# *Bilateral oncocytoma and the value of needle biopsy*

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IVEY BS, DEVARAJAN K, SUNDARAM CP. Bilateral oncocytoma and the value of needle biopsy. The Canadian Journal of Urology. 2010;17(2):5131-5134.

***Introduction:*** *Renal oncocytoma represents a diagnostic challenge to urologists. We present three patients with bilateral renal oncocytomas.*
*Cases: All three patients presented with bilateral renal masses and through surgical means, were diagnosed with oncocytoma. Renal biopsies were used to diagnose oncocytoma in the contralateral kidney.*
***Discussion:*** *Considering oncocytoma represents up to 16% of renal masses, there is overtreatment of benign disease due the difficulty in distinguishing between histologies on radiographs. Even when the diagnosis of oncocytoma is made, concurrent renal cell carcinoma can be found in a small subset of patients. The value of renal biopsy in these patients thus becomes increasingly important. The accuracy of needle biopsy has improved and is relatively safe. Accuracy in establishing a diagnosis is better than 70% in most series. Tissue acquisition remains a barrier to accurate diagnosis. Although not routine, patients with bilateral masses or impaired renal function may be candidates for renal biopsy.*
***Conclusions:*** *Oncocytoma in the setting of bilateral renal masses presents a difficult clinical scenario. The clinician must exclude renal cell carcinoma from the differential diagnosis. Renal biopsy represents a safe and accurate method towards that end so that patients can be followed radiographically.*

**Key Words:** kidney neoplasm, oncocytoma

## Introduction

Renal oncocytoma represents a well-documented diagnostic challenge to the practicing urologist. Radiologic features of oncocytomas are essentially the same as those for renal cell carcinomas.[1,2] Even histopathologic features of oncocytoma can be confusing to the pathologist.[3,4] Traditionally, surgical extirpation or renal biopsy have been the only ways to distinguish the malignant from the benign neoplasms. We have recently encountered three patients with bilateral renal masses whose pathologic diagnosis at the time of surgical treatment on one side was an oncocytoma. All three patients were found to have bilateral benign oncocytoma, some without secondary surgery. We present our experience in light of current literature and highlight the importance of percutaneous renal biopsy of the patient with synchronous bilateral renal masses.

Accepted for publication December 2009

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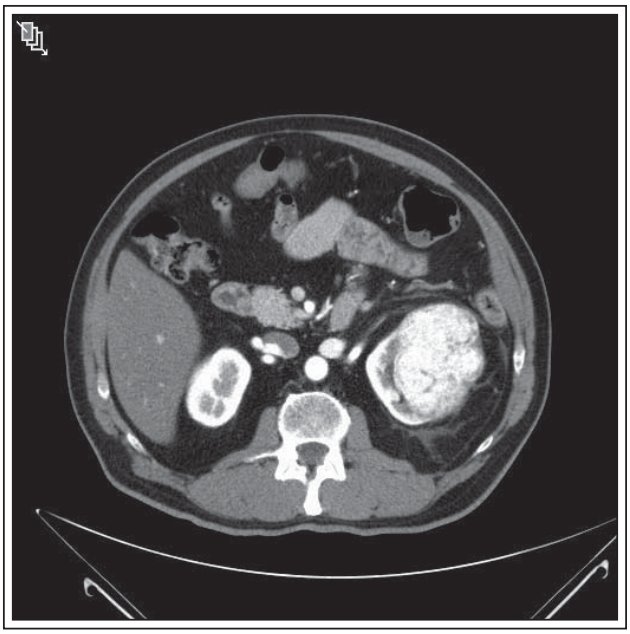

**Figure 1.** Axial cut of Patient 2 with large left renal mass.

## Case report

Patient 1 presented with bilateral renal masses. He underwent left partial nephrectomy and his pathology was consistent with multifocal renal oncytomatosis. A subsequent right renal fine needle aspiration was consistent with oncocytoma.

