An Unusual Case of Synovial Sarcoma with Breast Metastasis: Findings on Positron Emission Tomography-Computed Tomography

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Abstract

Synovial sarcomas are aggressive soft-tissue tumors with the propensity for metastases at presentation or later course of disease. The most common site of metastases is lung, followed by lymph node and bone. It rarely metastasizes to the liver and to the brain. Breast metastases from extramammary tissue are extremely rare, more so from synovial sarcoma. ^{18}F-fluorodeoxyglucose positron emission tomography–computed tomography (FDG PET/CT) plays a very important role in diagnosing occult metastasis in sarcomas. Histopathological diagnosis and translocation studies are important to confirm the diagnosis. We present a case of synovial sarcoma who underwent^{18}FDG PET/CT which showed occult metastasis to the breast.

Keywords: *Metastasis to breast, nonmammary metastases, positron emission tomography scan, synovial sarcoma*

Synovial sarcoma accounts for about 5%–10% of soft-tissue sarcomas (STSs) and seen in younger adults of 15–40 years of age.[1] Site of origin of synovial sarcomas is extremities in the majority of patients, and less common sites are the head, neck, mediastinum, and peritoneum.[2,3] Overall, 50% of patients develop metastatic disease either at presentation or later in the course of disease. The most common site of metastasis is the lung (74%–81%), lymph node (3%–23%), and bone (10%–23%).[4] Rare metastatic sites are liver and few anecdotal case reports of metastasis to the brain.[4,5] Nonmammary metastases to the breast are rare (0.5%–2%) and are seen in carcinomas, melanoma, and sarcomas.[6] The most common carcinoma reported is high-grade ovarian carcinoma and uterine leiomyosarcoma among sarcomas.[6] Another review of 127 cases of breast metastasis found lymphoma being the commonest followed by melanoma, rhabdomyosarcoma, and lung cancers.[7] Metastasis from synovial sarcoma is even exceptional, and there is only one case report available.[8]

STSs are highly fluorine-^{18}-fluorodeoxyglucose (F-FDG)-avid tumors. Positron emission tomography (PET) seems to be effective for the assessment of the extent of disease. The detection of occult metastasis helped us in the early identification of disease recurrence and managing the case with curative intent.

Interesting Image

A 26-year-old woman presented with cough and breathlessness of 2 weeks duration. Contrast-enhanced computed tomography (CECT) of the chest revealed a well-circumscribed moderately enhancing heterogeneous mass in the right lung lower lobe. The mass was abutting the right hilum medially, laterally extending up to the lateral chest wall and inferiorly to the diaphragmatic pleura [Figure 1a-c]. The biopsy was taken from the mass, which revealed synovial sarcoma (malignant spindle cell tumor cells immune positive for epithelial membrane antigen [EMA], MIC-2, Bcl-2). She underwent surgery and received radiotherapy and chemotherapy

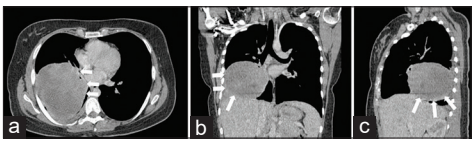

Figure 1: Contrast-enhanced computed tomography of chest axial (a), coronal (b) and sagittal (c) images show a well circumscribed moderately enhancing heterogeneous mass in right lung lower lobe (arrows), abutting the right hilum medially, inferiorly to the diaphragmatic pleura and extending up to the lateral chest wall

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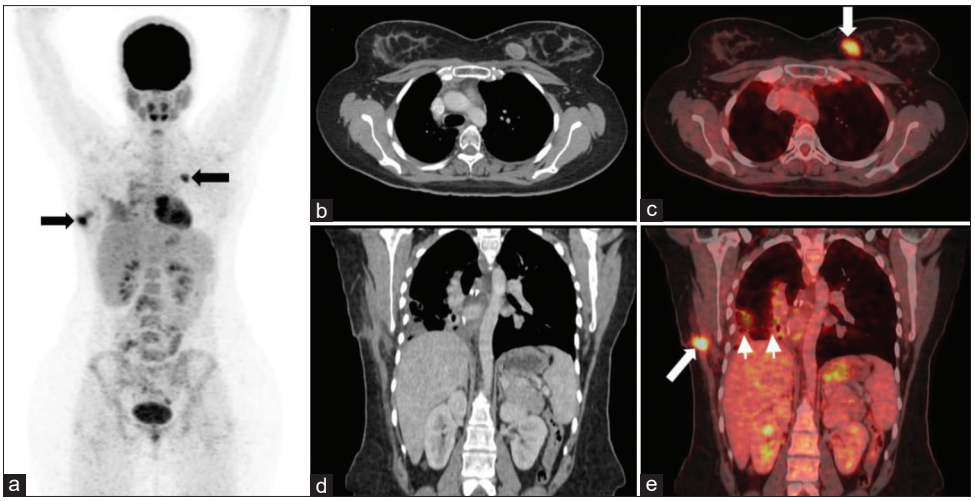

