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Frontal Metastasis Revealing Clear Cell Renal Cell Carcinoma: A Case Report

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Abstract **Case Report**

Clear cell renal cell carcinoma (CCRCC) is the most common type of kidney cancer and often progresses asymptomatically, with up to one-third of patients presenting with metastases at diagnosis. We report the case of a 47-year-old man who presented with a progressively enlarging frontal mass, a first generalized tonic-clonic seizure, and a first-degree atrioventricular block. Brain imaging revealed a hypervascular osteolytic frontal lesion suggestive of a bone metastasis. Further thoraco-abdomino-pelvic CT scan showed a 12 cm right renal mass (T3a) with frontal and humeral bone metastases. Laboratory findings included normocytic anemia and a moderate inflammatory syndrome. Percutaneous renal biopsy confirmed grade 3 CCRCC (Fuhrman). The patient received multidisciplinary care including antiepileptic therapy with levetiracetam, systemic therapy with the tyrosine kinase inhibitor sunitinib, and palliative radiotherapy for metastatic bone pain. This case highlights the rare presentation of CCRCC as a frontal bone metastasis revealed by a seizure, emphasizing the need for prompt multidisciplinary evaluation in atypical presentations.

Keywords: clear cell renal cell carcinoma; frontal bone metastasis; seizure; renal mass; case report; multidisciplinary management.

INTRODUCTION

Clear cell renal cell carcinoma (CCRCC) is the most common histological type of kidney cancer, accounting for 70% to 80% of malignant kidney tumors.

Its progression is often asymptomatic, which explains why nearly one-third of patients already have metastases at the time of diagnosis. The most common sites of metastasis are the lungs, bones, liver, and brain. Bone metastases affect 20 to 35% of patients with advanced disease, but a frontal metastatic lesion revealed by a seizure remains exceptional, as cranial metastases are rarer and often asymptomatic. This atypical presentation can delay diagnosis and requires urgent multidisciplinary management.

CASE REPORT

We report the case of a 47-year-old patient with a medical history notable for a traumatic amputation of the right upper limb (1997), repair of a bilateral inguinal hernia (2023), a history of alcohol withdrawal, and active smoking estimated at 53 pack-years. The patient was admitted for a progressively enlarging frontal swelling, associated with a first-degree atrioventricular block and an inaugural generalized tonic-clonic seizure, with no prior history of epilepsy.

Clinical examination revealed a firm, painless frontal mass, with no focal neurological deficits. Brain imaging (CT/MRI) revealed a hypervascularized osteolytic frontal lesion, suggestive of a bone metastasis. A staging workup via thoraco-abdomino-pelvic CT scan revealed a right renal mass measuring 12 cm—classified as T3a according to the TNM system—associated with frontal and humeral bone metastases. Laboratory findings demonstrated normocytic anemia, preserved renal function, and a moderate inflammatory syndrome.

The histological diagnosis was established via percutaneous renal biopsy, confirming a Grade 3 Fuhrman clear cell renal cell carcinoma (ccRCC). The patient received multidisciplinary care: antiepileptic treatment with levetiracetam was initiated as a first-line measure, followed by the secondary initiation of systemic therapy with a tyrosine kinase inhibitor (sunitinib). Palliative radiotherapy was also indicated for the management of pain associated with bone metastases.

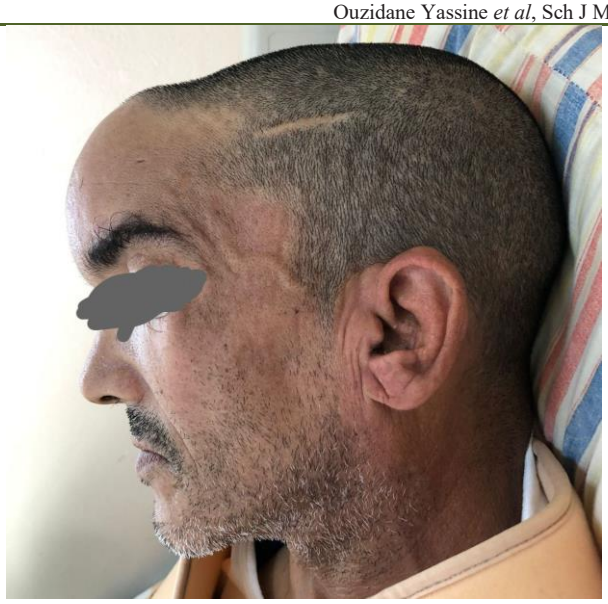

Figure 1: Clinical presentation of frontal metastasis.

