



How to Treat Quiz

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NEED TO KNOW

A small renal mass is defined as a solid kidney lesion measuring less than 3-4cm.

These lesions are commonly found in patients aged over 75.

Most small renal masses are renal cell carcinomas.

Small masses tend to be low-grade tumours with slow growth and low metastatic risk.

Renal cell carcinoma is most commonly diagnosed as an incidental finding on imaging.

Decision-making is based on patient factors, tumour factors and available treatments.

Options for management include surveillance, surgical excision or thermal ablation.

Small renal masses



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INTRODUCTION

SMALL renal masses are typically diagnosed incidentally. They may be detected on ultrasound or CT scans performed for investigation of other pathology such as renal colic, deranged liver function tests, renal impairment or abdominal pain.¹ With advances in the quality and accessibility of high-resolution ultrasound and CT scanning, the incidental detection of a small renal mass has become the most common presentation of renal cell carcinoma (RCC).²

However, not all small renal masses are RCC and many that are, represent low-grade, relatively indolent lesions that may not be clinically relevant.³

The detection of a small renal mass is often accompanied by diagnostic uncertainty, leading to invasive procedures or surgical treatment that may be unnecessary.⁴ The management dilemma posed by small renal masses requires excellent communication between patients, GPs and specialists regarding options ranging from surveillance, to partial (nephron sparing) nephrectomy or radical nephrectomy.

This How to Treat discusses the assessment and management of small renal masses.

EPIDEMIOLOGY

KIDNEY cancer is the seventh most commonly diagnosed malignancy in Australia, around 90% of which are RCC.⁵ It is estimated there will be more than 4000 kidney cancer diagnoses in Australia in 2020, representing nearly 3% of new cancer diagnoses in that year.⁵ Worldwide, around 400,000 new cases of RCC were identified in 2018.⁶

The five-year survival expectation of diagnosed kidney cancers is 79% (based on those diagnosed between 2012 and 2016).⁵ This has improved compared with those diagnosed between 1987-1991, when only 51% survived to five years.⁵ The prognosis in Australia is comparable to worldwide figures and is attributed to the accessibility of imaging and the smaller size of lesions at the time of diagnosis.¹

There is a male predominance (around 2:1) for both diagnosis and deaths from kidney cancers in Australia.⁵ In 2015, there were more than

13,000 people living with renal cancer who were diagnosed between 1982 and 2015. The lifetime risk of developing RCC in Australia is approximately one in 47 for men and one in 100 for women.⁵

PATHOLOGY

THERE are multiple subtypes of RCC, the most common of which is clear-cell RCC, representing up to 75% of cases.⁷ Papillary and chromophobe subtypes represent around 10% each, while a small number are unable to be classified. High nuclear grade and presence of sarcomatoid features are poor prognostic indicators.⁸ Clear-cell RCC is associated with a variety of genetic abnormalities and gene pathways that are under investigation.⁷

RISK FACTORS

MOST RCCs are sporadic, and familial disease accounts for less than 5% of cases.⁹ RCC associated with genetic conditions typically presents at a younger age (under 40) with multiple or bilateral tumours. Von Hippel Lindau syndrome and polycystic kidney disease both predispose patients to RCC.

In the general population, RCC is associated with obesity, smoking, hypertension and chronic kidney disease.⁹

Smokers typically have more aggressive and advanced disease at diagnosis. Conversely, RCC in obese patients tends to be of a lower grade and stage at diagnosis.⁹

PRESENTATION

SMALL renal masses that are suspicious for malignancy are most likely to be RCCs (around 80%).¹⁰ While RCC has the potential to present symptomatically, increasingly, these malignancies are incidental, asymptomatic findings.⁷ This is likely due to the increased availability of abdominal imaging, resulting in the diagnosis of renal tumours before they reach a size at which they are likely to cause symptoms.²

Although early diagnosis is an advantage of modern imaging techniques, the possibility that some RCC will remain clinically insignificant is important to remember.¹ Most small renal masses identified are low grade and exhibit slow growth (approximately 3mm per year).

« The risk of metastasis is less than 1% per year.¹¹

Constitutional symptoms and paraneoplastic syndromes can occur in those who present symptomatically (around 30% of cases).⁷ Symptoms at the time of presentation are associated with more advanced disease, including advanced local and metastatic disease.⁹ The most common presenting symptoms appear in box 1.

The 'classic triad' of a flank mass, haematuria and pain due to a large renal tumour is now a less-common presentation of RCC.

Paraneoplastic syndromes associated with RCC can present with the features listed in box 2.⁷

ASSESSMENT AND INVESTIGATIONS

A SMALL renal mass is defined as a solid renal lesion measuring less than 4cm.¹² An ultrasound diagnosis of small renal mass requires confirmation with a contrast-enhanced CT or MRI.

Following identification on imaging, each diagnosis of a small renal mass needs to be individually investigated and managed. Patient factors needing consideration include age and comorbidities. Tumour factors, including size and location within the kidney, are important for assessing the suitability for further diagnostic procedures and treatments. Local surgical and radiological expertise will affect available treatment and diagnostic options.

Blood tests

There are no specific tumour markers for RCC. Renal function is unlikely to be significantly compromised because of a small mass, however impaired renal function may impact upon decisions regarding treatment.

Blood tests for investigating patients with a small renal mass include baseline renal function and full blood count, while assessment for paraneoplastic syndromes may be indicated.

Imaging

Table 1 outlines the imaging modalities and their role in diagnosis.

Staging

A CT scan of the chest is usually sufficient to complete staging of a small renal mass, because of the low likelihood of metastatic disease at presentation.

Role of biopsy

Radiological-guided percutaneous biopsy is not indicated for all small renal masses before definitive surgical management, as around 80% of small renal masses are malignant.^{2,6} However, biopsy is an important diagnostic tool to guide management in some cases.

There is no consensus regarding when a biopsy should be performed, and each case needs to be individually evaluated for potential benefits of a biopsy-confirmed diagnosis. Situations where a biopsy is typically considered are listed in box 3.

