materials and Methods: A survey containing 18 questions on SRM management patterns was designed. In June 2022, an online survey was sent to all 711 active members of the Korean Urological Oncology Society via email. After response collection, a consensus meeting of the Korean Renal Cancer Study Group, which 19 specialists attended, was held to analyze the results.

Results: In total, 176 responses from participants practicing in an academic setting were obtained (24.8%, 176 of 711). Regarding the age of patients with SRMs, 42.6% (n=72) responded that they would recommend diagnostic evaluation and definitive treatment for anyone under 80 years of age as long as the patient was healthy. The most commonly used target indicators for surveillance termination were a tumor growth rate above a certain velocity (57.9%, n=102) and size increase above a certain diameter (36.9%, n=65). Renal mass biopsy was recommended in very select cases (<10% of all patients) by most respondents (53.4%, n=94), followed by "not using it at all" in 25.6% (n=45).

Conclusions: We described the current practice patterns for incidentally detected SRMs among urologic oncologists and identified key indicators in action plans for active surveillance. This survey provided robust information, empowering physicians with a detailed knowledge of practice patterns and valuable insights on SRMs.

Key Words: Renal cell carcinoma, Disease management, Surveys and questionnaires

INTRODUCTION

Increased abdominal imaging brought about an explosive increase in the incidental detection of small renal masses (SRMs). Frequently defined as renal tumors 4 cm or smaller in size [1], SRMs encompass a heterogeneous group of tumors with diverse growth kinetics and subsequent progress [2-4]. While most—even if malignant—are presumed to be indolent, especially when small, 10% grow rapidly, 4% progress, and 2% metastasize [5, 6]. Furthermore, the kidney is a vital organ, and every renal unit contributes to glomerular filtration, especially in the elderly population, which is frequently affected by various medico-surgical comorbidities [7]. Thus, not only the absolute size of an SRM but also its size in relation to the kidney on the affected side, its location in relation to the vasculature, as well as the baseline function of both renal units, are all important factors to consider when an SRM is detected and a management decision is contemplated.

In the absence of optimal guidelines for health screening, as well as subsequent diagnostic and therapeutic action plans, incidentally detected SRMs may likewise increasingly become a dilemma, especially in an aging society [8]. Although cancer is the second leading cause of death in both men and women in the United States [9], maintaining an adequate quality of life for the elderly has become a goal equally important as "getting better" [10]. Without a complete understanding of the natural history of SRMs of various histologic subtypes and grades, it is difficult to consider all the competing risks, let alone the cost-effectiveness of surveillance methods, the psychosocial burden, and the subsequent changes in the quality of life brought about by the entire process for patients and their families. The benefits of an accurate diagnosis and definitive treatment must be weighed against potential harms. Despite the increase in SRMs, data on how SRMs are actually managed when they are first detected incidentally in recent practice are scarce. In the current study, we aimed to describe the current practice patterns for incidentally detected SRMs among urologic oncologists and identify key indicators in action plans for active surveillance.

MATERIALS AND METHODS

A survey containing 18 questions on SRM management patterns was designed (Table 1). The survey consisted of questions on practice patterns for the initial management of incidentally detected SRMs, as well as questions inquiring about the rationale behind the decisions. After the predistribution and review process by an expert group, on June 7, 2022, an online survey was sent to all 711 active members of the Korean Urological Oncology Society via email, followed by second and third contacts to nonrespondents on July 7, 2022 and July 14, 2022, respectively. Responses were collected until July 22, 2022. After survey collection, a consensus meeting of the Korean Renal Cancer Study Group, which 19 specialists (including 18 urologists and 1 radiologist) attended, was held in August to discuss the results.

The terms used in the survey were defined as follows: An SRM is a single kidney tumor presumed to be a localized renal cell carcinoma of less than 4 cm in diameter on initial imaging tests that is asymptomatic and incidentally identified. Active surveillance was defined as the initial monitoring of tumor size by serial abdominal imaging (ultrasound, computed tomography [CT], or magnetic resonance imaging) with delayed interventions reserved for tumors showing clinical progression during follow-up. Watchful waiting was defined as following patients without the intention of any subsequent active treatment (as their comorbidities contraindicate any treatment) and thus

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Table 1. Questionnaires on solitary renal mass management patterns (N=176)

