

# Benign Renal Schwannoma

Heidi R. Umphrey, Mark E. Lockhart, Philip J. Kenney

Schwannomas are tumors arising from cells of the nerve sheath. While schwannomas are commonly found in peripheral nerves and cranial nerves, these tumors are rarely found within the kidney and may be difficult to differentiate from renal cell carcinoma. Few cases have been reported in the literature, and very little has been described regarding the imaging appearance of these rare renal tumors. We present a case of intrarenal schwannoma with sonographic, computed tomographic, and pathologic correlation.

## Case Report 52

A 63-year-old woman presented with hypertension and hot flashes at our primary care facility. The patient's initial untreated blood pressure was 204/100, improving to 152/90 on medical therapy. Laboratory evaluation revealed mild renal insufficiency, with a serum creatinine of 1.7 mg/dL and glomerular filtration rate of 32 ml/min. She underwent a renal ultrasound for further evaluation. This revealed what appeared sonographically as a markedly hypoechoic mass with lobulation and septations, thought to be a complex cyst (Bosniak 4) (Figure 1).

Computed tomography (CT) was recommended to further characterize this lesion. Subsequent evaluation with CT revealed a large lobulated mass involving the renal pa-

renchyma, and measuring 4.8 x 3.1 cm. On precontrast images, the mass demonstrated lower attenuation than the surrounding cortex (40 HU). A few faint calcifications were identified within the mass. The mass showed enhancement after contrast administration (66 HU); however, the tumor was hypodense to renal parenchyma on nephrographic phase images (Figure 2).

The patient was presented with the differential diagnosis including lymphoma and medullary tumor, such as collecting duct carcinoma, or atypical renal cell carcinoma. Clinical options were presented to the patient, and for reasons of her own, including intercurrent illness, biopsy was not performed. Follow-up CT exams were performed at 3 months, and 6 months. The 3 month follow-up CT showed no significant interval increase in the size of the right renal mass, and the patient elected for continued CT follow-up. The differential diagnosis at this time was similar to that at presentation, with lymphoma slightly less likely, but not excluded, in the absence of progressive growth. CT evaluation 9 months from the initial CT revealed an increase in the size of the right renal mass, which now measured 4.5 x 5.8 cm (Figure 3).

Subsequently, the patient elected to undergo hand-assisted laparoscopic right radical nephrectomy, which was performed without complication. Gross pathological evaluation of the right nephrectomy specimen revealed a well-circumscribed, white-tan to yellow multilobulated mass measuring 7.0 cm in maximal dimension (Figure 4).

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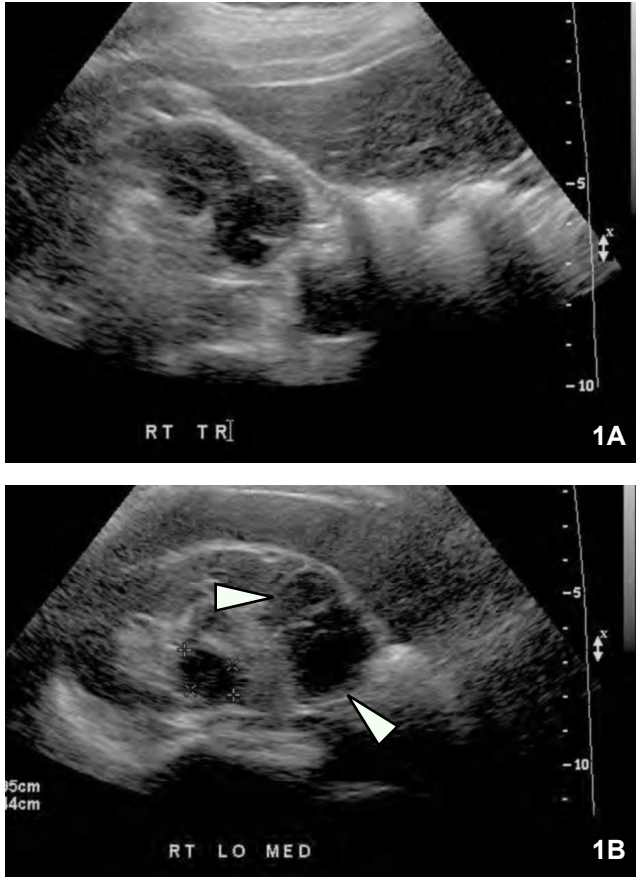
**Abbreviations:** CT, computed tomography