A diagnostic renal mass biopsy requires multiple cores to be obtained by an experienced interventional radiologist and examined by a histopathologist familiar with the technique. Fine-needle aspiration is not sufficient. Biopsy has the capacity to distinguish benign from malignant



Figure 1. A 3.5cm isoechoic lesion suspicious for RCC within the interpolar region of the left kidney, demonstrated using ultrasonography.



Figure 2. Renal cell carcinoma arising from the lower pole of the right kidney, coronal CT displaying vascular uptake of contrast.

Table 1. Imaging findings and role in diagnosis	
Modality	Findings
Ultrasound (figure 1)	A well-defined mass which is vascular and isoechoic when compared with normal renal parenchyma
Contrast-enhanced CT (see figure 2)	The renal mass exhibits post-contrast enhancement, indicating a vascular lesion
MRI (see figure 3)	May be considered in pregnancy or for patients with renal impairment or contrast allergy; the resolution is less clear than CT and from a practical perspective, MRI is less accessible and more expensive than ultrasound or CT
Nuclear renogram (DMSA)	This imaging modality may in some cases be used to differentiate between a true mass and an embryological anomaly (pseudo-tumour) A pseudo-tumour will demonstrate normal uptake of isotope compared with adjacent renal parenchyma, whereas a renal tumour will show reduced uptake

Box 1. Most common presenting features of renal cell carcinomas

- Fatigue.
- Weight loss.
- Hypertension (due to increased renin production).
- Fever.

Box 2. Presenting features of paraneoplastic syndromes associated with RCC

- Deranged liver function tests.
- Non-metastatic acute hepatitis (Stauffer's syndrome).
- Anaemia or polycythaemia.
- Elevated ESR.
- Hypercalcaemia.

Box 3. When to consider a biopsy

- Suspicion that the lesion is not consistent with RCC. Examples include radiological features of a benign lesion, clinical suspicion of secondary or metastatic disease, or suspicion of an inflammatory or infective lesion.
- The mass is not amenable to nephron-sparing surgery (partial nephrectomy) and a diagnosis is required prior to proceeding with total nephrectomy. This is especially relevant in young patients or those with renal impairment, in whom the consequences of losing a kidney to a benign lesion would be detrimental.
- Deciding between surveillance or surgical intervention for a lesion may be dependent upon whether the tumour is high or low grade.
- Treatment is being considered in a patient with a solitary kidney.
- Ablative treatment is being considered, to obtain histological confirmation of RCC.

Source: Patel HD et al 2016⁴

lesions, high-grade from low-grade disease and tumour subtype.¹ This information is useful for risk strat-

successful in differentiating benign from malignant lesions.¹ In cases with non-diagnostic biopsy results, around

cases. Complications of percutaneous renal mass biopsy are rare (less than 0.5%) but may include bleeding, infection or inadvertent injury to adjacent organs such as liver, spleen and bowel.¹²

Biopsy is not recommended for patients who are not candidates for intervention, even in the event of a malignant result. For example, elderly or comorbid patients who are deemed unsuitable for surgical intervention do not need to

It is worth remembering that there is a risk of false negative biopsies, but this is low, at about 1-2%.

ification.¹³ It is worth remembering that there is a risk of false negative biopsies, but this is low, at about 1-2%.¹ Ninety per cent of biopsies are

80% of repeat biopsies are subsequently diagnostic.² Patients with benign results should undergo surveillance, or repeat biopsy in some

Box 4. Advantages of a biopsy

- The risk of seeding is low.¹²
- Complications from percutaneous biopsy is low.
- Risk assessment can be performed without performing major surgery.
- Biopsy reduces the risk of surgery performed for benign lesions.

◀ PAGE 12 undergo biopsy to confirm the diagnosis, if the result will not change their management.²

The advantages of a biopsy are listed in box 4.

DIFFERENTIAL DIAGNOSES

ALTHOUGH most small renal masses are RCC, there are a variety of different, benign masses that can arise from the kidney, as well as other lesions of infective, inflammatory and vascular origin.

Oncocytoma

This benign renal tumour is histologically similar to the chromophobe sub-type of RCC. Imaging does not reliably differentiate between RCC and oncocytoma, although a ‘spoke-wheel’ pattern is often described in oncocytoma. RCC may coexist in approximately 10% of cases of oncocytoma.³

Papillary adenoma

This is the most common solid benign renal mass. It has a similar morphology to papillary RCC, however cytological atypia and necrosis is absent. It is possible that small papillary adenomas are precursor lesions of papillary RCC; this is being investigated.¹⁵

Angiomyolipoma

Angiomyolipoma is a benign tumour composed of variable amounts of abnormal blood vessels, smooth muscle and fat (see figure 4). It is more commonly seen in females.¹⁶ An angiomyolipoma can usually be differentiated from RCC by the presence of fat.

While benign, angiomyolipoma may grow rapidly, with an increased risk of bleeding during pregnancy from increased circulating levels of progesterone.

An angiomyolipoma may present with spontaneous bleeding resulting in flank pain, haematuria and hypotension (Wunderlich syndrome).

Patients with angiomyolipoma require monitoring with yearly ultrasound. Treatment may be considered if the lesion reaches a size greater than 4cm, at which point there is an increased risk of bleeding. The options for treatment include arterial embolisation or surgical excision (partial or total nephrectomy).

Pseudo-tumour

Congenital anomalies such as a hypertrophied column of Bertin or ‘dromedary hump’ may be confused with a small renal mass. Columns of Bertin are normal extensions of renal cortical tissue separating the pyramids; hypertrophied columns may create confusion.