Questionnaire	No. (%)
1. How long have you been treating kidney cancer?	
More than 10 years	97 (55.1)
5–10 Years	43 (24.4)
Less than 5 years	36 (20.5)
2. Approximately how many kidney cancer surgeries do you perform every year?	
More than 100 cases	19 (10.8)
50–100 Cases	20 (11.4)
20–50 Cases	64 (36.4)
Less than 20 cases	73 (41.5)
3. In patients with small renal mass, until what age do you recommend active diagnostic evaluations and definitive treatment?	
If healthy, all ages	36 (20.5)
Healthy under 70	19 (10.8)
Healthy under 75	34 (19.3)
Healthy under 80	75 (42.6)
Healthy under 85	12 (6.8)
4. In patients YOUNGER than your answer in #3, what is your size criteria for the renal mass to recommend definitive treatment?	
≥1 cm	35 (19.9)
≥2 cm	99 (56.3)
≥3 cm	26 (14.8)
≥4 cm	16 (9.1)
5. In patients OLDER than your answer in #3, what is your size criteria to recommend definitive treatment?	
≥1 cm	6 (3.4)
≥2 cm	51 (29.0)
≥3 cm	42 (23.9)
≥4 cm	55 (31.3)
Observe without treatment until intolerable symptoms occur	22 (12.5)
6. Do you use indexes to accurately measure patient's health status and comorbidities?	
Charlson Comorbidity Index	77 (43.8)
Chronic Disease Score/Modified-Chronic Disease Score	1 (0.6)
KDIGO classification of CKD risk	7 (4.0)
Do not use	90 (51.1)
7. How often do you recommend diagnostic renal biopsy for a small renal mass?	
Whenever it's helpful (>50% of all patients)	13 (7.4)
Whenever it's helpful (<50% of all patients)	24 (13.6)
Very select cases (<10% of all patients)	94 (53.4)
Do not recommend	45 (25.6)
8. In what situation, do you recommend biopsy? (multiple choices available)	
Before active surveillance	40 (22.7)
When considering surgery	46 (26.1)
Other types of cancer (lymphoma, metastasis) or inflammatory pseudotumor suspected	87 (49.4)
Before thermal ablation	63 (35.8)
9. What would be the reasons for not recommending biopsy? (multiple choices available)	
Concerns about track seeding	23 (13.1)
Nondiagnostic results (high probability of failure)	25 (14.2)
Not alter the treatment plans	23 (13.1)

(continued)

Table 1. Questionnaires on solitary renal mass management patterns (N=176) (continued)

Questionnaire	No. (%)
10. Nephron-sparing surgery is the preferred surgical method for small renal mass recommended in all current treatment guidelines for patients who choose definite treatment. What are the factors that make the choose to consider other methods? (multiple choices available)	
Baseline renal function	104 (23.0)
Tumor morphology	139 (30.7)
Patient's comorbidity	113 (24.9)
Patient's age	97 (21.4)
11. What is your preferred less invasive alternative to nephron-sparing surgery?	
Active surveillance	2 (1.1)
Cryotherapy	11 (6.3)
HIFU	1 (0.6)
Radiofrequency ablation	142 (80.7)
Stereotactic body radiotherapy	12 (6.8)
Always recommend nephron-sparing surgery	8 (4.5)
12. What is your preferred follow-up imaging method in patients on surveillance?	
Computed tomography (CT)	158 (89.8)
Magnetic resonance imaging	2 (1.1)
Ultrasonography	8 (4.5)
No big preference (use multiple methods in turns)	8 (4.5)
13. What is your preferred imaging technique for metastasis workup?	
Bone scan	1 (0.6)
Chest CT	51 (29.0)
Chest CT+bone scan	102 (58.0)
Abdomen & pelvis CT only (no other metastasis workup)	22 (12.5)
14. What do you think the appropriate follow-up interval is in the first year of surveillance?	
3 Months	62 (35.2)
3 Months initially, then 6 months	1 (0.6)
4 Months	10 (5.7)
6 Months	101 (57.4)
1 Year	2 (1.1)
15. Which of the following factors do you emphasize in counseling patients on surveillance?	
Hypertension	8 (4.5)
Diabetes	2 (1.1)
Obesity	4 (2.3)
Smoking	44 (25.0)
Explain everything above	82 (46.6)
I don't think it's very important after the tumor occurs; so, I don't explain.	36 (20.5)
16. What is the target termination indicator that you set when you begin active surveillance? Termination includes both termination of follow-up and transition to active treatment.	
Tumor size increase until radical nephrectomy is necessary	8 (4.5)
Nonmetastasis until target age	1 (0.6)
Increased tumor size above a certain velocity	102 (57.9)
Until the tumor has increased to a certain size	65 (36.9)