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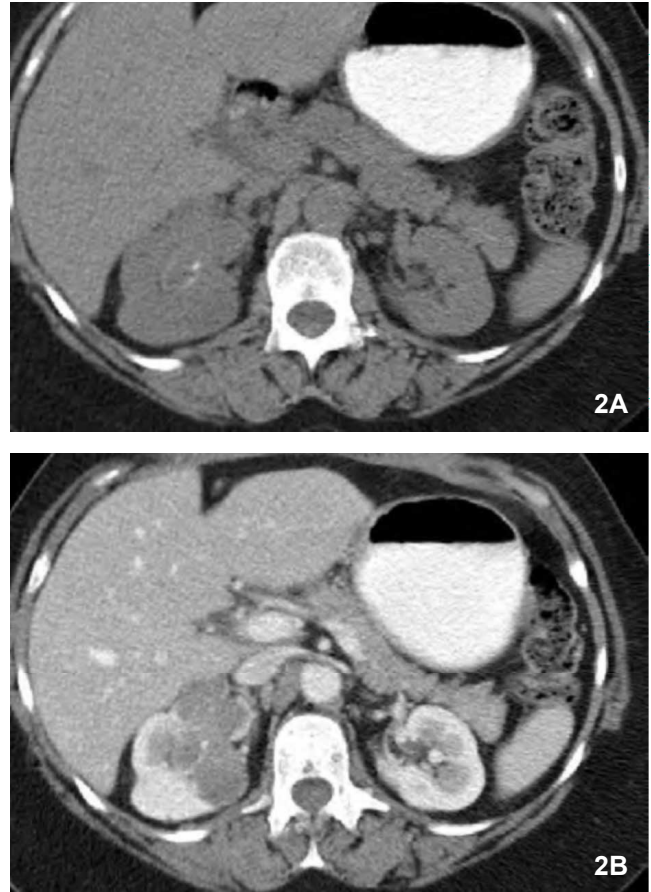
**Figure 1.** Sonographic images of the right kidney. **A.** Transverse image revealed a markedly hypoechoic mass with lobulation and septations. **B.** Longitudinal view of callipers measuring a separate renal cyst. Arrows designate hypoechoic mass.

Microscopic evaluation revealed a spindle cell neoplasm with two cellular patterns consisting of areas of tightly packed cells (Antoni A pattern) and areas of loosely arranged cells (Antoni B pattern) consistent with schwannoma (Figure 5). Tumor cells were immunoreactive with S-100 protein (Figure 6) and non-immunoreactive for smooth muscle actin and HMB-45. Hilar lymph nodes were negative for tumor, and the surgical margins were free of tumor.

Post surgical serum creatinine ranged from 2.0-2.3 mg/dL with GFR 23-28 mL/min. There was no interval change in the patient's hypertension post procedure. At follow-up one-year post resection, the patient was doing well, without evidence of recurrent tumor by magnetic resonance imaging.

### Discussion

Schwannoma is a common, benign tumor of peripheral nerves (1). However, its occurrence in the kidney is extremely rare, with only nineteen cases reported in the literature to date (2-5). The most common location of these tu-

