Bilateral Hippocampal High-Grade Glioma: An Exceptional Rare Entity

Vich Yindeedej[1], *Putch Phairintr*[2], *Pataravit Rukskul*[1]

Key words
- Bilateral
- Glioma
- High-grade
- Hippocampus

From the [1]*Faculty of Medicine, Division of Neurosurgery, Department of Surgery and* [2]*Faculty of Medicine, Department of Pathology, Thammasat University Hospital, Thammasat University, Pathumthani, Thailand*

To whom correspondence should be addressed: Vich Yindeedej, M.D.
[E-mail: vichy@tu.ac.th]

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We report a 60-year-old woman who presented with a 1-month history of progressive cognitive decline and was found to have bilateral enhancing lesions involving both hippocampi. Histopathological examination confirmed the diagnosis of high-grade glioma. High-grade gliomas arising specifically within the bilateral hippocampi are exceedingly rare and may mimic encephalitic processes, with only a single case previously reported in the literature. Nevertheless, this entity should be considered in the differential diagnosis of bilateral hippocampal lesions.

Here, we reported a case of 60-year-old woman who presented with a 1-month history of progressive cognitive decline. There was no history of headache or motor weakness. Neurological examination was unremarkable except for the presence of acalculia and severe recent memory impairment. She experienced a focal impaired-awareness seizure. Subsequent magnetic resonance imaging revealed bilateral enhancing lesions involving both hippocampi, without an apparent connection between the 2 masses. No leptomeningeal enhancement was observed (**Figure 1A, B**). In addition, a thin enhancing lesion was identified in the septum pellucidum region, suspected to originate from both fornices, suggesting invasion from the primary hippocampal lesions.

Given the mass-like appearance of the bilateral hippocampal lesions, an inflammatory process such as encephalitis was initially suspected. However, all blood tests were unremarkable. Based on the overall findings, metastasis could not be excluded and high-grade glioma remained a differential diagnosis, along with possible inflammatory etiologies, including encephalitis. Tissue biopsy was deemed necessary for definitive diagnosis.

However, 1 week prior to surgery, a repeat magnetic resonance imaging revealed increasing size of both hippocampal lesions with a new lesion in the left parieto-occipital periventricular region, which was considered a better candidate for stereotactic biopsy (**Figure 2A**). Histopathological examination revealed findings suspicious for high-grade glioma. Hematoxylin and eosin staining demonstrated a hypercellular area consistent with diffuse high-grade glioma of astrocytic morphology. Neoplastic cells showed diffuse nuclear positivity for Olig-2 on immunohistochemistry (**Figure 2B**). Isocitrate dehydrogenase 1 R132H immunostaining was negative, with retained Alpha-Thalassemia/mental Retardation syndrome X-linked expression. The final diagnosis was glioblastoma, isocitrate dehydrogenase—wildtype, central nervous system World Health Organization grade 4.

Bilateral hippocampal high-grade glioma is exceedingly rare, with only a single reported case.[1] Other non-neoplastic causes of bilateral hippocampal lesions include viral and autoimmune encephalitis. In herpes simplex virus encephalitis, bilateral temporal lobe involvement can occur, but cortical lesions and leptomeningeal enhancement are typically present.[2,3] In Japanese encephalitis, bilateral thalamic involvement is characteristic, and contrast enhancement is uncommon.[3] Human herpesvirus 6 infection can produce similar imaging findings to Japanese encephalitis but usually occurs in immunocompromised individuals.[2] In autoimmune (limbic) encephalitis, isolated hippocampal involvement without temporal lobe lesions is uncommon.[3] Given these considerations, alternative diagnoses were unlikely in this case, and tissue diagnosis was warranted despite the rarity of bilateral hippocampal high-grade glioma.

