

Aggressive co-existence: Collecting duct and clear cell carcinoma in the same kidney

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ABSTRACT

As in every organ, synchronous multiple cancers are rarely encountered in kidneys. In the literature, mostly co-existence of renal cell carcinoma and transitional cell carcinoma was reported. In the literature, the co-existence of collecting duct carcinoma and clear cell carcinoma was described only for a few cases with different patterns. With these two cases, we aimed to present a very rare entity with synchronous existence of clear cell renal cell carcinoma and collecting duct carcinoma in the same kidneys.

Keywords: Collecting duct carcinoma; clear cell renal carcinoma; synchronous.

Introduction

As is the case in every organ, synchronous multiple cancers are rarely encountered in kidneys. In the literature, mostly co-existence of renal cell carcinoma (RCC) and transitional cell carcinoma (TCC) was reported. The co-existence of different RCC subtypes in the same kidney is much rarer and there are only about 20 case reports in the literature.^[1]

The co-existence of collecting duct carcinoma (CDC) and clear cell carcinoma (ccRCC) was first reported by Auget et al.^[2] in the literature and thereafter only a few cases with different patterns were described.^[3-5]

With these two cases, we aimed to present a very rare entity which include synchronous existences of ccRCC and CDC in the same kidneys.

Case presentations

Case 1

A 54-year-old man was consulted to urology clinic with right flank pain. Physical examination and laboratory tests were normal. An ultrasonography and following computerised tomography (CT) scan revealed a 7x5x7cm solid mass in the upper pole of the right kid-

ney, without renal vein involvement. Multiple lymph nodes, having a long axis not more than 1cm were detected in the paraaortic region. In the thoracic evaluation, a 3 cm solid mass and multiple nodular opacities were detected in the lower lobe of the right lung and in the mediastinum (Figure 1).

Case 2

A 62-year-old man admitted to urology clinic for routine controls. Physical examination and laboratory tests were normal. An ultrasonography and following MRI revealed complicated renal cyst measuring nearly 5 cm (Bosniak 4) in the middle pole of the right kidney without renal vein involvement or pathological lymph nodes or metastases in the thorax (Figure 2).

Right radical nephrectomy was performed for both cases. In the first case; a complete ureterectomy and lymph node dissection could not be performed due to massive adhesions. In macroscopic examination; orange-yellow-colored ccRCCs, and greyish white CDCs were seen.

For both cases; components of collecting duct carcinoma and adjacent ccRCCs having a trabecular, glandular pattern and displaying a complex tubulocystic and intracystic papillary

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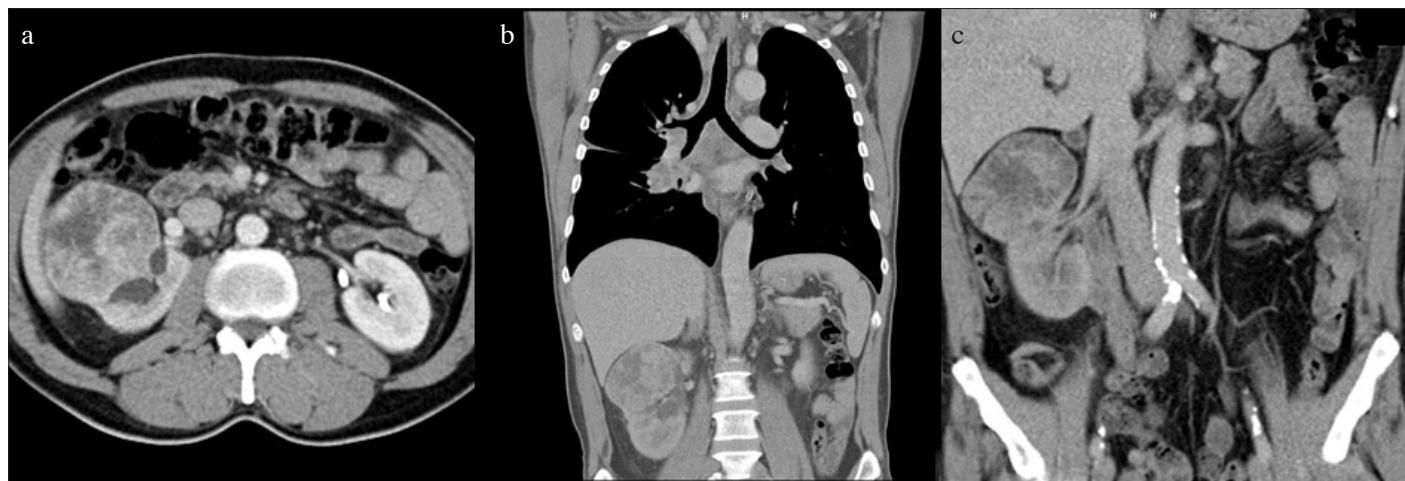


