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Diagnostic efficacy of PET/CT plus brain MR imaging for detection of extrathoracic metastases in patients with lung adenocarcinoma.

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We aimed to evaluate prospectively the efficacy of positron emission tomography (PET)/computed tomography (CT) plus brain magnetic resonance imaging (MRI) for detecting extrathoracic metastases in lung adenocarcinoma. Metastatic evaluations were feasible for 442 consecutive patients (M:F=238:204; mean age, 54 yr) with a lung adenocarcinoma who underwent PET/CT (CT, without IV contrast medium injection) plus contrast-enhanced brain MRI. The presence of metastases in the brain was evaluated by assessing brain MRI or PET/CT, and in other organs by PET/CT. Diagnostic efficacies for metastasis detection with PET/CT plus brain MRI and with PET/CT only were calculated on a per-patient basis and compared from each other. Of 442 patients, 88 (20%, including 50 [11.3%] with brain metastasis) had metastasis. Regarding sensitivity of overall extrathoracic metastasis detection, a significant difference was found between PET/CT and PET/CT plus brain MRI (68% vs. 84%; P=0.03). As for brain metastasis detection sensitivity, brain MRI was significantly higher than PET/CT (88% vs. 24%; P<0.001). By adding MRI to PET/CT, brain metastases were detected in additional 32 (7% of 442 patients) patients. In lung adenocarcinoma patients, significant increase in sensitivity can be achieved for detecting extrathoracic metastases by adding dedicated brain MRI to PET/CT and thus enhancing brain metastasis detection.

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