

¹⁸F-Fluorodeoxyglucose Positron Emission Tomography–Computed Tomography in Malignant Transformation of Paget’s Disease of Bone

Abstract

Malignant transformation Paget’s disease of bone to sarcoma is relatively rare, occurring in approximately 1% of these patients. Although few clinical and imaging findings may help in prediction of malignant transformation, most of them are nonspecific. We describe a case of carcinoma vocal cord and Paget’s disease of bone with sarcomatous transformation, where ¹⁸F-fluorodeoxyglucose (FDG) positron emission tomography–computed tomography was helpful in accurate diagnosis by demonstrating differential intense FDG uptake in transformed areas of pagetic bone and also FDG-avid osteoblastic pulmonary metastasis.

Keywords: ¹⁸F-fluorodeoxyglucose positron emission tomography–computed tomography, osteosarcoma, Paget’s disease, sarcomatous transformation

A 68-year-old man who was treated for squamous cell carcinoma of the vocal cord 7 years ago presented with pain in the right hip region. Computed tomography (CT) scan showed a mixed sclerotic and lytic lesion involving the entire right hemipelvis with minimal soft-tissue component, reported as suspicious for metastasis. A calcified nodule was found in the left lung lower lobe, which was considered as an old healed granuloma. ¹⁸F-fluorodeoxyglucose positron emission tomography–CT (¹⁸F-FDG PET-CT) was performed to assess the extent of disease, which showed no evidence of disease in the vocal cord. There was FDG-avid diffuse sclerotic change with interspersed lytic areas and thickened cortex involving the right hemipelvis along with multiple areas of focal intensely FDG-avid osteoblastic reaction and associated minimal soft-tissue components in the right pubic bone and posterior pillar of the right acetabulum [Figure 1a–e]. Intensely increased FDG uptake was seen in the calcific nodule in the anteromedial segment of the lower lobe of the left lung, suggesting the possibility of osteoblastic metastasis instead of calcified granuloma [Figure 1f–h]. Hence, the possibility of Paget’s disease with sarcomatous transformation and lung metastases was raised. PET-CT image-guided biopsy from intensely

FDG-avid areas of the right hemipelvis was performed, which showed round/fusiform/spindly cells displaying central or eccentrically placed mildly pleomorphic and hyperchromatic nuclei with moderate-to-scant cytoplasm. Fragments of both unmineralized and mineralized neoplastic osteoid were also seen with a coarse lace-like pattern, consistent with osteosarcoma, osteoblastic type [Figure 1i and j]. Paget’s disease of bone is a predominantly asymptomatic benign condition, affecting 3%–4% of the population over the age of 40.^[1] Malignant transformation to sarcoma occurs in approximately 1% of these patients.^[2,3] Although few clinical and imaging findings may help in prediction of malignant transformation, most of them are nonspecific.^[4–6] Radiographic hallmarks of sarcomatous transformation include aggressive osseous lysis, cortical destruction, and the presence of a soft-tissue mass.^[3,7,8] FDG PET-CT is helpful by demonstrating differential intense FDG uptake in transformed areas and also by additional specific findings in whole-body imaging like FDG-avid osteoblastic pulmonary metastases as in this case, giving a clue toward the possibility of Paget’s disease with malignant transformation.

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Received: 08-05-2020

Revised: 25-05-2020

Accepted: 26-05-2020

Published: 21-10-2020

Access this article online

Website: www.ijnm.in

DOI: 10.4103/ijnm.IJNM_99_20

Quick Response Code:



How to cite this article: Senthil R, Gangadharan VP, Ramachandran Nair AV, Mahadevan P, Pratap T. ¹⁸F-fluorodeoxyglucose positron emission tomography–computed tomography in malignant transformation of paget’s disease of bone. Indian J Nucl Med 2020;35:362-3.

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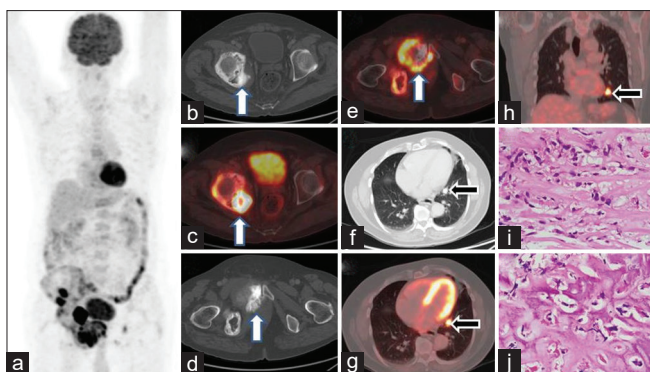


Figure 1: ¹⁸F-fluorodeoxyglucose positron emission tomography–computed tomography images (a-e) showing fluorodeoxyglucose-avid diffuse sclerotic changes with interspersed lytic areas and thickened cortex involving the right hemipelvis along with multiple areas of focal intensely fluorodeoxyglucose-avid osteoblastic reaction and associated soft-tissue components in the right pubic bone and posterior pillar of the right acetabulum. Fluorodeoxyglucose-avid calcific nodule noted in the anteromedial segment of the lower lobe of the left lung. (f-h) Histopathological examination from intensely fluorodeoxyglucose-avid areas of the right hemipelvis showing features suggestive of osteosarcoma, osteoblastic type (i and j)

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.

Financial support and sponsorship

Nil.

Conflicts of interest

There are no conflicts of interest.

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