

Diagnostic accuracy of bone metastases detection in cancer patients: Comparison between bone scintigraphy and whole-body FDG-PET

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¹⁸F-fluorodeoxyglucose (FDG) positron emission tomography (PET) has become widely available and an important oncological technique. To evaluate the influence of PET on detection of bone metastasis, we compared the diagnostic accuracy of PET and conventional bone scintigraphy (BS) in a variety of cancer patients. **Methods:** Consecutive ninety-five patients with various cancers, who received both PET and BS within one month, were retrospectively analyzed. A whole-body PET (from face to upper thigh) and a standard whole body BS were performed and these images were interpreted by two experienced nuclear medicine physicians with and without patient information using monitor diagnosis. Each image interpretation was performed according to 8 separate areas (skull, vertebra, upper limbs, sternum and clavicles, scapula, ribs, pelvis, and lower limbs) using a 5-point-scale (0: definitely negative, 1: probably negative, 2: equivocal, 3: probably positive, 4: definitely positive for bone metastasis). **Results:** Twenty-one of 95 patients (22.1%) with 43 of 760 areas (5.7%) of bone metastases were finally confirmed. In untreated patients, 12 of 14 bone metastasis positive patients were detected by PET, while 9 of 14 were detected by BS. Three cases showed true positive in PET and false negative in BS due to osteolytic type bone metastases. In untreated cases, PET with and without clinical information showed better sensitivity than BS in patient-based diagnosis. For the purpose of treatment effect evaluation, PET showed better results because of its ability in the evaluation of rapid response of tumor cells to chemotherapy. Out of 10 cases of multiple-area metastases, 9 cases included vertebrae. There was only one solitary lesion located outside of FOV of PET scan in the femur, but with clinical information that was no problem for PET diagnosis. **Conclusion:** Diagnostic accuracy of bone metastasis was comparable in PET and BS in the present study. In a usual clinical condition, limited FOV (from face to upper thigh) of PET scan may not be a major drawback in the detection of bone metastases because of the relatively low risk of solitary bone metastasis in skull bone and lower limbs.

Key words: FDG-PET, bone scintigraphy, bone metastasis