

## Oncology

## Breast cancer metastatic to the kidney: Case report



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## ABSTRACT

The Common sites for breast cancer metastasis include bones, lungs, brain and liver. Kidney metastases from the breast are rare. We report a case of metastatic kidney cancer. A 33-year-old woman who underwent a left mastectomy at the age of 30 for breast cancer followed by pulmonary and cerebral metastasis under chemotherapy. The CT scan revealed two right kidney lesions. He imitated a primary kidney tumor. Percutaneous kidney tumor biopsy confirmed metastases from breast cancer. Kidney surgery was avoided and treated with systemic chemotherapy.

## Introduction

The common sites of breast cancer metastases include bones, lung, brain, and liver. Renal metastasis from the breast is rare.<sup>1,2</sup> As the number of breast cancer survivors increases, the appearance of second malignancies and unusual metastatic patterns is increasing. We report a case of breast cancer metastatic to the kidney, which mimicked a primary renal tumor.

## Case report

A 33-year-old woman underwent a radical mastectomy and an axillary lymphadenectomy 3 years ago for left breast cancer. After surgery, the patient underwent chemotherapy due to multiple pulmonary and cerebral metastases (Fig. 1). 6 months later, a computed tomography (CT) scan obtained during a follow-up examination revealed two tumor-like lesions in the right kidney (Fig. 2). A Doppler ultrasound with a high frequency probe from 6 to 12 MHZ AFFINITI 50G device was carried out and objectifying two lesions, tissue, heterogeneous hypoechoic, hypo vascular and measuring 25 and 32 mm of major axes (Fig. 2). Percutaneous renal tumor biopsy poorly differentiated carcinoma consisting of atypical cells with high nucleus-to-cytoplasm ratio and prominent nucleoli in the renal parenchyma, and revealed that the histological characteristics of the sample were identical to those of its breast cancer resected 3 years ago. Immunohistochemistry confirmed the hypothesis of a metastasis of breast carcinoma in the kidney: the anti-CK7 antibody considered positive for breast carcinomatous cells.

(Fig. 3). The 15-3 cancer antigen (CA 15-3) and the carcinoembryonic antigen (CEA), which are the most used for breast cancer, were normal. Kidney surgery was avoided. Despite the chemotherapy, metastases disseminated in the lungs and the brain, she has been lost to follow-up.

## Discussion

Although microscopic kidney metastasis to breast cancer is quite common at autopsy, the clinical manifestation of renal metastasis is rare.<sup>1</sup> There are some studies that report symptomatic and radiological appearance of metastatic kidney breast cancer.<sup>2,3</sup> Hematuria and low back pain are common symptoms, but some patients are asymptomatic. The results of CT and ultrasound are not specific.<sup>2,3</sup> In our patient the discovery of the right renal lesions was CT scan. The diagnosis of renal metastases from breast cancer is difficult to make by radiological examinations and often requires a biopsy or nephrectomy.<sup>2,3</sup> The most frequent pattern of metastatic renal tumors are bilateral multiple circumscribed rounded masses. The kidney tumor in our patient was two tissue damage, and it is a less common appearance for a metastatic kidney tumor. These imaging results mimicked a primary kidney tumor, including transitional cell carcinoma, invasive renal cell carcinoma, collector duct carcinoma, and malignant lymphoma.<sup>4</sup> In addition, the kidney tumor in our patient was hypo vascular and slightly hypoechoic heterogeneous on doppler ultrasound. Percutaneous renal biopsy in our patient revealed poorly differentiated carcinoma consisting of atypical cells with high nucleus-to-cytoplasm ratio and prominent nucleoli in the renal parenchyma, the histological characteristics identical to those of

