Detection of bone metastases in patients with lung cancer: 99mTc-MDP planar bone scintigraphy, 18F-fluoride PET or 18F-FDG PET/CT.

Abstract:

PURPOSE: The aim of the study was to compare the diagnostic accuracy of (18)F-fluorodeoxyglucose (FDG) PET/CT versus standard planar bone scintigraphy (BS) and (18)F-labelled NaF ((18)F) PET for the detection of bone metastases (BM) in non-small cell lung cancer (NSCLC). METHODS: (18)F-FDG PET/CT was performed in 126 patients with NSCLC. Within 7 days BS (n = 58) or (18)F PET (n = 68) was performed. (18)F-FDG PET/CT, BS and (18)F PET were evaluated by two experienced readers. Lesions were graded on a scale from 1 (definite BM) to 5 (degenerative lesion), and equivocal lesions were determined as indifferent (grade 3). RESULTS: A total of 92 patients showed degenerative lesions (grade 4/5) on PET/CT, BS or (18)F PET. In 34 patients (27%) BM lesions were diagnosed (grades 1 and 2). In 13 of 18 patients BM were concordantly diagnosed with PET/CT and (18)F PET. PET/CT showed more BM compared to (18)F PET (53 vs 40). In one patient one osteolytic BM was false-negative on (18)F PET. However, (18)F PET identified four patients with BM compared to negative findings on PET/CT. Of 16 patients, 11 had concordant findings of BM on PET/CT and BS. In three patients BS was false-negative and in two patients BM were diagnosed as indifferent. CONCLUSION: Integrated
(18)F-FDG PET/CT is superior to BS in the detection of osteolytic BM in NSCLC. Thus, PET/CT may obviate the need to perform additional BS or (18)F PET in the staging of NSCLC, which significantly reduces costs.