

Focal Increased ^{18}F FP-CIT Uptake in a Recent Ischemic Lesion in the Frontal Lobe

Miju Cheon, MD* and Kyung-Han Lee, MD, PhD†

Abstract: A 65-year-old male patient was referred for rapid functional decline over 1 month with dysphagia and dysarthria. Past history disclosed left side weakness for 5 years. ^{18}F FP-CIT PET/CT was performed to evaluate the possibility of pseudobulbar palsy. Images showed a defect in the right posterior putamen that was consistent with an old cerebral infarction lesion. Unexpectedly, an oval area of intense ^{18}F FP-CIT uptake was found in the left frontal lobe. MRI and ^{18}F -FDG PET/CT indicated the lesion to be caused by recent cerebral ischemia.

Key Words: ^{18}F FP-CIT, brain ischemia, PET

(*Clin Nucl Med* 2015;40: e137–e139)

Received for publication December 22, 2013; revision accepted June 11, 2014.

From the *Department of Nuclear Medicine, Veterans Health Service Medical Center; and †Department of Nuclear Medicine, Samsung Medical Center, Sungkyunkwan University School of Medicine, Seoul, South Korea.

Conflicts of interest and sources of funding: none declared.

Reprints: Kyung-Han Lee, MD, PhD, Department of Nuclear Medicine, Samsung Medical Center, Sungkyunkwan University School of Medicine, 50 Irwon-dong, Gangnam-gu, 135-710 Seoul, South Korea. E-mail: khnm.lee@samsung.com.

Copyright © 2014 Wolters Kluwer Health, Inc. All rights reserved.

ISSN: 0363-9762/15/4002–e137

REFERENCES

1. Gerschlagner W, Bencsits G, Pirker W, et al. [^{123}I]beta-CIT SPECT distinguishes vascular parkinsonism from Parkinson's disease. *Mov Disord.* 2002; 17:518–523.
2. Rivers CS, Wardlaw JM, Armitage PA, et al. Acute ischemic stroke lesion measurement on diffusion-weighted imaging—important considerations in designing acute stroke trials with magnetic resonance imaging. *J Stroke Cerebrovasc Dis.* 2007;16:64–70.
3. Nour M, Liebeskind DS. Imaging of cerebral ischemia: from acute stroke to chronic disorders. *Neurol Clin.* 2014;32:193–209.
4. Boronat-Ferrater M, Lorenzo-Bosquet C, León A, et al. Unexpected I-123 FP-CIT uptake in a brain tumor. *Clin Nucl Med.* 2009;34:608–609.
5. Cascini GL, Ciarmiello A, Labate A, et al. Unexpected detection of melanoma brain metastasis by PET with iodine-124 betaCIT. *Clin Nucl Med.* 2009; 34:698–699.
6. Biancheri-Mounicq I, Colombié M, Pin JC, et al. Unexpected finding on I-123 FP-CIT SPECT leading to the diagnosis of cerebral meningioma. *Clin Nucl Med.* 2011;36:156–157.
7. Cilia R, Allegra R, Pezzoli G. Meningioma with intense I(123) FP-CIT uptake. *Mov Disord.* 2012;27:1744–1745.
8. Song IU, Lee SH, Chung YA, et al. The incidental suggestive meningioma presenting as high ^{18}F FP-CIT uptake on PET/CT study. *Clin Nucl Med.* 2014; 39:97–98.