Figure 1. a-c. (a) Nephrogram phase of axial abdominal CT. Heterogeneously enhanced right kidney mass is shown. Meanwhile it can be seen that there is no contrast material in the calyceal system of the right kidney but it can be observed in left. (b) Contrast-enhanced coronal CT reveals a mass lesion that grows toward hepatorenal recess and indentation of collecting system without any sign of invasion. (c) Contrast- enhanced coronal CT, the lumen of right proximal ureter is distended with soft tissue density which indicates TCC

CT: computed tomography; TCC: transitional cell carcinoma

proliferation with high nuclear grade and necrosis, which invaded widely the renal parenchyma and enclosing adipose tissue and renal sinus coexisted.

The nuclear grades of the ccRCC were Fuhrman Grade 2 and Grade 4 for Case1, and Case 2, respectively and had a well-defined margins with the enclosing renal parenchyma. The collecting duct carcinoma exceeded the surgical resection borders and invaded the renal venous vessels, perineural and lymphovascular tissues in Case 1. In Case 2; surgical resection borders and vessels were clear except the presence of lymphovascular invasion. The immunohistochemical analysis showed that the clear cell components were pan-cytokeratin (+), EMA (+), vimentin (+), cytokeratin7 (+) and CD10 (+). The collecting duct carcinomas were pan-cytokeratin (+), vimentin (+), EMA (+), CD10 focal (+), cytokeratin 7 (+), cytokeratin 20 (-), CEA (+), p63 (-), OCT3/4 (-).

Microscopic findings of cases were shown in Figures 3 and 4, respectively. Chemotherapy was planned after the final pathology report for the first case; but general status of the patient deteriorated quickly and the patient died six weeks after the surgery. The Case 2 has been taken into routine follow up and showed no signs of metastasis in ten months period after surgery. For both cases; written informed consent was obtained from patients who participated in this study.

Discussion

Renal cell carcinomas occur in 2-3% of all adult malignancies.^[6] Seventy-five percent of the cases are clear cell, 10% are papillary

and 5% are chromophobe cell carcinomas.^[6] The appearance of synchronous tumors in the same kidney is a much rare event and occurs in 10% of all renal cell carcinomas. The most frequently detected subtype in synchronous tumors is clear cell carcinoma.^[1] The most common association is renal cell carcinoma and transitional cell carcinoma.^[1] In synchronous tumors, the prognosis is worse especially in the presence of CDC, an aggressive tumor with a high risk of distant metastases at the time of diagnosis.^[7]

There are several theories about the occurrence of synchronous tumors. Simultaneous tumors may be attributed to 2 different tumoral cell groups originating from a common anatomic region of the body; or 2 different tumor cell groups, which differentiate from one common precursor; or independently proliferating 2 different tumor cell groups.^[5] Also CDC originates from the medullary collecting system and RCC from the tubular structures. Embryonically, RCC originates from the metanephric blastema and CDC from the mesonephros.^[8] From this point of view, the synchronous existence of these two tumors is a very rare condition and there are only a few cases in the literature.^[2-5]

Collecting duct carcinoma is a very rare tumor and detected in less than 2% of all RCC cases.^[2] In the study group of Korean Cancer Group, which was one of the largest groups in the literature mostly (76%) male 35 patients with the median age of 56 years with synchronous CDC, and RCC tumors were detected.^[9]

Collecting duct carcinoma are encountered in the younger ages compared with the normal RCC population and there is a positive familial history.^[2] At the time of diagnosis, 73% of the pa-

