Case Report

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Proximal Tibial Bone Metastases in Patient with Breast Carcinoma: A Rare Case Report

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Abstract

Bone metastases from any carcinoma below elbow and knee are rare, those to tibia are even rarer. We present a case of a 41 year female patient with a history of right breast carcinoma. Previously, the patient was misdiagnosed as right breast fibroadenoma. The patient was then advised to have an excisional biopsy and report revealed cribriform ductal carcinoma. 99mTc-MDP bone scan revealed that there is osteoblastic lesion in shaft of right proximal tibia suggestive of bone metastases that was confirmed with histopathology. Proximal tibial bone metastasis in breast carcinoma patient is relatively very uncommon, but challenging, site for bone metastasis.

Keywords: Acrometastases, bone metastases, breast carcinoma, bone scintigraphy, tibia.

Introduction

Tibial bone metastasis from breast cancer is considered a relatively rare presentation, as breast cancer metastases most commonly affect the axial skeleton (spine, ribs, pelvis, skull, and proximal long bones like the femur and humerus). However, there are few case reports and studies that include patients with tibial involvement.[1,2] One large study of 984 patients with bone metastases from breast cancer found that the tibia was involved in only 0.3% of cases.[3] ^{99m}Tc-MDP bone scan and histopathology may be performed to confirm the breast cancer origin, especially if it is the first or only site of metastasis.

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Case Report

We present a unique case of a 41 year female patient with a history of right breast carcinoma. Previously, the patient was misdiagnosed as right breast fibroadenoma with sebaceous cyst, a mass measuring 13.1x9.5x6.7 mm^3 in Ultrasonography (USG) report. The patient was then advised to have an excisional biopsy whole tumor mass and tumor was sent for histopathological examination to get confirmed diagnosis. The histopathology report revealed that there was cribriform ductal carcinoma in situ intermediate nuclear grade with positive margin. Before starting any treatment, the patient was advised to have all the required laboratory examinations, CECT chest-abdomen and ^{99m}Tc-MDP whole body bone scan. CECT revealed breast mass with hepatic solitary lesion.

Histopathology slides (Figure-1) were again reviewed and report revealed invasive carcinoma with immunohistochemistry (IHC) was Triple Negative Breast Carcinoma (TNBC). Whole body bone scan revealed that there was isolated osteoblastic lesion (measuring 2.7x1.7cm) in the shaft of the right proximal tibia suggestive of bone metastases (Figure-2). CT guided Fine Needle Aspiration Cytology (FNAC) performed from the focus present in the proximal 1/3 of the shaft of the right tibia revealed metastatic carcinoma.

Patient underwent for right breast modified radical mastectomy (MRM) followed with chemotherapy and local external field beam radiation therapy (30Gy/10#/ 2weeks). Later, she complained of severe pain below the left knee for which she also received local field radiation (20Gy/5#/1week). The symptoms decreased, allowing her to resume her daily routine. Tamoxifen was continued at 20mg/day. Patient was advised for 3-6 monthly follow up. The probable danger signs were explained and if any was advised for swift follow up.

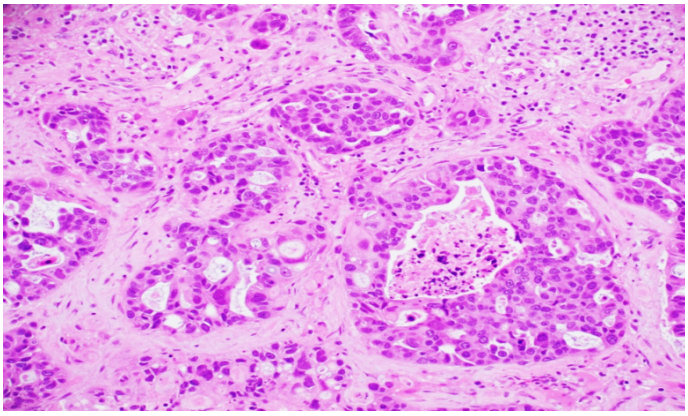

Figure 1: Histopathology image of Invasive carcinoma with Triple Negative Breast Cancer (TNBC) i. e. estrogen (ER), progesterone (PR), and HER2 protein all negative.

