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Case Report

Upper limb soft tissue metastasis in post mastectomy patient

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ABSTRACT

Soft tissue metastasis from any primary malignancy is considered very rare and a breast carcinoma metastasizing to soft tissue is still rarer. To the best of our knowledge, carcinoma breast with soft tissue metastasis to upper extremity is very uncommon with only seven cases been reported in world literature till date and our case is the eighth such case in an elderly female, a known case of carcinoma left breast operated 7 years back. Only few case series and isolated cases reports have been published regarding any primary malignancy or breast carcinoma metastasizing to soft tissues. PET CT done showed features suggestive of left anterior chest wall recurrence with contralateral axillary lymphnodal metastasis and with soft tissue metastases in the left arm. We hereby present this case with review of literature to highlight its extreme rarity, unusual presentation, clinicopathological characteristics and its overall prognosis.

Keywords: Breast carcinoma, Metastasis, Radiotherapy (RT), Soft tissue, Upper extremity

INTRODUCTION

Metastasis to soft tissue from a primary malignancy is very rare with few case series of skeletal muscle meatstases from Sridhar KS et al, McKeown PP et al, Plaza JA et al, Damron TA et al, Torigoe T et al, Tuoheti Y et al, Herring CL et al and Surov A, et al and isolated case reports to verify it.[1-9] It can easily be misdiagnosed as a soft tissue sarcoma (STS) or an inflammatory lesion.[5,6] It is invariable to distinguish between a metastatic soft tissue tumor from other diagnostic pathologies as the management pattern and prognosis in all these entities are different and any overlap may cause unnecessary morbidity.[4] Histopathological and immunohistochemical (IHC) analysis plays the major role in differentiating and determining the primary lesion. Metastasis to soft tissues is seen primarily in solid tumors like lungs, stomach, colon, esophagus, uterus and pancreas and haematological malignancies like lymphomas which have shown more propensities for soft tissue spread as compared to carcinoma breast.[5,6] Till date, breast carcinomas metastasizing to soft tissue, whether skeletal muscle or subcutaneous tissue has been rarely reported while only 7 previous cases of upper limb involvement have been described by Plaza et al, Surov et al and Konatam et al, thus establishing it as a rare entity and its early diagnosis and treatment are important for a better prognosis.[4,9-11]

CASE REPORT

A 63-year-old female patient, previously treated for carcinoma left breast 7 years ago, presented with progressive painful multiple swellings in left forearm

each measuring approximately 3 cm × 2 cm, for the past 11 months. It started spontaneously as a small nodule and has progressed to the present size. The swellings were firm to hard in consistency at the periphery with soft and cystic centres.

Figure 1: Showing subcutaneous metastasis in upper arm.

The lesions were not friable nor ulcerated. There was tenderness of the left anterior chest wall with no obvious swelling. There was no history suggestive of pulmonary or cerebral metastasis.

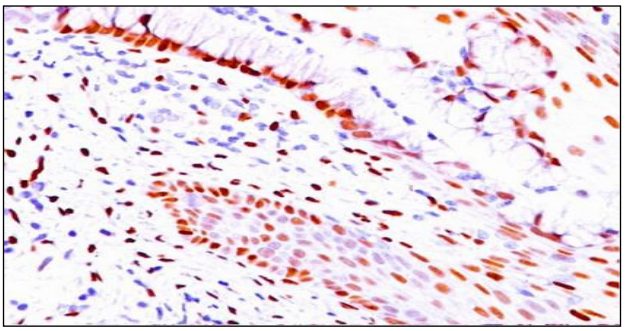

Figure 2: IHC (immunohistochemistry) showing ER (estrogen) positive.

Histopathological examination by incision biopsy of the skin nodule showed metastatic deposits (left arm). Further immunohistochemical (IHC) analysis revealed tumor cells staining positive for estrogen and progesterone receptors while negative for HER 2-Nu, desmin, epithelial membrane antigen, CK7 and thyroid transcription factor-1 (TTF-1), suggestive of metastasis from a primary breast carcinoma.

DISCUSSION

Soft tissue metastasis from any primary site has been rarely reported in world literature till date, while breast as the primary malignancy has been reported by still fewer studies.[4,9,10,11] With regard to soft tissue metastasis, some studies have reported a frequency of 0.8% based on autopsies GFwhile few reported an incidence of 0.2% based on clinical studies.[12,13]

This rarity can be due to the fact that soft tissues produce anti-carcinogenic factors like lactic acid, beta adrenergic receptors or protease inhibitors which serve as a deterrent for metastatic invasion.[1,9,14] Soft tissue metastasis can be in subcutaneous tissue or in muscular tissue.[5]

Regarding the primary neoplasm, only Plaza et al. reported 13 cases/11% cases of breast carcinomas as the primary, 16% cases of skin carcinoma, 11% cases of lung carcinoma, 10% colon and 10% kidney carcinomas in 118 cases of soft tissue metastasis, while Damron et al. and Torigoe et al highlighted lung carcinoma as the primary solid malignancy and lymphoma as the primary liquid malignancy apart from stomach, colon, esophagus, uterus and pancreas having the maximum tendency to metastasize to soft tissues as compared to breast.[4,5,6]

