

Cerebral venous thrombosis: MRI for cerebral infarctions that cannot be diagnosed without doubt

Hiroshi Hori, Takahiko Fukuchi, and Hitoshi Sugawara

Division of General Medicine,
Department of Comprehensive
Medicine 1, Saitama Medical Center,
Jichi Medical University, Saitama,
Japan

A 54-year-old man presented with unusual behavior, including “speaking out everything he was thinking” and “not paying for shopping,” for the past 10 days. Physical examination revealed no neurological abnormalities and no meningeal irritation. Cerebrospinal fluid examination showed no increase in cell count. Magnetic resonance imaging (MRI) of the head showed hyperintense lesions in the bilateral frontal lobes on fluid-attenuated inversion recovery (FLAIR) imaging (Fig. 1A). The patient’s behavior improved spontaneously, although on day 12, the

patient developed aphasia. MRI of the head showed a new high signal in the left frontal lobe on FLAIR imaging (Fig. 1B). On T2*-weighted MRI, a linear no-signal was observed along a blood vessel in the left frontal cortex (Fig. 2A) and a signal defect was found in the superior sagittal sinus (Fig. 2B). Thus, cerebral venous sinus thrombosis was diagnosed and heparin was administered. The patient had no underlying disease that could cause venous thrombosis.

Cerebral venous sinus thrombosis is idiopathic in approximately 20% of cases.

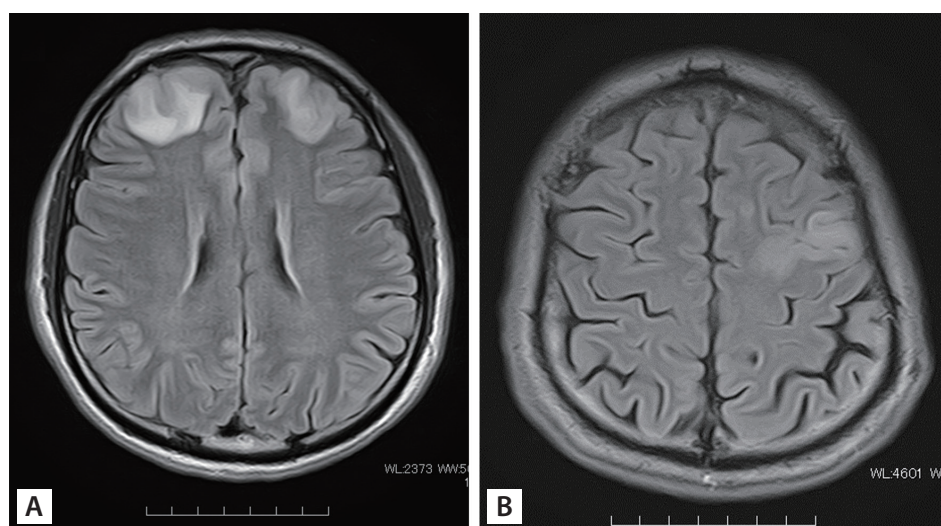


Figure 1. (A) Magnetic resonance imaging (MRI)/fluid-attenuated inversion recovery (FLAIR) imaging showing hyperintense lesions in the bilateral frontal lobes on the day of admission. (B) On day 12 of the illness, MRI/FLAIR imaging of the head showing a new high signal in the left frontal lobe.

Received : March 10, 2022
Revised : March 14, 2022
Accepted : March 14, 2022

Correspondence to
Hiroshi Hori, M.D.
Tel: +81-48-647-2111
Fax: +81-48-644-8617
E-mail: ubm5134@mbr.nifty.com
https://orcid.org/0000-0001-9466-2125

