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A Case of Male Breast Cancer and a Literature Review

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ABSTRACT

Background: Breast cancer in men, similar to that in women, originates in the mammary gland epithelium (ducts), and although less common than in women, its incidence has increased in recent decades, accompanied by significant advances in understanding the disease as a distinct entity. It shares important similarities with its female counterpart, with significant progress in diagnosis and treatment.

Case presentation: In this report, we describe the clinical and imagenological characteristics of a 64-year-old man with metastatic adenocarcinoma to the skin. The patient presented with an ulcerative lesion on the right hemithorax, along the mid-clavicular line and anterior axillary line at the fifth intercostal space. The lesion had a soft, necrotic appearance, was prone to bleeding, and was referred by the patient as "resulting from trauma" a year ago, with progressive expansion and deepening, despite antibiotic use and cleansing of the wound. It invaded the surrounding skin, which appeared desquamated, erythematous with neovascularization, friable to the touch prone to bleeding with difficulty to achieve hemostasis, and multiple brownish nodular satellite lesions, with no other associated symptoms. A thoracic CT scan performed in the emergency department revealed a bilateral pleural effusion, predominantly on the right side, occupying 50% of the right lung space, along with an osteolytic lesion at the level of the manubrium of the sternum. A follow-up thoracic CT scan showed a pleural effusion occupying 80% of the right lung space, with a minor pneumothorax. The placement of an endopleural chest tube on the right side resulted in the extraction of 1800 ml of serosanguineous fluid, and pleural fluid culture did not reveal microorganisms or tumor cells, making the diagnosis of pulmonary adenocarcinoma less likely. A biopsy of the surrounding tissue yielded an invasive, poorly differentiated adenocarcinoma. Immunohistochemical staining was positive for estrogen and progesterone receptors, CK19, and negative for CK7, CK20, leading to the primary diagnosis of breast cancer based on clinical presentation and lesion location.

Conclusions: Breast cancer in men, while sharing similarities with its female counterpart, presents its own unique characteristics. The identification of these factors and education about the significance of this condition, along with the discovery of specific biomarkers and targeted therapies, have the potential to significantly improve the prognosis of male patients in the future.

KEYWORDS: Breast Neoplasms; Breast cancer in men; Carcinoma/Skin Metastases; Adenocarcinoma, Malignant ulcer; Carcinoma.

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INTRODUCTION

We present the case of a 65-year-old male patient diagnosed with invasive adenocarcinoma of the skin, which practically excludes the skin as the primary site of the tumor, as this presentation is extremely rare, so it was treated as a metastasis and the primary site of the tumor was sought. The aim of this clinical case is to establish some points of reference in the clinic and in the imaging characteristics that help guide us to diagnosis and therapeutic decision-making.

PRESENTATION OF THE CASE

A 65-year-old man with a history of systemic arterial hypertension and right inguinal hernioplasty, drug addiction not referred, presented with a clinical picture of approximately 1 year of evolution, characterized by a

bleeding and oozing ulcer in the right hemithorax, painless, friable to the touch with perilesional nodular lesions accompanied by skin hyperpigmentation and desquamation, which did not improve with the use of antibiotics and daily cleaning of the wound.

Due to the fact that the condition was increasing with repetitive bleeding that was difficult to control, he decided to seek medical attention, where he underwent wound healing and a chest CT scan in which they observed a suspicious lesion of the osteolytic type at the level of the sternal manubrium, as well as bilateral pleural effusion of right predominance. Therefore, he was admitted to our hospital to continue with his approach.

The patient had a history of weight loss; Routine laboratory studies showed adequate renal and hepatic function, a pattern of moderate anemia without leukocytosis.

As there was a suspicious lesion on computed tomography, as well as an ulcer of atypical characteristics and evolution, it was decided to perform a biopsy of the ulcer and nodular lesions, which resulted in poorly differentiated invasive adenocarcinoma (Figures 1 and 2).

Figure 1. An ulcer was observed in the right hemithorax approximately at the level of the fifth intercostal space between the clavicular and anterior axillary midline, with atypical characteristics, with satellite lesions and indurated borders, with extensive neovascularization without evidence of active infection.

(Figure 2. 3D reconstruction of thoracic CT reveals osteolytic lesion at the level of the sternal manubrium.)