(continued)

Table 1. Questionnaires on solitary renal mass management patterns (N=176) (continued)

Questionnaire	No. (%)
17. The following are the criteria AUA 2021 guidelines recommend switching to active treatment during active surveillance. Which do you think is the most important?	
Changes in patient/tumor factors (clinical symptoms, changes to an infiltrative shape, etc.)	8 (4.5)
Growth kinetic (>5 mm/yr)	76 (43.2)
Stage progression	15 (8.5)
Tumor size >3 cm	77 (43.8)
18. Do you have any patients on active surveillance?	
About <10% of solitary renal mass patients	123 (69.9)
About >10% of solitary renal mass patients	26 (14.8)
None	27 (15.3)

KDIGO, Kidney Disease Improving Global Outcomes; CKD, chronic kidney disease; HIFU, high-intensity focused ultrasound; AUA, American Urological Association.

without follow-up imaging unless clinically indicated.

RESULTS

A total of 176 responses were obtained (response rate, 24.8%, 176 of 711). All respondents were practicing in an academic setting, with the number of years treating kidney cancer patients being less than 5 years, between 5 and 10 years, and more than 10 years in 36 (20.5%), 43 (24.4%), and 97 respondents (55.1%), respectively. The approximate number of kidney cancer operations performed per year was fewer than 20 cases, between 20 and 50 cases, between 50 and 100 cases, and more than 100 cases in 73 (41.5%), 64 (36.4%), 20 (11.4%), and 19 respondents (10.8%), respectively (Table 1). The questions were reorganized according to the subject and in the order of the frequency of answers (Table 2). The number of the question is marked next to "#" in Table 2.

1. Age and Competing Risks

Two questions (#3 and #6) independently addressed the issue of age and competing risks, and 2 (#4 and #5) others did so in relation to size criteria. Regarding the age of patients with SRMs, 42.6% (n=72) responded that they would recommend a diagnostic evaluation and definitive treatment for anyone under 80 years of age as long as the patient was healthy. Another 20.5% (n=36) responded that they would recommend it regardless of age if the patient is healthy and

Table 2. Questionnaires summary according to the subject of a question (N=176)

Questionnaire	No. (%)
Age and competing risks	
Age criteria for active treatment (#3)	
1. Healthy under 80	75 (42.6)
2. If healthy, all ages	36 (20.5)
3. Healthy under 75	34 (19.3)
4. Healthy under 70	19 (10.8)
5. Healthy under 85	12 (6.8)
Used index (#6)	
1. Do not use	90 (51.1)
2. Charlson Comorbidity Index	77 (43.8)
3. KDIGO classification of CKD risk	7 (4.0)
4. Chronic Disease Score/Modified-Chronic Disease Score	1 (0.6)
Emphasize in counseling (#15)	
1. Explain everything below	82 (46.6)
2. Smoking	44 (25.0)
3. I don't think it's very important after the tumor occurs; so, I don't explain.	36 (20.5)
4. Hypertension	8 (4.5)
5. Obesity	4 (2.3)
6. Diabetes	2 (1.1)
Size and growth kinetics	
Size criteria for younger age (#4)	
1. ≥2 cm	99 (56.3)
2. ≥1 cm	35 (19.9)
3. ≥3 cm	26 (14.8)
4. ≥4 cm	16 (9.1)
Size criteria for older age (#5)	
1. ≥4 cm	55 (31.3)
2. ≥2 cm	51 (29.0)
3. ≥3 cm	42 (23.9)
4. Observe without treatment until intolerable symptoms occur	22 (12.5)
5. ≥1 cm	6 (3.4)
Preferred AUA guideline indicator (#17)	
1. Tumor size >3 cm	77 (43.8)
2. Growth kinetic (>5 mm/yr)	76 (43.2)
3. Stage progression	15 (8.5)
4. Changes in patient/tumor factors (clinical symptoms, changes to an infiltrative shape, etc.)	8 (4.5)
Termination of surveillance and intervention	
Preferred follow-up imaging method (#12)	
1. Computed tomography (CT)	158 (89.8)
2. Ultrasonography	8 (4.5)
3. No big preference (use multiple methods in turns)	8 (4.5)
4. MRI	2 (1.1)
Preferred imaging technique for metastasis workup (#13)	
1. Chest CT+bone scan	102 (58.0)
2. Chest CT	51 (29.0)
3. Abdomen & pelvis CT only (no other metastasis workup)	22 (12.5)
4. Bone scan	1 (0.6)
First year follow-up interval (#14)	
1. 6 Months	101 (57.4)
2. 3 Months	62 (35.2)
3. 4 Months	10 (5.7)
4. 1 Year	2 (1.1)
5. 3 Months initially, then 6 months	1 (0.6)

