Urology Case Reports 48 (2023) 102411

Contents lists available at ScienceDirect

Urology Case Reports

journal homepage: www.elsevier.com/locate/eucr

Oncology

Rare coexistence of primary renal cell carcinoma and primary adrenal adenoma in a cushingoid patient: A case report

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ARTICLE INFO

Keywords:
Cushing's syndrome
Primary renal carcinoma
Primary adrenal adenoma

ABSTRACT

Pituitary or adrenal lesions can cause Cushing syndrome, which has an incidence of 10–15 per million people. A growing variety of tumor subtypes make up the heterogeneous illness known as renal cell carcinoma (RCC). Herein, we described a case with renal clear cell carcinoma and an adrenal adenoma. As was mentioned, it is recommended that these patients routinely have their pituitary-adrenal axis evaluated. The primary etiology of these two illnesses occurring simultaneously is extremely rare.

1. Introduction

Worldwide, there are about 400,000 new instances of renal cell carcinoma (RCC) each year. Sadly, about one-third of patients present with or acquire metastatic illness, and RCC exhibits an overall mortality of 30–40% for all patients. Men, smoking, being overweight, having high blood pressure, and having chronic renal disease are all well-known risk factors for developing RCC. Environmental risk factors have been identified, including trichloroethylene, asbestos, herbicides, pesticides, and copper sulfate exposure in the workplace, as well as environmental toxins such as arsenic contamination of water and exposure to industrial solvents.[1]

2. Case presentation

A 40-year-old patient with a past medical history for type 2 diabetes mellitus complicated by peripheral neuropathy, for which she takes metformin 750 mg once daily, and controlled hypertension, both were diagnosed before 2 months. Before 6 months, the patient started to complain of recurrent attacks of periumbilical discomfort 2–3 times daily associated with a post-prandial burning sensation as well as abdominal distention that improved partially with antispasmodics. The patient also noticed a significant weight gain of 15–20 kg during the last 4 months. She also reported easy bruisability and difficulty standing from a seated position, along with menstrual irregularities during the past 2 years. Past surgical history is positive for appendectomy and tonsillectomy. The patient denies any change in bowel habits, oral ulcers, dysphagia, odynophagia, chest pain, palpitations, dizziness, or headache. There is no history of black tarry stool, fever, skin rash, or any urinary complains.

Physical assessment revealed a patient with a plethoric moon-shaped face with a blood pressure of 143/88 mmHg, BMI of 48 kg/m2, and a waist circumference of 85 cm. Abdominal examination was unremarkable except for a diffuse stria. Laboratory evaluation was consistent with Cushing syndrome including low dose dexamethasone suppression test which was found to be high of 16 μg/dl, Aldosterone was 123 pg/ml, plasma renin activity was 0.48 ng/ml/hour, Aldosterone-renin ratio was 25.8 ng/dl/ng/ml/hour and 24-h urine cortisol collection was 937 μg/dl, DHEAS was 16.9, potassium level 3 mEq/L, metanephrines, prolactin and TSH were normal. An abdominal ultrasound showed a hyperechoic lesion measuring about 3.2 cm in the right kidney (Fig. 1).

The patient underwent a contrast-enhanced computed tomography (CT) of the abdomen, which revealed an enhancing soft tissue mass measuring 3 cm by 3 cm in the right kidney, partially exophytic, extending from the renal pelvis outside, and located in the anterolateral aspect (Fig. 2). A CT scan also revealed a focal soft tissue mass of 3 cm with high density in the right adrenal gland with non-contrast 22 Hounsfield unit, 111 at venous phase, 46 at delayed phase, and absolute washout measured about 73% which is strongly consistent with adrenal adenoma. There is also a small, fat-filled renal mass measuring 4 cm, located in the upper pole of the right kidney and compatible with angiomyolipoma. Considering the history of the patient, these findings

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https://doi.org/10.1016/j.eucr.2023.102411
Received 19 March 2023; Received in revised form 19 April 2023; Accepted 30 April 2023
Available online 1 May 2023

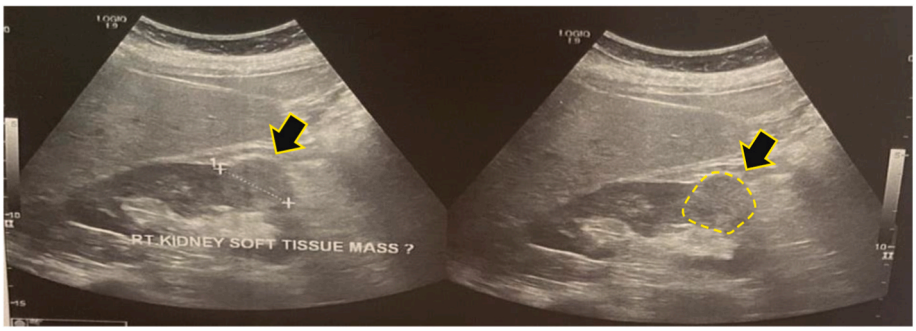

Fig. 1. Is a Renal Ultrasound showing a hyperechoic soft tissue mass measuring about 3.2 cm in the right kidney (**arrows**).

