

# Case Report of Denovo Musculoskeletal Metastasis from Hormonal Positive and Her2 Negative Receiving CDK4 Inhibitor

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## Abstract

Skeletal muscle metastasis from breast cancer is a very rare presentation. We reported a case with breast cancer metastatic to skeletal muscle, bone, peritoneum and lymph node at presentation detected in FDG PET-CT. A Core needle biopsy was performed from the left breast tail lesion. Immunohistochemistry showed hormonal positivity, Her2 negativity with low KI67. Patient was treated with combined CDK4 inhibitor and non-steroidal aromatase inhibitors with regressive course in the PET-CT after the 1st 3 months. More studies should investigate the prognosis and proper management of skeletal muscle metastasis in breast cancer.

## Keywords

Breast Cancer, Metastasis, Skeletal Muscle, CDK4 Inhibitors

## 1. Introduction

Breast cancer most frequently metastasizes to bone (70%), lung (66%), and liver (61%) but may involve other organs [1].

The prevalence of metastases to skeletal muscle from post-mortem studies of patients with cancer ranges from 0.03% to 17.5%. For the patients who were treated from skeletal muscle metastasis, genital tumors (24.6%) were the most frequent malignancies metastasizing into the skeletal musculature, followed by gastrointestinal tumors (21.3%), urological tumors (16.4%), and malignant melanoma (13.1%). There is other rare tumor that may have muscle metastasis as bronchial carcinoma (8.2%), thyroid gland carcinoma (4.9%), and breast carcinoma (3.3%) [2]. There is no consensus on treating it as different entity but treating as other metastatic sites and according to the biological types. It is

usually associated with poor prognosis [3].

## 2. Case Report

Our patient is 70 years old female patient with no previous medical history or comorbidities and she had not any history of regular medication intake. She presented in March 2019 with severe back pain and right shoulder pain. Right shoulder X-ray showed impacted fracture of the neck of the humerus and MRI showed altered signal of L5. On examination she had left breast mass with left axillary lymph node. Mammography confirmed left breast 2 suspicious masses  $3 \times 2$  and  $1.3 \times 1$  cm with left axillary lymph nodes. Biopsy performed from the left breast mass showed invasive mixed duct and lobular carcinoma with predominantly lobular carcinoma immunohistochemistry; luminal A.

Her PET-CT showed: upper outer quadrant left breast spiculated lesion infiltrating the pectoralis, serratus anterior, latissimus dorsi, teres major and the subscapularis muscle with multiple skeletal bone metastasis the most active recorded at 10th dorsal vertebrae. Patient was complaining of severe back pain for which we started with palliative radiotherapy to the dorsal spine, 30 Gy/10 fractions/2 weeks with improvement of the pain and she has started CDK4 inhibitor (Palbociclib) with letrozole and Denosumab (monthly) in March 2019. During the 3rd month of treatment, she had neutropenia and anemia she received blood transfusion (250 cc/day for 2 days) and we had to delay Palbociclib for 1 week. In July 2019, she was improving clinically with no complaint and patient was assessed using PET-CT. It was done in comparison with the previous one that showed good therapeutic effect. She was advised to continue to be assessed after another 3 months. In October 2019, another assessment was done using PET-CT that showed sustained good therapeutic response. Her CA15.3 was 168 U/mL compared to 141 U/mL in September 2019. We advised to continue for another 3 months then to be assessed. In January 2020, CA15.3 was 406 U/mL and PET-Ct showed mild disease progression in the form of metabolic reactivation of the osseous lesions. She was shifted to Fulvestrant-Everolimus till June 2020 and CA15.3 was 1980 U/mL and was planned to start Chemotherapy using Paclitaxel, but her performance status was 2 so she was advised for supportive treatment and palliative care then unfortunately she died in July 2020 at her home.

## 3. Discussions

Skeletal muscle metastases are rare likely due to inability to remove lactic acid associated with angiogenesis from the microenvironment, the activation of lymphocytes and NK cells in skeletal muscles, and mechanical tumor destruction from motion [3]. The incidence of subclinical skeletal muscle metastasis has been reported to range from 0.2% to 17.5% in the autopsies which is considered higher than thought [4]. It is usually uncommon for breast cancer and if present it is always presented at disseminated stage [5]. It is usually presented as painful swelling at the involved muscle [6]. These metastases are very challenging to be

evaluated with a CT scan alone as they have isodensity with surrounding muscle. They are more appropriately identified with MRI or PET-CT [7].

In reviewing the literature, Ogiya *et al.* reported a case of breast cancer with an isolated metastasis into the abdominal wall muscle, with a review of 13 previously reported cases of which four presented as an isolated skeletal muscle metastasis without other distant metastases. The metastatic sites were the paraspinal muscle, scalene muscle, iliopsoas muscle, and extraocular muscle [5]. Kim *et al.* also reported 2 cases with relapse in the skeletal muscle one relapsed with an abdominal wall muscle metastasis without other distant organ metastasis, and the other showed gluteal muscle metastasis with involvement of iliac lymph nodes [8]. Our patient has metastasis in the pectoralis, latissimus dorsi, serratus anterior, teres major and subscapularis.

Breast cancer with skeletal muscle metastasis is treated as systemic disease according to the guidelines for metastatic breast cancer according to the immunohistochemistry with 3 fundamental agents (hormonal treatment, targeted agent and cytotoxic drugs) [9].

It was observed that skeletal muscle metastasis is associated with poor survival. Li *et al.* presented a case with the case condition that survives for only one year and our case also survived for 1 year and four months [9].

To our knowledge, all the patients have relapsed in the form of skeletal muscle metastases either alone or associated with other metastatic sites, and our patient was first diagnosed with metastatic breast cancer to skeletal muscle and bone.

The prognosis and appropriate treatment of skeletal muscle metastasis are currently uncertain. Further studies are needed to determine the prognosis and therapeutic strategies for skeletal muscle metastasis in breast cancer.

## Consent

The patient's son (The judicial witness) gave his free well approval for informed consent for the case report to be published without any influences.

## Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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