Case Report

Clear Cell Papillary Renal Cell Carcinoma and Capsular Leiomyoma in a Kidney: Description of a Case

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Abstract

We present the case of a middle-aged male with synchronous Clear Cell Papillary Renal Cell Carcinoma and a Capsular Leiomyoma in a kidney. The former constitutes 1% of renal neoplasms while the latter is found with a 4.2% frequency at autopsies. Analysis of both tumours focused on their histological and immunohistochemical features and similarities. Few cases of synchronous, histologically different, renal tumours have been reported and this is the first observation of a new association: a Clear Cell Papillary Renal Cell Carcinoma and a Capsular Leiomyoma.

ABBREVIATIONS

CCPRCC: Clear Cell Papillary Renal Cell Carcinoma; CT: Computed Tomography; CCRCC: Clear Cell Renal Cell Carcinoma; Ck: Cytokeratin; HMWC: High Molecular Weight Cytokeratin; AMACR: Alpha-Methylacyl-CoA Racemase; ISUP: International Society of Urological Pathology

INTRODUCTION

Primary synchronous neoplasms in one kidney are very rare, especially when the histogenesis of each is different [1]. Almost all the few available reports of associated tumours with different histologies, described two synchronous ipsilateral tumours, while only two described a triple or multiple association [2]. We present the case of two rare ipsilateral renal tumours: a Clear Cell Papillary Renal Cell Carcinoma (CCPRCC) and a Capsular Leiomyoma. To the best of our knowledge this association has not previously been reported.

CASE PRESENTATION

A 49-year-old-male with a family history of pancreatic cancer, presented for a routine abdominal ultrasound (US) scan which visualized a 35 mm hypo-anechoic mass, in the upper pole of the left kidney. There was no vascular signal at EchocolorDoppler. An abdominal pelvic computed tomography (CT) scan confirmed it was a solid exophytic mass, with regular borders, that was separate from the adrenal gland (Figure 1A). Another solid lesion, undetected at US, measuring 18 mm, was found in the lower pole parenchyma of the same kidney (Figure 2A). Both tumours had an early intense post-contrast-enhancement. CT findings led us to hypothesize a bifocal Clear Cell Renal Cell Carcinoma (CCRCC).

Two months later the patient underwent partial nephrectomy with removal of the two polar lesions. No other anti-cancer therapies were administered and 23 months after the diagnosis the patient is alive and well without signs or symptoms of recurrence. Follow-up was scheduled at 3-6-12 months and then

Figure 1 (A) - (upper pole renal tumour (arrow)); (B) - (cells arranged in intersecting fascicles (20X)); (C) - (lymphangiomyomatous component (20X)); (D) - (HMB-45 positivity (40X)).

every six months, including abdominal CT scan (Figure 3) and chest-x ray.

The two nodules were extracted separately. The mass in the upper pole was fragmented, corresponding macroscopically to a solid grayish, area. The lower pole lesion was a brownish, well-delineated nodule measuring 13x9 mm. Surgical specimens were fixed in 10% formalin, embedded in paraffin, sectioned at 4 µm and stained with hematoxylin and eosin. Immunohistochemical analysis of both tumours used commercial antibodies (Table 1), a biotin-free polymeric-horseradish peroxidase-linker antibody conjugate system (Bond Polymer Refine Detection; Leica Biosystems Ltd, New Castle, UK) and the Leica Bond III automated immunostainer (Vision Biosystems Ltd, Melbourne).

Histologically, the upper pole lesion consisted of spindle cells arranged in intersecting fascicles that were mixed with fibrous sclero-hyaline bands (Figure 1B). Focally they were arranged in a lymphangiomyomatous pattern (Figure 1C). The lesion did not infiltrate the parenchyma but its edges pushed into the peri-renal fat. With no nuclear pleomorphism, necrosis or mitosis, cells showed widespread positivity for Alpha-Smooth Muscle Actin, Desmin, Caldesmon and focal positivity for HMB-45 (Figure 1D). No immunoreactivity emerged for CD34, CD117, S-100 protein, Cytokeratin AE1/AE3 (Ck AE1/AE3), Cytokeratin 7 (Ck 7), High Molecular Weight Cytokeratin (HMWC), Alpha-methylacyl-CoA Racemase (AMACR), RCC, CD10 and MART-1. The proliferative index (Ki67) was 5%. Capsular leiomyoma was diagnosed.

