Interesting images

SPECT-CT finding of $^{99m}$Tc-HMDP uptake in abdominal adenopathies in a patient with metastatic breast cancer

Hallazgo mediante SPECT-TC de captación de $^{99m}$Tc-HMDP en adenopatías abdominales en una paciente con cáncer de mama metastásico


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A 45-year-old female patient with history of breast cancer was sent to the nuclear medicine department for metastatic bone disease follow up. Nine years ago she was diagnosed with invasive ductal carcinoma (3.5 cm × 2.5 cm). A left mastectomy plus axillary lymph node dissection was performed, showing two metastatic adenopathies out of 7 removed lymph nodes. One year later, she presented with hiporexia and weight loss and was diagnosed with bone and liver metastasis (pT4 pN3b M1). She then received radiotherapy, hormone therapy and chemotherapy.

A whole body scintigraphy was performed 2h after the administration of 740 MBq of hydroxymethylene diphosphonate radiolabelled with $^{99m}$Tc-pertechnetate ($^{99m}$Tc-HMDP), and the study was completed with a thoraco-lumbar spine SPECT-CT (Figs. 1 and 2). In the tomographic study a focus of increased uptake

Fig. 1. Whole bone scintigraphy, anterior and posterior projections (A), and thoraco-lumbar spine SPECT-CT – axial slices (B and C): Foci of faint uptake in the spine body of T8 (A), showing lytic and blastic mixed areas (B), and in 5th right lateral costal arch (A), which is expanded (C), suggestive of bone metastasis.

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was identified in the superior abdomen, which was located in a soft-tissue lesion in the fusion study, next to the pancreas head, perhaps due to metastatic disease. These findings were confirmed with endovenous and oral contrast enhanced CT (Fig. 2).

There are several papers about the extraosseous accumulation of diphosphonates and in particular, it has been described in some primary tumours or their metastasis.\(^1\)\(^2\) However, in breast cancer, it is unusual to find abdominal adenopathies, and these, in turn, very rarely show uptake of this radiotracer. There is not enough evidence about the mechanism of extraosseous uptake of diphosphonates. It has been suggested that, in the calcified lesions, it could be caused by ionic exchange at the crystalline surface of an area of calcification. In our case there was no macroscopic calcium. In this situation there are several hypotheses about the uptake mechanism, such as the increase of blood flow or capillary permeability. Also, cases with amorphous calcium phosphate accumulations with a low calcium phosphate molar ratio and a large surface area can produce avid diphosphonate adsorption.\(^3\) Our case, in addition, highlights the value of the SPECT-CT in the detection of foci of uptake, not identified in the planar imaging, and the accurate characterization of the findings.

References