A dromedary hump is a focal bulge of the lateral border of the left kidney. This normal variant of the kidney’s contour is a result of a splenic impression onto the superolateral aspect of the left kidney. The diagnosis is

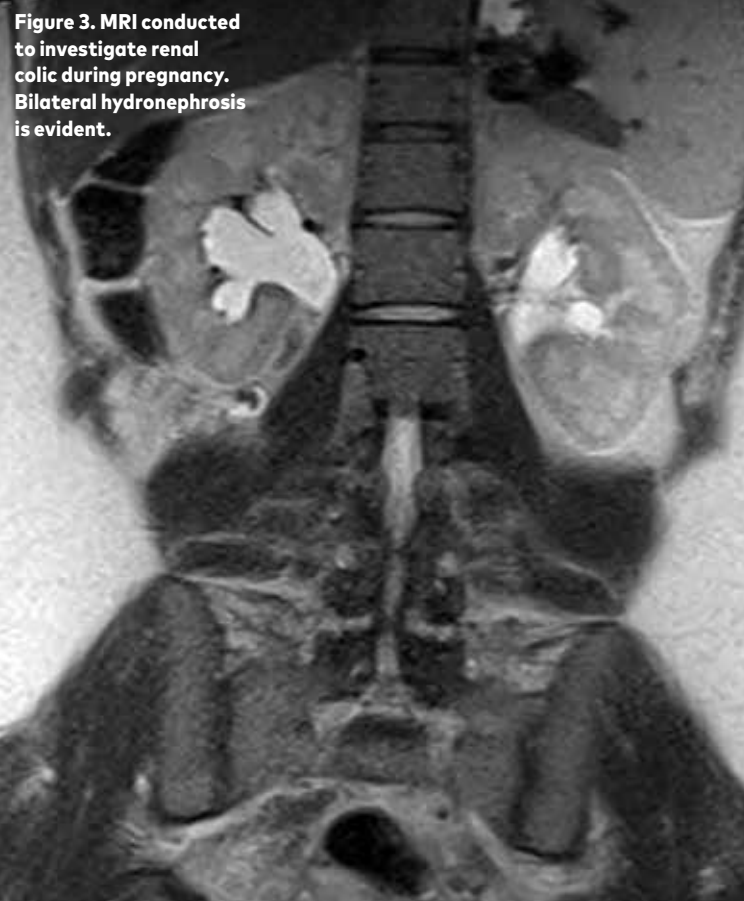


Table 2. Bosniak classification of renal cysts

Bosniak grade	Features on imaging	Further investigation	Chance of malignancy
I	Simple cyst, imperceptible wall	No work-up required	Approaching 0%
II	Minimal complexity A few thin septae or containing proteinaceous or haemorrhagic material Smaller than 3cm	No work-up required	Approaching 0%
IIF	Minimal complexity. More septae, wall thickening with perceptible enhancement Larger than 3cm	Similar to II but follow-up imaging at six months to assess for change	5%
III	Intermediate complexity Thick, nodular multiple septa with enhancement or measurable wall enhancement	Treatment indicated	55%
IV	Solid mass with large cystic or necrotic component	Nephrectomy indicated	100%

Source: Silverman SG et al 2019¹⁷

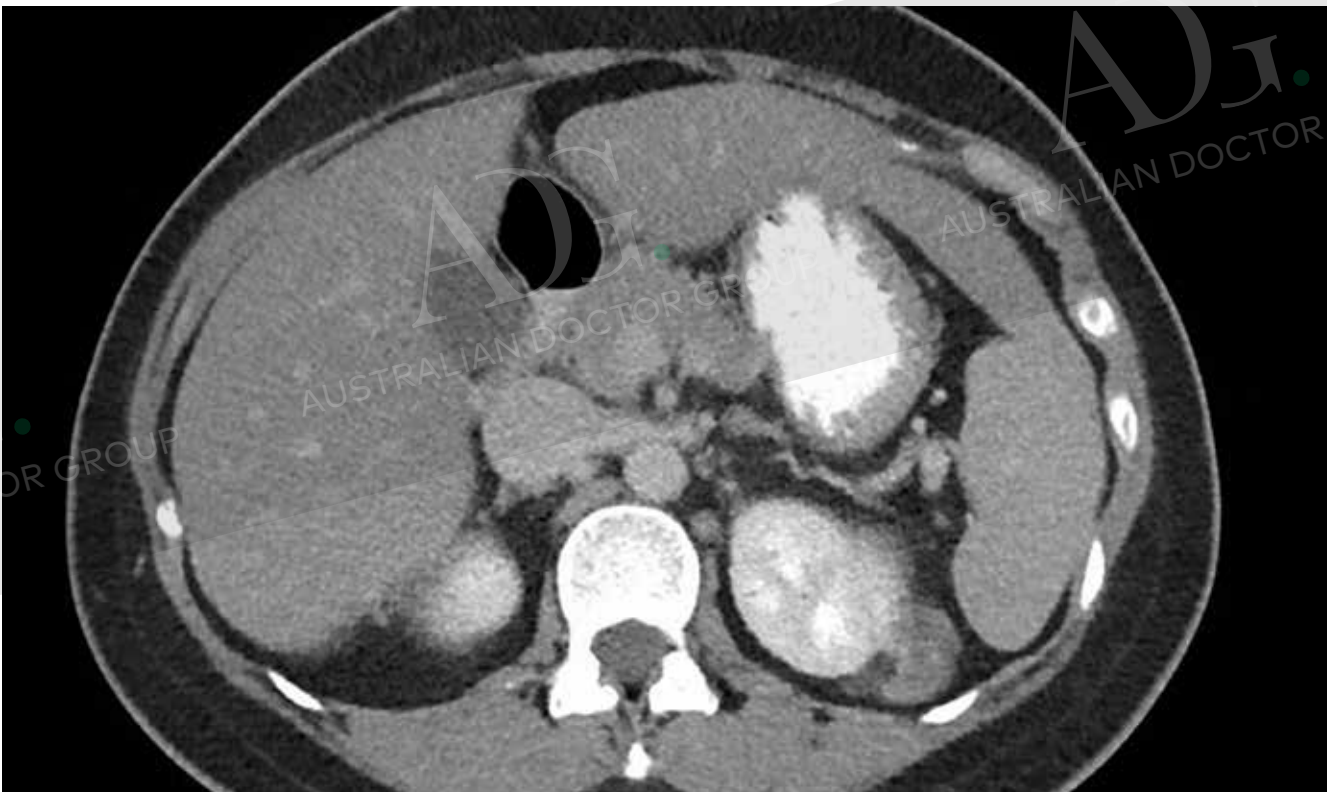


Figure 4. Angiomyolipoma arising from the lower pole of the left kidney.

made on contrast-enhanced CT but a nuclear renogram may be useful in unclear cases.

