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Contralateral Adrenal Metastasis After Renal Cell Carcinoma Treatment

Mehmet Balasar[a, c], Abdulkadir Kandemir[a], Mahmut Zahid Unlu[a], Aykut Yildirim[b], Ahmet Tekin[b]

Abstract

Renal cell carcinoma (RCC) is highly metastasizing. Metastasis may occur synchronously with the primary tumor or in various organs many years after the treatment of the primary RCC. However, isolated contralateral adrenal metastasis (CAM) following the treatment of primary RCC is quite rare. The present study is a case report of a 58-year-old female patient diagnosed with CAM who had been surgically treated 5 years earlier for primary RCC.

Keywords: Renal cell carcinoma; Contralateral adrenal metastasis; Adrenalectomy

Introduction

Renal cell carcinoma (RCC) makes up to 90-95% of kidney-originated neoplasm. RCC lacks any early warning signs, has various clinical manifestations and is resistant to ionizing radiation therapy as well as chemotherapy. In RCC, one-third of the patients are already suffering from the metastatic disease during the diagnosis and despite of efficient therapy, one-third of the cases develop metastases over time. Despite the fact that RCC can metastasize to almost every organ, the most common organs and areas of metastasis are the lungs, liver, bones, lymph nodes and mediastinum [1]. Adrenal metastases from RCC are also evident in patients who underwent nephrectomy with an incidence of 3% of solitary adrenal metastasis to the ipsilateral gland and of 0.7% to the contra lateral gland [2].

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[a]Department of Urology, Necmettin Erbakan University Meram Medical School, Konya, Turkey
[b]Department of General Surgery, Necmettin Erbakan University Meram Medical School, Konya, Turkey
[c]Corresponding Author: Mehmet Balasar, Department of Urology, Necmettin Erbakan University Meram Medical School, 42080 Akyokus, Konya, Turkey. Email: drbalasar@gmail.com

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Case Report

A mass was determined in the right kidney in the abdominal ultrasound image of a 58-year-old female patient who was referred to the emergency service with intense abdominal pain. Abdominal and pelvic computed tomography (CT) revealed in the middle pole of the right kidney a mass of 50 × 45 mm. Enhanced CT (dynamic study) with contrast material revealed a mass with necrotic areas, contoured lobules, displaying heterogeneous retention of contrast material. No pathological masses were seen in the other organs in the abdominal CT and X-ray images.

The patient with radiological and clinical RCC diagnosis underwent right flank radical nephrectomy. Tumor was of 50 × 45 mm size and tattletale gray. No adrenal tissue was seen in the specimen. Histopathological analysis made using hematoxylin and eosin stain showed nests of epithelial cells with clear cytoplasm and a distinct cell membrane, separated by a delicate branching network of vascular tissue and thus verified clear cell RCC. The pathology report of the nephrectomy specimen showed a Fuhrman grade 2 stage T1 (T1bN0M0) RCC. The patient did not undergo chemotherapy or immunotherapy during the post-operative period. During the 4 years following the surgical intervention, there were not any pathological findings in the abdominal and thorax CT images. Yet, at the fifth year, a 30 × 15 mm mass was seen in the left adrenal gland (Fig. 1). Laboratory analyses, including hormonal examina-

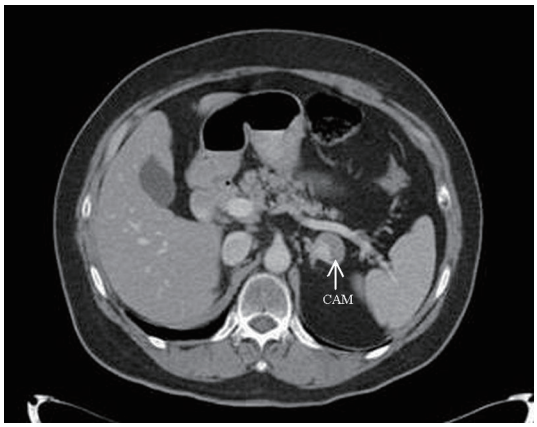

Figure 1. CT images. CAM: contralateral adrenal metastasis.

