

Renal Incidentalomas - Diagnosis and Treatment of Small Renal Masses

Brittnee MacIntyre, MSN, APRN, FNP-C
 Advanced Practice Provider
 Department of Urology

Abstract

Background:
 One of the most common incidental or unexpected findings on diagnostic imaging scan is a kidney cyst or mass. The incidence is rising due to increased diagnostic imaging, longer life expectancy, better quality imaging.

Incidence:
 1980s and before, kidney masses weren't usually found until they were much larger and symptomatic. Classic triad of flank pain, an abdominal mass and blood in the urine. Subtle signs and symptoms like fever, cough, fatigue, weight loss, edema.

Review of Literature:
 Since the 1980's and after, there has been a surge in diagnostic imaging and likewise the number of renal incidentalomas. Reasons include longer life expectancy, increased availability of imaging, and better quality of scans. Most renal masses are asymptomatic and are found incidentally. 20-30% of small renal masses are benign or non-cancerous. A

Implications for Practice:
 Providers in many different settings ordering areas may benefit from knowledge of how to triage these patients, how to talk to patients about these findings, and to know which findings warrant a referral for further evaluation and management. Therefore, there is no rush for urgent consult for evaluation and treatment if <3 to 4 cm.

Small Renal Mass Definitions and Key Facts

Renal Incidentaloma

- 50% of the time renal masses are found incidentally.
- Most incidentalomas are asymptomatic and unrelated to why they were found.
- The vast majority of renal incidentalomas are small renal masses (1 to 4 cm).

Tumor (Solid)

Can be benign or malignant

Benign:

- The most common benign renal tumors are Oncocytomas and Angiomyolipomas.

Malignant:

- Renal Cell Carcinoma (RCC) 80-85% of all kidney cancers
- RCC originates from the outer portion of the kidney called the renal cortex. Since these cells are so metabolically active, they are the ones most prone to dysplasia or cancer.
- RCC is usually asymptomatic unless tumors are quite large or metastatic.
- Urothelial Carcinoma 6 to 7%
- urothelial carcinoma originates from the renal pelvis, ureters or bladder. It is also called transitional cell carcinoma, which are the type of cells that line the upper and lower urinary tract. Treatment for urothelial renal masses is different than RCC since it is more similar to bladder cancer
- Other rare types ~5% or metastasis from other primary cancer

Cystic mass (fluid)

Simple:

- Benign "bag of fluid"
- 50% of patients age 50
- Do not affect kidney function, cause symptoms, or turn into cancer

Complex:

- Most are benign

Bosniak Classification for Cystic Renal Masses

System developed in 1986 by a radiologist to categorize and risk stratify.

- Bos 1 and 2% chance of malignancy
- Bos 2F has a 5% chance of malignancy
- Bos 3 has a 50% chance of malignancy
- Bos 4 has a 90% chance of malignancy

Evaluation and Management of Small Renal Mass

Active Surveillance

Appropriate for most small renal masses, meaning no rush for urgent consult or treatment if <3 to 4 cm.

Advantages Avoids or delays overtreatment, Ability to perform future treatment not affected by AS

Disadvantages

Requires close monitoring
 Small but possible risk of metastasis

Biopsy

- Percutaneous image-guided by IR
- Fine needle aspiration (FNA) and multiple cores of tumor
- Indicated if suspect hematologic, urothelial, metastatic, inflammatory, or infectious etiology, Competing medical risks
- Contraindicated (relative) in cystic or very central renal mass

Advantages

Avoids or delays overtreatment
 20-40% of small renal masses are BENIGN.

Disadvantages

- 1-2% complication rate
 hemorrhage or infection
- 10% - 15% nondiagnostic rate
- Needle is inserted into the tumor percutaneously and heat or ice destroys cancer cells.
- Radiofrequency ablation creates heat.
- Cryoablation causes freezing
- Indicated for solid renal masses <3-4 cm

Ablation

Useful in pts with solitary kidney, low kidney function, poor surgical candidate, tumor recurrence after surgery

Advantages Minimally invasive
 Faster recovery (than surgery)
 Preserves renal function (similar to PN)

Disadvantages

Long term data on cancer control not available
 Slightly higher recurrence rate
 Chance of tumor persistence/recurrence
 More imaging compared to after surgical resection (yearly indefinitely)

Surgery

Can be done open or laparoscopic, and may be radical nephrectomy or partial nephrectomy
 Type of surgery performed is based on the size and location of the tumor, which may vary by surgeon or facility.

Partial best when possible, because kidney function is preserved.
 However, partial nephrectomy is more technically challenging procedure (High-volume center is best)

Higher risk of complications (than radical) like bleeding and urine leak

What Makes a Renal Mass Suspicious?

Solid enhancing mass is suspicious for renal cell carcinoma.

Is Active Surveillance Safe?

YES! Small renal masses metastasize VERY RARELY (~1 to 2%). 20-40% of small renal masses are BENIGN.

Overview of imaging (MRI vs CT)

CT

Preferred for most small renal masses
 Enhancement (Hounsfield unit)
 Radiation exposure
 No contrast if allergic or eGFR <30

MRI

Excellent soft tissue discrimination for vessels, cystic lesions
 Caution if claustrophobia or metal implant.