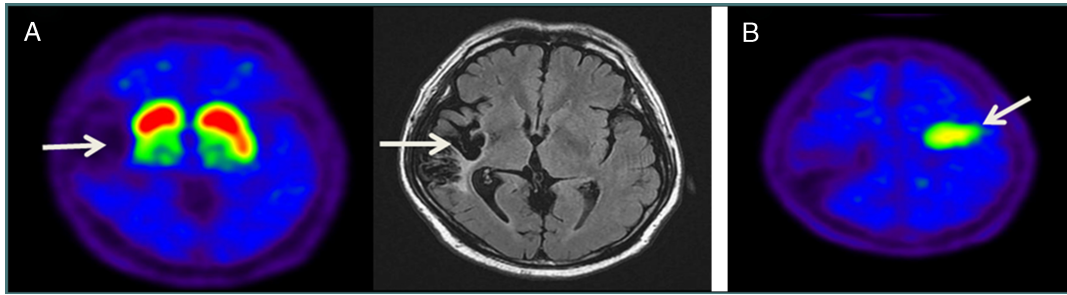


FIGURE 1. ^{18}F FP-CIT PET images. **A**, PET images acquired 3 hours after injection of 196 MBq ^{18}F FP-CIT showed a defect in the right posterior putamen (left, arrow) that matched an area of tissue loss on fluid-attenuated inversion recovery MRI (right, arrow). A past history of cerebral infarction and MRI scans indicate the FP-CIT defect to be vascular in etiology.¹ **B**, Unexpectedly, there was a focal oval area of increased FP-CIT uptake in the subcortical region of the left frontal lobe (arrow).

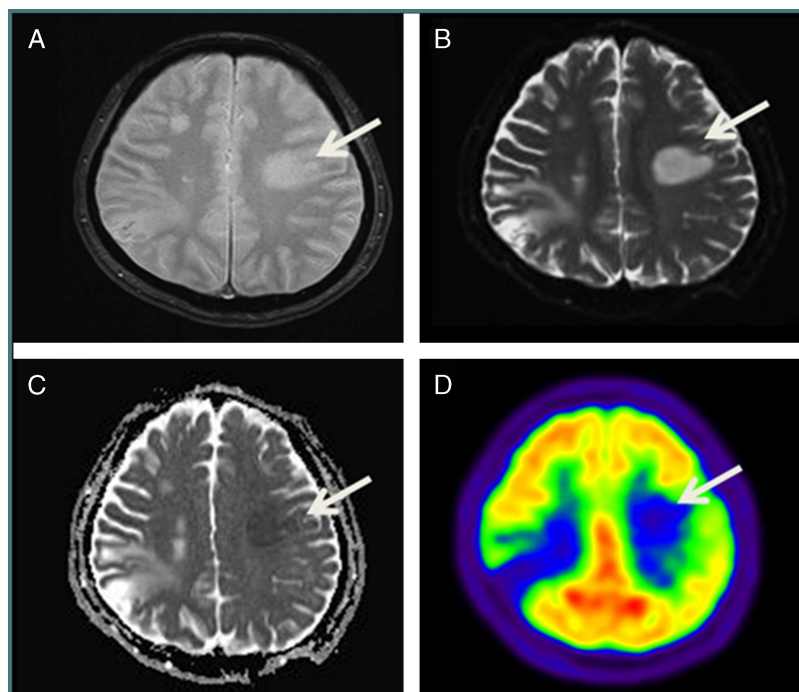


FIGURE 2. MRI and ^{18}F -FDG PET/CT images. The above lesion displayed increased signal intensity on T2-weighted MRI (A) and showed restricted diffusion on diffusion-weighted (B) and apparent diffusion coefficient MRI (C). ^{18}F -FDG PET images showed multifocal hypometabolic lesions including the right parietal and left frontal cortex (D). ^{18}F FP-CIT is a ligand with high specificity for striatal dopamine transporters.¹ However, the MRI findings indicate that the high cerebral ^{18}F FP-CIT uptake in this case was caused by recent cerebral ischemia.^{2,3} This finding thus seems to reflect unspecific cerebral uptake caused by local blood-brain barrier disruption from ischemic damage. Although there have been a few reports of uptake of dopamine transporter imaging ligands in cerebral tumors,⁴⁻⁸ to the best of our knowledge, this is the first description of an ischemic lesion showing intense ^{18}F FP-CIT uptake.