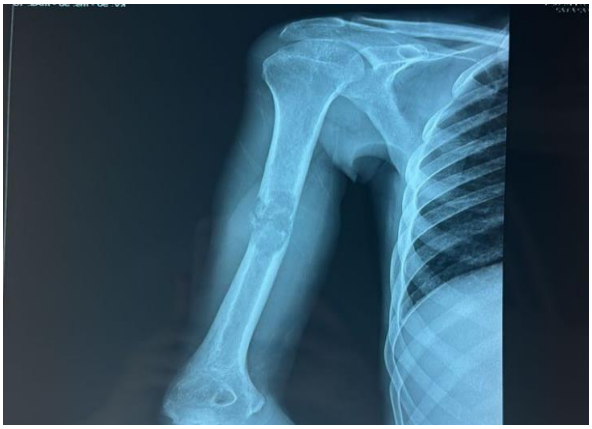

Figure 2: Standard X-ray showing a pathological fracture of the right humerus.

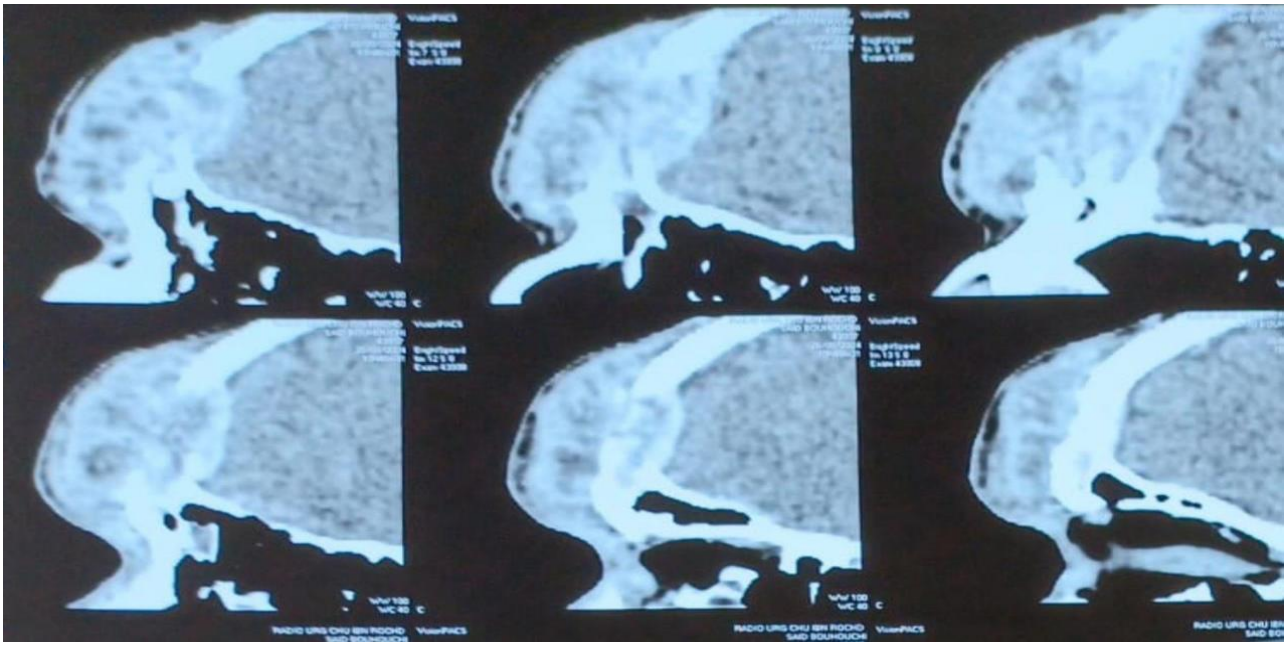

Figure 3: A brain scan showing a mass in the frontal lobe

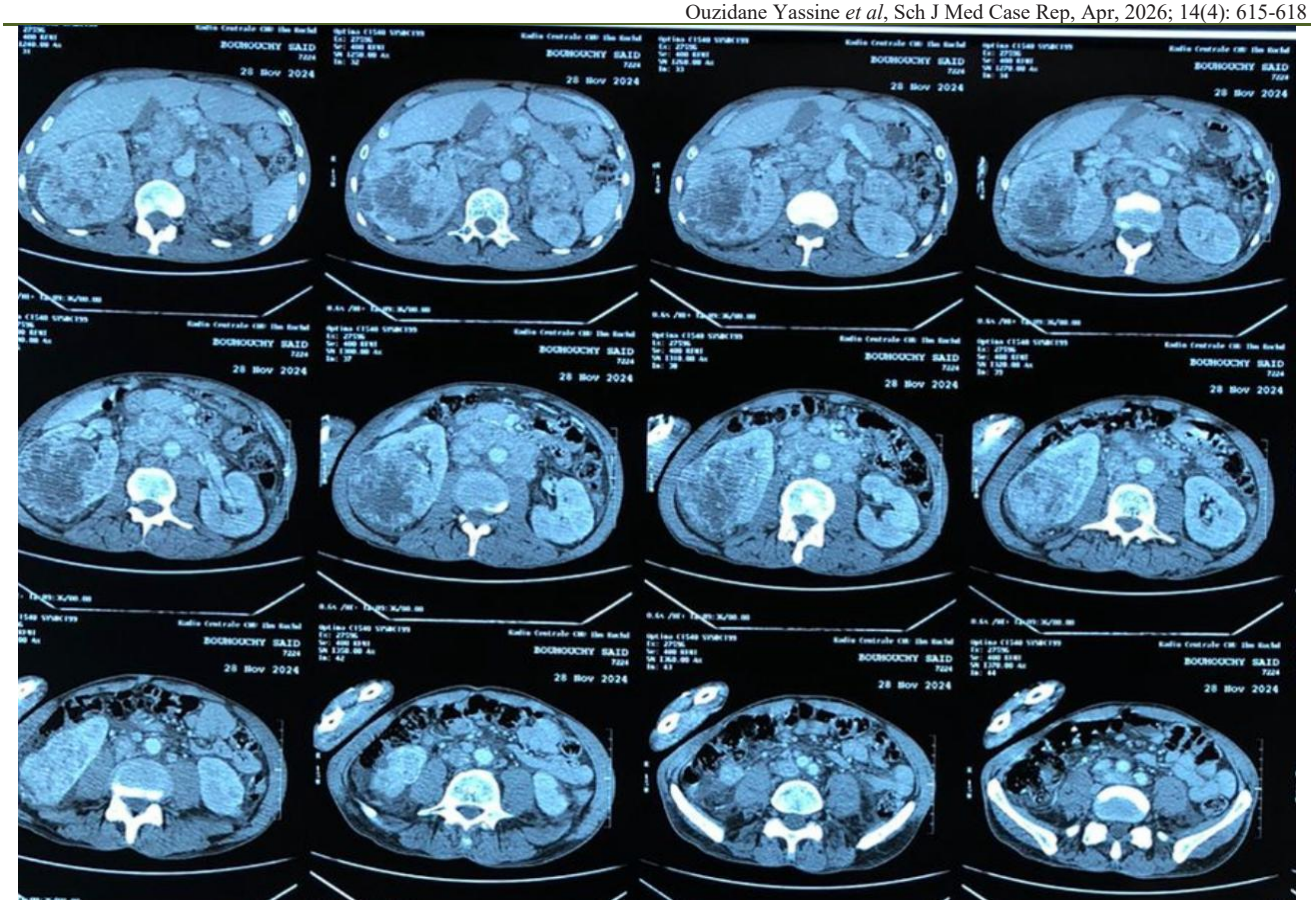

Figure 4: Abdominal and pelvic CT scan showing a locally advanced tumor in the right kidney

DISCUSION

Bone metastases from clear cell renal cell carcinoma (CCRCC) are a common manifestation of advanced disease, affecting nearly 30% of patients, as demonstrated in the Korean national cohort by Kim *et al.,*[1]. Their osteolytic behavior and hypervascularization reflect the inherently aggressive biology of SCC, mechanisms well described in the systematic review by Ratti *et al.,*[2]. Cranial metastases, however, remain rare, with an incidence of 8% to 13% according to recent data from Singh *et al.,*[4]. Their initial presentation as a seizure, as observed in our case, remains exceptional and underscores the importance of a rapid neuro-oncological diagnosis in the presence of any osteolytic cranial lesion.

From a therapeutic standpoint, patients with bone or brain metastases constitute a high-risk subgroup with a significantly poorer prognosis. According to Choi *et al.,*[3], these sites respond less well to systemic treatments. Tyrosine kinase inhibitors (TKIs), such as sunitinib administered in our case, remain a standard first-line option, although they show limited efficacy on bone metastases, which is consistent with the radiological progression observed in our patient. Data from Escudier *et al.,*[5] further confirm that TKIs improve overall survival, but that their impact on metastatic bone sites remains limited.

In our clinical situation, cytoreductive nephrectomy was not selected, in accordance with current recommendations that reserve this procedure for selected patients with limited metastatic disease or a prior good systemic response. The patient's general condition, the extent of bone metastases, and the cranial location guided the strategy toward systemic therapy combined from the outset with palliative radiotherapy to optimize symptom control. Radiotherapy remains an essential component of treatment for cranial bone metastases, even though CRCC is considered relatively radiation-resistant; however, modern techniques allow for better local outcomes.

This case highlights the need for a rigorous systemic evaluation in the presence of a cranial mass with osteolytic features, the variability in how CRCC presents, and the challenges posed by bone and brain metastases. Above all, it underscores the need for specific prospective data for this subgroup of patients, who remain largely underrepresented in current clinical trials.

CONCLUSION

In conclusion, this case highlights the clinical heterogeneity of CRCC, with initial presentation as cranial bone metastasis and a seizure. The site of metastasis plays a decisive role in terms of prognosis and treatment strategy. Bone and brain metastases are

associated with reduced survival, and their management requires a comprehensive, multidisciplinary, and personalized approach. It is imperative to strengthen the clinical data specific to these sites in order to improve treatment recommendations.

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