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Table 2. Questionnaires summary according to the subject of a question (N=176) (continued)

Questionnaire	No. (%)
Active surveillance termination indicator (#16)	
1. Increased tumor size above a certain velocity	102 (57.9)
2. Until the tumor has increased to a certain size	65 (36.9)
3. Tumor size increase until radical nephrectomy is necessary	8 (4.5)
4. Nonmetastasis until target age	1 (0.6)
Factors considering alternative treatment (#10)	
1. Tumor morphology	139 (30.7)
2. Patient's comorbidity	113 (24.9)
3. Baseline renal function	104 (23.0)
4. Patient's age	97 (21.4)
Alternative to nephron-sparing surgery (#11)	
1. Radiofrequency ablation	142 (80.7)
2. Stereotactic body radiotherapy	12 (6.8)
3. Cryotherapy	11 (6.3)
4. Always recommend nephron-sparing surgery.	8 (4.5)
5. Active surveillance	2 (1.1)
6. HIFU	1 (0.6)
Renal mass biopsy	
Renal biopsy recommendation (#7)	
1. Very select cases (<10% of all patients)	94 (53.4)
2. Do not recommend	45 (25.6)
3. Whenever it's helpful (<50% of all patients)	24 (13.6)
4. Whenever it's helpful (>50% of all patients)	13 (7.4)
Reason for recommending biopsy (multiple choices available, #8)	
1. Other types of cancer (lymphoma, metastasis) or inflammatory pseudotumor suspected	87 (49.4)
2. Before thermal ablation	63 (35.8)
3. When considering surgery	46 (26.1)
4. Before active surveillance	40 (22.7)
Reason for NOT recommending biopsy (multiple choices available, #9)	
1. Nondiagnostic results (high probability of failure)	25 (14.2)
2. Concerns about track seeding	23 (13.1)
3. Not alter the treatment plans	23 (13.1)

KDIGO, Kidney Disease Improving Global Outcomes; CKD, chronic kidney disease; HIFU, high-intensity focused ultrasound.

wants active management.

To objectively measure patients' health status in addition to age and comorbidities, 43.8% (n=77) of respondents reported using the Charlson Comorbidity Index, while the majority did not use any indices. Once surveillance was chosen, 79.5% (n=140) said that they counseled patients on control of smoking (25.0%), hypertension (4.5%), diabetes (1.1%), obesity (2.3%), or all of those risk factors (46.6%).

2. Size and Growth Kinetics

Questions relating to tumor characteristics and the clinical decisions made in that regard addressed size criteria in relation to patients' age and subsequent changes influencing a decision. In younger candidates presumed to be fit for definitive treatment, a tumor size criterion of ≥2 cm was the most frequently used, by 56.3% of respondents (n=99). While 19.9% (n=35) responded that they would recommend active treatment for tumors ≥1 cm, 9.1% (n=16) preferred deferring active treatment until tumors grew beyond 4 cm. In contrast, in more elderly candidates presumed to be a better fit for initial surveillance, tumor sizes ≥3 cm or ≥4 cm were considered at similar rates to the ≥2 cm criterion, in 23.9%, 31.3%, and 29.0% of responses, respectively. For this cohort of patients, 12.5% (n=22) of the physicians responded that they would observe the RSM without any investigation or treatment until intolerable symptoms occur.

In addition to the initial tumor size, subsequent changes considered significant were rapid growth (>5 mm/yr) in 43.2% (n=76) of responses and size growth beyond 3 cm in another 43.8% (n=77). Stage progression, in 8.5% (n=15) of responses, and changes in patient and/or tumor factors (e.g., tumor shape), in 4.5% (n=8) of responses, were also considered significant.