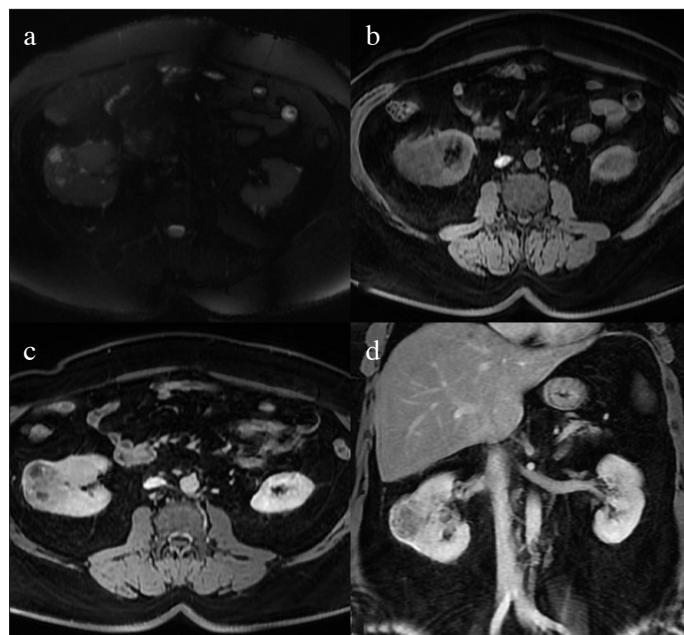


Figure 2. a-d. (a) T2-weighted axial MR image. Arrow depicts central hyperintense, peripheral isointense renal mass in the interpolar cortical region of right kidney. (b) T1-weighted fat-saturated axial MR image of same lesion with isointense signal. (c) Postcontrast T1-weighted fat-saturated axial MR image demonstrates contrast uptake of the peripheral sides of the lesion, central parts do not show contrast enhancement (cystic changes). (d) Postcontrast T1-weighted coronal MR image portrays lesion that extends from medullary region to cortical region of the right kidney

tients have symptoms like gross hematuria, pain, weakness and 75.6% are at Stage T3.^[9,10] The incidence of the distant metastasis is 32.1% at the time of diagnosis.^[11] The metastasis is encountered most frequently in the regional lymph nodes, lung, bones and liver.^[11] The 2-year survival rate after the diagnosis is 66 percent.^[12] Cytokeratin, high molecular weight cytokeratin, Ckbe12, CD10 and vimentin are expressed in CDC.^[5]

In 2003, Méjean et al.^[13] reported 30% mortality in the perioperative and early stage of the postoperative period, in their study with 10 cases. Radical nephrectomy is not a must in many patients, as there is usually distant metastasis and most of the patients have a poor preoperative performance score.

Discussions on interferon alpha (IFN-alpha), interferon-gamma (IFN-gamma) and interleukin-2 (IL-2) are still ongoing.^[11-13] Oudard et al.^[12] reported that 26% of their patients responded to the gemcitabine treatment.

Pickhardt et al.^[14] and Yoon et al.^[15] described the radiological features of CDC with 17 and 18 patients respectively. In preoperative imaging, generally, the authors noted that, these tumors

