

# Teaching NeuroImage: Glucose Hypermetabolism in the Basal Ganglia

The Decisive Clue to the Diagnosis of an Unusual Anti-LGI1 Encephalitis

Ye Eun Kim, MD, Jae-Sung Lim, MD, PhD, Yoojin Lee, MD, and Jae-Hong Lee, MD, PhD

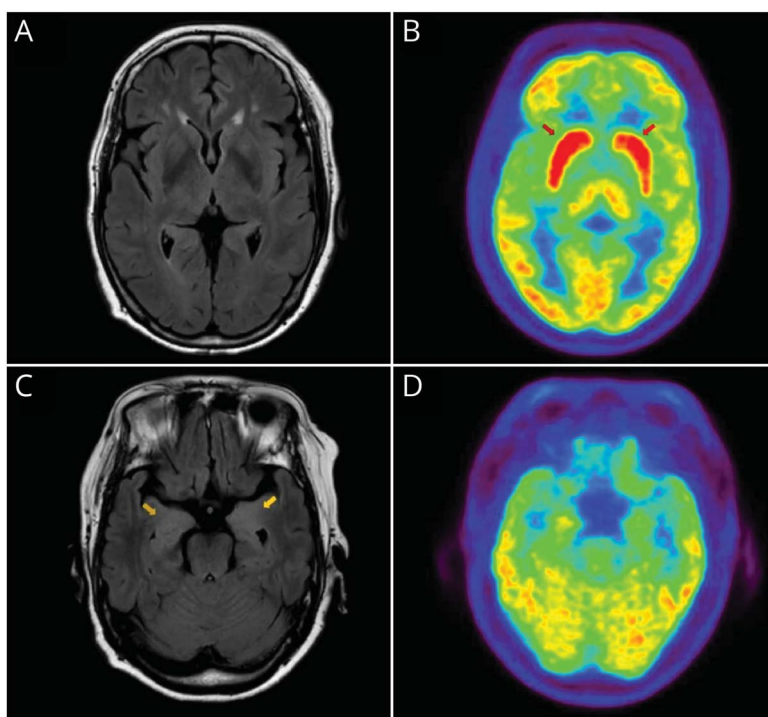
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**Figure 1** Brain MRI FLAIR Sequence and <sup>18</sup>F-FDG-PET



We matched axial cuts showing the basal ganglia (A and B) and medial temporal lobes (C and D) of fluid-attenuated inversion recovery (FLAIR) MRI and <sup>18</sup>F-FDG-PET. FDG-PET image shows prominent glucose hypermetabolism in bilateral basal ganglia (B, red arrow). FLAIR image shows subtle hyperintensities in both medial temporal lobes (C, yellow arrow).

A 61-year-old woman presented with subacute excessive sweating, dizziness, and cognitive impairment. Neurologic examination was unremarkable, and Mini-Mental State Examination score was 13 with disorientation and dyscalculia. Extensive workup revealed only mild hyponatremia (sodium 132 mmol/L) and dysautonomia with hyperhidrosis and orthostatic hypotension. Brain MRI fluid-attenuated inversion recovery revealed slight hyperintensities in medial temporal lobes, but fludeoxyglucose (FDG)-PET showed hypermetabolism prominently in basal ganglia (maximum standard unit value [SUVmax] 10.57/9.83) and mildly in the right medial temporal lobe (SUVmax 5.64) (Figures 1 and 2). CSF study showed no pleocytosis (white blood cell 4 cells/ $\mu$ L, glucose 92 mg/dL, and protein 58.6 mg/dL) and anti-leucine-rich glioma-inactivated 1 (LGI1) antibody was detected. Her symptoms markedly improved with IV immunoglobulin.

Most cases of anti-LGI1 encephalitis present with cognitive dysfunction, psychiatric symptoms, or seizures. Autonomic dysfunction rarely triggers a timely diagnosis of anti-

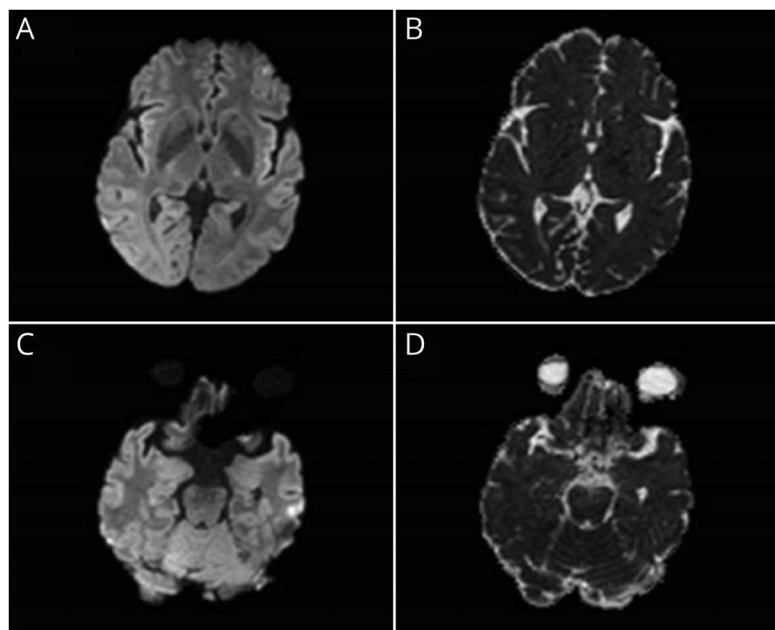
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We matched axial cuts showing the basal ganglia (A and B) and medial temporal lobes (C and D) of diffusion-weighted imaging (DWI) and apparent diffusion coefficient (ADC) sequence of MRI. There was no diffusion restricted lesion.

LGII encephalitis.<sup>1</sup> We conducted anti-LGII antibody testing, prompted by characteristic FDG-PET findings. This case illustrates that basal ganglia and medial temporal lobe hypermetabolism are two distinct targets of anti-LGII encephalitis, although similar findings can be found in other types of autoimmune encephalitis (e.g., anti-NMDA, anti-IgLON5) or autoimmune chorea.<sup>2,3</sup>

### Author Contributions

Y.E. Kim: drafting/revision of the manuscript for content, including medical writing for content; major role in the acquisition of data; analysis or interpretation of data; lead author. J.-S. Lim: drafting/revision of the manuscript for content, including medical writing for content; major role in the acquisition of data; analysis or interpretation of data. Y. Lee: analysis or interpretation of data. J.-H. Lee: drafting/revision of the manuscript for content, including medical writing for content; major role in the acquisition of data; study concept or design; analysis or interpretation of data.

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