

Case of the Month—June 2006

FDG-PET for Detecting Brain Metastasis

History

A 71-year-old female initially presented with a mass in the right lower lobe of the lung as seen from a CT scan. An FDG-PET study demonstrated intense FDG uptake corresponding to the mass seen from CT, as well as additional uptake in the A-P window. The patient underwent biopsy and wedge resection of the right lower lobe, which indicated non-small cell lung cancer. After radiation therapy, one year later, another FDG-PET study was ordered for restaging the patient.

PET Findings

The second PET showed interval resolution of the right lower lobe uptake. The uptake in the A-P window has reduced significantly in intensity. Mild residual uptake in the A-P window region is most likely due to post-radiation change. There is no focal hypermetabolism in the body. A focus of intense FDG uptake, however, is seen in the left cerebellum and anatomic correlation was recommended (Figure 1).



Figure 1

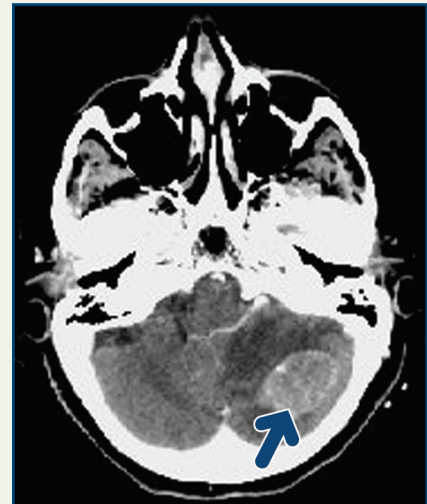


Figure 2

Follow Up

A CT scan with contrast was performed and revealed a 3.8 x 2.3-cm enhancing mass in the posterolateral aspect of the left cerebellar hemisphere (Figure 2). Biopsy of the left cerebellar lesion confirmed metastasis from the lung primary.

Discussion

FDG-PET is very accurate for staging cancer in the body. Due to high background activity in the brain tissue, it is less accurate in the detection of small brain

metastases. Hypometabolism metastasis has been reported and is very difficult to identify¹. This is why we routinely do not include the brain in our FDG-PET staging protocol. On the other hand, the presence of an FDG-avid brain lesion has a high positive predictive value.

(1) Rohren, E.M., et al, "Screening for Cerebral Metastases with FDG in Patients Undergoing Whole-Body Staging of Non-Central Nervous System Malignancy." *Radiology* (2003), 226:181-187.

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