

연속적인 FDG-PET/CT 검사에서 섭취 감소로 관찰된 비소세포암의 뇌전이

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Sequential Change of Hypometabolic Metastasis from Non-small-cell Lung Cancer on Brain FDG-PET/CT

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A 60-year-old woman, who had non-small-cell lung cancer (NSCLC) in left lower lobe underwent brain F-18 fluorodeoxyglucose positron emission tomography/computed tomography (FDG-PET/CT) for evaluation of cerebral metastasis. On follow-up FDG-PET/CT, only hypometabolic lesion was detected and progressed in right frontal lobe at 6 months and 10 months, later. Hypermetabolic metastasis was not detected even at last scan time of FDG-PET/CT. Brain MRI showed brain metastasis in right frontal lobe. As might be expected, the physician should take cerebral metastasis into consideration even though there is only hypometabolic change on subsequent FDG-PET/CT in patients with NSCLC. (Nucl Med Mol Imaging 2009;43(5):505-507)

Key Words: F-18 fluorodeoxyglucose, positron emission tomography/computed tomography, cerebral metastasis, non-small-cell lung cancer

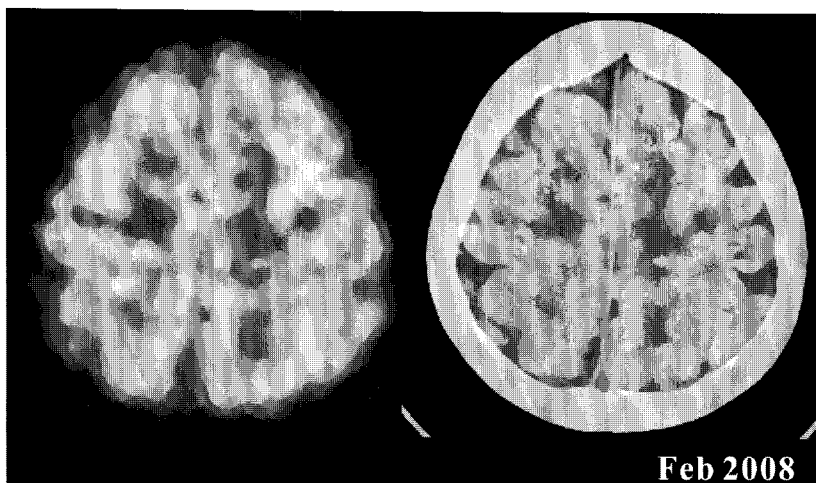


Figure 1. This is a baseline F-18 FDG PET/CT done for staging in a 60-year-old woman with NSCLC in left lung. The FDG PET scan was done 1 hour after the intravenous injection of 370 MBq (10 mCi) of F-18 FDG. The FDG PET/CT scan did not demonstrate significant change of FDG uptake throughout cerebral hemisphere.

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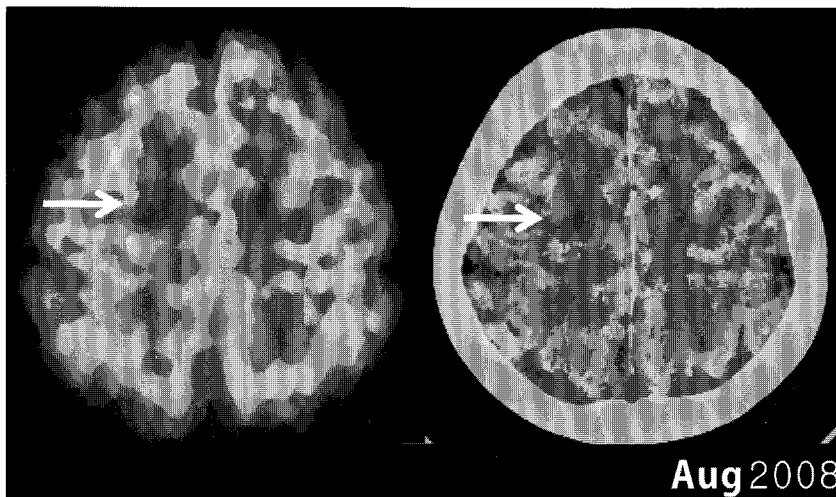


Figure 2. Follow-up FDG PET/CT was done after 6 months. Compared with the baseline scan, there was slight reduction (arrow) in the intensity of tracer uptake in right frontal lobe.

