Multiple Extra-Bone Accumulations of Technetium-99m-HMDP

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Bone scintigraphy was performed on a woman 2 years and 10 months after surgery for rectal cancer. Intense extra-bone accumulations of 99mTc-HMDP were visible in an aortic atherosclerosis lesion and in a metastatic liver tumor. Uptake in the metastatic lesion was confirmed by x-ray CT. Uptake in the aortic lesion was shown as typical calcification by x-ray CT.

Key Words: technetium-99m-HMDP; extra-bone accumulation; metastasis; atherosclerosis


Technetium-99m-labeled phosphate bone scanning agents are used for detecting reactive bone lesions. There are many reports of extra-osseous accumulation. These reports are usually due to extra-osseous calcification.

CASE REPORT

An 81-year-old woman with a history of rectal cancer was referred for possible bone metastasis. Whole-body bone scintigraphy images were obtained using a high-resolution parallel-hole collimator following injection of 740 MBq 99mTc-HMDP. X-ray CT was performed with a 10-mm slice thickness.

Figure 1 shows an anterior whole-body scintigraphic bone image. This image shows striking hepatic tumor and abdominal accumulations. Figure 2 is the posterior whole-body scintigraphic bone image acquired at the same examination. There is a hot spot on the left 12th rib bone, possibly a bone metastasis.

Figure 3A and B are x-ray CT images at the levels of the liver and middle abdomen, respectively. A large hepatic metastasis and typical calcification of the abdominal aorta and iliac arteries are visible.

DISCUSSION

The use of 99mTc-labeled HMDP or MDP for bone scintigraphy in skeletal tumors is well established and uptake in a variety of soft-tissue malignancies has been reported (1–5). The concentration of 99mTc-diphosphonate in calcifications has been reported (6–8). This case demonstrates accumulation in both a hepatic metastasis and an abnormal arterial calcification.

The exact mechanism for soft-tissue uptake of bone-seeking radiopharmaceuticals is not established, although there are...
many explanations for the accumulation in calcifications and malignant tissues. In this case there were multiple accumula-
tions of $^{99m}$Tc-HMDP.

Care is needed to differentiate multiple extra-osseous accumu-
lations in an individual patient, especially when metastatic
lesions are known to be present. The uptake in the calcified
abdominal aortic aneurysm could have been mistaken for
another liver metastasis.

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