Breast metastasis 18 years after nephrectomy for renal cell carcinoma: a case report

Ihssan Elouarith1,*, Yassine Bouhtouri2, Salma Elmajoudi1, Salma Bekarsabein1, Soumaya Ech-charif1, Mouna Khmou1,
Hamza Messaoudi2, Youssef Mahdi1, Hafid Hachi2 and Basma El khannoussi1

1Pathology Department, Oncology National Institute, Faculty of Medicine and Pharmacy, Mohammed V University, Rabat, Morocco
2Department of Surgical Oncology, Oncology National Institute, Faculty of Medicine and Pharmacy, Mohammed V University, Rabat, Morocco

*Correspondence address: Pathology Department, Oncology National Institute, Faculty of Medicine and Pharmacy, Mohammed V University, Rabat 10100, Morocco. E-mail: i.elouarith@gmail.com

Abstract

Metastasis of renal clear cell carcinoma (RCC) to the breast is exceptional. Breast metastases of extra-mammary tumors are rare and usually involve melanoma, lymphoma or leukemia. We report the case of a patient with breast metastasis of renal clear cell carcinoma occurring 18 years after nephrectomy. A history of RCC should always raise suspicion about breast metastasis, a situation that remains exceptional and whose diagnosis relies on anatomopathology.

INTRODUCTION

Breast metastasis of extra-mammary tumors is rare and usually involves melanoma, lymphoma or leukemia [1]. Metastasis of renal clear cell carcinoma (RCC) to the breast is exceptional [2, 3]. We report the case of breast metastasis of RCC, occurring 18 years after nephrectomy.

CASE PRESENTATION

The patient was 69 years old and had undergone surgery 18 years ago for a right renal tumor for which the diagnosis of clear cell renal cell carcinoma was confirmed on the anatomopathological study of the surgical excision specimen.

Six months ago, the patient was referred to our facility by a general practitioner for the management of a nodule of the left breast, with a left breast mass in the upper external quadrant, tissue, about 2.5 cm long axis, poorly limited and irregular (Fig. 1).

The patient underwent a biopsy of the mass. The anatomopathological examination included a carcinomatous tumor proliferation of alveolar architecture composed of cells with clear cytoplasm surrounded by distinct cell membranes. Nests of tumors are separated by the delicate vascular network. Immunohistochemical staining showed that the tumor cells were positive for paired box gene (PAX) 8 and cluster designation or cluster of differentiation (CD) 10 but negative for GATA binding protein 3 (GATA3) and CK7 (Fig. 2). Faced with this morphological and immunohistochemical aspect, the diagnosis of breast localization of a clear cell renal carcinoma was made.

The patient underwent a lumpectomy whose anatomopathological study confirmed the diagnosis of breast metastasis of RCC.

DISCUSSION

RCC accounts for 3% of all adult malignancies [4]. RCC metastasizes often to the lung, bone, lymph nodes, liver, adrenal gland and brain [5]. Metastasis to the breast remains exceptional [2, 3]. Breast metastases from extra-mammary malignancies are a rare situation and concern mainly lymphoma, leukemia, melanoma as well as ovary, stomach and lung [1]. Metastatic breast tumors may present as a single or multiple lesions. Radiographically, they are usually well-circumscribed without
calcifications, whereas primary breast tumors often show speculations and/or microcalcifications [6, 7].

Anatomopathological study plays an indispensable role in the diagnosis of certainty of a breast metastasis of clear cell renal cell carcinoma. A morphological study under the microscope shows nests and sheets of tumor cells that are typically separated with a regular network of small and thin-walled blood vessels. Uncommonly, another minor pattern including tubular, papillary and trabeculae may be focally present. Tumor cells have well-defined cell membranes with clear cytoplasm that contain abundant cytoplasmic lipid and glycogen. Nucleoli may be small or conspicuous and prominent depending on the grade of the tumor. In high grade tumors, cells show a high nuclear grade and may present granular eosinophilic cytoplasm [8]. The immunohistochemical study allows confirming the renal origin of the tumor in front of positive nuclear staining of the tumor cells by anti-PAX8 antibodies and positive staining by CD10, anti-cytokeratin and antivimentin antibodies compatible with clear cell renal carcinoma. It also differentiates lesions from primary breast tumor proliferation by negative immunostaining with anti estrogen receptor (RE), progesterone receptor (RP), human epidermal growth factor receptor-2 (Her2)neu and GATA3 antibodies. Other breast metastases from extra-mammary malignancies present a problem of differential diagnoses, such as melanoma which can be eliminated after negative immunostaining for melanocyte markers human melanoma black (HMB-45) and adrenal cortical carcinoma characterized by positive staining of tumor cells by inhibin, Melana and steroidogenic factor 1 (SF1) but negative for PAX8, Epithelial membrane antigen (EMA) and keratins [9].