Figure 2: Maximum-intensity projection image showing fluorodeoxyglucose avid lesions in the right lateral chest wall left chest wall region anteriorly (a, arrows). Corresponding axial computed tomography (b) and fused (positron emission tomography–computed tomography) images (c) at the level of breast lesion showing a fluorodeoxyglucose avid well-defined soft-tissue density nodular lesion in the left breast upper inner quadrant (arrow). Coronal images of the computed tomography (d) and fused positron emission tomography–computed tomography (e) at the level of right lateral chest wall lesion showing increased fluorodeoxyglucose uptake along the surgical scar (arrow), postoperative and postradiotherapy changes in the right lower thoracic cavity (arrow heads)

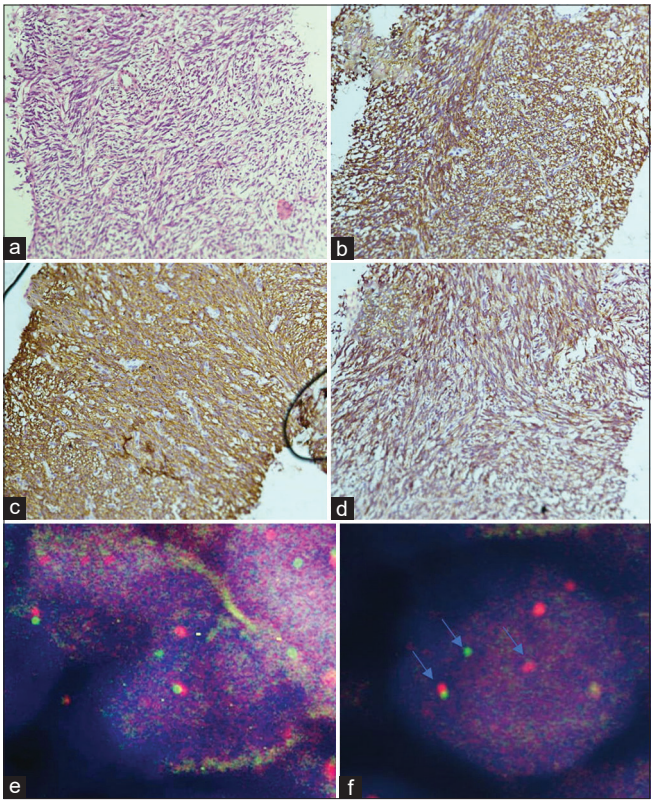

Figure 3: Histopathology (a, H and E, b 200) showed malignant spindle cell tumor cells arranged in fascicles and sheets and the cells showed hyperchromatic nuclei with moderate pleomorphism and occasional mitotic activity. Immunohistochemistry showed tumor cells positive for epithelial membrane antigen (b), MIC-2 (c) and Bcl-2 diffuse (d). Translocation study by break apart fluorescence *in situ* hybridization showed presence of X:18 translocation (e and f)

(she received six cycles of ifosfamide and adriamycin and 50Gy/25# radiotherapy). Post therapy CECT showed no evidence of any residual disease. A follow-up ^{18}F-FDG PET/computed tomography (CT) was done after 6 months. Maximum intensity projection images showed FDG-avid lesions in the region of the left breast and right lateral chest wall [Figure 2a]. CT and fused PET/CT images at the level of left breast revealed a well-defined soft-tissue density nodular lesion in the left breast upper inner quadrant with increased FDG uptake and maximum standardized uptake value of 4.2 [Figure 2b and c]. Corresponding CT and fused PET/CT images at the level of right lateral chest wall lesion showed increased FDG uptake along the surgical scar, postoperative, and postradiotherapy changes in the right lower thoracic cavity [Figure 2d and e]. Biopsy from the breast lesion was suggestive of metastases from synovial sarcoma (sections showed features of malignant spindle cell tumor arranged in fascicles and sheets and tumor cells were immune positive for EMA, MIC-2 , diffuse Bcl-2) [Figure 3a-d]. Biopsy from the lateral chest wall lesion revealed inflammatory changes. In view of the rarity metastasis to the breast from synovial sarcoma diagnosis was confirmed with translocation studies, which confirmed synovial sarcoma specific chromosomal translocation t (X: 18)(p11.2;q11.2) [Figure 3e and f].

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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