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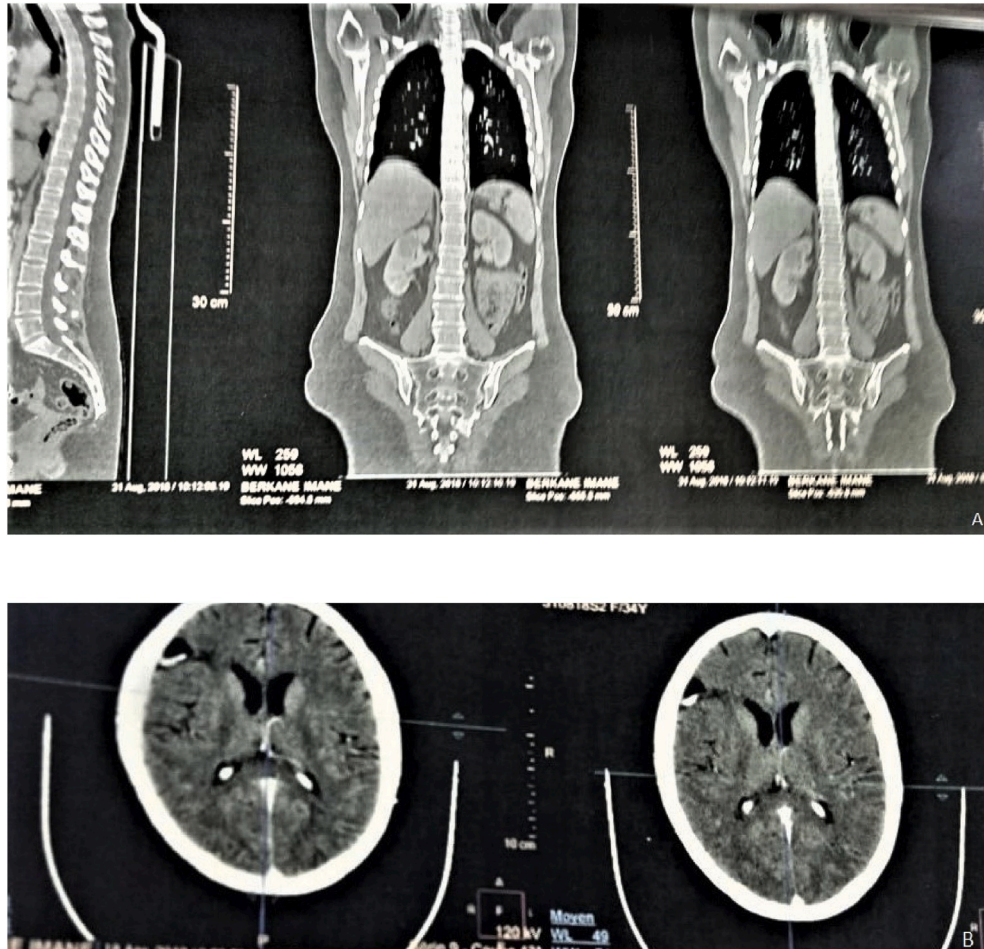


Fig. 1. Numerous metastatic lesions in the lungs (A) Brain metastasis (B).