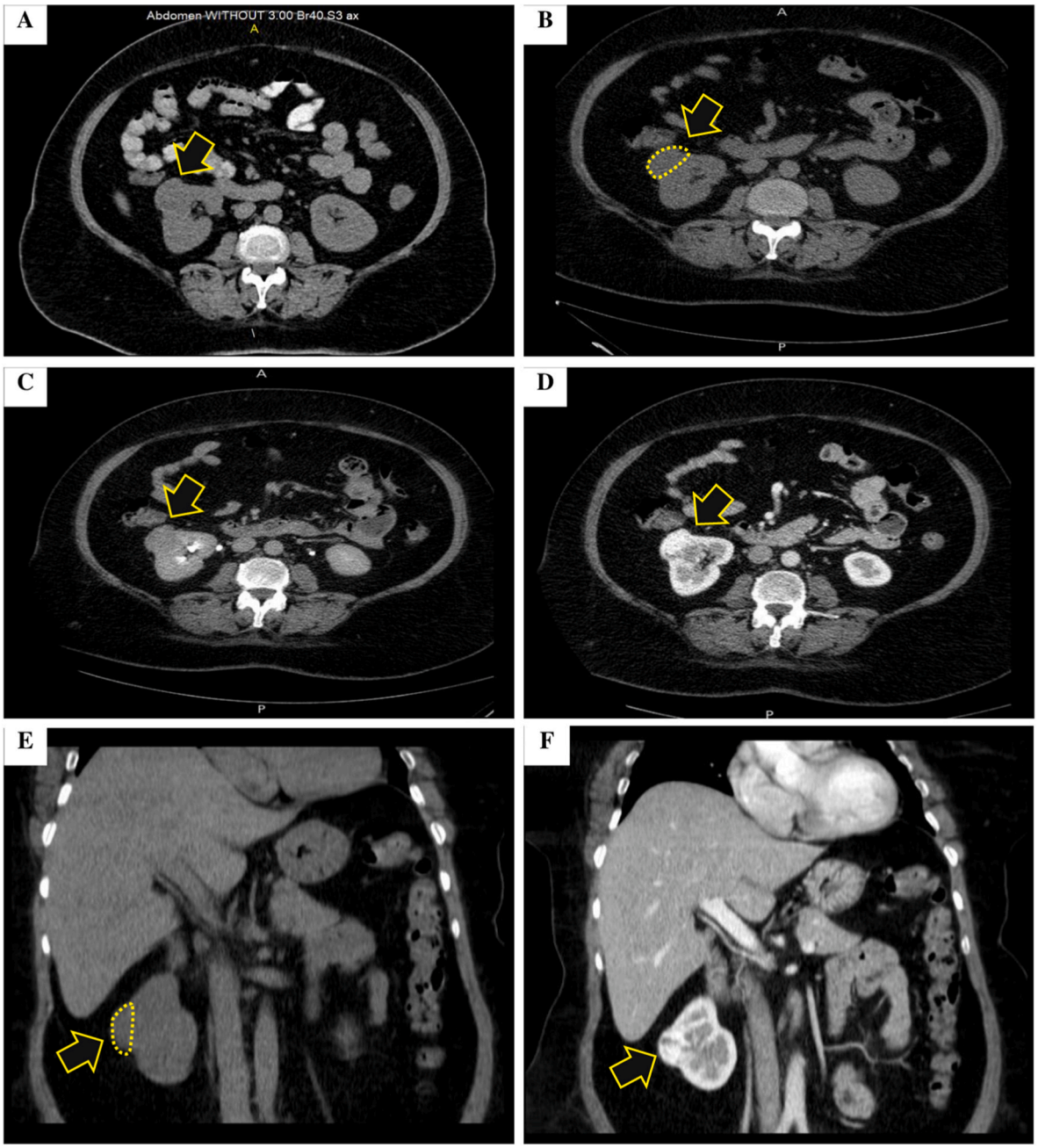

Fig. 2. (A, B, C & D) is an axial computed tomography scans with various sequences showing an enhancing soft tissue lesion measuring 3 cm × 3 cm in the right kidney, partially exophytic, extending from the renal pelvis outside, and located in the anterolateral aspect **(arrows). (E & F) is** a coronal computed tomography scans with and without contrast (A & B, respectively) demonstrating the right renal mass **(arrows).**