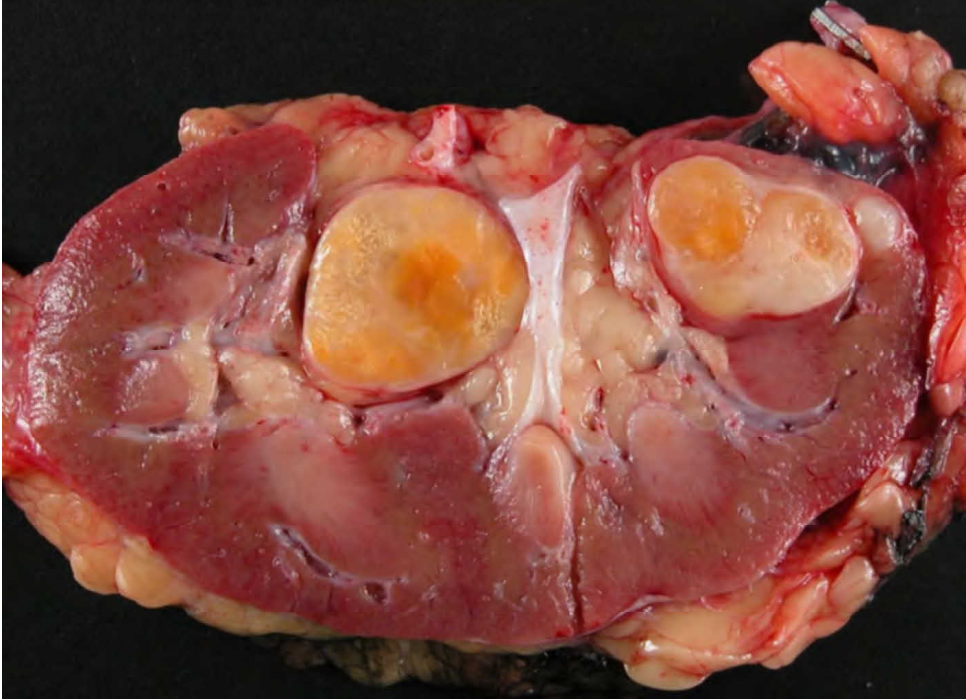


**Figure 2A.** Precontrast CT demonstrates a lobulated right renal mass (40 HU) with a small amount of calcification. **2B.** Contrast enhanced CT demonstrates enhancement of the right renal mass (66 HU), which remains hypodense to surrounding renal parenchyma.

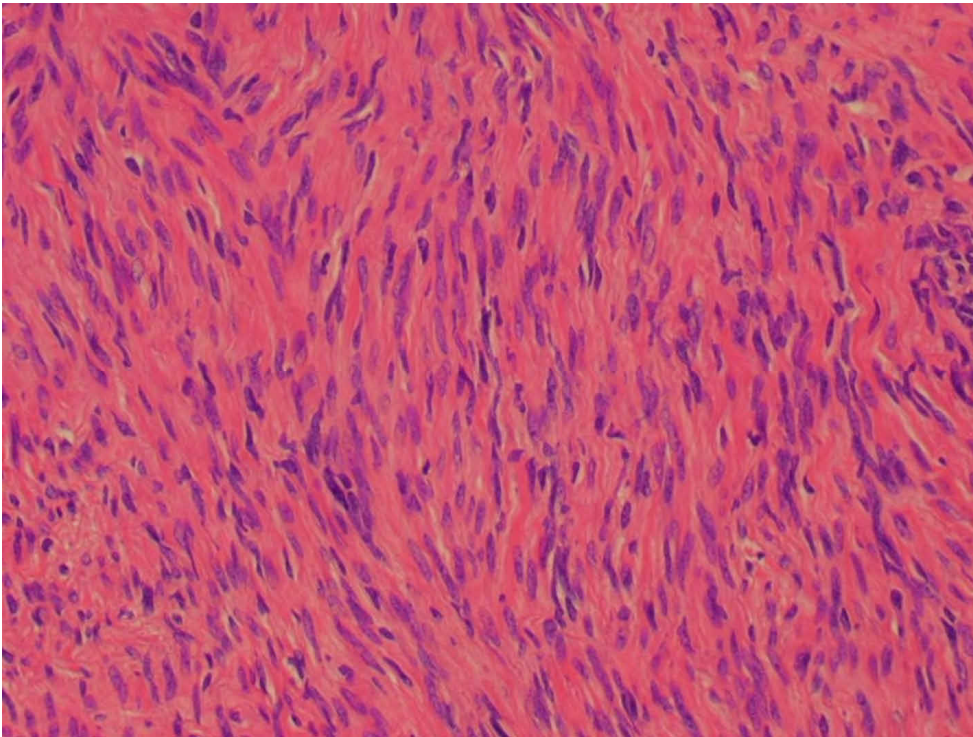


**Figure 3.** Follow-up contrast enhanced CT demonstrates slight interval enlargement of enhancing lobulated right renal mass.