Infection

A renal abscess may mimic a small renal mass. The correct diagnosis can usually be ascertained on clinical history. A renal abscess may occur as a complication of pyelonephritis or as a result of haematogenous seeding.

Renal infarction

This generally occurs in a wedge-shaped distribution which can mimic a mass. Again, the diagnosis should be evident from the clinical history and CT features.

Renal cyst

Renal cysts are very common, found in 30% of those aged over 50.³ While most renal cysts are classified as ‘simple’, some renal cysts contain proteinaceous debris which may appear to be solid (see figure 5). Renal cysts are classified using the Bosniak criteria, which is based on CT imaging (see table 2). This predicts the likelihood of malignancy and determines the need for follow-up.

Metastasis

Tumours including lymphoma, lung, breast and melanoma may metastasise to the kidney.

Uncommon solid benign renal tumours

Renal leiomyoma originates from the smooth muscle cells of the renal cap-

Tumours including lymphoma, lung, breast and melanoma may metastasise to the kidney.

sule or renal pelvis. This is histologically similar to leiomyosarcoma, a malignant lesion demonstrating local invasion on imaging.¹⁸

Metanephric adenomas arise from renal epithelium and can have epithelial, stromal or mixed histology. They can appear heterogenous on imaging because of areas of necrosis and haemorrhage.¹⁸

Reninoma arise from renal juxtaglomerular cells. Even small lesions of around 1cm may be active in producing significant amounts of renin.

Reninoma is an uncommon cause of secondary hypertension in young people (see figure 6).¹⁸

Carcinoid tumours arise from neuroendocrine cells and may be found in the kidney in association with a horseshoe malformation. Around one-third contain dystrophic calcification that is evident on imaging.¹⁸

MANAGEMENT

REFER all patients with a small renal mass to a urologist for a thorough evaluation and discussion regarding the most appropriate management option. Each treatment modality has advantages and disadvantages that must be discussed with patients.³

This process considers patient factors, including goals of management, tumour factors (see table 3), size, location and risk stratification where this information is available, and surgical factors including

surgeon experience and availability of technology.⁸

Surveillance

An initial period of surveillance may be considered because of the indolent nature of many small renal masses.¹ There are no agreed protocols for surveillance; however, imaging may be performed initially at intervals of three and six months to ensure stability in size. Ultrasound may be sufficient for monitoring, but it is important to be aware of possible inter-observer variability in size measurements. A repeat CT scan can be performed for clarification. The premise of surveillance is that patients who demonstrate progressive disease will progress to treatment.¹² Studies evaluating the safety of this approach have found that around 30% of lesions do not grow; those that do, grow slowly; and the risk of metastatic disease is low.²

The advantages and disadvantages of surveillance appear in box 5.

Surgery

A nephron-sparing approach (partial nephrectomy) is the preferred option



Figure 5. A simple renal cyst arising from the right kidney is demonstrated on CT.

Box 5. Surveillance

- Advantages:
 - May avoid unnecessary treatment of benign or low grade-tumours.
- Disadvantages:
 - Risk of interval growth which may preclude nephron-sparing surgery or thermal ablation.
 - Small risk of development of metastatic disease.
 - Patient anxiety and burden of surveillance regimen.
- Best suited to:
 - Older population.
 - Increased number of comorbidities.
 - Smaller size of tumour at diagnosis.

Box 6. Surgery

- Advantages:
 - Lower risk of metastatic disease and improved cancer-specific survival compared with surveillance or ablative therapy.
 - Histological confirmation allows for appropriate post-operative surveillance.
 - Preserved renal function of partial compared to radical nephrectomy.
- Disadvantages:
 - Risk of positive surgical margins/incomplete tumour excision.
 - Acute surgical complications.
 - Loss of renal function.