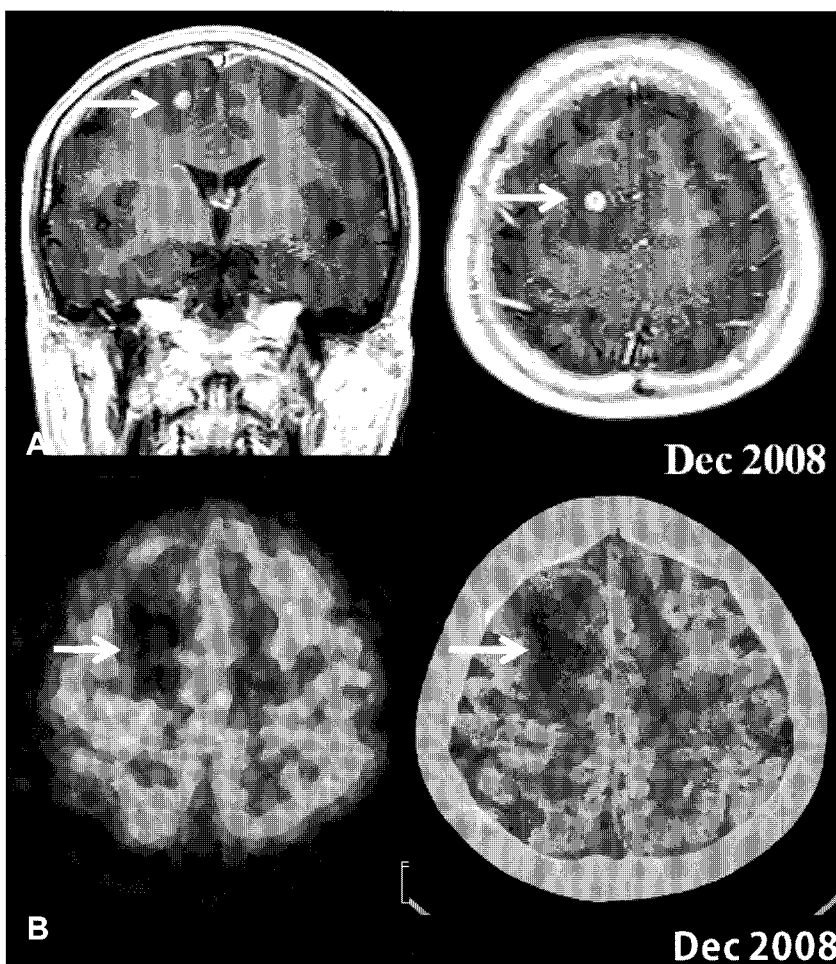


Figure 3. After 4 months, the patient presented with a progressively worsening symptoms of the central nervous system. (A) A MRI was performed for evaluation of cerebral metastasis and a enhanced nodule, measured less than 1cm (arrow), was observed in right frontal lobe. It was followed immediately by (B) an F-18 FDG PET/CT scan and it showed markedly decreased FDG uptake associated with vasogenic edema in right frontal lobe. Even at the time of this FDG PET/CT scan, the cerebral metastasis revealed only hypometabolic lesion and metastatic lesion with increased FDG uptake was not seen. It has been recognized that common malignant tumors that metastasize to the brain are lung cancer, colorectal cancer, melanoma, and breast cancer in sequence.¹⁾ Most of the metastatic brain tumors from lung cancers are hypermetabolic, however, they could be iso-, or hypometabolic on FDG-PET.^{2,3)} Although this case revealed hypometabolic cerebral metastasis from NSCLC, metastatic brain tumors from NSCLC was more frequently hypermetabolic than those of small cell lung cancer (SCLC).²⁾ Even though lesion size has been suggested as a false negative factor in detection of cerebral metastasis at FDG-PET,⁴⁾ biological characteristics such as expression of GLUTs and hexokinase activity of tumors are important for FDG accumulation in a brain lesion.^{5,6)} In a previous study, the main mechanism of glucose uptake in SCLC cell lines was via the expression of GLUT-1 and GLUT-3, which might be ineffective for FDG uptake in brain metastatic lesions.⁷⁾ To clarify the cerebral metastasis from NSCLC, a further study is necessary to draw a more definite explanation about the mechanism of a low FDG uptake in metastatic brain tumors from NSCLC.

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