

Paget's disease of pelvis mimicking metastasis in a patient with lung cancer evaluated using staging and follow-up imaging with fluorine-18 fluorodeoxyglucose-positron emission tomography/computed tomography

Koramadai Karuppusamy Kamaleshwaran, Sudhakar Natarajan¹, Deepu Shibu, Anjali Malaikkal, Ajit Sugunan Shinto

Departments of Nuclear Medicine, PET/CT and Radionuclide Therapy and ¹Medical Oncology, Comprehensive Cancer Care Centre, Kovai Medical Centre and Hospital Limited, Coimbatore, Tamil Nadu, India

ABSTRACT

Paget's disease of bone is a benign disease, of uncertain etiology, characterized by an accelerated turnover, that is, bone resorption and formation. Paget's disease may be present in up to 5% of the population, and the majority of cases are asymptomatic. We report the imaging findings of Paget's disease of pelvis discovered incidentally in patient with lung cancer evaluated by fluorine-18-fluorodeoxyglucose (FDG) positron emission tomography/computed tomography (PET/CT) for staging. FDG PET-CT scan showed intense uptake in the right lung lower lobe primary and mediastinal lymph nodes. Furthermore, increased uptake noted in left hemipelvis suggestive of Paget's disease. He underwent follow-up FDG PET-CT after chemotherapy showed decrease in lung mass and mediastinal nodes. However, the uptake in left hemipelvis remains same confirming Paget's disease.

Keywords: Fluorine-18-fluorodeoxyglucose positron emission tomography/computed tomography, lung cancer staging, Paget's disease, pelvis

INTRODUCTION

Paget's disease is a chronic bone disorder characterized by focal areas of excessive osteoclastic resorption accompanied by a secondary increase in osteoblastic activity, resulting in abnormal bone structure, bone expansion, and deformity.^[1] Scintigraphy using either Tc^{99m}-methylene diphosphonate or fluorine-18 (F-18) fluoride is the most useful method of detecting pagetic lesions.^[2] Additional plain radiographs are obtained to characterize lesions detected by scintigraphy. Paget's disease when associated with malignancy may pose diagnostic dilemma. We report the imaging findings of a patient

with Paget's disease in carcinoma lung who underwent during staging and follow-up imaging using F-18-fluorodeoxyglucose (FDG) positron emission tomography/computed tomography (PET/CT).

CASE REPORT

A 65-year-old male patient diagnosed to have right lower lobe lung adenocarcinoma was referred for FDG PET/CT for staging evaluation. FDG PET-CT showed intense tracer uptake in the right lower lobe lung lesion along with multiple mediastinal and right supraclavicular lymph nodes [Figure 1]. Furthermore, increased tracer uptake noted in the entire left hemipelvis with a maximum standardized uptake value (SUVmax) of 5.3. CT showed cortical thickening, intra trabeculation with coarse thick trabeculae, bone expansion, and multiple areas of sclerosis, consistent with Paget's disease [Figure 2]. The level of alkaline phosphatase (ALP) was 456 IU/l. He underwent follow-up FDG PET-CT after three cycles of chemotherapy showed intense FDG uptake with decrease in size and metabolism of the

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Address for correspondence:

Dr. Koramadai Karuppusamy Kamaleshwaran, Department of Nuclear Medicine, PET/CT and Radionuclide Therapy, Comprehensive Cancer Care Centre, Kovai Medical Centre and Hospital Limited, Coimbatore - 641 014, Tamil Nadu, India. E-mail: dr.kamaleshwar@gmail.com

lung primary and mediastinal nodes with complete response in supraclavicular and some mediastinal nodes. But left hemipelvis uptake remains same, and he was asymptomatic for Paget's disease [Figure 3].