Breast carcinoma generally metastasizes to bone, lung, liver, brain and lymph nodes, whereas soft tissue is not the usual site. As for the soft tissue metastatic sites, Plaza et al and Torigoe et al reported anterior abdominal wall, Damron et al identified thigh as the predominant location, Surov et al. reported extraocular muscles as a potential site followed by back, chest wall and lower extremities with upper extremities being the least common site as happened in our case. Plaza et al. described 3 cases, Surov et al. reported 2 while Konatam et al. reported 1 case of upper extremity involvement from breast cancer. As for the size of metastatic lesion, Konatam et al. described a 15 cm × 7 cm swelling while we report a 21 cm × 17 cm soft tissue metastatic swelling.[6,4,9,10]

Breast carcinoma is an aggressive disease with about 10-15% patients developing distant metastasis within 3-4 years, however such manifestation after 15 years is uncommon though not unusual in the present scenario of highly advanced diagnostic modalities, definitive and adjuvant treatment which has increased the life span of a patient where the metastatic state can manifest.

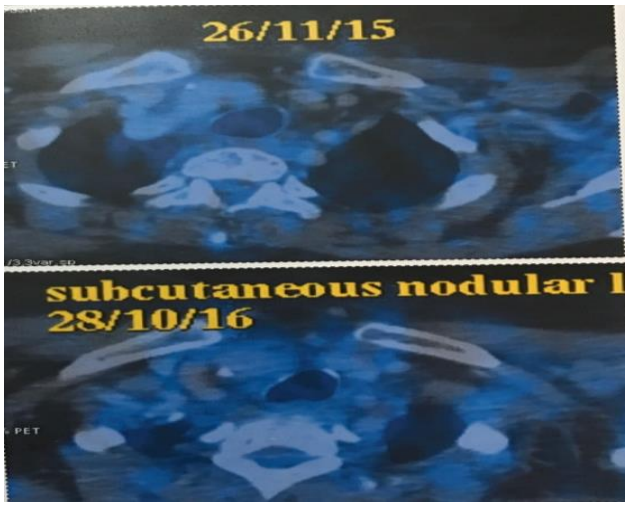

Figure 3: Pet CT shows subcutaneous nodule.

This also implies that the patient harbours the risk of distant metastasis during their entire lifetime which is further enhanced by the heterogenous nature of the breast disease which makes it difficult to identify the risk factors and assess the curative modality.

Distant or local spread via hematogenous or lymphogenous route augers a dismal prognosis for the patient with a larger tumor size, higher grade, high lymph nodal burden and lymphovascular invasion (LVI) being the known prognostic markers. Hormone receptors studies have shown that estrogen receptor (ER) positive breast carcinomas metastasize to skeletal system, while HER 2-Neu overexpression is associated with poor prognosis in axillary lymph node positive patients.[10]

Another important clinical entity which can resemble a soft tissue swelling of upper extremities in a previously treated breast carcinoma causing a clinical dilemma is lymphedema, or lymphangiosarcoma in a chronic lymphedema case. A lymphedema is a known side effect of breast carcinoma treated with surgery and RT which damage the rich lymphatics of the breast causing lymph to accumulate in body tissues resulting in swelling of the affected organ.

The main diagnostic approach for identifying soft tissue metastasis has been magnetic resonance imaging (MRI) which is now being superseded by 18-fluorodeoxyglucose whole body positron emission tomography (18-FDG WB PET CT) scan due to its higher sensitivity as most metastatic lesions have higher FDG uptake as compared to normal tissues. The CT component of the scan helps localize the lesions as soft tissue metastatic lesions appear hyperdense or hypodense as compared to the surrounding soft tissues. [15]

However, only a histopathological examination of biopsy specimens verifies the diagnosis, as the metastatic lesion and the primary will have similar histological features. Further immunohistochemistry of the tissue confirms the exact site of primary lesion. Expression of desmin, CD 34, EMA, S100 indicates an STS, while immunopositivity for $CK7^+$ and/or $CK20^+$, TTF-1 signifies a pulmonary or gastro-intestinal adenocarcinoma respectively.[16] Our case stained positive for both ER and PR while being negative for desmin, CK7, TTF-1, EMA which proved breast origin of metastasis. The diagnosis of the exact pathology is of utmost importance as the treatments of all entities are different and any misdiagnosis can result in undue morbidity or even death.

Regarding treatment of metastatic soft tissue tumors, a multimodality approach generally is adopted depending upon the performance status of the patient, any comorbid condition, type of primary malignancy, site and size of the metastatic lesion. RT and chemotherapy have been generally considered the primary modality of therapy either in combination or separately while surgery is reserved for patients not responding to radiation or chemotherapy.[4,5] Damron et al. reported 25% while Torigoe et al. reported 47% 1-year survival rate in the combined chemoradiation modality, thus indicating the poor prognosis of patients with soft tissue metastasis.[6,5]

CONCLUSION

By reporting our case we want to suggest that newer prognostic markers should be developed to identify breast carcinoma patients who are at risk for developing distant metastases. Also, a better understanding and interpretation of the molecular and biological mechanism of metastasis may help to device therapeutic strategies to counter this disease process. A high degree of clinical suspicion and immuno-histopathological confirmation is required to identify and diagnose any soft tissue swelling over body in a previously treated breast primary to prevent any inappropriate treatment causing undue morbidity or even mortality.

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