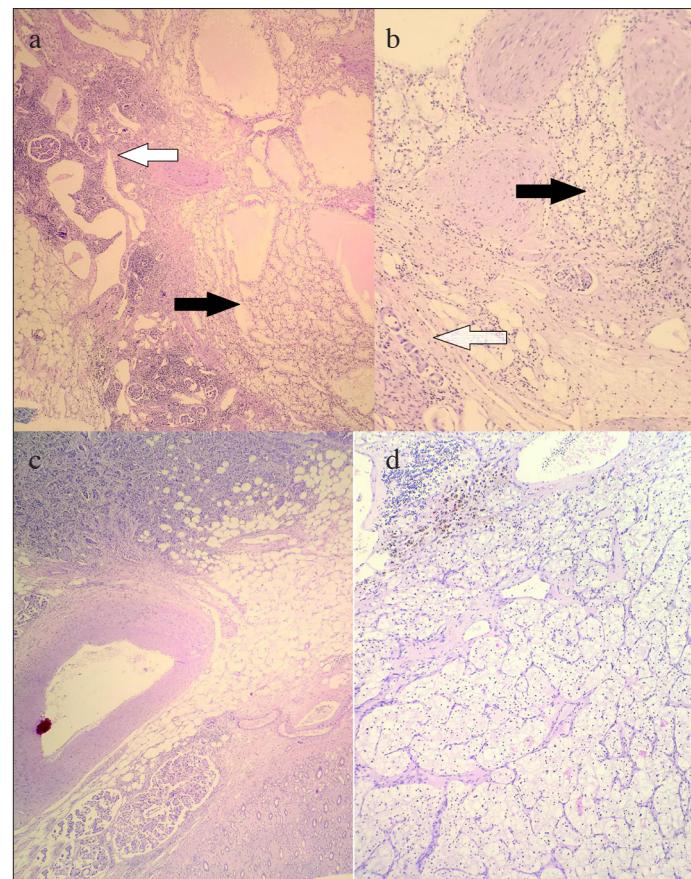


Figure 3. a-d. (a) Synchronous existence of the clear cell renal cell carcinoma with tubulocystic pattern (right) and collecting duct carcinoma mostly involving lymphatic vessels (left). Magnification: x200 (b) Synchronous existence of the clear cell renal cell carcinoma with intralymphatic collecting duct carcinoma. Magnification: x200. (c) Collecting duct carcinoma invaded widely the renal sinus adipose tissue. Magnification: x100. (d) Clear cell renal cell carcinoma component. Magnification: x100
Black arrows: Clear Cell Renal Cell Carcinoma
White arrows: Collecting Ductal Carcinoma was observed in lymphatics in the form of papillae

were found in renal medulla and a renal sinus invasion was detected in 94%, infiltrative spread in 67%, and a cystic component in 50% of the cases.

Currently, to distinguish these tumors from RCC using preoperative imaging modalities does not change our initial treatment steps (radical nephrectomy); but because these patients are candidates for developing neoadjuvant therapies, the recognition of radiological features and the ability to distinguish them from RCC preoperatively may be one of the key points of treatment in the future. In our study, both cases had cystic components and infiltrative appearance, and invasion through renal sinus may be seen on radiological imaging.

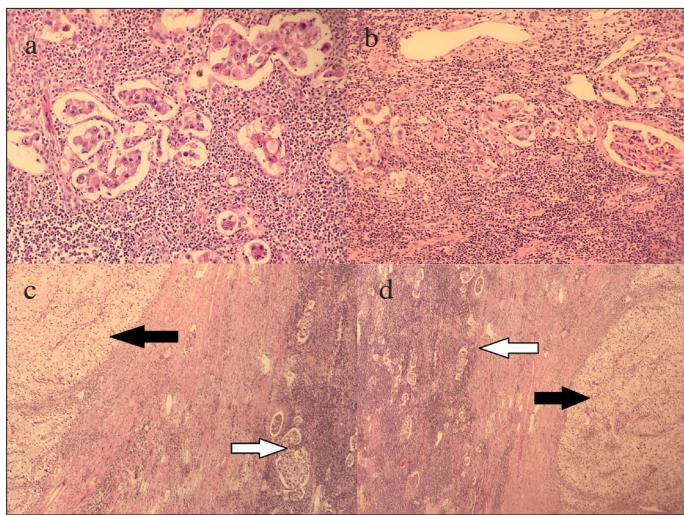


Figure 4. a-d. (a) CDC in lymph vessels at the top, ccRCC at the bottom. Magnification: x400 (b) CDC in lymph vessels and kidney parenchyma. Magnification: x400 (c) CDC in the lymph vessels and kidney parenchyma. Magnification: x100 (d) ccRCC at large magnification. Magnification: x100
Black arrows: Clear Cell Renal Cell Carcinoma
White arrows: Papillary collecting duct carcinoma was observed in lymphatics in the form of.

In conclusion, the co-existence of different RCC subtypes in the same kidney is very rare. CDC should be kept in mind in the presence of a young patient, tumor close to the medullary system and metastatic spread at the time of the diagnosis. Especially for the metastatic disease; the treatment method should be planned according to the performance status of the patient.

Informed Consent: Written informed consent was obtained from patients who participated in this case.

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