

Multiple Lytic Lesions on F-18 Fluorodeoxyglucose Positron Emission Tomography/Computed Tomography not Always Metastatic?

Sir,

A 26-year-old female presented with complaints of pain in the left knee since 2 years and right arm pain and swelling for 2 weeks. The patient had a history of fall 2 months ago. Radiographs of the arm and thigh revealed lytic lesions in mid shaft of right humerus associated with pathological fracture and lytic lesion in the left femoral shaft. The patient was referred for an F-18 fluorodeoxyglucose positron emission tomography/computed tomography scan (F-18 FDG PET/CT) which revealed lytic lesions with variable FDG uptake involving extensive skeletal sites associated with pathological fractures [Figure 1]. Generalized osteopenia was also noted. In addition to this, a well-defined soft tissue density nodule measuring 2.1 cm × 1.6 cm was seen posterior to lower pole of left thyroid lobe which showed low FDG uptake [Figure 1b and c]. Based on the above findings, serum calcium and serum parathyroid hormone (PTH) levels were sought. Due to elevated serum calcium, serum PTH levels, multiple lytic lesions with pathological fractures and diffuse osteopenia, a clinical suspicion of parathyroid adenoma arose. Subsequently, the patient underwent Technetium 99 m sestamibi scan (Tc99m MIBI) which revealed a left-sided parathyroid adenoma [Figure 2]. Although F18 FDG PET/CT is routinely used for investigating multiple lytic lesions, this is an important example of how a biochemical screening could have changed the diagnostic algorithm. A simple endocrine evaluation thus eventually resulted in guiding a definitive surgical cure for the patient. This patient underwent surgery and histopathology confirmed a parathyroid adenoma.

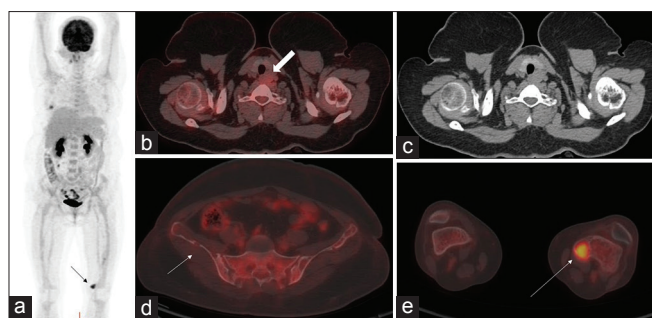


Figure 1: F-18 fluorodeoxyglucose positron emission tomography/computed tomography maximum intensity projection image (a) and fused positron emission tomography/computed tomography and computed tomography images at neck (b and c) soft-tissue density nodule posterior to left lobe of thyroid with no significant fluorodeoxyglucose uptake (thick white arrow) and multiple lytic lesions as shown in fused positron emission tomography/computed tomography axial sections at pelvis (d) with no significant uptake (small white arrow) and at knee level (e) with increased fluorodeoxyglucose uptake (white arrow)

Primary hyperparathyroidism characterized by elevated serum PTH due to hyperfunctioning parathyroid glands manifests as hypercalcemia due to abnormal bone metabolism and brown tumors.^[1,2] Brown tumors are non-neoplastic and are due to high osteoclastic activity leading to bone resorption.^[1] The sensitivities of Tc99 m MIBI scintigraphy, ultrasound, and combined techniques have been reported to be about 85.3%, 72.5%, and 90.4%, respectively.^[3] Parathyroid surgery is the only definitive cure for primary and tertiary hyperparathyroidism.^[4] Cases has been reported in which patients diagnosed with brown tumors have resolved after successful parathyroidectomy due to mineralization of the brown tumors after normalization of the serum calcium and PTH levels.^[5] This case demonstrates how biochemical evaluation of calcium, phosphorus, and PTH changed the whole management in the light of F-18 FDG PET/CT findings.

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.

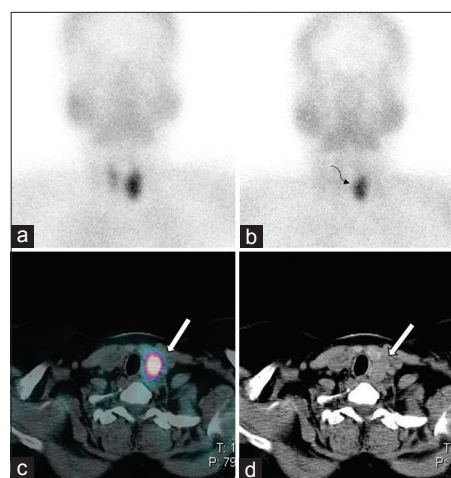


Figure 2: Tc99m MIBI early image (a) radiotracer uptake in both lobes of thyroid gland with delayed image, curved arrow (b) wash-out of tracer from thyroid and persistent uptake which corresponds to soft tissue density nodule posterior to lower pole of thyroid in single-photon emission computed tomography/computed tomography image (white arrow) (c and d)

Conflicts of interest

There are no conflicts of interest.

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