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BREAST METASTASIS REVEALING RENAL CELL CARCINOMA: A CASE REPORT AND LITERATURE REVIEW

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ABSTRACT

Breast metastasis from Renal Cell Carcinoma (RCC) is a very rare disease. Clinical and radiological presentations are not specific. Histological examination with immunochemistry confirmed the diagnosis. The management requires a multidisciplinary approach. The treatment depend essentially of the number, the site and the resectability of metastases. We report a case of breast metastasis revealing a metastatic RCC while reviewing the appropriate literature.

INTRODUCTION:

Renal cell carcinoma (RCC) accounts approximately for 3% of all adult cancers and it represent the third most frequent genitourinary tract tumor. It has a tendency to metastasize, habitually to the lung, lymph nodes, bone, liver, adrenal gland and brain **(1)**.

Breast metastases from extra-mammary tumors are rare; it represents 0.5 to 2% of all breast malignancies, and the primitive site is usually melanoma, lymphoma and leukemia **(2)**. RCC metastasis to the breast is exceptional and occurs in 3% of all metastatic RCC. Indeed, only a very few cases has been reported in the literature. We report a case of breast metastasis revealing a metastatic RCC while reviewing the appropriate literature.

CASE REPORT:

A 62-year-old woman without medical history presented to our institution with a nodule in the right breast. Physical examination revealed a palpable and mobile mass in the junction of the upper and lower inner quadrant of the right breast with bilateral axillary lymph nodes. No skin or nipple retraction were noticed. The mammogram showed a 1 cm dense well circumscribed solid mass, not speculate, with no microcalcifications. Ultrasound examination was therefore performed revealing a hypoechoic homogenous solid nodular formation with quite regular margins in the same site **(Figure 1)**; color and power Doppler showed intense vascularity. Bilateral axillary lymph nodes were present; measuring 24x19 mm in the right and 20x16 mm in the left. A tru-cut biopsy of the nodule was performed. Pathological examination revealed island of tumor cells with clear cytoplasm, lying in fibrovascular stroma. Immunohistochemistry confirmed the diagnosis of metastatic clear cell RCC. Tumor cells were positive for vimentin, CD10 and cytokeratin (CK)7, while there were negative for CK20, Estrogen receptor and Progesterone receptor. A computed tomography scan of the body revealed a voluminous left kidney mass measuring 74x71 mm with para-aortic lymph nodes and lung metastasis **(Figure 2)**. Bone scintigraphy showed a bone metastasis in the left hip joint **(Figure 3)**.

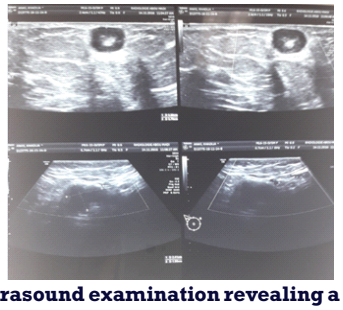

Figure 1: Ultrasound examination revealing a hypoechoic homogenous solid nodular formation

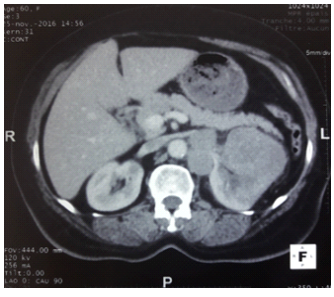

Figure 2: Computed tomography scan showing a left kidney mass

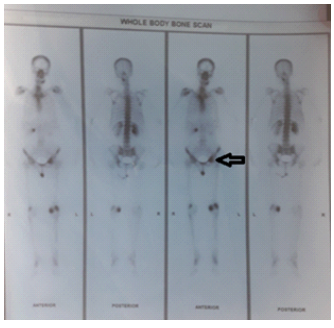

Figure 3: Bone scintigraphy showing a bone metastasis in the left hip joint

Another biopsy was performed in the left renal mass.

Histological examination with immunochemistry confirmed the diagnosis of clear cell RCC. Biological exams showed anemia (hemoglobin at 9 g/dL), hypercalcemia (corrected calcium at 125 mg/L) and elevation of lactate dehydrogenase (800 UI/L). The patient received sunitinib 50 mg/day (4 weeks on/ 2 weeks off) with denosumab 120 mg monthly. The treatment was well tolerated with manageable side effects (grade 2 fatigue and grade 1 hypertension). Patient had a stabilization disease for 9-month treatment. Then, she presented multivisceral progression. She died 4-months later.

DISCUSSION:

Metastases to the breast from extramammary primary cancers are uncommon. Both breasts are similarly affected and bilateral involvement is not exceptional. However, solitary lesions occur in 85% of cases. The most implicated primitive site are melanoma, lymphoma, lung cancer and in man, prostate cancer. Breast metastasis from a renal tumor is extremely rare, accounting for 3% of the cases. However, it is probable that the incidence of such finding will become more frequent because of the increasing number of patients with RCC who will have longer overall survival. Indeed, the 10-year survival rates for the patients treated with nephrectomy are 91% for pT1, 70% for pT2, 53% for pT3a, 43% for pT3b and 42% for p T3c respectively **(3, 4)**.

Clinically, metastatic lesions in the breast are commonly described as solitary, discrete, and asymptomatic. Patients have a tendency to present with the typical picture of a rapidly enlarging, painless, palpable breast mass. The skin is usually not affected and axillary lymph node involvement is variable **(5)**.

Mammogram shows well-circumscribed lesions, which lack microcalcifications, due to the absence of desmoplastic reaction. Ultrasound examination of breast metastases typically shows a heterogeneous, poorly defined, hypoechoic mass without posterior attenuation of the ultrasounds. The only finding common to all cases reported in the literature that can be suggestive of malignancy is the prominent peripheral and penetrating vascular network, well evident to color and power Doppler **(6, 7)**.

Histological examination showed metastasis from clear cells RCC. Immunochemistry affirm the diagnosis; tumoral cells are typically positive for vimentin, CD10 and cytokeratin (CK)7, while there are negative for CK20, Estrogen receptor and Progesterone receptor **(8)**.

The treatment depends on the timing of mammary metastasis and the presence of other metastatic sites at the time of diagnosis. Indeed, breast metastasis can occurs in synchronous (44%) or metachronous setting (56%). If mammary metastases are isolated, surgical treatment should be offered for both sites; breast and kidney **(9)**. In the opposite case, in case of presence of multiple non-resectable metastases, different options are available **(10)**:

- Favorable risk metastatic RCC: Axitinib plus pembrolizumab, pazopanib and sunitinib are different treatment options.
- Intermediate and poor risk metastatic RCC: Ipilimumab plus nivolumab, axitinib plus pembrolizumab, temsirolimus, cabozantinib and sunitinib are different treatment option.
- Denosumab (anti RANK ligand) or zoledronic acid for treatment of bone metastasis.

Our patient was at high risk and she received sunitinib for treatment. Immunotherapy is more efficient than tyrosine kinase inhibitors. It was not given because this treatment was inaccessible in our context. However, patient received denosumab witch is more effective than zoledronic acid in bone metastasis.

Prognosis depends on performance status, number and sites of metastasis. Some studies demonstrated that patients with removable metastases have a longer overall survival than patients with non-removal metastases. The average survival of patients undergoing nephrectomy and metastasectomy is about 30 months **(11)**.

CONCLUSION:

Breast metastasis revealing RCC is very rare. Histological examination with immunochemistry confirmed the diagnosis. The management requires a multidisciplinary approach (Radiologist, surgeon, anatomical pathologist, and oncologist).

Conflicts of interest:

The authors have no conflicts of interest to declare.

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