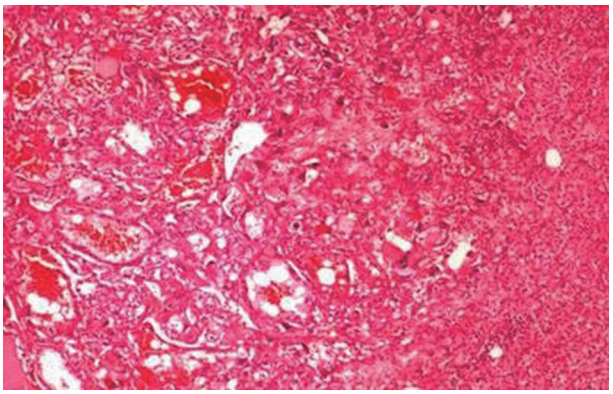

Figure 2. Typical histologic appearance of clear cell renal cell carcinoma on hematoxylin and eosin stain, showing nests of epithelial cells with clear cytoplasm and a distinct cell membrane.

tions, revealed data within normal limits. Likewise, chest CT and bone scintigraphy revealed no abnormal findings. Upon this, the patient underwent left laparoscopic adrenalectomy. The macroscopic tumor size was 30 × 15 mm and histopathology analysis enabled metastatic clear cell RCC (Fig. 2). Since the second post-operative period was also uneventful, the patient was discharged on the fourth post-operative day. As her contralateral adrenal mass was a result of systemic metastasis, she was placed on tyrosine kinase inhibitor treatment.

Discussion

Previously, RCC diagnosis was made based on the classical triad consisting of flank pain, gross hematuria, and the existence of palpable mass. In approximately half of the patients, the metastatic disease was diagnosed. However, with the existence of advanced imaging technologies such as USG, CT, and magnetic resonance (MR), the ratio of coincidentally diagnosed RCC cases varies between 15% and 60% [3, 4], with one-third of the patients suffering from the metastatic disease and despite sufficient treatment in one-third of the diagnoses cases metastases will occur [1]. Whereas the high grade of the primary tumor increases metastasis risk, the histopathological subtype (clear cell type mostly to the lungs, papillary to the lymph nodes, and chromophobe to the liver) provides a clue to which sites metastases will occur [5]. The most metastases sites are, according to their ration, the lungs (33-72%), bones (21-25%), liver (5-10%), intra-abdominal lymph nodes (3-35%), and brain (7-13%) [6, 7].

Adrenal metastases from RCC are not uncommon. It is limited with same side adrenal gland malignancy cases with only 1.2-10% [8, 9]. Adrenal invasion risk is higher in patients with upper pole tumor or vena cava metastasis (10%) [10]. Moreover, contralateral adrenal involvement in RCC is extremely rare. In an autopsy study made with > 400 RCC patients who had undergone nephrectomy, contralateral adrenal gland was the only site of metastatic involvement in only 2.5% [2]. Saitoh et al's study made in order to study the frequency of metastasis in RCC patients with a series of 1,828 autopsies revealed that solitary and synchronous CAM was seen only in 0.19% of the patients [2]. Another retrospective study made with 610 radical nephrectomy cases has shown that CAM incidence was 1.1% [11] and that all metastases to the contralateral adrenal glands were clear cell tumors. These findings confirm the importance of histological tumor analyses; papillary and chromophobic RCCs have a lower metastatic potential [12]. The tumor in the present case was papillary RCC.

Adrenal metastases most of the time do not show any anatomical and functional symptoms and patients rarely complain about signs of adrenal insufficiency. Single metastasis to the contralateral adrenal gland can lead to uncertainty as the histological status may not be clear [13]. An ideal approach to a solitary contralateral adrenal tumor diagnosis in RCC patients does not exist and differs from the management of "incidentalomas" [14]. Radiological studies may contribute to the preoperative diagnosis, yet, cannot determine definitively if an adrenal tumor in an RCC patient is a primary adrenal neoplasm, an adrenal cortical adenoma, or a metastasis [14]. In the present case, the normal metabolic screen and patient history reaching back to 5 years earlier suggested adrenal metastasis as the most likely diagnosis.

The prognosis of metastatic RCC patients is quite bad; yet, the conception of it has changed dramatically with the emergence of effective treatment method in the prevention of recurrence and metastases. Total resection of isolated metastases has enabled 35-60% increases in 5-year survival rates and lessened death risk two times [15]. RCC patients with adrenal metastasis only, resection of the adrenal gland are a curative treatment approach and during the follow-ups it was seen that 29-35% of them survived 5 years or more. Plawner has shown in his study that the 5-year survival of patients operated on for metachronous solitary RCC metastases to the contralateral adrenal gland was lower than that for patients with synchronous adrenal metastases (20% and 40%, respectively) [16]. Patients who underwent nephrectomy and resection of solitary metastases were reported to have 30% prolonged survival rates, many of them for more than 5 years.

As in the present case, laparoscopic adrenalectomy for an isolated adrenal metastasis has been accepted as minimally invasive surgery recently. Moreover, it can be performed either with a retroperitoneal or a transperitoneal approach, to minimize possible morbidity further.

Conclusion

Solitary CAM from RCC is an extremely rare clinical complication that can occur very late following radical nephrectomy. The increased use of radiological diagnostic tests like USG, CT, and MR has led to a more efficient detection of metastatic lesions. Aggressive surgery remains the single treatment option improving prognosis in some of the patients.

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