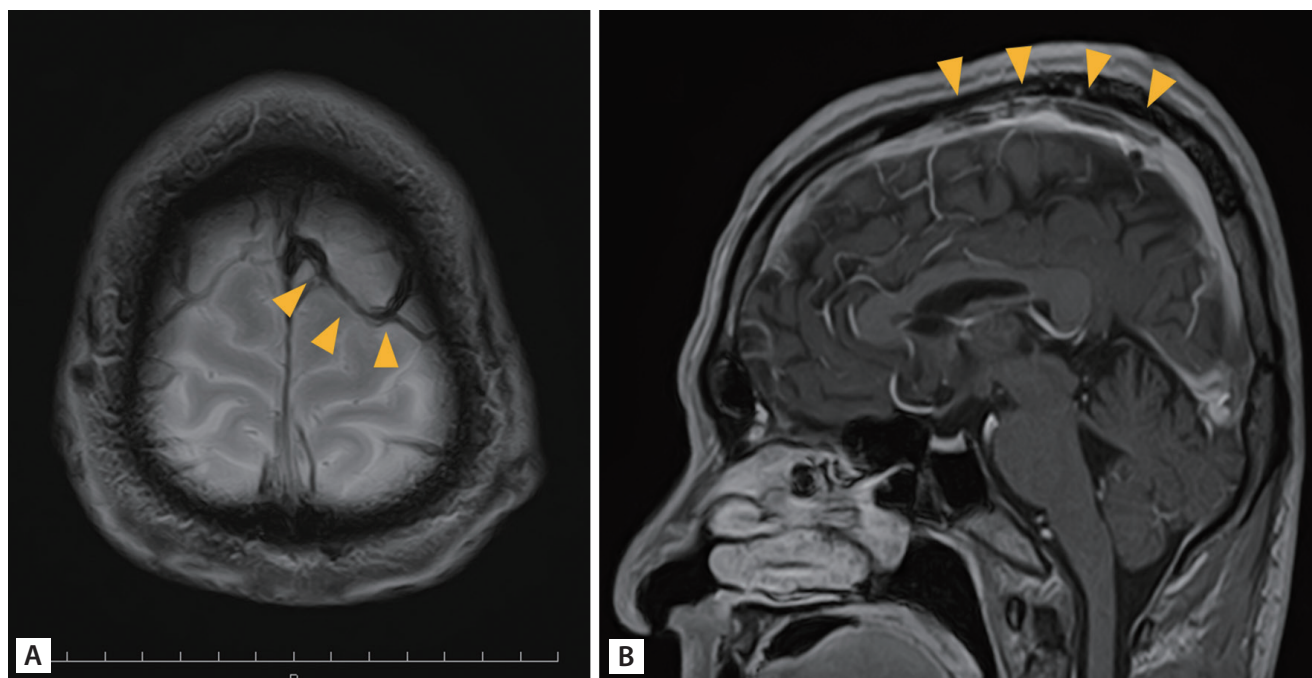


Figure 2. On T2*-weighted magnetic resonance imaging, (A) a linear no-signal along the blood vessel (arrowheads) is observed in the left frontal cortex, and (B) a signal defect (arrowheads) is found in the superior sagittal sinus.

Despite being a cerebrovascular disease, the subacute course is most common. Various clinical symptoms including headache, convulsions, aphasia, encephalitis, fever, and delirium are observed, making diagnosis challenging. Prompt diagnosis and treatment are desirable to avoid neurological complications. Diagnostic imaging is important, especially MRI, which can diagnose venous thrombosis without a contrast medium. Since deoxyhemoglobin is present in the acute phase of the thrombus, the sensitivity of thrombus visualization is low in the T1 and T2 sequences. Conversely, T2* gradient echo and susceptibility-weighted imaging have high deoxyhemoglobin and methemoglobin delineation sensitivity, and T2* has a sensitivity of approximately 90%. Suspected cases of venous thrombosis with subacute onset of neuropsychiatric symp-

toms show lesions that do not match arterial innervation. Hence, it is useful to add an imaging sequence of T2* gradient echo or susceptibility-weighted imaging for MRI.

We have obtained written informed consent for publication from the patient.

Conflict of interest

No potential conflict of interest relevant to this article was reported.

Acknowledgments

The authors would like to thank Editage (<https://www.editage.jp/>) for English language editing.