Case Report

A Unique Case of Muscle-Invasive Metastatic Breast Cancer Mimicking Myositis

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Breast cancer rarely metastasizes to the muscles, and it is even more unusual for this phenomenon to result in airway compromise. We present a unique case of an 84-year-old African-American female who presented with neck swelling and upper airway obstruction due to metastatic breast cancer invading the sternocleidomastoid muscles. After establishing the diagnosis and discussing possible treatment options, the patient elected for antiestrogen therapy, palliative tracheostomy, radiation therapy, and hospice services.

1. Introduction

Breast cancer is the most commonly diagnosed cancer in women. The incidence of breast cancer increases with age, and a woman’s lifetime risk is approximately 12.5%. While breast cancer is diagnosed at stage 1 in approximately half of non-Hispanic white women, diagnosis of metastatic disease as the initial presentation is seen in 6% of patients [1]. Breast cancer typically metastasizes to lung, liver, and bone [2]. Involvement of skeletal muscle is rare, but when it occurs, it usually presents with contiguous involvement of a soft tissue lesion and may appear clinically as a lump or mass. It may also occur in the setting of extensive bone involvement or in the presence of widely disseminated disease [3, 4]. ExtrANodal head and neck metastases are also uncommon with only a few case reports and case series documenting involvement of the thyroid, mandible, subcutaneous tissues, or pharynx [5–11]. Thus, metastases to muscles of the neck are almost unheard of, with only one such case documented in medical literature [12]. We report the exceedingly unusual case of an 84-year-old African-American female with neck swelling and airway obstruction due to metastatic breast cancer invading the musculature of the head and neck.

2. Case Report

An 84-year-old African-American female with no known history of malignancy initially presented at a local Emergency Department (ED) with complaint of dyspnea for several months. Patient was diagnosed with asthma and given an albuterol inhaler. Five months later, she presented to our ED with progressive neck swelling and dysphagia. Urgent evaluation with Otolaryngology (ENT) was arranged as she was noted to have difficulty controlling her secretions. During ENT evaluation, she acutely developed respiratory failure requiring emergent fiber-optic nasotracheal intubation and transfer to the medical intensive care unit (MICU).

A CT of the neck, chest, abdomen, and pelvis was remarkable for extensive inflammatory stranding of multiple muscular and fascial planes in the neck, mediastinum, and anterior chest. There was also moderate narrowing of the supraglottic airway (Figure 1). There was no evidence of other evidence of distant metastases. The CT did not reveal any bony lesions. A PET-CT and bone scan were unable to be performed given patient’s unstable condition in the MICU.

Erythrocyte sedimentation rate (ESR) was within normal limits at 26 mm/hr, and C-reactive protein (CRP) was
clinically appreciable. A bilateral breast ultrasound showed axillary, supraclavicular, or cervical lymphadenopathy was malignant cells.

arytenoid, epiglottis, and uvula biopsies demonstrated no with a breast primary malignancy. Biopsies from vocal cord, These immunohistochemical findings were most consistent maglobin showed strong positivity within malignant cells. Cells were mildly to moderately positive for GCDFP-15, CD34, CD30, and PAX-8 (Figure2). Staining with mam- ularweightcytokeratin(K903),GATA-3,andmammaglobin. tural was strongly positive for estrogen receptor (ER), pro- ated inflammatory infiltrate or necrosis was identified. The obtained which revealed infiltrating carcinoma.

improvement with high dose steroids.

was mildly elevated at 239IU/L. Evaluation for an autoim- ferase (AST) was normal at 26U/L. Creatinine kinase (CK) labs reference range at 155U/L, and aspartate aminotrans- undetectable. Lactate dehydrogenase (LDH) was within the reference range at 238U/mL. CEA was elevated just above the reference range at 3.5ng/L. There were no pathologies axillary lymph nodes appreciated on imaging. No malignancy was found at 3.5ng/L. There were no pathologies axillary lymph nodes appreciated on imaging. No malignancy was found.

significant thickening of the sternocleidomastoid muscle (blue arrows). Soft tissue density obliterating numerous fat planes extending into the mediastinum and completely encasing the major vessels and left paraspinal musculature including the left brachiocephalic vein. The patient had no palpable breast masses, and no tumor was palpable in the right breast.

Imaging of the chest showed a 1.7 × 1.0 × 1.5 cm mass in the left breast with increased vascularity highly suggestive of malignancy (BI-RADS 5) and 1.1 × 1.1 × 0.5 cm mass in the right breast without increased vascularity. A bilateral breast ultrasound showed a hyperechoic, oval-shaped, solid mass in the left breast with increased vascularity, highly suggestive of malignancy (BI-RADS 3). There were no palpable axillary lymph nodes appreciated on imaging. No malignancy was found.
The nature of this breast cancer metastasis was also unusual. Skeletal muscle metastases are rare in and of themselves, likely due to a hostile microenvironment created by muscle's pH, ability to remove lactic acid associated with angiogenesis, the activation of lymphocytes and NK cells in skeletal muscles, and mechanical tumor destruction from motion. It is thought that for these reasons, skeletal muscle metastases from breast cancer are uncommon. However, this pattern of metastasis has been described and is usually seen with disseminated, multiorgan involvement [18]. When skeletal muscle metastases do develop, they often present as isolated, painful soft tissue masses in the involved areas [4, 18]. Typically, these metastases are challenging to evaluate with CT alone due to isodensity with surrounding muscle. They may be more appropriately identified with MRI or FDG PET-CT and are often found to have round or oval shapes with well-defined margins [19, 20]. However, in this case, the metastases manifested as diffuse infiltration of cervical musculature without a discrete lump or mass. Breast cancer presenting with direct muscle invasion in an infiltrative pattern mimicking myositis has only been reported in one other case [12]. Due to its relatively rare occurrence, there currently is no consensus on the standard treatment for skeletal muscle metastases, and further studies are needed to determine the prognosis and proper diagnostic and therapeutic treatment [18].

Given that imaging studies for this patient depicted what appeared to be impressive inflammatory stranding of the muscles of the neck, it is probable that subtler changes may have been detected earlier in the disease course prior to the development of respiratory failure. Earlier imaging in this case may have led to more timely intervention and prevention of this airway emergency. Various modalities to achieve airway patency are available. These options may include emergent tracheostomy, laser therapy, contact electrocautery, argon plasma coagulation, cryotherapy, photodynamic therapy, brachytherapy, and airway stenting [21].

4. Conclusion

This case illustrates a unique presentation of metastatic breast cancer presenting as a muscle infiltration mimicking myositis and resulted in airway compromise. Initial imaging showed distortion of tissue planes which appeared inflammatory in
etiology thus confounding the differential diagnosis. This patient’s initial subacute presentation of cough and dyspnea were nonspecific and would be unlikely to trigger a concern for breast cancer. However, close clinical follow-up and repeat imaging may have led to a more timely diagnosis thereby preventing the development of imminent respiratory failure. Earlier recognition may have allowed for the availability of wider array of palliative interventions to improve the patient’s life expectancy and quality of life.

Unfortunately, this patient’s clinical course was highly aggressive, and she ultimately required urgent intubation and subsequent tracheostomy. A high index of suspicion for neoplasms should be maintained when patients present with an indeterminate myositis. For patients with progressive dyspnea, dysphagia, and evidence of myositis by imaging, it is important to biopsy areas of involvement to evaluate for sarcoidosis, amyloidosis, drug-induced myositis, other infections, and familial and autoimmune as well as neoplastic etiologies. A wide range of therapies are available to patients with airway compromise secondary to malignancy but should coincide with goals of care.

Conflicts of Interest

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

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