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Some Renal Masses Did Not "Read the Book": A Case of a High Grade Hybrid Renal Tumor Masquerading as a Renal Cyst on Non-contrast Imaging

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ABSTRACT

Hybrid renal tumors (HRT) are rare neoplasms that contain both benign and malignant components. Sporadic solitary HRT that contain high-grade malignant pathology appear to be extremely rare [1]. We describe a case at our institution of a tumor that was characterized as a type-2 papillary RCC and atypical oncocytoma hybrid that mimicked a simple cyst on non-contrast computed tomography.

Introduction

The incidence of HRT ranges between 1–17% at surgical extirpation.[1–3] Risk of harboring malignant pathology adjacent to a benign tumor component has significant implications for critical decision-making that surrounds percutaneous renal mass biopsy (RMB).[4] Here we present a case of a collision tumor that contained components of type-2 papillary RCC and an atypical oncocytoma. Moreover, on non-contrast computed tomography, the lesion masqueraded as a Bosniak I renal cyst.

Case presentation

A 73-year-old male with history of stable stage 3 chronic kidney disease was referred to our center for evaluation of a right renal mass. The patient was found to have a 3.1 cm enhancing exophytic solid renal mass (R.E.N.A.L. Nephrometry Score $1+1+1+x+2=5x$) (Fig. 1) on an MRI that was obtained during a work-up of gross hematuria. The patient elected to proceed with a short period of active surveillance and a restaging non-contrast CT of the chest/abdomen/pelvis was obtained to establish tumor growth kinetics. On non-contrast CT, the tumor exhibited attenuation of <5 Hounsfield Units (HU), a finding most consistent with a Bosniak I renal cyst (Fig. 2). The patient elected for transperitoneal robotic partial nephrectomy. Final pathology demonstrated a predominantly oncocytic neoplasm consistent with atypical oncocytoma that contained a microscopic focus of type-2 papillary renal cell carcinoma (Fig. 3).

Discussion

HRTs composed of both benign renal oncoctyoma (RO) and RCC pathology are rare (~5%) in patients without hereditary syndromes who present with solitary sporadic renal masses.[1–3] In a recent report from our institution, which included nearly 150 benign renal masses, none contained coexisting high-grade tumor components.[1] Nonetheless, reports of high-grade malignant pathology in an HRT do exist.[5] Yet, to our knowledge, there has only been one previous report of a hybrid tumor containing a component of papillary RCC.[6] Furthermore, to our knowledge, this is the first published report of an HRT masquerading as a simple renal cyst on non-contrast imaging. Renal incidentalomas are frequently discovered on CT. Indeed, unenhanced CT is increasingly utilized in the diagnosis of a variety of ailments. The finding of a renal lesion on such imaging poses a specific challenge, as contrast is unavailable to elucidate a lesion's vascularity or internal architecture.[7] Several guidelines

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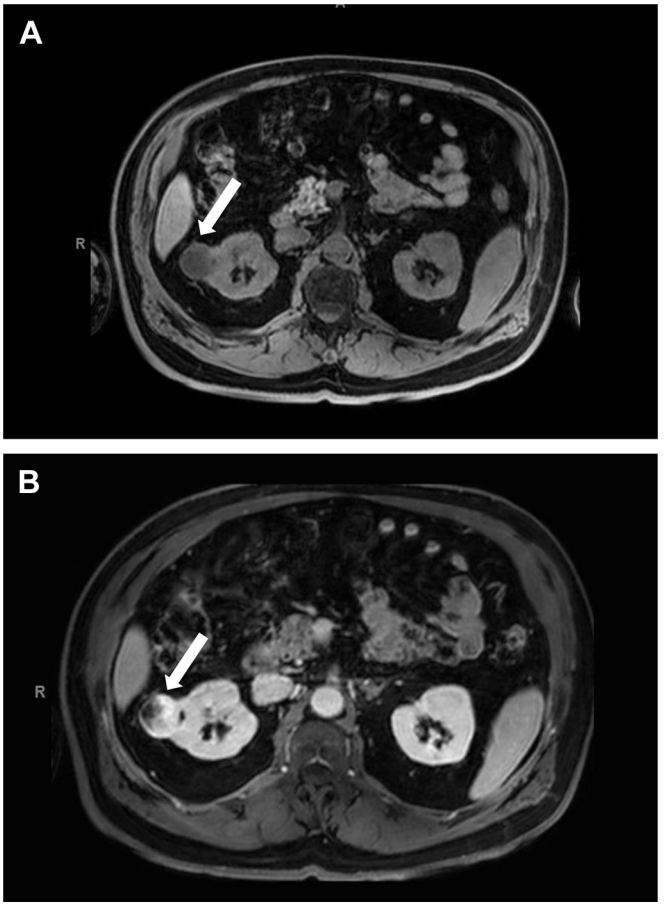

