



Oncology

Renal schwannoma: A case report and literature review of a rare and benign entity mimicking an invasive renal neoplasm

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ABSTRACT

Schwannomas of the kidney are rare with only a handful of cases reported in literature. We present a case of a large Schwannoma of the right kidney causing mass effect with imaging characteristics thought to represent renal cell carcinoma. On imaging, these masses present similarly to solid renal masses and are therefore indistinguishable without tissue diagnosis. Thus, surgical resection is the definitive treatment for renal schwannomas.

Introduction

Schwannomas are commonly benign tumors that develop from Schwann cells within the sheaths of peripheral nerves. They frequently originate in the head, neck and extremities. Despite reports that up to 3% of schwannomas originate in the retroperitoneum, involvement of the kidney is extremely rare.¹ Most often, renal schwannomas are diagnosed during pathologic examination, as patients present with inconsistent, vague symptoms and no specific findings on imaging studies to differentiate from more common renal neoplasms.

Case presentation

We present a 47 year-old male that presented with right flank pain in the absence of gross hematuria. He underwent a CT abdomen/pelvis due to suspicion for an obstructing ureteral stone. He was found to have an obstructing punctate right ureterovesical junction stone with mild hydronephrosis, but more notably a 12cm right renal mass concerning for a primary renal neoplasm was incidentally discovered. (Fig. 1).

Renal function was within normal limits. He was managed with medical expulsive therapy for the ureteral stone and referred to a tertiary care center for further work-up of the right renal mass. Radiographically, the mass was centrally located and possibly invading or originating from the renal collecting system. A CT-urogram was performed, which was significant for the enhancing large right renal mass with no filling defect of the renal pelvis, thus decreasing the likelihood of

urothelial cell carcinoma. A urine cytology was also found to be negative for urothelial carcinoma. There was no tumor thrombus noted, but there was mass effect on the renal hilum (Fig. 2).

Staging nuclear medicine bone scan and CT thorax were negative for evidence of metastatic disease. He ultimately underwent biopsy of the right renal mass with pathology significant for spindle cells. Of note, patient had no known family history of renal masses or kidney cancer.

Due to the radiographic findings of a large, centralized, and enhancing renal mass, the patient elected to proceed with robotic-assisted laparoscopic right radical nephrectomy due to concern for an invasive malignant renal neoplasm. Intra-operatively, the mass appeared firm and grossly infiltrative with significant parasitic vessels. There were no intra-operative complications and the patient had an uneventful post-operative course. The final pathology of the right nephrectomy specimen was consistent with schwannoma and one lymph node free of tumor.

Discussion

Renal schwannomas are exceedingly rare, with approximately 30 cases reported in literature.¹ As a result, they are often misdiagnosed as a renal carcinoma and removed surgically with either a partial or complete nephrectomy; often, only after pathologic examination are they identified as schwannoma. While schwannomas are most frequently benign, there are reports of malignant degeneration presented within the literature.

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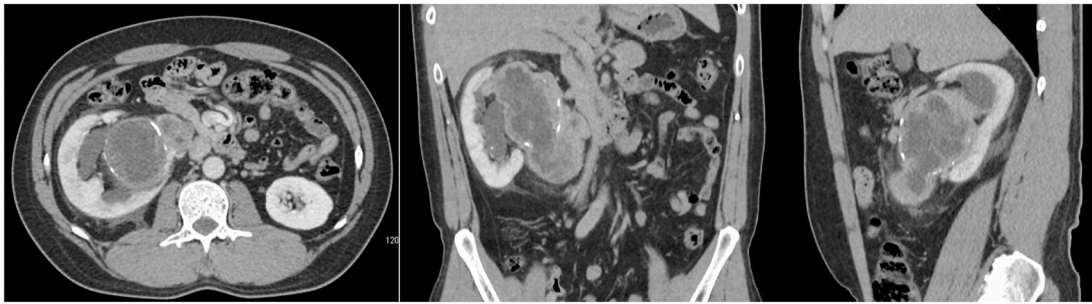


Fig. 1. Representative CT imaging of right renal mass. (A) Axial, (B) Coronal, (C) Sagittal.