Immunohistochemical staining was positive for estrogen and progesterone receptors, as well as for CK19, with negativity to CK7 and CK20 (Figure 3.)

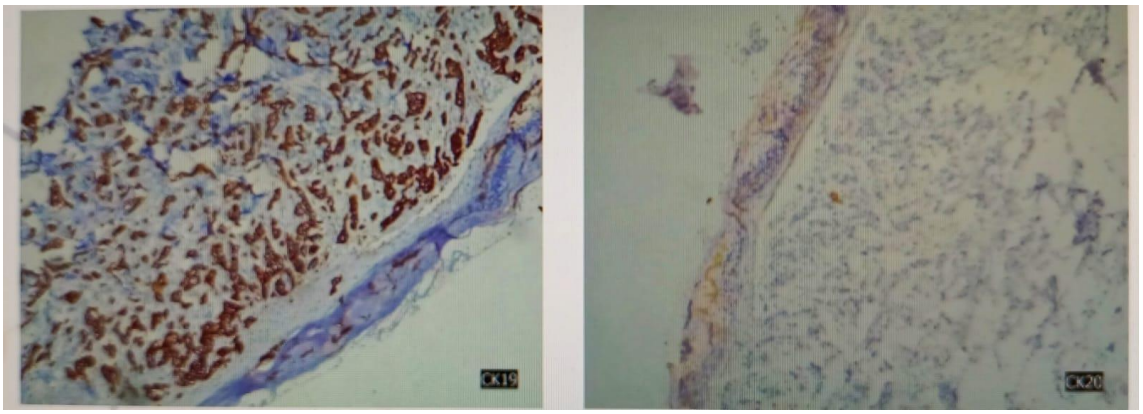

Figure 3. Biopsy with positive staining for CK19 and negative for CK20.

Due to the findings described above, an endopleural catheter was placed on the right side and he was referred to the medical oncology service to define a therapeutic strategy, being discharged with home oxygen for follow-up by the outpatient clinic, however, the follow-up with the patient was lost.

DISCUSSION: BREAST CANCER IN MEN

Breast cancer in men is a rare but significant entity that presents diagnostic and treatment challenges unique to the oncology setting. Throughout this discussion, we will examine various aspects related to breast cancer in men, including its epidemiology, risk factors, clinical features, diagnosis, treatment, and prognosis. In the end, we will come to a conclusion that will summarize the main points of discussion and highlight the importance of continued awareness and research in this area.

EPIDEMIOLOGY

Breast cancer in men is rare, accounting for approximately 1% of all breast cancer cases globally (1). Despite its low incidence, it should not be underestimated, as it can still have a significant impact on men's health. The incidence of breast cancer in men tends to increase with age, being more common in men over 60 years of age (3). In addition, an increasing trend in its incidence has been observed in recent decades, possibly due to increased awareness and early detection.

RISK FACTORS

Risk factors for breast cancer in men are similar to those seen in women, although with some differences. The main risk factors include:

1. **Age:** The risk increases with age, being more common in older men.
2. **Family history:** The presence of a family history of breast cancer in women or men may increase the risk.
3. **Genetic mutations:** Mutations in the BRCA1 and BRCA2 genes (3) can significantly increase the risk of breast cancer in men, as well as in women.
4. **Radiation:** Previous exposure to radiation therapy to the chest area, as a treatment for lymphoma, may increase the risk (3).
5. **Hormones:** Exposure to high levels of estrogen, such as in hormone treatment for prostate cancer, may increase the risk (4).
6. **Liver cirrhosis:** Chronic liver cirrhosis has been associated with an increased risk of breast cancer in men.

CLINICAL FEATURES

Breast cancer in men usually presents in a similar way to that in women, with the presence of a palpable mass in the breast. However, due to the lack of awareness about this disease in men, most cases are diagnosed in advanced stages. In addition, symptoms, such as nipple changes, discharge (29), and pain, are often overlooked or attributed to other benign conditions.

