Case Report

Occult tumour-induced osteomalacia causing lesion detected by FDG-PET/CT scan

ABSTRACT

Oncogenic osteomalacia is a rare condition, with overproduction of fibroblast growth factor 23, leading to hypophosphatemia, phosphaturia. If it is associated with benign mesenchymal tumor, then resection of tumor is curable. Thus, detection and localization of the lesion are of utmost importance. We report a case, where ^{18}F-FDG PET/CT scan was useful in detection of such occult lesion.

Keywords: FDG PET/CT scan, oncogenic osteomalacia, tumor-induced osteomalacia

INTRODUCTION

Oncogenic osteomalacia is a paraneoplastic syndrome which involves hypophosphatemia, phosphaturia, and osteomalacia. It is commonly associated with benign connective tissue mesenchymal tumors and features mimic that of X-linked or autosomal dominant hypophosphatemia rickets. Tumor resection is curable; however, since these lesions are small and can be located anywhere in the body, they pose great difficulty in detection by routine anatomic imaging. Since most of these tumors demonstrate fluorodeoxyglucose (FDG) avidity, whole-body FDG positron emission tomography-computed tomography (PET-CT) scan can be useful in diagnosis, as seen in our report.

CASE REPORT

A 47-year-old woman presented with generalized weakness and pain in multiple joints for 2 years. She was referred for ^{99m}Tc-MDP bone scan [Figure 1], which was showed increased tracer uptake in multiple joints, likely favoring metabolic bone disease/osteomalacia. Her laboratory tests revealed normal calcium; however, she had hypophosphatemia (1.2 mg/dl).

Subsequently, on clinical suspicion of occult malignancy, she was referred for whole-body ^{18}F-FDG PET-CT scan. The maximum intensity projection image [Figure 2c] showed fairly physiological distribution with faint increased uptake in the right proximal thigh. The axial image and coronal images [Figure 2a and b] revealed low-grade FDG uptake in soft tissue nodular lesion in the proximal right thigh, just lateral to femoral vessels in anteromedial aspect of infratrochantric region. Biopsy of the lesion confirmed diagnosis of mesenchymal tumor, which was then surgically excised. Thereafter, the patient showed dramatic improvement within a month.

DISCUSSION

Oncogenic osteomalacia involves abnormal phosphate metabolism due to phosphaturic hormone fibroblast growth factor 23.[1] Biochemical findings are of hypophosphatemia due to renal phosphate wasting. Patients usually present with debilitated state, generalized weakness, body pain,

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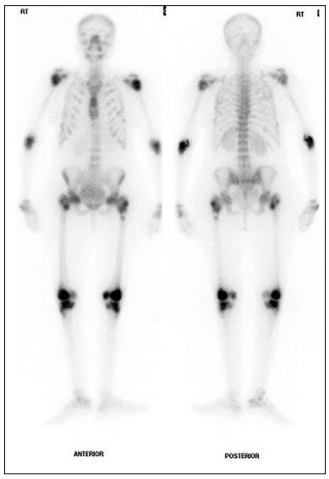

Figure 1: Bone scan image of patient suggestive of increased tracer uptake in multiple joints, likely favoring metabolic bone disease/osteomalacia

and recurrent fractures. They are mostly associated with benign mixed connective tissue mesenchymal tumor and surgical excision is treatment of choice. Since they are small and varied in location, conventional imaging modalities such as CT scan and magnetic resonance imaging are often less useful in detecting the occult lesion.[2] The various locations reported includes middle cranial fossa,[3] skull bone, and tibia.[4] Increased somatostatin expression has been seen in these tumors, and few reports of indium-111 octreotide scan for localization have been published,[5] and now, gallium-68 has also been used for lesion localization;[6] however, in occasional case reports, somatostatin expression was not seen.[7]

Due to generalized symptoms, small tumors, varied locations, and slow growth rate, anatomical imaging is not much helpful and there is significant delay between onset of symptoms and diagnosis. In literature, cases have been reported for detecting occult mesenchymal lesion using FDG PET-CT scan.[8] As seen in our case, there was a delay in diagnosis as initial investigations failed to locate the lesions. Whole-body FDG PET-CT scan was useful in diagnosis, thus leading to appropriate treatment. Since mesenchymal tumors are low-grade FDG avid and whole-body FDG PET scan can evaluate entire body (including lower limbs, as these tumors are usually in extremities), this investigation is helpful to localize the occult lesion, thus helping in management. Thus, early use of FDG PET-CT scan in high clinical suspicion of oncogenic osteomalacia would be worthwhile to arrive at diagnosis earlier and help in excision of occult lesion.

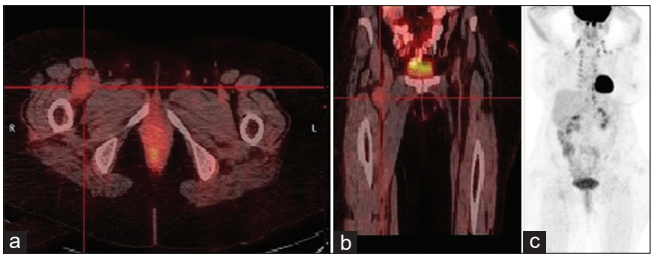

Figure 2: Fluorodeoxyglucose positron emission tomography-computed tomography scan images of patient, axial (a) and coronal images (b) showing tracer uptake in revealed low-grade fluorodeoxyglucose uptake in soft tissue nodular lesion in proximal right thigh, just lateral to femoral vessels and maximum intensity projection (c) image of the scan

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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Nil.

Conflicts of interest

There are no conflicts of interest.

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