Interesting image

Breast cancer lung metastases incidentally detected on bone SPECT/CT: A rare finding that might be missed on whole body scan

Metástasis pulmonares de un cáncer de mama detectadas incidentalmente en SPECT/TC óseo: hallazgo infrecuente que puede pasar desapercibido en un rastreo corporal

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A R T I C L E  I N F O

Article history:
Received 16 July 2013
Accepted 9 September 2013

A 87-year-old female breast cancer patient followed-up for 6 years without any known metastasis was referred to bone scintigraphy with low back pain and slightly increased tumor markers [CA 15–3 = 37 U/ml (normal levels = 4.50–25.0 U/ml)]. The initial stage of the tumor was T2N1M0 (Stage 2B) and the patient received hormonal treatment after left modified radical mastectomy. Two hours after the injection of 740 MBq $^{99m}$Tc- MDP, whole body bone scan was performed. It revealed increased, heterogenous osteoblastic activity in the spine suggestive of degenerative changes (probable cause of the patient’s primary complaint) and a focal increased tracer uptake in the right ninth rib which was consistent with patient’s previous history of trauma. Additionally, two foci of increased activity projecting over the anterior tip of the 4th rib and left 8th intercostal space on posterior image were also seen (Fig. 1). Thoracic SPECT/CT was performed for anatomical correlation of the findings. Degenerative changes in the spine and posttraumatic callus formation around the right ninth rib were clearly seen on tomographic slices (Fig. 2A). The other two increased radiopharmaceutical uptakes in the chest on planar images were matched with the non-calcified paranchymal nodules in the inferior lobe of the left lung and middle lung lobe (Fig. 2B). These nodules also showed mild to moderate FDG uptake on the sequential restaging PET/CT (Fig. 3). These lung nodules could not be biopsied due to the patients’ advanced age and accompanying comorbidities. Since no other pathological FDG uptake that could explain the elevated tumor markers was seen on the PET/CT, these nodules were regarded as metastases of primary breast cancer. Although visualization of primary or metastatic tumors of the lung (e.g., osteosarcoma, Ewing sarcoma, neuroblastoma, etc.) during routine bone scintigraphy was described before, MDP avid lung metastasis of breast cancer has not been reported yet. The most common causes of accumulation of bone seeking radiopharmaceuticals in extraskeletal tissues include dystrophic and/or metastatic

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Fig. 1. Whole body bone scan revealed degenerative changes in the spine and a focal increased tracer uptake in the right ninth rib which was consistent with patient’s previous history of trauma (arrow head). Additionally, two foci of increased activity projecting over the anterior tip of the 4th rib and left 8th intercostal space on posterior image were also seen (arrows).
Fig. 2. Thoracic bone SPECT/CT showed degenerative changes in the spine and posttraumatic callus formation around the right ninth rib (arrow heads in (A) axial SPECT, CT and fusion SPECT/CT images). The other two increased radiopharmaceutical uptakes in the whole body images (Fig. 1) were matched with the metastatic, non-calcified oarenchymal nodules in the inferior lobe of the left lung (45 mm in diameter) and middle lung lobe (23 mm in diameter) (arrows in (B); axial SPECT, CT and fusion SPECT/CT images).

Fig. 3. These lung nodules also showed mild to moderate FDG uptake (SUVmax: 2.4) on the sequential restaging PET/CT (arrows in (A); maximum intensity projection (MIP) image and (B); axial PET, CT and fusion PET/CT images).

calcification, increased ectopic osteoblastic activity, metastases from bone-forming primary tumors, increase of calcium-binding tissue cations, local pH changes, inflammation, and increased tumor vascularity.5 Thoracic extraskeletal MDP uptakes in cancer patients should be carefully evaluated and CT correlation of equivocal uptakes should be obtained whenever possible. They may indicative of lung metastasis and change patient management as in our case.

References