3. Termination of Surveillance and Intervention

To evaluate metastasis at the initial diagnosis, 58.0% (n=102) of respondents stated that they checked CT of the chest and a bone scan, and another 29.0% (n=51) and 12.5% (n=22) checked CT of the chest or only abdominal and pelvic CT, respectively. When active surveillance was chosen, the preferred follow-up radiographic method was nearly unanimously CT scans (89.8%), but the intervals significantly differed; most (55.7%, n=44) respondents with less than 10 years of experience in treating kidney cancer abided by initial surveillance intervals of 3–4 months, while those with more than 10 years of experience preferred intervals of 6 months (68.0%, p=0.001). Table 3 shows the differences between physicians with less or more than 10 years of experience in kidney cancer treatment

As a target indicator for surveillance termination, a tumor growth rate above a certain velocity (57.9%, n=102) and a size increase above a certain diameter (36.9%, n=65) were the most commonly used criteria. When patients are converted to definitive therapy, nephron-sparing surgery should be considered as a priority, following the recommendations of

Table 3. Differences by kidney cancer treatment experience

Questionnaires	<10 Years of experience (N=79)	>10 Years of experience (N=97)	p-value
1. How long have you been treating a kidney cancer patient?			<0.001
For more than 10 years	0 (0)	97 (100)	
5–10 Years	43 (54.4)	0 (0)	
Within 5 years	36 (45.6)	0 (0)	
2. Approximately how many kidney cancer patients do you perform surgery a year?			0.006
More than 100 cases	5 (6.3)	14 (14.4)	
50-100 Cases	3 (3.8)	17 (17.5)	
20-50 Cases	34 (43.0)	30 (30.9)	
Within 20 cases	37 (46.9)	36 (37.1)	
3. Until what age do you recommend active diagnosis and treatment of small rental mass?			0.243
If healthy, all ages	15 (19.0)	21 (21.6)	
Healthy under 70	11 (13.9)	8 (8.2)	
Healthy under 75	10 (12.7)	24 (24.7)	
Healthy under 80	37 (46.8)	38 (39.2)	
Healthy under 85	6 (7.6)	6 (6.2)	
4. What is your size criteria to recommend definitive treatment for small renal mass in YOUNGER age as you answered in question number 3?			0.392
≥1 cm	20 (25.3)	15 (15.5)	
≥2 cm	43 (54.4)	56 (57.7)	
≥3 cm	10 (12.7)	16 (16.5)	
≥4 cm	6 (7.6)	10 (10.3)	
5. What is your size criteria to recommend definitive treatment for small renal mass in OLDER age as you answered in question number 3?			0.398
≥1 cm	2 (2.5)	4 (4.1)	
≥2 cm	24 (30.4)	27 (27.8)	
≥3 cm	14 (17.7)	28 (28.9)	
≥4 cm	29 (36.7)	26 (26.8)	
Observe without treatment until severe symptoms occur	10 (12.7)	12 (12.4)	
6. Do you use indexes to accurately measure the patient's comorbidity?			0.637
Charlson Comorbidity Index	38 (48.1)	39 (40.6)	
Chronic Disease Score/Modified-Chronic Disease Score	0 (0)	1 (1.0)	
KDIGO classification of CKD risk	3 (3.8)	4 (4.2)	
Do not use	38 (48.1)	52 (54.2)	
7. Do you recommend renal biopsy for a small renal mass?			0.286
Whenever it's helpful (>50% of all patients)	7 (8.9)	6 (6.2)	
Whenever it's helpful (<50% of all patients)	9 (11.4)	15 (15.5)	
Very select cases (<10% of all patients)	38 (48.1)	56 (57.7)	
Do not recommend	25 (31.6)	20 (20.6)	
8. If renal biopsy is recommended, what is the case? (multiple choices available)			0.652
Before active surveillance	14 (14.3)	25 (15.5)	
When considering surgery	18 (18.4)	36 (22.4)	
Suspect another type of cancer (lymphoma, metastasis) or infection (abscess)	41 (41.8)	55 (34.2)	
Before thermal ablation	25 (25.5)	45 (28.0)	
9. If renal biopsy is NOT recommended, what is the case? (multiple choices available)			0.597
Concerns about seeding	12 (28.6)	11 (37.9)	
I don't think the diagnosis will be accurate (high probability of failure)	16 (38.1)	8 (27.6)	
Not effective in determining the treatment policy	14 (33.3)	10 (34.5)	
10. Nephron-sparing surgery is the preferred surgical method for small renal mass recommended in all current treatment guidelines for patients who choose definite treatment. What are the factors that make the choose to consider other methods? (multiple choices available)			0.718
Preoperative renal function	42 (21.4)	62 (23.0)	
Tumor morphology	65 (33.2)	84 (31.2)	
Patient's comorbidity	52 (26.5)	63 (23.4)	
Patient's age	37 (18.9)	60 (22.3)	