When to Refer to Urology

>5mm/yr growth rate or >2cm size.
 Bosniak Criteria can guide referral and management for cystic masses.
 Simple cysts do not need follow up or referral.
 Refer to Suspicion of Cancer clinic renal lesions < 2cm.

Take Home Points

Most renal masses are asymptomatic and are found incidentally
 Simple cysts = ignore
 Solid enhancing mass = suspicious

Triggers for Change from Active Surveillance to Treatment

Change in tumor

- Increased size >3cm
- Grows 5mm/yr (3mm/yr is average)
- Cystic to solid
- Increased contrast enhancement

Clinical Pearl

“Do a biopsy when you need to, do a partial nephrectomy (or ablation) when you can, do a radical nephrectomy when you can’t, and do active surveillance when the patient can’t.”

(Karam, 2017)

Patient Anxiety or concern

Patient health improved

References

Campbell SC, Clark PE, Chang SS, Karam JA, Souter L, Uzor G. Renal Mass and Localized Renal Cancer Evaluation, Management, and Follow-Up: AUA Guideline. Part I. J Urol. 2021;206(2):199-208. doi:10.1097/JU.0000000000000911

Campbell SC, Uzor RG, Karam JA, Chang SS, Clark PE, Souter L. Renal Mass and Localized Renal Cancer Evaluation, Management, and Follow-Up: AUA Guideline. Part II. J Urol. 2021;206(3):209-216. doi:10.1097/JU.0000000000000912

Chandrasekar T, Bhojan SA, Capitano U, Geshman B, Mir MC, Kulkov A. Collaborative Review: Factors Influencing Treatment Decisions for Patients with a Localized Solid Renal Mass. Eur Urol. 2021;80(5):575-588. doi:10.1016/j.eururo.2021.01.021

Finelli A, Ismailia N, Bro B, et al. Management of Small Renal Masses: American Society of Clinical Oncology Clinical Practice Guideline published correction appears in J Clin Oncol. 2017 Apr 1;35(10):11411. J Clin Oncol. 2017;35(16):688-690. doi:10.1200/JCO.2016.69.8665

Karam J. Managing small renal masses: A point-by-point consideration of Aso's clinical practice guideline. The ASCO Post. https://ascopost.com/issues/may-25-2017/managing-small-renal-masses-a-point-by-point-consideration-of-ascos-clinical-practice-guideline/?utm_source=TrendMD&utm_medium=ppc&utm_campaign=Kidney_Cancer_TrendMD.0 Published May 25, 2017. Accessed at July 11, 2022.

Kidney cancer | Renal cancer | American Cancer Society. https://www.cancer.org/cancer/kidney-cancer.html. Published 2022. Accessed at July 11, 2022.

Kim DY, Wood CG, Karam JA. Treating the two extremes in renal cell carcinoma: management of small renal masses and overreductive nephrectomy in metastatic disease. Am Soc Clin Oncol Educ Book. 2014;3(2):4-e21. doi:10.14684/EdBook_Am2014_34e214

Ljungberg B, Albiges L, Abu-Ghanem Y, et al. European Association of Urology Guidelines on Renal Cell Carcinoma: The 2020 Update [published online ahead of print; 2022 Mar 25]. Eur Urol. 2022;83(3):283R(22):1076-1. doi:10.1016/j.eururo.2022.03.006

Mason RJ, Abdolell M, Tridder G, et al. Growth kinetics of renal masses: analysis of a prospective cohort of patients undergoing active surveillance. Eur Urol. 2011;59(5):863-867. doi:10.1016/j.eururo.2011.02.023

Morrison JC, Laurent BM, Barqan ZA, Kim SP. Surgical management of the localized renal mass: risks and benefit trade-offs and surgical approach considerations. AME Med J. 2021;16:15. doi:10.21037/amej20-77

Motzer RJ, Jonasch E, Agarwal N, et al. Kidney Cancer, Version 3.2022. NCCN Clinical Practice Guidelines in Oncology. J Natl Compr Canc Netw. 2022;21(7):71-90. doi:10.6004/jcn.2022.020001

Nicolai B, Antonelli N, Paffi B, Sebastiani C. Imaging Characterization of Renal Masses. Medicina (Kaunas). 2021;57(1):51. Published 2021 Jan 8. doi:10.3390/med57010051

Odisho AY, Greene KL. Renal Parenchymal Neoplasms. In: McAninch JW, Lue TF, eds. Smith & Tanaghos General Urology, 19e. McGraw-Hill; 2020. Accessed June 25, 2022.

Patel HD, Pierorazio PM, Johnson MH, et al. Renal Functional Outcomes after Surgery, Ablation, and Active Surveillance of Localized Renal Tumors: A Systematic Review and Meta-Analysis. Clin J Am Soc Nephrol. 2017;12(7):1057-1069. doi:10.22034/clinem.1194116

Smaildone MC, Kulkov A, Eggleston BL, et al. Small renal masses progressing to metastases under active surveillance: a systematic review and pooled analysis. Cancer. 2012;118(4):997-1006. doi:10.1002/cncr.22360