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CASE REPORT

Laparoscopic Partial Nephrectomy Revealed a Collision Tumor Composed of Renal Papillary Cell Cancer and Oncocytoma: A Case Report

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Abstract

Diagnosing symptomatic or incidental renal masses increased with the advances in technology. Renal cell carcinoma (RCC) is the most common type of kidney cancer. Papillary RCC is the second most subtype of RCC. Renal oncocytoma is a benign epithelial tumor of kidney and is the second most common benign tumor after angiomyolipoma. Hybrid tumors of oncocytoma and chromophobe RCC are known in the literature. However, primary renal collision tumors are rare neoplasms those composed of two different cell lineages. We present a rare entity as a case report which is oncocytoma with renal papillary cell cancer Type 1.

Keywords: Collision tumor; laparoscopic partial nephrectomy; oncocytoma; papillary renal cell cancer; renal cancer.

Renal cell carcinoma (RCC) is the most frequent type of kidney cancer that is generally diagnosed at the age of 55–60 years[1]. Papiller type RCC (PRCC) is the second most subtype of RCC, containing 11–18.5% of all RCCs. PRCC originates from proximal renal tubular epithelial cells. It happens over a wide age range, from 30 to 80 years, and is connected with multifocality contrasted and other dangerous renal tumor subtypes[2]. PRCC is partitioned into Types 1 and 2, with Type 1 having a superior survival in the long-term. PRCC generally shows trisomy organs of chromosomes 7 and 17 and loss of chromosome Y[3]. Immunohistochemical studies helpful in the diagnosis of this tumor include cytokeratin 7 (CK7; diffuselypositive in the majority of Type 1 PRCCs) and alphamethylacyl-CoA racemase (AMACR) (diffuse granularcytoplasmic positivity)[4].

Oncocytomas comprise 3–7% of renal tumors[5]. Most happen across a broad age range and present asymptomatically. These tumors seem to begin from collecting duct intercalated cells[6]. Cytogenetic abnormalities include loss of chromosomes 1 and Y,23,26 and later information shows that these tumors may also harbor translocations between chromosomes 6 and 9[7].

Collision tumors are coexistent tumors that contain two different but adjacent neoplasm. Hybrid tumors of oncocytoma and chromophobe RCC are known and common in literature, both are originated from intercalated cells of collecting ducts[8]. Collision tumors consisting of neoplasms from multiple cell lines, such as oncocytoma and papillary

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RCC, are however, highly rare[9]. We present a 57 years of male patient who is diagnosed with incidental renal mass and pathologic study resulted as oncocytoma (95%) and renal papillary cell carcinoma Type 1 (5%).

Case Report

A 57-year-old man has incidentally diagnosed with the right renal lower pole mass as 63×55×50 mm by ultrasonography. In abdominal magnetic resonance imaging (MRI), there were multiple gallbladder calculus, the biggest is <5 mm and right renal mass (48×38×45 mm) with irregular microlobulated contours and contrast-enhancement (Fig. 1). There was extension to the perirenal fatty tissues. RCC was the radiologist's diagnosis. There was no sign of metastasis, invasion, or lymph node in the image. The left kidney was in normal appearance. His physical examination was non-remarkable. In the past medical history, he has hypertension and obesity. He was smoker (10 package/year). In laboratory examination, creatinine level was 0.85 mg/dL, urine culture was sterile, and urine analysis was normal. With USG and MRI findings, patient underwent right laparoscopic partial nephrectomy due to suspicion of RCC. Pathology of specimen resulted as oncocytoma (95%) and renal papillary cell carcinoma (5%) Type 1 (collision tumor). Tumor volume was 5.5×4.5×4 cm and appearance was cream-coffee colored. Bottom parenchyma thickness was between 3 mm and 9 mm. The tumor capsule was stained with green. Surgical margins were negative. In immunohistochemical study, CK7 and Vimentin staining is observed in tubular component between oncocytic lobules; however, there was no staining in the tumor. Staining with CD117 is observed in the tumor. The papillary component of the tumor was Fuhrman Grade I. Because of the papillary component amount of the tumor was %5, it was interpreted as T0 by the pathologist. Pathologist noted that the main tumor was oncocytoma and there was common tubular structures of renal papillary cell carcinoma which divides oncocytoma to the lobules (Fig. 2). In the literature, oncocytoma with renal papillary cell carcinoma is a rare entity, only seen in case reports.