CRediT AUTHORSHIP CONTRIBUTION STATEMENT

Vich Yindeedej: Writing — review & editing, Writing — original draft, Resources, Investigation, Formal analysis, Data curation, Conceptualization. **Putch Phairintr:** Writing — review & editing,

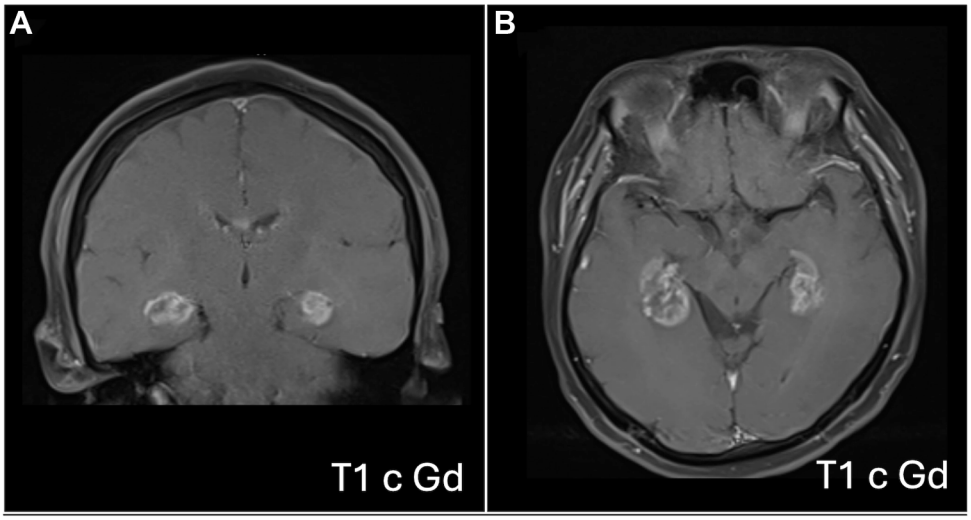

Figure 1. First images, MRI brain T1-weighted images with gadolinium (Gd) enhancement demonstrate bilateral enhancing lesions involving both hippocampi (**A**: coronal T1 with Gd; **B**: axial T1 with Gd). MRI, magnetic resonance imaging.

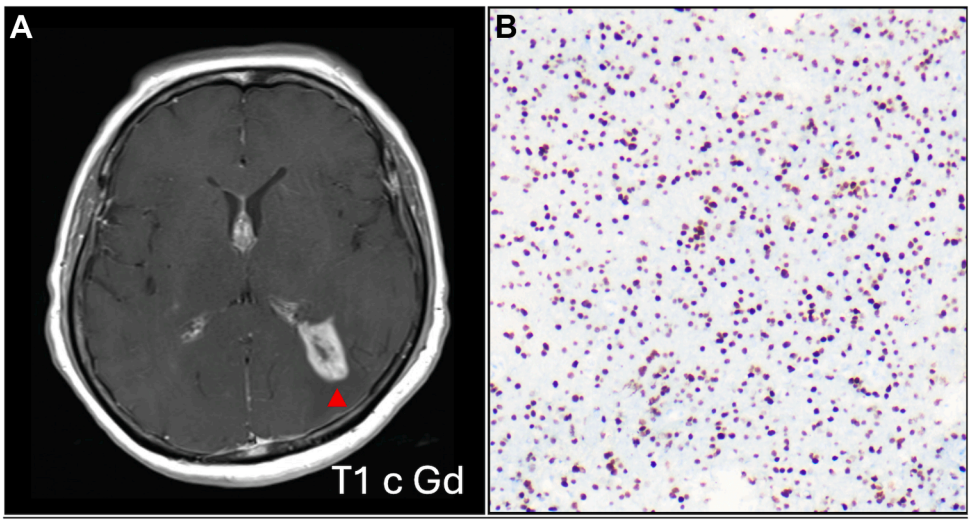

Figure 2. Preoperative images and the pathology. **(A)** MRI brain T1-weighted images with gadolinium (Gd) enhancement revealing a newly developed lesion (red arrow head) in the left parieto-occipital periventricular region with surrounding vasogenic edema. **(B)** Immunohistochemical staining showing diffuse nuclear positivity for Olig-2 in neoplastic cells (400x). MRI, magnetic resonance imaging.

Investigation, Data curation. **Pataravit Rukskul:** Supervision.

REFERENCES

1. Shimauchi M, Wakisaka S, Kinoshita K. Amnesia due to bilateral hippocampal glioblastoma. MRI finding. *Neuroradiology*. 1989;31:430-432.

2. Eran A, Hodes A, Izbudak I. Bilateral temporal lobe disease: looking beyond herpes encephalitis. *Insights Imaging*. 2016;7:265-274.

3. Park S, Yu IK, Kim H. MRI findings of acute hippocampal disorders: pictorial essay. *J Korean Soc Radiol*. 2022;83:1046-1058.

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