(continued)

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Table 3. Differences by kidney cancer treatment experience (continued)

Questionnaires	<10 Years of experience (N=79)	>10 Years of experience (N=97)	p-value
11. If you choose a less invasive method than nephron-sparing therapy, what is your preferred method?			0.692
Active surveillance	1 (1.3)	1 (1.0)	
Cryotherapy	5 (6.3)	6 (6.2)	
HIFU	0 (0)	1 (1.0)	
Radiofrequency ablation	67 (84.8)	75 (77.3)	
Stereotactic body radiotherapy	4 (5.1)	8 (8.2)	
Always recommend nephron-sparing surgery	2 (2.6)	6 (6.0)	
12. In the AUA 2021 guidelines, follow-up imaging with CT or ultrasonography is recommended, and ultrasonography are recommended to be used more frequently in stable patients. What is the most preferred follow-up imaging method when there is a small renal mass?			0.190
Computed tomography (CT)	70 (88.6)	88 (90.7)	
Magnetic resonance imaging	0 (0)	2 (2.1)	
Ultrasonography	3 (3.8)	5 (5.2)	
No big preference (use multiple methods in turns)	6 (7.6)	2 (2.1)	
13. What is your preferred imaging technique for metastasis workup?			0.489
Bone scan	0 (0)	1 (1.0)	
Chest CT	26 (32.9)	25 (25.8)	
Chest CT+bone scan	45 (57.0)	57 (58.8)	
Abdomen & pelvis CT only (no other metastasis workup)	8 (10.1)	14 (14.5)	
14. The AUA 2021 guideline recommends the initial active surveillance period of 3–6 months. How do you think the appropriate initial 1-year follow-up interval for a small renal mass?			0.001
3 Months	35 (44.3)	27 (27.8)	
3 Months initially, then 6 months	0 (0)	1 (1.0)	
4 Months	9 (11.4)	1 (1.0)	
6 Months	35 (44.3)	66 (68.0)	
1 Year	0 (0.0)	2 (2.1)	
15. Which of the following factors is explained to be actively controlled in patients with small renal mass?			0.373
Hypertension	3 (3.8)	5 (5.2)	
Diabetes	2 (2.5)	0 (0.0)	
Obesity	3 (3.8)	1 (1.0)	
Smoking	21 (26.6)	23 (23.7)	
Explain everything above	37 (46.8)	45 (46.4)	
I don't think it's very important after the tumor occurs; so, I don't explain.	13 (16.5)	23 (23.7)	
16. What is the target end indicator that you usually set when you start active surveillance? Termination included both termination of follow-up and transition to active treatment.			0.153
Tumor size increase until radical nephrectomy is necessary	6 (7.6)	2 (2.1)	
Nonmetastasis until target age	0 (0)	1 (1.0)	
Increased tumor size above a certain velocity	41 (51.9)	43 (44.3)	
Increased tumor size above a certain velocity	5 (6.3)	13 (13.4)	
Until the tumor has increased to a certain size	27 (34.2)	38 (39.2)	
17. The following are the criteria for switching from the AUA 2021 guidelines to active treatment during active surveillance. What is the most important criterion that you consider?			0.681
Clinical changes in patient/tumor factors (clinical symptoms, changes to an infiltrative shape, etc.)	2 (2.5)	6 (6.2)	
Growth kinetic (>5 mm/yr)	36 (45.6)	40 (41.2)	
Stage progression	7 (8.9)	8 (8.2)	
Tumor size >3 cm	34 (43.0)	43 (44.3)	
18. Are there any patients who are currently in active surveillance?			0.911
About <10% of solitary renal mass patients	55 (69.6)	68 (70.1)	
About >10% of solitary renal mass patients	11 (13.9)	15 (15.5)	
None	16 (12.9)	8 (16.3)	

Values are presented as number (%).