There were no complications in the post-operative period. Urinary catheter was removed on the post-operative 1st day and the drain removed on the 2nd post-operative day. The patient was discharged on the 3rd day.

Discussion

In the kidney, collision tumors are known; however, they were generally composed of oncocytoma and chromophobe RCC (ChRCC)[8]. Mixed renal tumors other than ChRCC are rare, especially combination of oncocytoma and PRCC is extremely rare[9]. Cell lineages of oncocytoma and PRCC are different, PRCC originates from proximal or distal convoluted tubule; however, oncocytoma originates from distal nephron, probably from epithelium of the collecting tubules[10]. Given the possibility that oncocytomas can harbor other tumors, careful inspection of the samples is recommended, particularly in large oncocytomas, to rule out the existence of associated malignant neoplasms, which may have a significantly worse prognosis than oncocytoma. Since the prognosis of the two histotypes changes critically, differential diagnosis is needed. Sporadic oncocytomas are benign lesions with good prognosis, they do not recur after surgical removal, lifespan of affected people is usually not impacted by the tumor[11]. PRCC is a malignant tumor whose prognosis depends on histomorphology (mitosis, necrosis, etc), the stage, surgical respectability of the tumor, the age, and comorbidities of the patient[12].

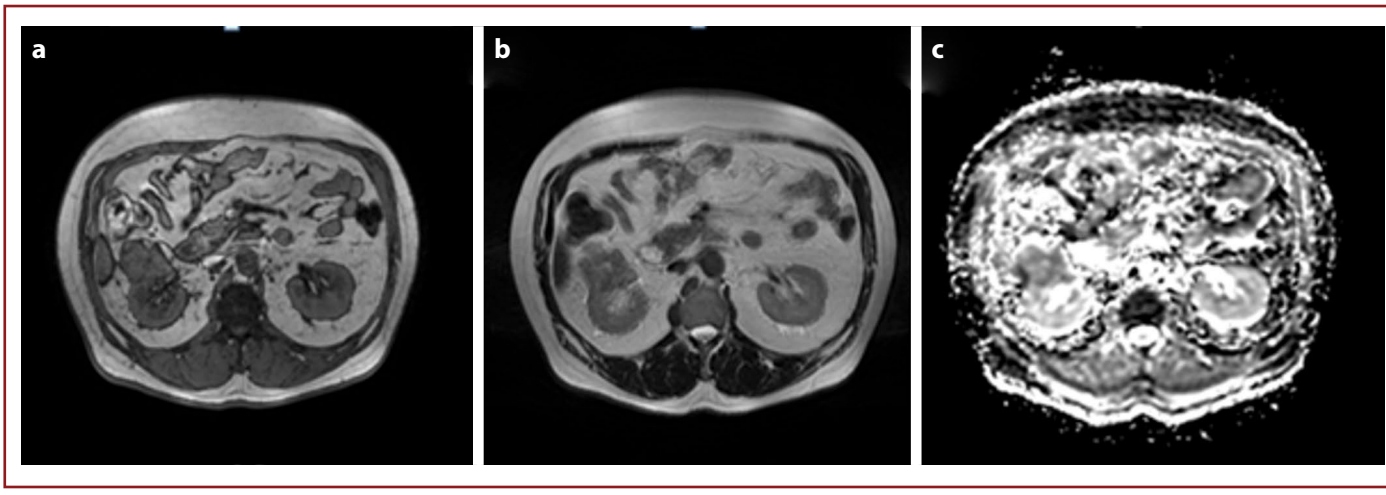

Figure 1. (a) Dynamic Contrast Enhanced, Cross-Sectional, **(b)** T2 Cross-Sectional, **(c)** Diffusion Weighted, Cross-Sectional.