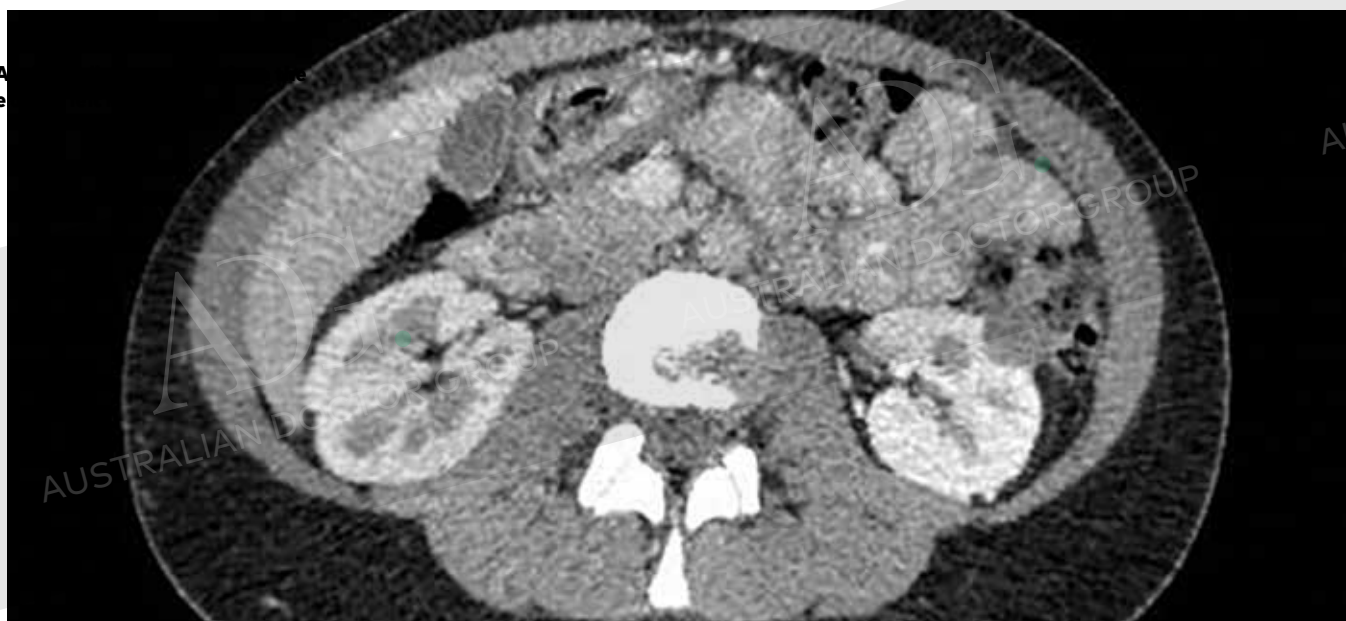


Figure 6. Non-enhancing, partially exophytic lesion arising from the mid-pole of the left kidney representing reninoma – the cause of long-standing hypertension in a 24-year-old female.

Thermal ablation

Thermal ablation utilises thermal energy in the form of either heat (radiofrequency ablation) or cold (cryoablation) to kill the tumour cells to prevent growth or metastatic spread.¹³ The oncological outcomes are not as reliable when compared with surgical intervention, however this may be a good option for a patient who is not suitable for, or is unwilling, to undergo surgery.³

Indications may include those with an enlarging renal mass who are not fit for an operation because of frailty or medical comorbidities, or where surgery poses significant risks.¹³

A radiological-guided biopsy is performed to obtain tissue for histopathology to confirm the diagnosis before proceeding. This can be done at the time of the ablation procedure; however, a repeat biopsy cannot be performed if the biopsy is non-diagnostic. Tissue diagnosis before ablation helps to stratify risk and guide a surveillance regimen following the procedure.⁵

Obtaining tissue in advance of the ablation procedure allows for a different approach if the lesion is found to be benign or aggressive. Thermal ablation is best suited to tumours up to 3cm in size, in a peripheral location, and away from other organs, the ureter and the collecting system of the kidney.

Follow-up imaging is performed at intervals to assess for vascularity (ultrasound) or enhancement (CT) as a surrogate for tumour viability. The mass may shrink in size or remain



Figure 7. Small exophytic renal mass arising from the left kidney suitable for nephron-sparing surgery.

Table 3. RENAL score for assessing renal mass characteristics and suitability for nephron-sparing surgery

Feature	Feature
Radius	Scores tumour size as a maximal diameter
Exophytic	Quantifies exophytic and endophytic portions of the tumour
Nearness	Proximity of the deepest portion of the tumour to the collecting system
Anterior	Anteriorly or posteriorly located lesion
Location	Location relative to the polar line

This score helps surgeons assess technical difficulty of a partial nephrectomy. Four components are scored on a 1-, 2- or 3-point scale, location is designated anterior, posterior, x for indeterminate or h for hilar. Higher scores have been correlated with conversion from partial to radical nephrectomy, longer ischaemic time and higher intraoperative blood loss. It is designed to objectify anatomical features and guide decision making but there are no numerical cut-offs and decisions are made in combination with surgeon experience.

Source: Basu S et al 2019¹⁹

for the surgical management of small renal masses.¹³ This approach, when performed correctly, achieves equivalent disease-free survival when compared with total nephrectomy.³

Partial nephrectomy involves removal of the mass with minimal amount of surrounding normal renal tissue, thus preserving renal function. Partial nephrectomy results in a

lower risk of long-term chronic kidney disease.¹³ The ability to safely perform partial nephrectomy and the approach utilised depends on the size and location of the tumour within the kidney.

The RENAL score defines tumour features including size and location that affect amenability to nephron-sparing surgery (see table 3).

Surgeon expertise and access to technology such as robotics also affects surgical approach. Partial nephrectomy was traditionally performed via an open approach; however, the advent of robotic surgery has enabled complex partial nephrectomy to be performed safely with equivalent oncological outcomes, via a minimally invasive approach.¹³

Laparoscopic or robotic approaches reduce length of hospital stay and are associated with shorter recovery time. In some cases, it may not be possible to safely perform partial nephrectomy, and a total nephrectomy may be required for small renal mass (see figure 7).

The advantages and disadvantages of surgery appear in box 6.

