Case study

Tumor recurrence of breast cancer associated with pulmonary thromboembolism and septic shock: case report

ABSTRACT

Aims: Breast cancer is a malignant neoplasm caused by disordered clonal proliferation of breast cells, resulting from the influence of hormonal exposure or inherited susceptible genes.

Presentation of Case: The present report is about a female patient with comorbidities and with a previous history of breast cancer, she was admitted for investigation of tumor recurrence, and was diagnosed with a primary breast tumor, estrogen and progesterone receptor, which gave rise to a series of complications.

Discussion: According to the Global Cancer Observatory, breast cancer is the most common malignant neoplasm in the world.

Conclusion: The importance of cancer patients, especially those with breast tumors, is emphasized to maintain follow-up after undergoing surgical treatment for removal of the tumor and subsequent remission of the disease, since the early intervention of any complication is related to greater survival and better quality of life.

Keywords: Breast Neoplasms; Recurrence; Neoplasm Metastasis, Septic Shock.

1. INTRODUCTION

Breast cancer is a malignant neoplasm caused by disordered clonal proliferation of breast cells, resulting from the influence of hormonal exposure or inherited susceptible genes .(1) It is the type of cancer that most affects women in Brazil, second only to non-melanoma skin tumors. It was estimated that in Brazil occurred around 66,280 new cases of breast cancer in the year 2021.(2) Among the malignant breast cancers, breast adenocarcinoma is the most frequent, which is subdivided into three subgroups, relying on the expression of estrogen receptors and HER2 receptors. The three subgroups based on receptor expression are estrogen receptor positive, and Human Epidermal Growth Factor Receptor-type 2 (HER2) receptor positive and negative. The importance of these subgroups is related to patient characteristics, response to treatment and survival.

In addition to the primary site, breast cancer may have distant metastases, which are associated with the type of tumor, influencing the time and the sites of metastasis. We present the report of a patient with a previous diagnosis of breast cancer, hospitalized for investigation of tumor recurrence with hepatic and pleural implants. The presentation of the case of breast cancer and its associated bone and extraosseous metastases, in addition to thromboembolic events, are important elements that deserve disclosure, with the aim of building new knowledge.

2. PRESENTATION OF CASE

Female patient, 53 years old, was admitted to the emergency department of the hospital service on 01/04/2020 in regular general condition, dyspneic and tachypneic, with moderate ventilatory effort and saturating 85%, pulmonary auscultation showed vesicular murmur present with sparse wheezing, reduced in left base. Patient has a previous diagnosis of systemic arterial hypertension, depression and breast cancer. Previously, from 12/18 to 12/23/2019, the patient had been hospitalized for investigation of tumor recurrence, with hepatic and pleural implants. In pleural biopsy, a primary breast tumor was diagnosed, estrogen and progesterone receptor, with Ki-67 of 15%. The patient underwent the first percutaneous breast biopsy in 2008, when he received the result of grade 3 invasive lobular carcinoma. The following year, in a new biopsy, a grade 1 invasive ductal carcinoma was identified and, in 2015, a mastectomy and 1st skin implant were performed. Breast (RE: +), with loss of follow-up for follow-up of the disease from then on.

Also, on 01/04/2020, she reported ventilatory-dependent pain and dyspnea that worsens a lot in recumbency. She underwent a chest tomography, which showed an image suggestive of carcinomatous lymphangitis, osteoblastic lesions suggestive of secondary implants. On 01/05/2020, the patient was admitted to the general intensive care unit (ICU), with abdominal tomography demonstrating liver and bone metastases and Glasgow 15. On the same day, the patient underwent Doppler ultrasound of the lower limbs, which showed echogenic material and a non-compressible vessel in the left soleus vein, resulting in a diagnosis of muscular distal deep vein thrombosis, in a single vessel, with an asymptomatic patient, but with a persistent risk factor. On 01/07/2020, the patient underwent a pericardial window, maintained non-invasive ventilation and intensified respiratory physiotherapy, with a forecast of discharge from the ICU if stability was maintained.