## Benign Renal Schwannoma



**Figure 4.** Hemisected nephrectomy specimen reveals a yellow-tan lobulated intrarenal mass, similar to the appearance suggested by CT.



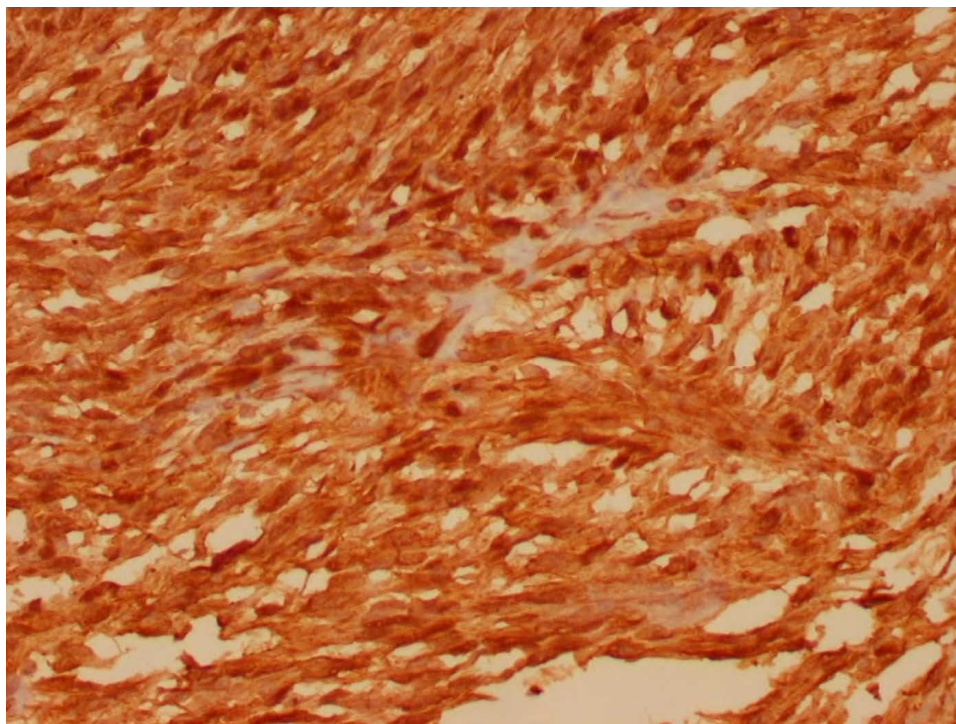
**Figure 5.** Hematoxylin and eosin stained tissue sections of the tumor demonstrate spindle cells in a palisading arrangement consistent with Antoni A pattern of a schwannoma (100x).

mors is the renal parenchyma (similar to our patient), followed by the renal pelvis and capsule. Patient presentation generally includes nonspecific symptoms such as malaise, weight loss, fever, and abdominal or flank pain. In many patients with renal schwannoma, a palpable abdominal mass is noted upon physical examination, and rarely, hematuria is noted. The incidental finding of a renal schwannoma, as seen in this patient, has been reported occasion-

ally in the literature. These tumors are frequently found in middle-aged individuals with a female predominance similar to our patient.

Renal schwannomas are solitary, well-circumscribed, rounded masses with occasional lobulation. In a series of four patients, the mean diameter has been reported as 9.7 cm (range 4 to 16 cm), and the masses varied in color from tan to yellow (3). Our patient had similar pathologic find-

## Benign Renal Schwannoma



**Figure 6.** Photomicrograph shows tumor cells are diffusely immunoreactive for S-100 protein. (100x).

ings. Microscopically, a renal schwannoma is composed of spindle cells arranged in a palisading pattern (Antoni A) and/or loosely arranged cells (Antoni B pattern). Tumor cells are immunohistochemically reactive with S-100 protein (3). The literature is limited due to variable follow-up data; however, benign renal schwannomas including cellular variants show no significant disease recurrence (3).

While rare, renal schwannoma should be considered in the differential of a lobulated, well-defined, hypoechoic, enhancing renal mass that shows slow growth or stability. Prospectively, the differential diagnosis of this mass was lymphoma, atypical renal carcinoma and collecting duct carcinoma. However, the lack of progression without treatment made lymphoma unlikely, so pathologic diagnosis was sought.

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