DISCUSSION

Paget's disease is a disorder of unknown etiology with unevenly increased osteoclastic and osteoblastic skeletal remodeling. Bone involvement may be monostotic or polyostotic with characteristic radiographic features of osseous enlargement, deformity, and trabecular thickening. Paget's disease have a male predominance and increasing frequency related to age.^[3] There is a rise in serum ALP and abnormal remodeling of bone, leading to characteristic radiograph appearances of "cotton wool" appearance of the skull, "ivory" vertebra, and "blade of grass" shape in long bones.^[2,4] FDG-PET is a tomographic technique, with superior spatial resolution compared with a bone scan, with the added ability to quantitatively measure (SUVmax) disease activity, and monitor the response to treatment.^[5] The role of FDG-PET in Paget's disease is not as yet well-elucidated. It is unclear whether Paget's disease may lead to false-positive findings in oncological patients, or if FDG-PET can reliably differentiate benign pagetoid changes from metastatic and sarcomatous changes of bone. Some studies have concluded that Paget's disease is not associated with FDG uptake in most of the cases, but FDG uptake may be seen in patients with more active disease.^[6,7]

Previous reports of increased tracer uptake in Paget's disease mimicking metastasis in a case of malignant mesothelioma and rectal cancer have been reported.^[8,9] We describe a case of increased FDG activity in pagetoid pelvis in lung cancer patient detected incidentally using PET/CT. The intense FDG focal uptake in the left hemipelvis lesion on FDG-PET in our case is a possibility of false positive findings in patients with cancer.^[10] Fused PET/CT images can add increased specificity in the characterization of an osseous lesion when compared with stand-alone PET by differentiating between the exact location of FDG uptake in these lesions. In general, cortical distribution of FDG uptake is more frequently seen in Paget's disease, and a medullary distribution of FDG uptake is more often associated with osseous metastases.^[8]

Computed tomography correlation may often improve the diagnostic accuracy of nonspecific FDG uptake in some patients, with the potential for discriminating between benign Paget's disease and associated sarcomas. Coregistered PET/CT data may obviate the need for further evaluation or biopsy, as in our case, especially when CT scan findings are characteristic for Paget's disease. Follow-up imaging was helpful as lung primary and nodes were responding to the chemotherapy but the pelvic lesion remains same confirming unrelated to lung cancer as Paget's disease of pelvis.



Figure 1: Whole body fluorodeoxyglucose-positron emission tomography/computed tomography (FDG PET/CT) maximum intensity projection image showing primary right lower lobe lung mass and mediastinal, right supraclavicular nodes. Furthermore, diffuse increased uptake in left hemipelvis noted (Paget's disease)

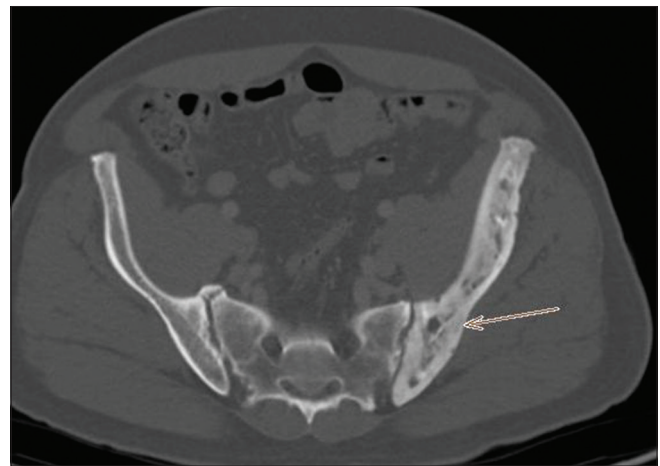


Figure 2: Axial computed tomography of the pelvis showing left ilium cortical thickening, intra trabeculation with coarse thick trabeculae, bone expansion, and multiple areas of sclerosis, consistent with Paget's disease

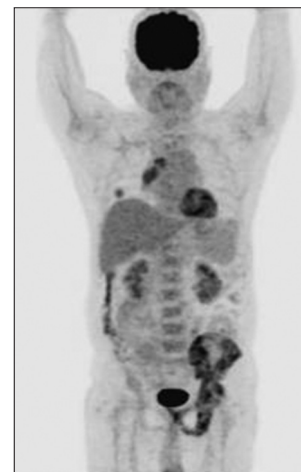


Figure 3: Whole body fluorodeoxyglucose-positron emission tomography/computed tomography (FDG PET/CT) maximum intensity projection image showing decrease in primary right lower lobe lung mass and mediastinal nodes. Diffuse increased uptake in left hemipelvis remains unchanged (Paget's disease)

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