Figure 1. Axial T1-weighted pre-contrast (A, left) and post-contrast (B, right) MR image at initial presentation. Right renal mass measured 3.1 × 2.4 × 2.4 cm and its anatomic complexity was characterized by an R.E.N.A.L. Nephrometry Score of 1 + 1 + 1 + x + 2 = 5x (arrow).

have been proposed regarding which lesions identified on non-contrast imaging require further evaluation. O'Connor and colleagues used an indeterminate range of 20-70 HU to predict malignant pathology within renal lesions with 100% sensitivity and 89.4% specificity.[8] Importantly, a validation study confirmed that no malignant lesions in a series of 193 renal masses exhibited HU <20 on unenhanced CT.[7] Nevertheless, heterogeneity of attenuation

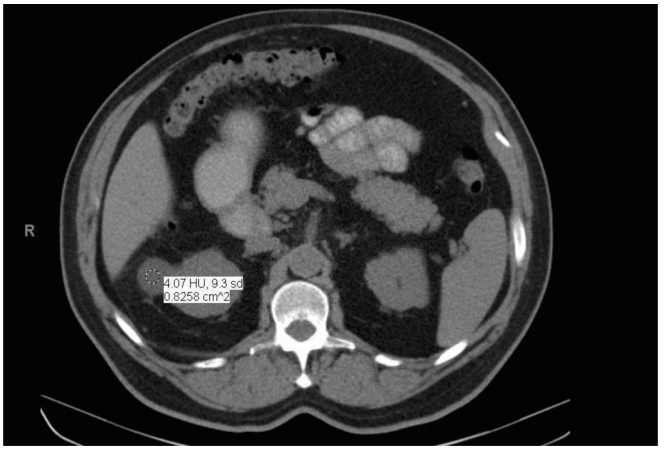

Figure 2. On non-contrast CT image the tumor masqueraded as a Bosniak I renal cyst.

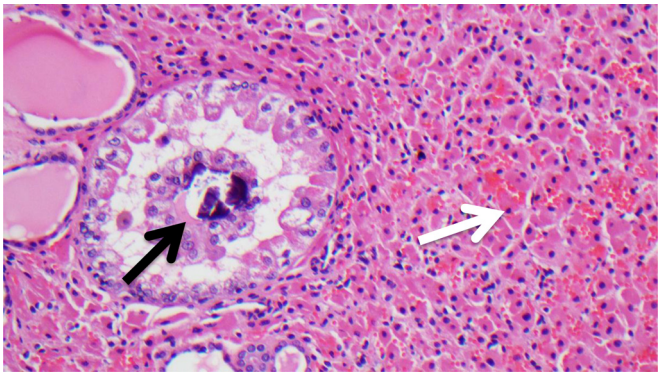

Figure 3. Tumor histopathology demonstrating an oncocytic neoplasm, favored to be an atypical oncocytoma with abundant eosinophilic granular cytoplasm and small nuclei (white arrow) with concomitant components of Type-2 papillary renal cell carcinoma with large nuclei, prominent nucleoli, and a psammoma body (black arrow).

within renal masses exists, and pre and post-contrast imaging should be undertaken for masses with focal areas of indeterminate attenuation on non-contrast CT even if the majority of the tumor is <20 HU.[7] Indeed, on careful analysis of pre-contrast CT imaging for our patient's lesion, areas of attenuation between 20–70 HU were present. As such, this case underscores that careful assessment of attenuation of the entire lesion on non-contrast CT imaging is important for accurate characterization.

Conclusions

Hybrid renal tumors are rarely occurring neoplasms composed of both benign renal oncocytic features and RCC pathology. However infrequent, the existence of high-grade, malignant RCC pathology in HRT appears to be a clinical reality. We report the first case of an HRT with a type-2 papillary RCC component that masqueraded as a simple renal cyst on unenhanced CT. Steadfast consideration to the attenuation of the entire mass is thus critical in determining risk of malignancy for renal lesions identified on unenhanced CT.

Conflicts of interest

None of the authors of this manuscript reported any conflicts of interest.

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