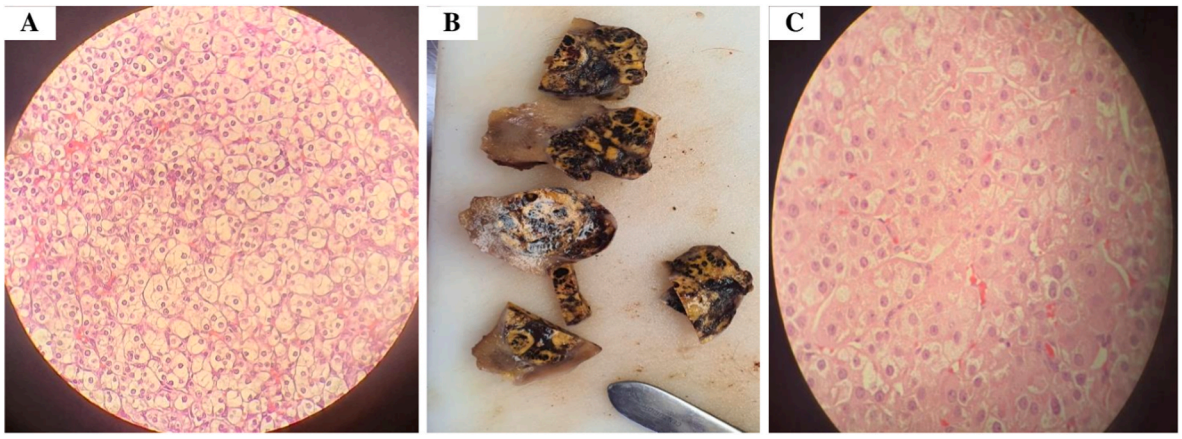

Fig. 3. (A): is a H & E stain of renal lesion biopsy consistent with primary clear cell renal carcinoma. **(B)** Is a gross image for the resected part of renal and adrenal lesions. **(C)** Is a H & E stain of adrenal lesion biopsy consistent with primary adrenal adenoma.

were suspicious for renal cell carcinoma (RCC) coexisting with Cushing syndrome. The patient received a stress dose steroid and underwent partial nephrectomy and adrenalectomy followed by tapering of the steroid. Biopsies were taken from the excised masses and sent to pathology. Histopathological assessment of the specimens revealed a primary renal cell carcinoma of clear cell type with Fuhrman nuclear grade 1 and stage of pT1aN0M0 for the first specimen and the second one showed a primary adrenal adenoma. The surgical margins were free of malignancy.

Post-operative levels of cortisol and aldosterone were normalized. As a result, the patient was diagnosed with primary renal clear cell carcinoma in the sitting of primary adrenal adenoma (Fig. 3). The patient was followed up for 6 months without any recurrence.

3. Discussion

Over the past few decades, significant technological and scientific advances have reshaped medical understanding of RCC pathogenesis and progression-driving molecularities, as well as enabled the development of crucial clinical tools for better RCC detection, evaluation, and therapeutic decision-making. RCC still ranks among the deadliest urological cancers today despite constituting only 3% of all cancer cases among adults worldwide.[2]

The long-standing and still steady increase in RCC incidence rates worldwide are attributable to the extensive integration of ultrasonography (US) and computer tomography (CT) in ordinary clinical practice. In addition, there has been a sharp decline in the RCC's initial stage at diagnosis, with the majority of RCCs now being discovered by chance as asymptomatic, confined, tiny renal masses. Conversely, advanced RCC patients continue to have poor clinical outcomes and are incurable despite significant recent advancements in systemic RCC therapeutic therapy. As a result, since the 1990s, the overall rate of RCC-specific mortality has been continuously rising (1.1%/year).[3]

The widespread and inexpensive use of ultrasonography (US) technology has led to a rise in the incidental discovery of asymptomatic kidney malignancies. B-mode ultrasound is typically used for the initial assessment of parenchymal kidney lesions because it is particularly effective at differentiating between cystic lesions and solid renal masses. The addition of color Doppler US enables the assessment of intra-tumor vascular distribution as well as the measurement of RCC major vessel invasion or the identification of the distinctive RCC tumor thrombus extension into the renal veins and/or inferior vena cava.[4]

The tumor of adrenocortical cell origin known as an adrenal cortical adenoma does not exhibit malignant morphologic characteristics. Adrenal cortical adenomas can produce or secrete steroid hormones with subclinical or overt clinical symptoms, or they might be hormonally inactive. Although some patients may have concomitant primary aldosteronism and Cushing syndrome, cortisol and aldosterone-secreting adrenal cortical adenomas are the most common functional correlates of adrenal cortical neoplasms. Adrenocortical tumors are quite common, occurring between 1% and 7% of the general population and becoming more common as people age (the majority are incidentalomas).[5]

4. Conclusion

Herein we present a case diagnosed as an adrenal adenoma accompanied by a renal clear cell carcinoma. As discussed, an assessment of the pituitary–adrenal axis should be commonly performed in these patients. It considers extreme rare to have these two conditions as primary origin together.

Patient consent

Written informed consent to publish this case and use anonymized radiologic material was obtained from the patient.

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or not-for-profit sectors.

Authorship

All authors attest that they meet the current ICMJE criteria for authorship.

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Guarantor

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Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgments

None.

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