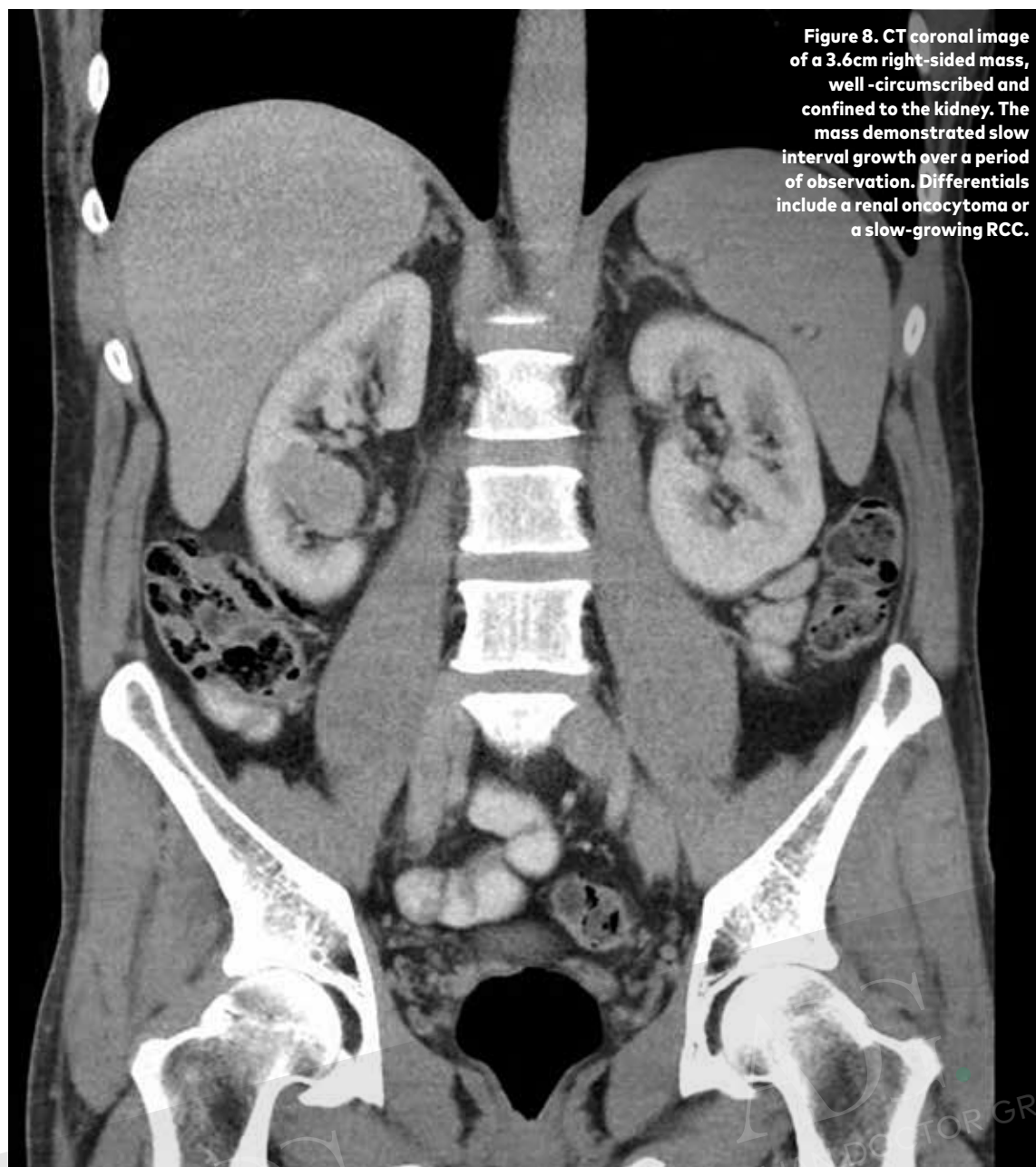


Figure 8. CT coronal image of a 3.6cm right-sided mass, well-circumscribed and confined to the kidney. The mass demonstrated slow interval growth over a period of observation. Differentials include a renal oncocytoma or a slow-growing RCC.

Box 7. Thermal ablation

- Advantages:
 - This is a minimally invasive technique suitable for patients who are poor surgical candidates or whose preference is not to undergo surgery.
 - Minimal loss of renal function.
 - Cost effective.
 - Minimal risk of complications from the procedure.
- Disadvantages:
 - Ablation is associated with inferior oncological outcomes compared with surgery.
 - There is a lack of long-term follow-up data assessing treatment success.
 - Ablation is limited by tumour size and proximity to surrounding structures.
 - Salvage operations are made more difficult by prior ablation.^{13,7}
- Best suited to:
 - High risk surgical patients whose preference is for treatment rather than surveillance.

Table 4. ISUP Grading of renal cell carcinoma

ISUP grade	Description
1	Tumour cell nucleoli are absent or inconspicuous at around 400x magnification Cells are basophilic
2	Tumour cell nucleoli are conspicuous and eosinophilic at around 400x magnification They are not prominent at 100x magnification
3	Tumour cell nucleoli are eosinophilic and clearly visible at around 100x magnification
4	Tumour cells show nuclear pleomorphism They may contain neoplastic giant cells or display sarcomatoid or rhabdoid differentiation

Source: Ljunberg B et al 2018³

stable following treatment. The advantages and disadvantages of thermal ablation appear in box 7.

DECISION-MAKING IN ELDERLY PATIENTS

CAREFULLY consider the most appropriate management of small renal mass in the elderly population. Around half of patients diagnosed with renal cancers are older than 75, and each patient is unique when considering comorbidities and treatment preferences.¹³

This population frequently has a reduced life expectancy from comorbid conditions, where the risk of non-cancer related mortality may be higher than harm from the small renal mass.¹³ Patients with cardiovascular conditions such as cardiomyopathy or congestive heart failure, chronic kid-

ney disease, chronic obstructive pulmonary disease, peripheral vascular disease and cerebrovascular disease have decreased overall survival.¹

ney disease, chronic obstructive pulmonary disease, peripheral vascular disease and cerebrovascular disease have decreased overall survival.¹ Nomograms to help guide decision-making for elderly patients may be useful tools. These include the Charlson Comorbidity Index, Cardiac Risk Index and five-year Cancer Specific Survival rates which can be used to stratify mortality risk from comorbidities.¹

PROGNOSIS

THE five-year prognosis for cancer-specific and overall survival of patients with a small renal mass identified as T1a renal carcinoma (less than 4cm, confined to kidney) following treatment is excellent and approaches 95-100%.³ Poor prognostic factors are listed in box 8.

Grading of RCC remains an area of investigation as we gain an understanding of different histological and nuclear features, and their prognostic

Box 8. Poor prognostic factors

- High grade tumour.
- Presence of necrosis.
- Positive surgical margins.
- Variant tumour pathology.

for small renal mass. This approach permits the preservation of nephrons and allows those with impaired renal function to undergo curative surgery.⁷

Robotic surgery is widely available in the private sector but access is also slowly increasing in Australia's public health system, with minimally invasive surgery using robotic techniques becoming a financially viable option.