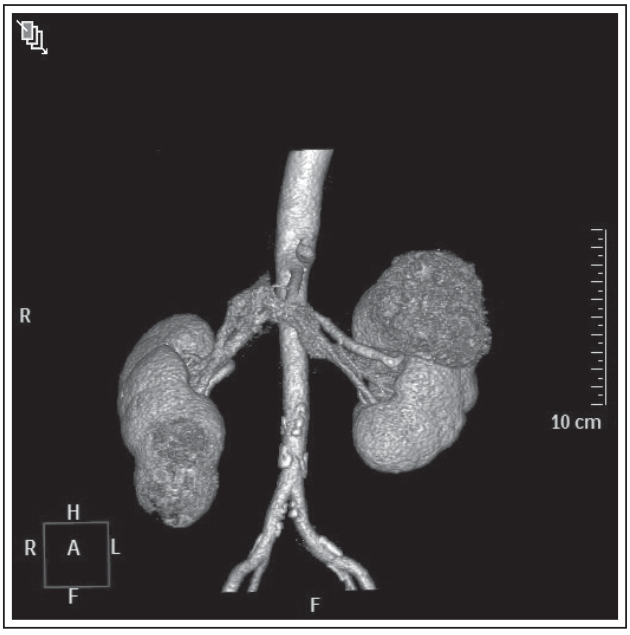


**Figure 2.** CT reconstruction of bilateral renal masses in Patient 2.

Patient 2 presented with two right renal masses and a large synchronous left renal mass. He underwent a right partial nephrectomy, which revealed an oncocytoma. A fine needle aspirate (FNA) specimen of the large left renal mass was also diagnostic for oncocytoma. A partial nephrectomy was done despite the results of the renal biopsy to preserve renal function, since an enlarging oncocytoma threatened to damage the kidney.

Patient 3 presented with multiple left renal masses and a concurrent right renal mass. A right laparoscopic nephrectomy was performed. Final pathologic diagnosis was oncocytoma. CT guided FNA was then performed on the left side and each specimen was consistent with oncocytoma as well.

There were some common characteristics for all three of our study patients. None of the patients showed clinical signs or had history of genetic syndromes, such as von Hippel Lindau or Birt-Hoge-Dube', that commonly exhibit renal masses. None of these patients had a positive metastatic workup, exhibiting what appeared to be localized disease. Further, no patient in our report had a previous renal neoplasm history. Figures 1-3 show selected images from Patient 2. Table 1 summarizes the three patients.

## Discussion

Bilateral renal masses raises the differential of renal cell carcinoma, metastasis, lymphoma, angiomyolipoma

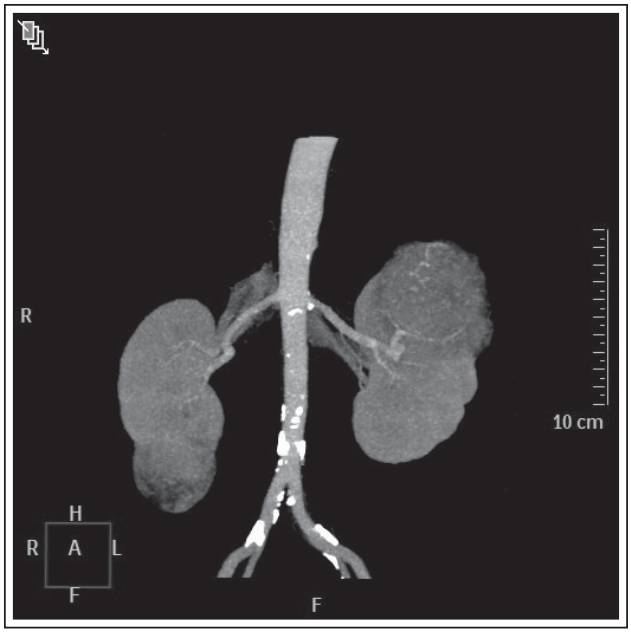


**Figure 3.** Two dimensional subtraction reconstruction of Patient 2.

TABLE 1. **Patient data in three patients with benign disease in bilateral renal lesions**

| | Age (years) at presentation, gender | Primary mass(es), location | Primary diagnosis, method | Contralateral mass(es), location | Contralateral diagnosis, method |
|---|---|---|---|---|---|
| Patient 1 | 67, male | Multiple masses with three > 1 cm, left kidney | Oncocytomatosis, left partial nephrectomy | 4 cm x 3 cm, right kidney | Oncocytoma FNA needle biopsy |
| Patient 2 | 66, male | Two masses 6.0 cm and 1.5 cm, right kidney | Oncocytomas, right partial nephrectomy | 8.6 cm, left kidney | Oncocytoma, left partial nephrectomy, after needle biopsy |
| Patient 3 | 61, male | 1.2 cm, right kidney | Oncocytoma, right laparoscopic partial nephrectomy | Multiple masses up to 1.9 cm, left kidney | Oncocytomas, FNA needle biopsy |