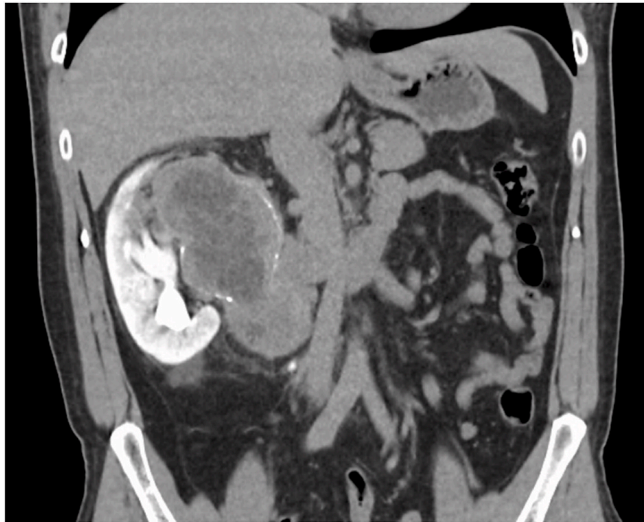


Fig. 2. CT Urogram coronal image showing no involvement of collecting system.

Most renal schwannomas are slow growing and asymptomatic. Patients generally present with vague, nonspecific symptoms leading to diagnosis incidentally. The most common presenting symptom is flank and/or abdominal pain, followed by hematuria. Patients vary in age at diagnosis (14–89 years) with a median in the 5th decade of life, and additionally a female predominance.^{2,3}

Renal schwannomas have been reported to originate in the hilar region (44% of patients), renal parenchyma (31%), both the hilum and parenchyma, or the renal capsule.¹ This distribution is thought to be related to the presence of parasympathetic nerve cells that enter the

kidney through the renal artery, although this does not obviate its presentation inside the renal parenchyma. Histologically, schwannomas are comprised of two different cell patterns Antoni A and Antoni B. Antoni A, which is a compact arrangement of spindle cells with palisading nuclei surrounding pink regions (Verocay bodies). Antoni B being a loose, hypocellular pattern with myxoid change. All cases of renal schwannomas are strongly positive for S100 immunostaining, as demonstrated in this case (Fig. 3).³

Renal schwannomas present a diagnostic challenge, as they cannot easily be distinguished from other renal masses based on radiographic imaging alone. More specific MRI characteristics have often been described as isointense on T1-weighted images and hyperintense on T2-weighted images, in addition to gadolinium-enhanced T1-weighted images demonstrating strong homogeneous enhancement in the solid part of the tumor. However, these specific findings are inconclusive.^{2,3}

Surgical resection is the definitive treatment for renal schwannomas. Given the low incidence and limited distinguishing factors on radiographic imaging, renal schwannomas are commonly excised under the guise of renal carcinoma, and later reclassified upon histologic examination. While certain features on MRI are more suggestive of renal schwannomas, there is no current way to distinguish between a benign or malignant lesion. As a result, surgical resection remains the preferred treatment modality.

Conclusion

This case report presents a rare, but known process arising within the kidney. In our case, given the large, and invasive appearing features both radiographically and intra-operatively, we felt that this may represent an atypical renal neoplasm such as a sarcoma, though on final pathology this represented a benign schwannoma.

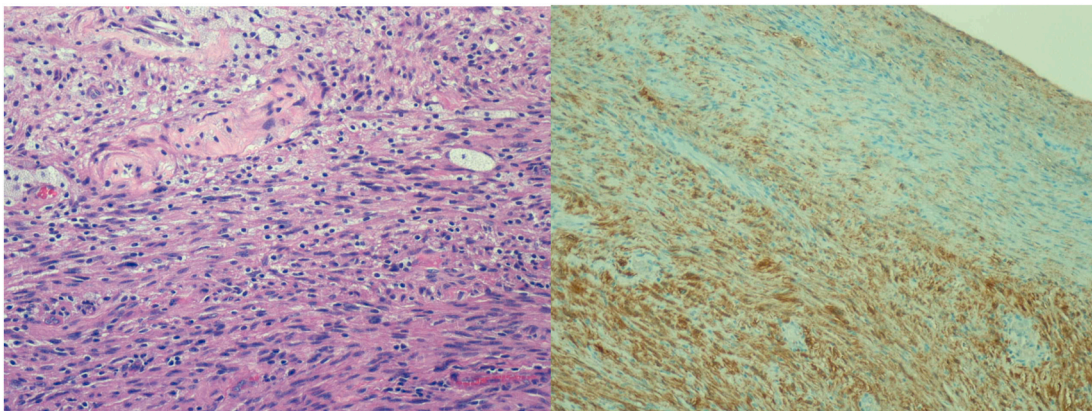


Fig. 3. Final pathology slide of nephrectomy specimen. (A) 200× showing bland spindle cells (B) S100 positive stain at 200×

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Declaration of competing interest

None.

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