On 01/09/2020, in the afternoon, the patient was tachypneic, with pain in the chest drain region and difficulty breathing. She had a chest X-ray, which showed worsening of the bilateral infiltrate, most prominently at the base of the right lung. Her picture suggested the evolution of the disease with superimposed infection, requiring a repeat chest tomography and angiotomography to rule out pulmonary thromboembolism.

Chest angiotomography showed pericardial effusion, small pleural effusion on the right, filling defect in the left inferior segmental artery (small pulmonary thromboembolism), without foci of consolidation. Anticoagulation was started and, if the ventilatory pattern worsened, a return to the ICU was planned. On 01/10/2020, no HER2 protein was found, being classified as luminal A, in clinical stage 4, metastatic, with visceral crisis. Chemotherapy (Qt) was prescribed due to the worsening of the ventilatory pattern, for application in a hospital stay. On 01/11/2020, it was decided to advance the chemotherapy treatment and request it immediately, as the patient's condition worsened significantly. The situation is explained to the patient and her family, as well as the impossibility of cure due to the advanced stage of the disease, opting for palliative treatment in common agreement.

On 01/12/2020, still without starting Qt, the patient presented a worsening in the ventilatory pattern, with dyspnea since the previous night, with rapid progressive worsening and associated cough, expectorating clear secretion. Nebulization was prescribed, with placement of the Hudson mask. A few hours later, intubation was performed in the ward, followed by installation of norepinephrine at 15mL/h for hypotension after intubation. Approximately 3 hours later, on reassessment, the patient presents septic signs: BP 160/110 mmHg, RR 36 irpm, in addition to cold extremities and sweating. Therefore, empirical antibiotic therapy is started – Sodium Piperacycline + Sodium Tazobactam -, laboratory tests are requested and a return to the ICU is requested.

In the ICU, sedation with Midazolam and Fentanyl was performed, and the patient was placed on mechanical ventilation with moderate standards. In addition, she was hemodynamically unstable, and cultures were collected, with previous empiric antibiotic initiation. On examination, she was in a regular general condition, with a RASS -5 scale and medium-sized photoreactive pupils. On 01/13/2020, the patient remained hemodynamically unstable, febrile (38ºC), on high doses of noradrenaline and on mechanical ventilation with an orotracheal tube, with a poor prognosis. She had severe septic shock, with a poor prognosis, refractory to the measures already instituted, without clinical conditions for oncological treatment and with a high risk of evolution to death. On 01/14/2020, she remained with clinical worsening, unresponsive to intensive treatment measures, maintaining fever and refractory shock, associated with incurable and intractable oncological pathology. Patient died on 01/14 at 4:13 pm due to cardiorespiratory arrest unresponsive to maneuvers.

3. DISCUSSION

According to the Global Cancer Observatory (3), breast cancer is the most common malignant neoplasm in the world. In Brazil, more than 65,000 cases were estimated for the year 2020, which represents about 30% of neoplasms diagnosed in Brazilian women. (4) The greatest number of deaths is observed in the group of women aged 50-59 years, which represent 45% of cases. (5)

Breast neoplasms comprise a heterogeneous group of lesions that differ in morphology, degree, molecular expression and biological behavior, which directly influence the prognosis of patients with this diagnosis. The main histological types are carcinoma in situ, invasive ductal carcinoma and invasive lobular carcinoma. (6) Carcinoma in situ is

the neoplasm with the best prognosis, this subtype is characterized by the proliferation of presumably malignant epithelial cells within the mammary ductal system, with no evidence of invasion into the surrounding stroma on microscopic examination. (7) Invasive ductal carcinoma (DC) is the most common invasive subtype among lesions and can be divided into well-differentiated, moderately differentiated and poorly differentiated types, as less differentiated, the lesser the characterization in glands and the greater the mitotic activity. (8) Lobular carcinoma (LC) is the second most common invasive lesion; its incidence has been increasing in the United States associated with the higher risk relationship that this type has with postmenopausal hormone therapy. About the case reported, the patient's first diagnosis, which occurred in 2008, was an invasive lobular carcinoma grade 3. The high grade of the tumor when diagnosed is common in this tumor type, since the LC has a more infiltrative pattern and lower density on mammography, therefore, it usually has a larger size at diagnosis. (9) The patient was also diagnosed in 2009 with a grade 1 invasive ductal carcinoma, which is the most found type and starts in the breast duct cells. The fact that it is a grade 1 carcinoma would indicate a good prognosis, since it is a well-differentiated cell with a slower progression.