(AML), or other neoplastic processes, such as oncocytoma. Clinical differentiation of non-renal primary disease is usually distinct. Additionally, AML is usually clinically evident by radiographic appearance, although low fat content can obscure the diagnosis in these patients. When considering primary renal neoplasms, oncocytoma occurs in up to 10% of patients.[5]

Bilateral renal oncocytoma has been well established in the literature. Most cases are synchronous, although some patients will develop metachronous benign disease in the contralateral kidney. Uncommonly, multifocal disease is encountered.[6-8]

Familial oncocytoma also exists and can be linked to genetic defects such as loss of chromosome 1 or 1p deletion, loss of the Y chromosome in male patients, as well as chromosome 14q and 11q abnormalities.[9-11] Other translocation events have also been known to cause sporadic oncocytomas.[11-13] Interestingly, loss of chromosome 1 has also been documented in chromophobe renal cell carcinomas, a tumor which shares many histologic similarities with oncocytoma.

Coexistent renal cell carcinoma (RCC) in the setting of oncocytoma poses a difficult management question to the urologist. Counseling patients with regard to risk of malignancy becomes paramount when deciding how to approach the second kidney. The incidence of RCC in the setting of a contralateral oncocytoma has been reported[6,7,14] and estimated as high as 32%.[15]

In the largest series of oncocytoma patients to date, RCC coexisted in 10% of 138 patients with oncocytoma. Although many of these existed in a single kidney, 4% patients had bilateral masses with oncocytoma and RCC existing in opposite kidneys.[7]

Once a benign mass has been identified, the diagnostic value of renal biopsy increases in the face of possible bilateral benign disease. Both core and FNA biopsy using computed tomography, ultrasound, and fluoroscopy, are potentially available to the clinician. Some clinicians do not employ the use of renal biopsy in their workup of indeterminate renal masses.[16]

In the ideal setting, with near perfect ability to access neoplastic tissue and obtain multiple core samples for histologic review, Wunderlich et al presented limited ability to accurately identify tissue of origin, grade, and tumor biology in over 50% of cases, but tumor biology alone was assessed in 98% of cases.[17] FNA has been used with varying sensitivity and specificity for diagnosis of renal lesions.[18,19] Wood et al presented a false negative rate of 6% (negative predictive value 83%) in a series of 79 patients who underwent FNA renal biopsy.[20] Shannon and colleagues demonstrated 78% accuracy with core biopsy in patients with small renal masses, illustrating the majority of failures stemming from poor tissue acquisition.[21] Similarly, Shah et al also reported accurate diagnosis in 51 out of 66 patients who underwent renal core biopsy for renal masses, again citing poor tissue acquisition in 14 of the 15 failed biopsies.[22] A review of the literature by Lane et al showed an overall failure to obtain adequate tissue in 8.9%.[23]

FNA biopsy samples are more difficult for the pathologist to interpret due to lack of cellular architecture. One recently published series, however, showed an adequate sample in 80 of 102 FNA samples, with all but three providing a diagnosis based on available cytology.[18] In a recent review of FNA series, Volpe et al report ranges of FNA sensitivity from 76%

to 97%, and goes further to suggest that FNA may play a complementary role to core needle biopsy.[24]

Routine biopsy of renal masses is not standard of care due to its low diagnostic yield.[25] In light of the low incidence of oncocytoma, yields and risks have not warranted routine biopsy, but in patients with a known oncocytoma on one side, the yield on the contralateral side may increase and save the patient substantial morbidity and mortality from a potentially unnecessary operation.

## Conclusions

Oncocytoma is an uncommon, but well-known pathology for renal masses. Bilateral masses of the kidneys can include oncocytoma unilaterally or bilaterally. Encountering an oncocytoma in the context of an undiagnosed contralateral renal mass should give pause for the clinician when considering the next diagnostic step. Renal biopsy has improved in the last two decades and should be considered by the clinician. Biopsy may help elucidate bilateral benign disease versus a synchronous malignant neoplasm. Biopsy proven oncocytoma may be observed with radiologic surveillance. □

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