Long-term studies are required on outcomes for ablative treatments which are currently most appropriate for non-surgical candidates but may be applicable to a wider range of patients in the future. Ablation is typically performed in the older and comorbid population, which has resulted in data on long-term outcomes being difficult to obtain.¹³

It may be possible to obtain more specific prognostic information and risk stratification from genetic profiling of RCC.² Mutations in the VHL gene located on chromosome 3 are associated with both Von Hippel Lindau syndrome (which predisposes to multisystemic cystic tumours and RCC – see figure 9) as well as sporadically occurring RCC.⁷

CASE STUDIES

Case study one

THERESA, 56 years old, fit and healthy, has a small renal mass identified incidentally on an ultrasound performed for investigation

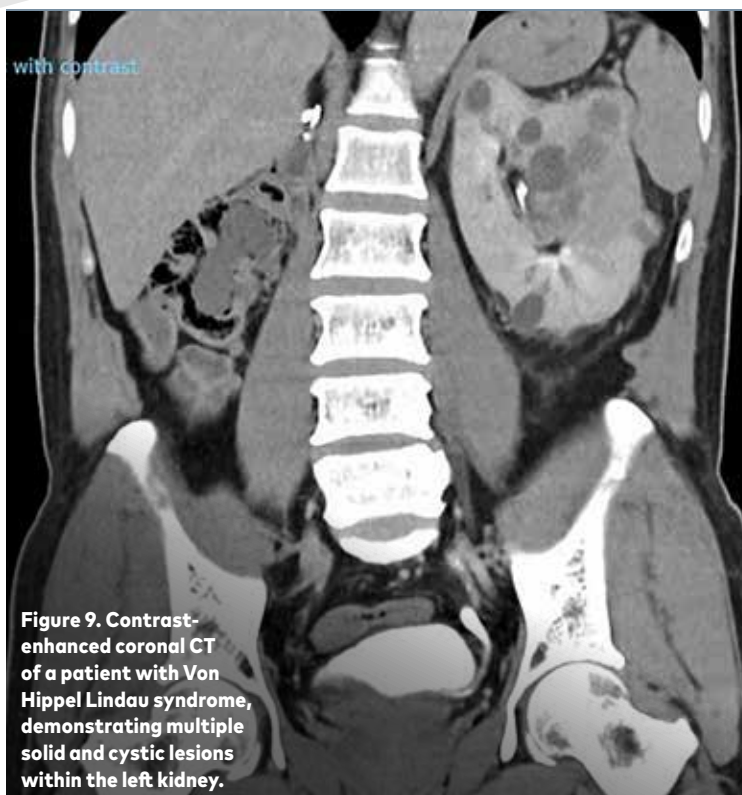


Figure 9. Contrast-enhanced coronal CT of a patient with Von Hippel Lindau syndrome, demonstrating multiple solid and cystic lesions within the left kidney.

of recurrent UTI. The ultrasound demonstrates a 3cm partially exophytic right renal mass. A contrast-enhanced CT is performed; this confirms an enhancing lesion suspicious for an RCC.

Following a discussion regarding the likely diagnosis and the management options, Theresa opts to proceed directly to surgery. The option of a diagnostic biopsy is discussed; however, it was felt that this would not change her management. She is uneasy about the risk of a false negative biopsy.

Robotic-assisted partial nephrectomy is performed with use of intra-operative ultrasound to accurately

delineate the margins of the tumour.

Nephron-sparing surgery is successful, with preservation of renal function. Theresa recovers well and is discharged on day two post-op. The pathology confirms a Fuhrman Grade 2 clear-cell RCC with negative surgical margins. Follow-up imaging is performed initially after six months, followed by yearly surveillance for five years in total. The risk of recurrence, while low, is greatest in the first two years. The lungs are the most common site of distant metastasis.

Case study two

HAROLD, 60, is incidentally found to have a 2cm left renal mass. PAGE 18 ►

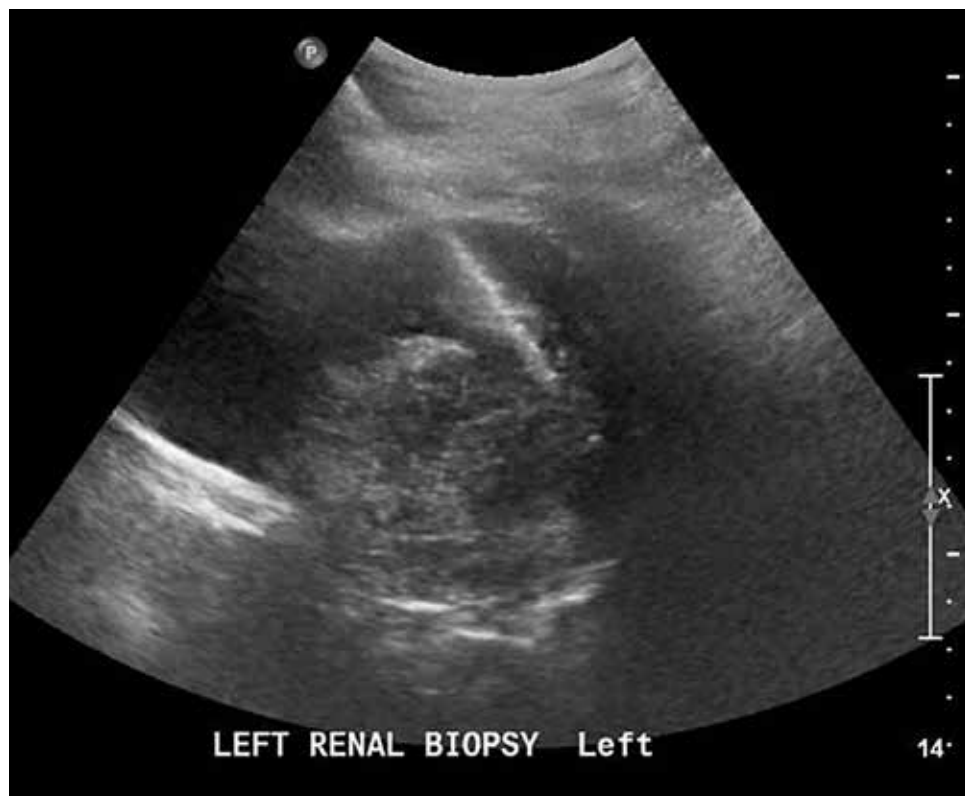


Figure 10. Ultrasound-guided biopsy of a small renal mass. The lesion in the image showed histopathology consistent with RCC.