MOLECULAR AND BIOLOGICAL PATHOLOGY

Although breast cancer in men shares histopathological features with breast cancer in women, there is a growing understanding of the molecular differences between the two groups. It has been shown that male breast tumors tend to be more aggressive (7), with a higher histological grade and a higher expression of the Ki-67 marker, which indicates greater cell proliferation, as well as the expression of androgen receptors that hinder treatment and poor prognosis, as they are associated with a greater number of lymphatic metastases (18). In addition, the presence of mutations in the BRCA1 and BRCA2 genes is associated with an increased risk of breast cancer in men, as well as in women. Most breast cancers in men are infiltrating or invasive ductal cancers (20) and estrogen receptor-positive (without a corresponding increase in the progesterone receptor), with a weak association with estrogen markers such as PS2, HSP27, and Cathepsin-D (13). They are rarely HER2 positive. In a study that compared tumor phenotypes obtained with immunohistochemistry versus PAM50 (a prognostic genetic test that analyzes the gene expression of 50 genes to classify the tumor in one of the 4 intrinsic subtypes of breast cancer) it was obtained that: 60% were luminal B, 30% luminal A and

10% enriched with HER2. None were of the baseline type. Immunohistochemistry was 51% B-luminal, 44% A-luminal, 4% triple-negative, and only 1% HER2-positive (23). Similar results were obtained in another study that sought to compare the phenotypes obtained by immunohistochemistry and PAM50, with marked differences in terms of HER2 positivity and the frequency of the luminal A phenotype in immunohistochemistry (80%) (26).

DIAGNOSIS

The diagnosis of breast cancer in men is based on a thorough clinical evaluation, imaging studies such as mammography and breast ultrasound, and histological confirmation through a biopsy. Immunohistochemistry plays a crucial role in tumor characterization, identifying the expression of hormone receptors (ER and PR) and HER2/neu, being almost exclusively hormone receptor positive and HER2/neu negative in men (6). These markers guide treatment decisions.

TREATMENT

The treatment of breast cancer in men is similar to that of women, but there are some important differences due to the pathological differences between breast cancer in men and women (25), which have recently become an important reason for study. Treatment may include:

1. **Surgery:** Surgery is essential and may include mastectomy (removal of the breast) or breast-conserving surgery (removal of the tumor and surrounding tissue).
2. **Radiation therapy:** May be needed after surgery to reduce the risk of recurrence. Adjuvant treatment with tamoxifen in estrogen and progesterone receptor positive patients may improve prognosis (22).
3. **Hormone therapy:** Hormone therapy, such as tamoxifen, is used in hormone-positive tumors to reduce the risk of recurrence, and is more effective in men than aromatase inhibitors (11). However, in the case of androgen receptor positivity, the effectiveness of tamoxifen is reduced (18).
4. **Chemotherapy:** In cases of advanced or aggressive tumors, chemotherapy may be part of the treatment.
5. **Targeted therapies:** In cases of HER2-positive tumors, targeted therapies such as trastuzumab may be effective.
6. **Gene therapies:** Gene therapy and editing are being investigated as potential approaches to treat tumors with specific genetic mutations such as poly-ADP-ribose polymerase inhibitors or agents that target androgen receptors, either monotherapy or in combination (1).

The therapeutic approach should be individualized and based on the stage, tumor characteristics, and overall health of the patient.

PROGNOSIS

The prognosis for breast cancer in men varies depending on the stage at which the diagnosis is made. No marked improvement in survival has been observed in recent decades (27). When detected in early stages, survival rates are comparable to those of women. However, in advanced stages, the prognosis may be less favorable due to lack of awareness and late diagnosis. Although it tends to have a worse prognosis in men due to the diagnosis in advanced clinical stages and greater tumor aggressiveness (7), no significant difference has been found in terms of survival in advanced stages (IV), but there is a significant difference in the clinicopathological characteristics and pattern of metastasis between the two genders (15).

CONCLUSION

Breast cancer in men is a rare but important clinical entity that presents diagnostic and treatment challenges. A lack of public and professional awareness of this disease can lead to late diagnoses and a poorer prognosis. To address this issue, it is essential to promote education and awareness about breast cancer in men.

In addition, ongoing research is needed to better understand specific risk factors in men, as well as biological and genetic differences that may influence the disease. This will allow for the development of more effective early detection strategies and treatments.

In summary, breast cancer in men is a clinical reality that should not be overlooked. Through awareness, research, and specialized medical care, we can improve the early detection and prognosis of this disease, giving affected men the best possible chance of recovery and survival.

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