KDIGO, Kidney Disease Improving Global Outcomes; CKD, chronic kidney disease; HIFU, high-intensity focused ultrasound; AUA, American Urological Association.

all current guidelines [11-13]. In specific clinical scenarios, however, respondents stated that they considered factors such as tumor morphology (30.7%, n=139), comorbidities (24.9%, n=113), baseline renal function (23.0%, n=104), and age (21.4%, n=97) when deciding upon alternative therapeutic methods, for which radiofrequency ablation was the preferred option (80.7%, n=142)

4. Renal Mass Biopsy

Renal mass biopsies were recommended in very select cases (<10% of all patients) by most respondents (53.4%, n=94), followed by "not using it at all" in 25.6% (n=45). Among the respondents utilizing biopsies, the indications were predominantly to diagnose cancer: to differentiate the mass other types of cancer or an inflammatory condition in 49.4% (n=87), before thermal ablation in 35.8% (n=63), and before active surveillance in 22.7% (n=40). Opinions against performing biopsy were based on concerns about track seeding in 13.1% (n=23) of responses, nondiagnostic results in 14.2% (n=25), and the likelihood that the biopsy results would not change the treatment plan in 13.1% (n=23).

DISCUSSION

We aimed to describe the current practice patterns for incidentally detected SRMs among urologic oncologists and identify key indicators in action plans with regard to active surveillance (Fig. 1). We found that among the respondents, the initial decision to recommend surveillance involved similar key parameters, but the criteria for individual parameters varied independent of years of experience or volume of practice.

In the current survey, most participants were generous with regard to chronological age if patients were healthy and wanted active treatment. Patient-related factors are the most central parameters to consider and, in a society where life expectancy is rapidly increasing, our findings may suggest a potentially significant public health issue. Interest in health screening is high and on the increase, while the cultural sentiment is that active and definitive management of any detected abnormalities is preferred. Without a cost-effectiveness analysis available on abdominal screening [14], no guideline exists on how often and how long abdominal screening needs to be done to remain effective. Thus, the decision and subsequent plan remain to be made by individual practitioners and their patients. In this situation, comorbidity indices and frailty scales may help to objectively measure competing health risks and prioritize them [15,16]. Baseline renal function and the conditions affecting it immediately and long-term [7], access to and coverage by healthcare, the understanding of the surveillance scheme among patients and their caregivers, and motivation and compliance are all relevant patient factors. In this survey, these scales were not a routine practice for most respondents, although the respondents were aware of health risks and the need for counseling about them [17].

Tumor size at initial detection was an important criterion, but diverse patterns were observed, especially in relation to patients' age. Size is critical as it is directly associated with the probability of metastatic disease [18, 19]. In addition to the initial tumor size, the annual growth rate and growth beyond a preset diameter were frequently considered together. In actual practice, additional tumor-related factors, including the location and complexity of the tumor, its shape, and infiltration pattern (with or without identifiable pseudocapsules), always influence decisions [20]. Patient-related factors, such as both ipsilateral and total renal function, and treatment-related factors, such as the availability of less invasive alternatives, are also interlaced [21, 22]. Therefore, while we singled out each factor for our investigation, it would be more meaningful to develop a scoring system with the identified parameters weighted according to their contribution [23, 24]. Such a scoring system could be used in the initial counseling of patients and when deciding whether to surveil, helping to set appropriate goals for each patient.

Similarly, predefining indicators for intervention may be the most difficult part of initiating surveillance because the natural history of the disease is not yet completely understood [25]. Evaluations for metastasis during follow-up in patients undergoing surveillance are usually deferred until symptoms ensue. In the absence of "notable" growth, when to simply stop following may also require a strategy depending on the frailty of the patient population. Even in highly motivated patients, relieving patients of their anxiety