The lower pole lesion was a well-delineated, roundish, mostly cystic neoplasm, with a thin external capsule consisting of parallel layers of spindle cells (Figure 2B). Inside, spindle cells stretched between cystic spaces and acini. Cystic spaces containing blood and macrophages were lined by one or two layers of flattened or cuboidal cells with clear cytoplasm. Papillae protruded focally into the cysts (Figure 2C). In the inter-cystic spaces tumour cells were arranged in tubules and acini, had a clear cytoplasm and a low nuclear grade (Fuhrman grade 1). One peculiar feature was that clear cell nuclei were oriented away from the basement membrane and towards the apical surface (Figure 2C). Clear cells had intense, widespread Ck 7 and HMWC positivity and were negative for AMACR, RCC, CD10, HMB45 and MART-1. Capsule and spindle cell stretches were focally positive for α-Smooth Muscle Actin (Figure 2D) and Caldesmon. These findings indicated a Clear Cell Papillary Renal Cell Carcinoma (CCPRCC) with smooth muscle stroma.

**DISCUSSION**

Primary synchronous tumours in the same kidney are very rare, especially when their histogenesis is different [1]. In fact, to date only nine cases have been reported, six of which were carcinoma. Mesenchymal-type tumour was reported only in 3 cases: two leiomyomas and an angiomyolipoma. None of the previous reports described a leiomyoma associated with a CCPRCC, perhaps because the latter is a new entity that the International Society of Urological Pathology (ISUP) has only recently introduced [3]. CCPRCC was originally known by several different names: “renal angiomyoadenomatous tumour” (RAT), a rare entity that was first described in 2000 [4], “clear-cell papillary RCC of the end-stage kidneys” because it had been observed in terminal disease [5], and “RCC with diffuse Ck 7 positivity” because of singular widespread reactivity to Ck 7 and negativity for the RCC antigen and CD10 [6]. In the present case, since the CCPRCC had another peculiar feature i.e. myoid differentiation in its capsule and spindle cell stretches, it should be considered as a CCPRCC with a prominent smooth muscle stroma [3,7].

Renal leiomyomas are rare [8]. Arising from smooth muscle kidney cells, they are most frequently detected in the renal capsule, followed by the renal pelvis and renal vessels [9]. The main differential diagnosis for CCPRCC with a prominent smooth muscle stroma, previously named RAT, and for leiomyoma, is with angiomyolipoma (AML). When adipose tissue is identified in AML it is easily distinguished from a CCPRCC/RAT. Furthermore, AML contains thick blood vessels and its myoid stromal cells are typically arranged perpendicular to the vessel lumen. At immunohistochemistry AML, unlike CCPRCC, shows widespread,
intense immune reactivity for HMB-45 and MART1 in epithelioid peri-vascular cells and in spindle cells.

Differentiating between a leiomyoma and an AML can be very difficult, particularly the AML leiomyomatous variant which contains only a small amount of mature adipocytes. Both tumours have similar architecture and very similar immunohistochemical profiles. One distinctive feature between these two entities is that in leiomyoma there are no adipocytes or renal tubules which are focally present in the peripheral fields of almost all leiomyomatous AMLs. Consequently, we diagnosed a leiomyoma. In the differential diagnosis we also considered angioleiomyoma, which was excluded because thick-wall vessels were absent in our lesion and, unlike angioleiomyoma, it was HMB-45 positive.

In conclusion, this is the fourth case of an epithelial neoplasm combined with a mesenchymal lesion in one kidney and it is the first to describe a leiomyoma coupled with a CCPRCC. Both tumours displayed a smooth muscle component, as the unique feature of the leiomyoma and as a minor capsular differentiation in the CCPRCC.

To date, the few cases of renal leiomyomas and the lack of correlated specific genetic mutations do not allow us to determine whether a common pathway could account for the simultaneous presence of these low-grade tumours in a kidney. Therefore, we can only state that these were two distinct neoplasms.

REFERENCES