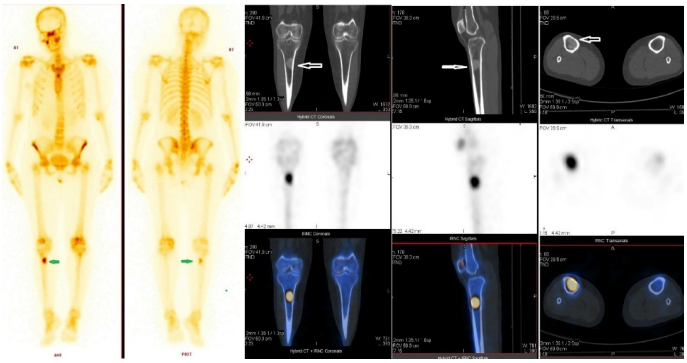

Figure 2: Tc-99m-MDP Whole Body Bone Scintigraphy and SPECT/CT shows there is increased radiotracer in the proximal shaft of right tibia likely metastases.

Discussion

Metastatic bone disease is the most common form of bone cancer found in oncology practice. Its incidence varies from 6% to 85% in several studies, and bone is the third most common site of metastases after lung and liver.[4] The primary cancers most commonly associated with bone metastases are Lung, Breast, Prostate, Thyroid and Kidney.[5] The spine appears to be the most affected bony site followed by the pelvis, ribs, skull and the upper arm bones. Breast cancer and lung cancer (which is 20% of cases) are the most common causes of distal or below elbow and below-knee metastases.[6]A literature review shows below-knee and below elbow metastases are found in only about 7% of cases. The tibia alone is affected in 4.4% while the foot and the ankle are involved in 1% each.[7] Our case also had metastasis to tibia. Most of these cases of acral metastases have been found to arise from bronchogenic carcinoma followed by renal cell carcinoma and breast cancer. The cause of the rarity of acral metastases is the relative lack of active hematopoetic bone marrow in these sites.[8] There have been reports of lung and breast cancers spreading to the thumb, or presenting just as an isolated metastases in the talus, or even to the phalanx.[9]

About 70% of cases with bony metastases are detected radiographically and 85% show lytic changes. Bone scans are not done routinely for early stage breast cancer and is recommended in stage II tumors>3 cm and high histologic grade, and in stage III and IV cancers.[10] On the other hand, stage II patients and stage I should only undergo for bone scans if the patients have bone pains. Hematogenous spread has been documented as the most common and important mechanism of bone involvement.[11] Metastases most often occur in red marrow, which are present in cancellous bone in vertebrae throughout adult life, hence the high frequency of spinal spread.

Metastases to peripheral skeleton distal to the elbows and knees are uncommon, hence a high index of suspicion needs to be maintained for diagnosis and effective management, especially in patients with prior cancers. Any suspected cases found through physical exams and imaging must be histopathological examination for definitive confirmation. While the general approach is palliative, surgical intervention might be an option for limited disease. In

such cases, CT or MRI is essential to map the local extent of the spread. Aggressive management may be beneficial for patients with contained disease who have a favorable prognosis. Radiotherapy is a key tool for managing pain, and the specific systemic therapy regimen is determined by the primary tumor's characteristics.

Summary

A case report of tibial bone metastasis in a breast cancer patient highlights an uncommon site of spread that typically requires aggressive local management (often surgery and/or radiation) in addition to ongoing systemic therapy and bone-modifying agents to manage symptoms, prevent SREs, and maintain the patient's quality of life and function.

Conflicts of Interest: None

AUTHOR'S CONTRIBUTION AND ORCID IDS

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Contribution ?
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