Interesting image

An incidental finding of a nonpathological lumbar transverse process fracture on $^{18}$F-FDG PET-CT in a patient diagnosed of breast cancer

Hallazgo accidental de una fractura no patológica de apófisis transversa de una vértebra lumbar mediante $^{18}$F-FDG PET-TAC en una paciente diagnosticada de carcinoma de mama

A. Parra$^{a,b,*}$, M.A. Ubieto$^b$, E.F. Rambalde$^a$, S.M. Ayala$^a$, L.F. Cáncer$^a$, A. Andrés$^a$, J. Banzo$^b$

$^a$ Servicio de Medicina Nuclear, Hospital Clínico Universitario Lozano Blesa, Zaragoza, Spain
$^b$ Unidad de Medicina Nuclear, Grupo Hospitalario Quirón La Floresta, Zaragoza, Spain

A 66-year-old patient with a history of invasive micropapillary multicentric right breast cancer (T4N3M0) 3 years ago, that was treated with radical right mastectomy, adjuvant chemotherapy (ACT) and radiotherapy. The patient presented locoregional recurrence 6 months later and underwent wide excision of the scar and ACT. After finishing ACT treatment, an $^{18}$F-FDG PET-CT scan was requested. The exploration showed a residual soft tissue mass in the right chest wall, slightly hypermetabolic (maximum SUV = 1.7).

Fig. 1. $^{18}$F-FDG PET-CT scan. (A) High intensity image in which it is shown the residual soft tissue mass in the right chest wall (arrowheads). (B) Axial CT and (C) PET-CT, respectively focusing on the lower back. These pictures identified a focal lesion with increased metabolism of $^{18}$F-FDG localized in the left transverse process of L3 vertebrae (arrows) consistent with a fracture line on CT scan.
It also identified a focal lesion with increased metabolism of 18\textsuperscript{F}-FDG localized in the left transverse process of L3 vertebrae. In CT at that location, we could identify a fracture line consistent with the metabolic imaging. We performed a detailed medical history, and the patient reported a lumbar trauma 20 days ago while travelling by bus. So we considered the vertebral lesion as a nonpathological fracture. There were no locoregional lymph node disease or distant metastases.

An appropriate interpretation of studies with 18\textsuperscript{F}-FDG PET-CT requires knowing the physiological distribution of the radiotracer in the healthy body, and being familiar with normal variants and benign uptake patterns in inflammatory processes, infection and cicatrisation/scarring as well as post treatment anatomical alterations.\textsuperscript{1}

We believe that this knowledge is essential for optimal performance of PET-CT scan and it could avoid as far as possible, false positive results in oncology scans with 18\textsuperscript{F}-FDG PET-CT. 18\textsuperscript{F}-FDG PET-CT is relatively sensitive to detect bone metastases, especially in the context of osteolytic lesions. However, there may be an important overlapping in the degree of FDG uptake (metabolic overlap) between malignant bone lesions and other benign bone processes where there is a tissue repairment or active healing, such as fractures, surgical resections, active arthropathies, Paget’s disease, fibrous dysplasia and bone infarction.\textsuperscript{2,3}

The incidental finding of vertebral fractures in 18\textsuperscript{F}-FDG PET-CT scan is uncommon and, when present, are a possible cause of false positive results for bone metastases. An assessment of the distribution pattern of 18\textsuperscript{F}-FDG PET and a correlation with radiological findings and patient history are the cornerstones to differentiate pathological fracture from bone metastases (Fig. 1).

Conflict of interest

The authors declare no conflict of interest.

References