Breast cancer staging is performed according to the norms of the American Joint Committee on Cancer (AJCC) through the Classification of Malignant Tumors (TNM system) added to the histological grade and status against the biomarkers HER2, Estrogen Receptor (ER) and Progesterone (PR), with a total of seven variables. There are stages in four levels (I, II, III and IV). In the present case, the patient was in stage IV, in which the tumors have spread beyond the breast and nearby lymph nodes to other parts of the body. Treatment for stage IV breast cancer is usually systemic therapy (drug). The patient's recurrence was diagnosed in stage IV, which corroborates the metastasis found and the unfavorable outcome that occurred with the patient. (10)

Breast cancer (CA) is strongly related to metastases. It is estimated that 20 to 30% of patients diagnosed with early-stage breast CA will have recurrence in the form of distant metastasis - as in the case reported, in which the patient had recurrence of the primary tumor, in addition to metastatic implants in the liver and pleura. (11) The most frequent sites of metastasis are bones, lungs and liver, with bone metastasis being the most frequent. In this regard, compared to other sites, bone metastasis, individually, generally has a longer survival. However, in case of bone metastases associated with extraosseous metastases, as in the case reported above, or only extraosseous metastases, the prognosis becomes worse. LC can be easily confused with other interstitial lung diseases and, therefore, it should always be remembered in association with breast CA. Pleural effusion, as in the case reported, is present. LC is clinically characterized by cough associated with progressive dyspnea. (12) In the case of the reported patient, a very serious picture is concluded, with a very poor prognosis, as she presented a set of complications commonly derived from breast CA, in association: liver implants, osteoblastic lesions suggestive of secondary implants, and carcinomatous lymphangitis.

In addition, essential to be addressed in cancer patients is thromboembolism, since both deep vein thrombosis (DVT) and pulmonary thromboembolism (PTE) represent an important cause of morbidity and mortality in cancer patients. When relating venous thromboembolism (VTE) with CA breast, there is a 9 to 12 times greater risk of an episode of this type than in the general population. Once again, the case report illustrates the connection between disease and complication: cancer patient, in a state of hypercoagulability, bedridden, is strongly suspected of having thromboembolism. (13) She was submitted to Lower Limb Doppler Echo, precisely because she was at high risk of DVT and consequently PTE and had a positive diagnosis. The treatment of breast CA varies according to multiple variables: disease staging, metastatic sites, tumor characteristics, receptors, age, menopausal status, comorbidities and patient preferences. (14) Treatment is based on two major groups: local treatment and systemic treatment. Local treatment includes surgery and radiotherapy, while systemic includes chemotherapy, hormone therapy, and biological therapy. In the case of the referred patient, with stage IV, the therapeutic decision seeks to prolong survival, improve symptoms and improve quality of life, therefore, the modality adopted is systemic treatment.

From the case report and the deepening of the main comorbidities presented by the patient, in the ICU setting, it is noted the difficulty in the treatment of the multi-comorbid patient, as well as the importance of knowledge by the multidisciplinary medical team about the heterogeneity of breast cancer and its metastases. In patients with positive hormone receptors and negative HER2, the preferred therapy is based on hormone therapy, however in patients with rapid disease progression or metastatic extension with organ dysfunction, chemotherapy is preferred (15).

4. CONCLUSION

In the present report, was observed a therapeutic challenge in a patient with a previous history of breast cancer and hospitalization due to tumor recurrence, added to deep vein thrombosis, pulmonary thromboembolism, visceral crisis and septic shock. In this sense, the importance of cancer patients, especially those with breast tumors, is emphasized to maintain follow-up after undergoing surgical treatment for removal of the tumor and subsequent remission of the disease, since the early intervention of any complication is related to greater survival and better quality of life. Furthermore, a multidisciplinary approach, paying attention to local and systemic signs, is essential to reduce suffering and promote greater patient comfort.

CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images'. A copy of the written consent is available for review by the Editorial office/Chief Editor/Editorial Board members of this journal.

ETHICAL APPROVAL

The present work was approved by the PUCRS Research Ethics Committee.

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