Figure 11. Coronal view of a biopsy confirmed clear-cell RCC. The patient underwent radiofrequency ablation.

◀ PAGE 16 This is discovered on a CT performed in ED where he presented for investigation of abdominal pain. He has type 2 diabetes, increased BMI and a previous TIA for which he is taking aspirin.

An initial decision is made for surveillance of the mass. Over a period of two years, the mass demonstrates interval growth to reach a size of 3cm. At this point, it is felt that if the mass continues to grow, it may no longer be amenable to partial nephrectomy or thermal ablative treatment.

A decision is made to perform a percutaneous biopsy. The pathology confirms a benign oncocytoma. Because of the histological similarity with chromophobe RCC and the risk of a false negative biopsy, Harold continues to undergo surveillance of the mass. Repeat biopsy or treatment can be considered if the mass continues to increase in size (see figure 10).

Case study three

Ron, 81, is found to have 4cm renal lesion during imaging conducted to investigate flank pain. He also has kidney stones which are managed conservatively. Review of previous imaging shows that the lesion was evident nine months previously, and there has been no interval growth in that time.

Ron has a number of comorbidities including arthritis, depression, gout and trigeminal neuralgia. Surgical intervention is offered. However, as he lives alone, Ron does not feel he would manage well undergoing an operation. He is referred for biopsy and ablation; biopsy confirms clear-cell RCC.

Radiofrequency ablation is performed without complication. Imaging is performed three months

post-treatment and shows a reduction in the size of the lesion. After this appointment, Ron chooses not to have further follow-up scans (see figure 11).

CONCLUSION

SMALL renal masses are a common incidental finding and most often represent RCC. Differential diagnoses include benign growths of the kidney, infective or inflammatory lesions. Management options include surveillance, surgical or ablative treatments.

Further diagnostic clarification in the form of biopsy is appropriate for some patients to guide treatment decisions, but is not a requirement for proceeding to surgical intervention.

Tissue diagnosis is not necessary for patients whose biopsy results will not change management. Surgical intervention achieves excellent oncological outcomes, however surgical candidates need to be selected carefully taking into consideration age, renal function and comorbidities.

RESOURCES

- **UroOnco: content provided by the European Urological Society (EAU). Educational resources for GPs and specialists. Highlights kidney cancer resources ranging from the latest scientific publications to educational materials and practical tools.** bit.ly/3gVDqpi
- **EAU Guidelines on Management of Renal Cell Carcinoma** bit.ly/3mvoWxr
- **Kidney Health Australia** bit.ly/3419sWL
- **Cancer Council** bit.ly/3p5yRMd
- **Charlson Comorbidity Index** bit.ly/35bt8wK
- **Revised Cardiac Risk Index for Pre-Operative Risk** bit.ly/3pPM4Jj
- **Australian Government Cancer Australia National Cancer Control Indicators** bit.ly/395697s

References on request from howtotreat@adg.com.au

How to Treat Quiz.

SMALL RENAL MASSES



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1. Which THREE statements regarding small renal masses are correct?

- a Small renal masses are most often diagnosed incidentally.
- b Around 90% of kidney cancers are renal cell carcinoma.
- c Kidney cancer is equally common in men and women.
- d Clear cell renal cell carcinoma is the most common subtypes of RCC.

2. Which THREE are non-genetic risk factors for RCC?

- a Obesity.
- b Gout.
- c Hypertension.
- d Chronic kidney disease.

3. Which TWO are among the most common presenting features of RCC?

- a Fatigue.
- b Flank mass.
- c Hypertension.
- d Haematuria.

4. Which THREE presenting features of paraneoplastic syndromes are associated with RCC?

- a Hypocalcaemia.
- b Deranged liver function tests.

- c Elevated ESR.
- d Anaemia or polycythaemia.

5. Which TWO statements regarding the investigation of a small renal mass are correct?

- a There are no specific tumour markers for renal cell carcinoma.
- b MRI is the preferred imaging modality for confirmation of a small renal mass identified on ultrasound.
- c Order radiological-guided percutaneous biopsy in all patients with a small renal mass.
- d The information obtained on biopsy is useful for risk stratification.

6. Which THREE are differential diagnoses of a small renal mass?

- a Renal cell carcinoma.
- b Oncocytoma.
- c Angiomyolipoma.
- d Simple renal cyst.

7. Which TWO statements regarding small renal masses are correct?

- a Renal cysts are very common, found in 30% of those aged over 50.
- b Metastases to the kidney may occur from lymphoma, lung and breast tumours, and melanoma.
- c The Bosniak criteria predict the recurrence risk.
- d Reninoma is the most common cause of secondary hypertension in young people.

8. Which THREE statements regarding the management of small renal masses are correct?

- a Thermal ablation may be indicated.
- b All patients with a renal mass will ultimately require surgery, so initial surveillance is not recommended.

- c Laparoscopic or robotic approaches reduce length of hospital stay and are associated with shorter recovery time.
- d A potential disadvantage of surgery is loss of renal function.

9. Which TWO statements regarding the management of small renal masses are correct?

- a Thermal ablation is indicated in those with an enlarging renal mass who are not fit for an operation.
- b Thermal ablation offers equivalent oncological outcomes to surgery.
- c Surgery is best suited to an older population with an increased number of comorbidities.
- d Nomograms to help guide decision-making for elderly patients may be useful tools.

10. Which THREE are poor prognostic histological factors for renal cell carcinoma?

- a Presence of haemorrhage.
- b High-grade tumour.
- c Positive surgical margins.
- d Variant tumour pathology.

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