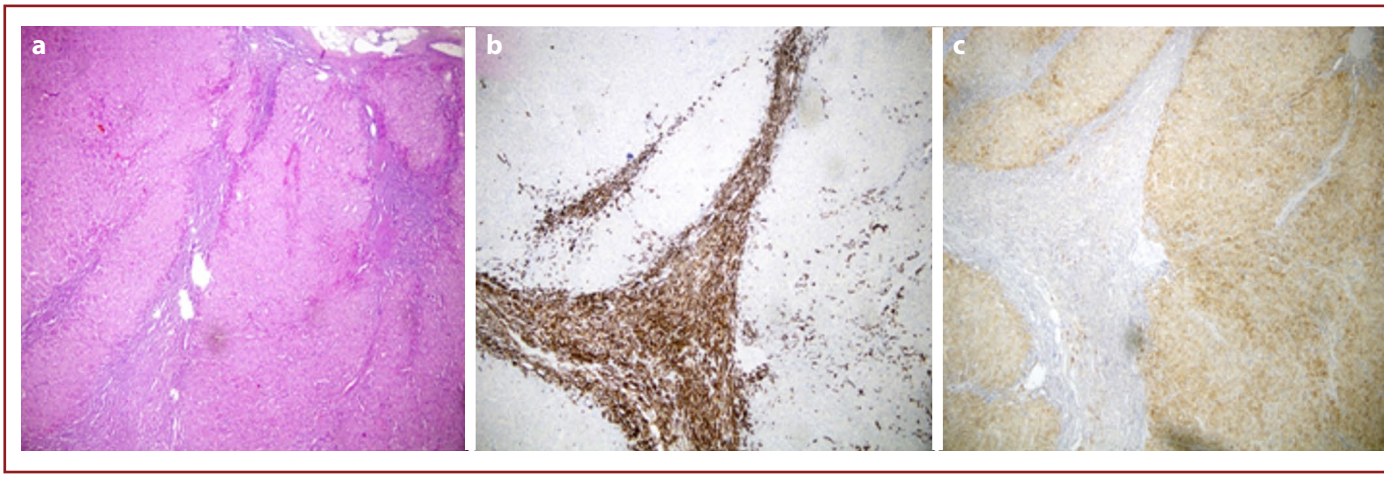

Figure 2. (a) Tubulopapillary tumor proliferation between tumor islands showing oncocytic features H and E ×40. **(b)** While the oncostioma does not show CK7 expression, the presence of diffuse strong expression in the intervening tubulopapillary tumor. IHK. CK7 ×40. **(c)** Positive cytoplasmic staining was observed with CD117 in the oncocytoma. No expression was observed in papillary carcinoma. IHK. CD117 ×40.

Although associated malign neoplasm with oncocytoma is rare, it may affect the prognosis of the disease.

Several locations, such as lungs, gastrointestinal tract, genitourinary tract, meninges, lymph nodes, and adrenal glands, have documented collision tumors[13]. In the kidney, collision tumors have previously been described and they mostly have included oncocytoma and chromophobe RCC[14]. However, only rare cases, including PRCC andoncocytoma, of a collision tumor, have been identified. All of them, confirmed by immunohistochemistry, had a smaller papillary RCC portion present inside, admixed, or adjacent to a greater oncocytoma. A smaller portion of low nuclear papillary RCC, Type 1 adjacent to a larger oncocytoma component, has also been found in our case. Cytokeratin 7 (CK7; diffusely positive in the majority of Type 1 PRCCs), vimentin (positive in Type 1 PRCCs), and CD117 (positive in oncocytomas) confirmed by immunohistochemical analyses.

In the literature, only eight cases are described[9]. Notably, however, several of these papillary lesions measured <1.5 cm, which might qualify for classification as papillary adenomas in the updated WHO Classification, depending on grade and encapsulation[15]. The presence of trisomy of chromosomes 7 and 17, although found in more than half of cases, was not uniform in the papillary lesions, possibly influenced by several factors, including the difficulty of assessing a sufficient number of neoplastic cells in small papillary adenomas with FISH, and possibly a lower rate of this alteration in early adenomas compared to larger fully developed RCCs[16]. When a renal tumor has a mixed morphology of papillary neoplasm and other histology, it is recommended that pathologists carefully evaluate the morphological and immunohistochemistry characteristics especially cytokeratin 7, AMACR, KIT, and vimentin for oncocytoma and chromophobe RCC) that can often support the diagnosis of a collision phenomenon.

Conclusions

We presented a 57-year-old man who underwent right partial nephrectomy for the right renal mass. Pathologic diagnosis was oncocytoma with renal papillary cell cancer Type 1 which is a very rare entity. New cases of combined oncocytoma-PRCC could provide more information for optimal treatment options. The possibility of a mixed malignant tumor should be considered while treating benign tumors such as oncocytoma, clinical, and pathologic features of this rare case were discussed for the contribution to the literature.

Informed Consent: Written informed consent was obtained from the patient for the publication of the case report and the accompanying images.

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