A history of RCC should always raise suspicion of breast metastasis; RCC may recur after nephrectomy with an interval that varies from a few months to several years. The route of RCC metastasis to the breast is considered to be hematogenous [10].

In general, breast metastases of any cancer have a poor prognosis with a mean survival of 10 months [11]. For patients with RCC metastases, the 5-year survival rate after ablation was 53%, compared with 5% in cases where ablation was not performed [12]. In the face of this finding, resection should always be considered in cases of solitary RCC metastasis to improve the prognosis.

**CONCLUSION**

A history of RCC should always raise suspicion for breast metastases, a situation that remains exceptional and whose diagnosis relies on anatomopathology.

**ACKNOWLEDGEMENTS**

Not applicable.

**CONFLICT OF INTEREST**

No conflicts of interest.

**Funding statement**

This study was not funded.

**ETHICAL APPROVAL**

Not applicable.

**CONSENT FOR PUBLICATION**

Written consent has been obtained from the patient and the patient’s family for the publication of this case report.

**GUARANTOR**

Elouarith Ihssan.

**REFERENCES**

1. Mun SH, Ko EY, Han BK, Shin JH, Kim SJ, Cho EY. Breast metastases from extramammary malignancies: typical and atypical ultrasound features. *Korean J Radiol* 2014;15:20–8.
2. Schlesinger-Raab A, Treiber U, Zaak D, Holzel D, Engel J. Metastatic renal cell carcinoma: results of a population-based study with 25 years follow-up. *Eur J Cancer* 2008;44:2485–95.
3. Gravis G, Chanez B, Derosa L, et al. Effect of glandular metastases on overall survival of patients with metastatic clear cell renal cell carcinoma in the antiangiogenic therapy era. *Urol Oncol* 2016;34:167.e17–23.
4. Campbell SC, Flanigan RC, Clark JI. Nephrectomy in metastatic renal cell carcinoma. Curr Treat Option On 2003;4:363–72.
5. Bianchi M, Sun M, Jeldres C, et al. Distribution of metastatic sites in renal cell carcinoma: a population-based analysis. Ann of Oncol 2012;23:973–80.
6. McAulgin SA, Thiel DD, Smith SL, Wehle MJ, Menke DM. Solitary breast mass as initial presentation of clinically silent metastatic renal cell carcinoma. Breast 2006;15:427–9.
7. Lee AH. The histological diagnosis of metastases to the breast from extramammary malignancies. J Clin Pathol 2007;60:1333–41.
8. WHO Classification of Tumors of the Urinary System and Male Genital Organs, (4th edn. Lyon: IARC Press, 2016.
9. Verma V, Isarahmed A, Rao RN. Metastatic clear cell renal cell carcinoma presenting as breast lump: a rare case report. Diagn Cytopathol 2021;49:E281–5. 10.1002/dc.24710 Epub 2021 Feb 20. PMID: 33609330.
10. Holland R, Veling SH, Mravunac M, Hendriks JH. Histologic multifocality of T1-2 breast carcinomas. Implications for clinical trials of breast-conserving surgery. Cancer 1985;56:979e990.
11. Vassalli L, Ferrari VD, Simoncini E, et al. Solitary breast metastases from a renal cell carcinoma. Breast Cancer Res Treat 2001;68:29–31.
12. Noguchi S, Shuin T, Takase K, et al. Surgical treatment of renal cell carcinoma with metastases. Nihongantyougakkaishi 1996;31:5–13.