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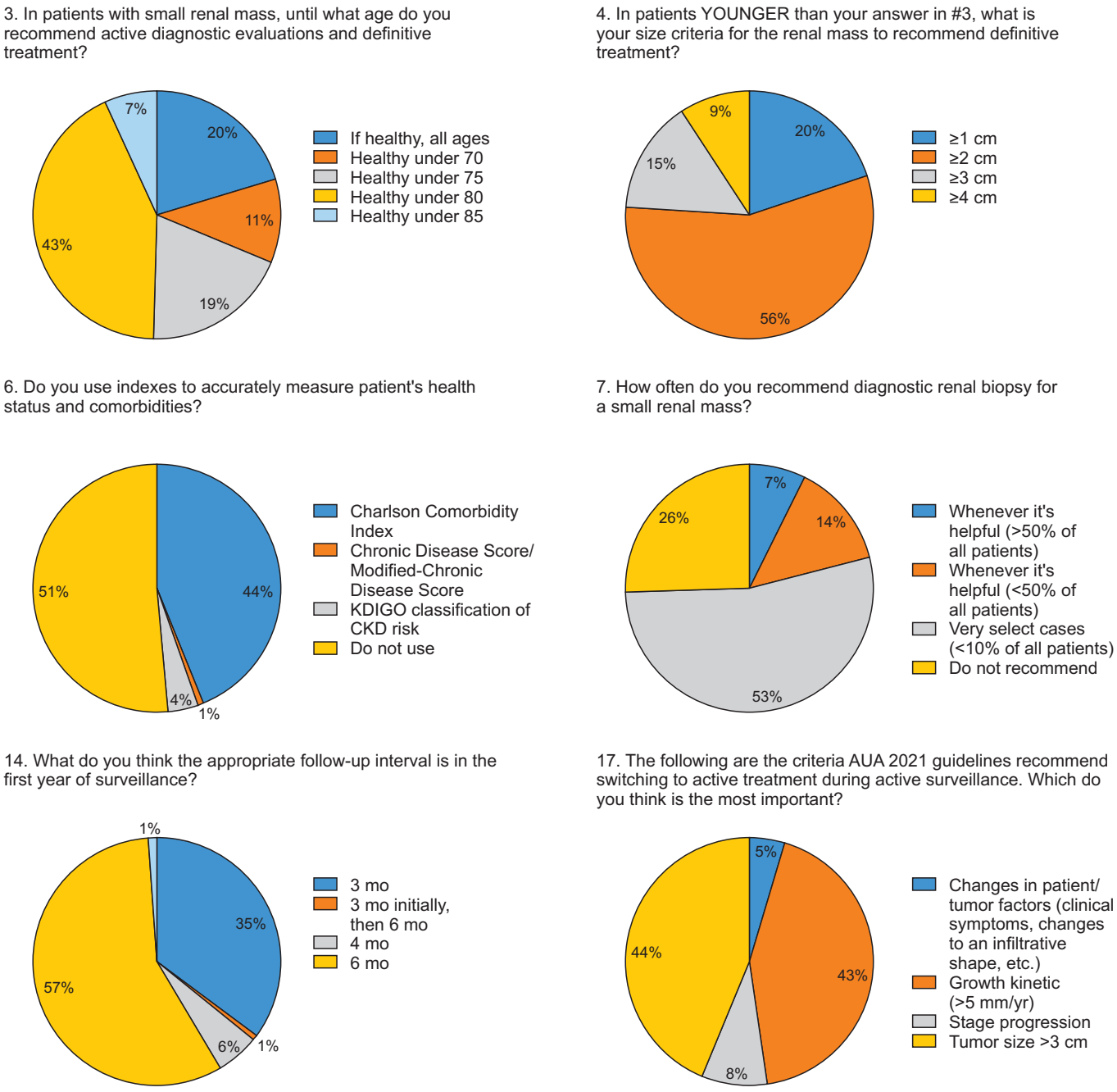

Fig. 1. Key indicators in the action plan with regard to active surveillance. In this survey, 6 key indicators was identified regard to active surveillance method in small renal mass patients. AUA, American Urological Association.

by confirming that their tumors have shown minimal changes and thus improving their general quality of life needs to be balanced against healthcare expenditures [26]. In such a situation, knowing whether the tumor is cancerous or not may often have an impact. Surprisingly, in the survey, we found that renal mass biopsies were not routinely utilized. Concerns about biopsy track seeding and nondiagnostic results were common reasons for opposing biopsy. However, contemporary series on renal biopsy have repeatedly refuted the need for such concerns [27, 28]. Pathological upstaging and progression-free survival have also been reported to be similar irrespective of preoperative biopsy for patients with T1a renal cell carcinoma receiving partial nephrectomy. The likelihood that the biopsy results would not change the treatment plan was another reason, which may stem from the fact that biopsies are not able to reliably detect

high-grade renal cell carcinoma secondary to intratumoral grade heterogeneity [28-30]. Meanwhile, the information that we can currently obtain from biopsies is very limited, which may limit their use. Besides cancer diagnosis, even the nuclear grade is discordant in up to 16% [30]. With accumulating molecular and genetic insights, we hope for more comprehensive prospects in making predictions based on biopsy specimens, which can inform an individualized surveillance strategy.

CONCLUSIONS

We described current practice patterns for incidentally detected SRMs among urologic oncologists and identified key indicators in action plans for active surveillance. This survey has provided robust information, empowering physicians with detailed knowledge of practice patterns and valuable insights on SRMs.

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