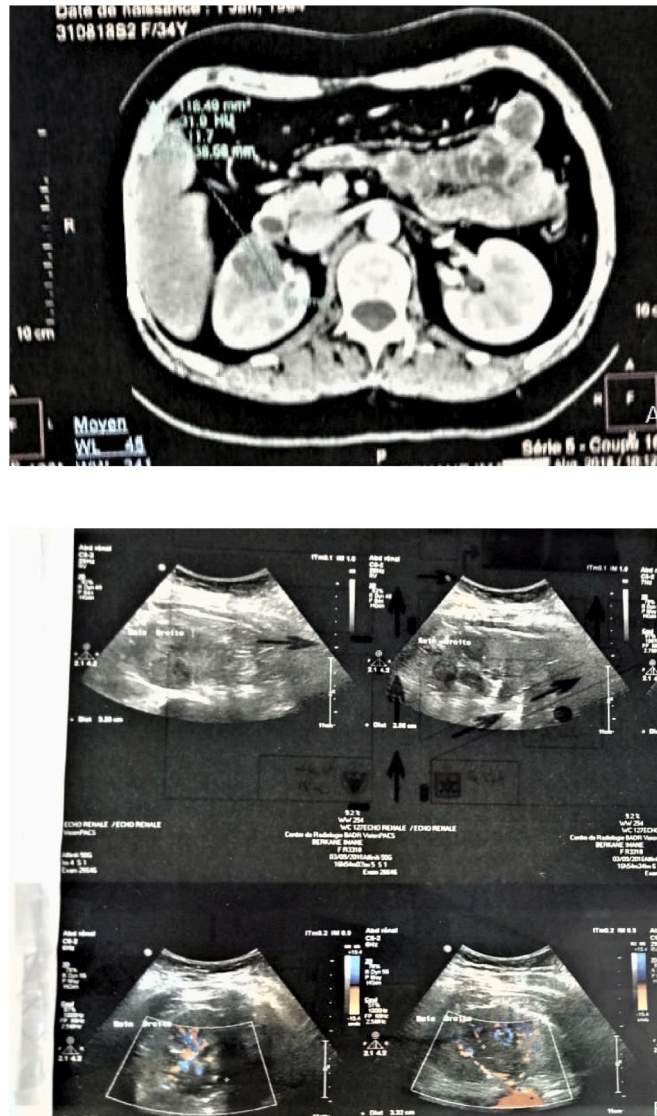
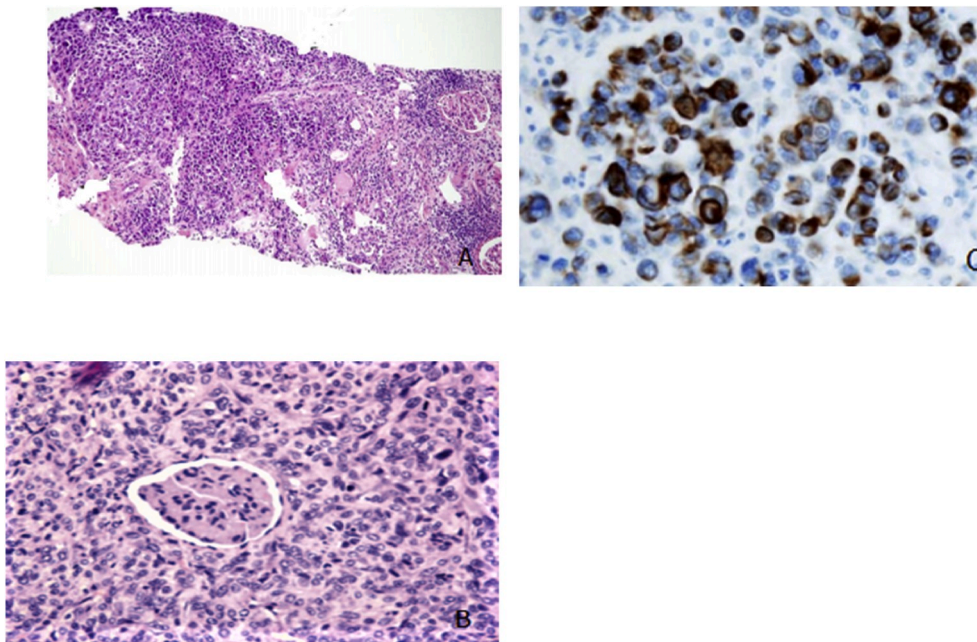


Fig. 2. Two tumor-like lesions in the right kidney (A) A doppler ultrasound: two lesions, tissue, heterogeneous, hypoechogenic and hypo vascular (B).



**Fig. 3.** Photomicrograph (hematoxylin-eosin stain, original magnification,  $\times 100$ ) of renal tumor biopsy specimen: shows of tumor cells deeply infiltrating the renal parenchyma (A). Photomicrographs (hematoxylin-eosin stain, original magnification,  $\times 400$ ) renal glomerulus surrounded by malignant stroma of metastatic of the breast, poorly differentiated carcinoma consisting of atypical cells with high nucleus-to-cytoplasm ratio and prominent nucleoli (B). Anti-CK 7 immunohistochemistry: breast carcinoma CK 7 positive (C).

her breast cancer resected 3 years earlier. Immunohistochemistry confirmed the hypothesis of a metastasis of breast carcinoma in the kidney: the anti-CK7 antibody considered positive for breast carcinomatous cells. As for metastases of mammary carcinomas in the kidneys, it can be linked to the physiological properties of the kidney, namely renal blood flow which represents a large part of cardiac output with a high probability of passage of circulating tumor cells in renal capillaries.<sup>4</sup> The occurrence of metastases is an unfavorable prognostic factor, since the effectiveness of the treatment of these cases is low and the average time between the generalization of the disease and death varies, according to the data in the available literature, from 5 to 24 months approximately.<sup>5</sup> In our patient, she was lost to follow-up. Accurate evaluation of the effectiveness of chemotherapy is difficult because the number of cases presented is small.

### Conclusion

Metastatic kidney cancer of the kidney may present with tumor-like kidney damage, which mimics a primary kidney tumor. Histopathological examinations of renal biopsies are recommended in patients with

a history of breast cancer, as systemic treatment is appropriate rather than nephrectomy.

### Declaration of competing interest

The authors declare that they have no conflict of interest.

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