Diagnosis: Thrombosis of the vein of Galen

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Symmetric thalamic lesions may appear in various disorders, such as in acute disseminated encephalomyelitis, acute hemorrhagic leukoencephalitis, severe hypoxia or traumatic injury, toxins, inflammation, tumors, metabolic disorders, acute necrotizing encephalopathy, arterial or venous infarct, and so on.[1-3] Bilateral thalamic lesions occasionally result from venous occlusion, especially thrombosis of the deep cerebral veins (eg, vein of Galen and straight sinus).[4] Additionally, as the management and prognosis were distinct between patients with venous and arterial occlusion, early diagnosis is of great importance.[5,6]

MRI of the patient showed bilateral thalamic lesions with features of abnormal signal intensity, as follows: the T1-weighted image (T1WI) decreased (**Figure 2A**); gadolinium-enhanced MRI revealed a mild enhancement effect (**Figure 2B**); the T2-weighted image (T2WI) increased; and the fluid-attenuated inversion recovery (FLAIR) increased (**Figure 2C**). Of note, the diffusion-weighted imaging (DWI) showed mixed intensity (**Figure 2D**), while the apparent diffusion coefficient (ADC) was hyperintense (**Figure 2E**), which was primarily consistent with vasogenic edema. These features noted upon imaging motivated us to focus on the cerebral vein system. It is well known that the internal cerebral veins that receive venous blood from the medullary thalamic and thalamostriate veins converge with the basal veins of Rosenthal into the vein of Galen, and then with the inferior sagittal sinus from the straight sinus.[4] After thrombosis of the vein of Galen and straight sinus develops, the venous drainage becomes blocked and vasogenic edema of the brain may appear in MRI ADC maps. This is distinct from cytotoxic edema caused by artery occlusion in the acute phase.[4] Therefore, DWI and ADC play a critical role in the early recognition of parenchymal changes following cerebral vein thrombosis (CVT).[7] Further, computed tomography venography of the patient failed to reveal the vein of Galen, and the straight sinus was incontinuously seen (**Figure 2F**). We then postulated that the symmetric thalamic lesions were caused by thrombosis of the vein of Galen. Treatment with low-molecular-weight heparin was immediately initiated and the patient gradually recovered. He gained consciousness after 1 month of treatment.

In addition, lesions caused by CVT may either deteriorate progressively, which may lead to the development of hemorrhagic infarction and/or parenchymal hemorrhage due to increased venous and capillary pressure, or resolve with recanalization.[3,8] MRI re-examination 2 months later showed remarkably alleviated edema (**Figure 2G**, FLAIR; and **Figure 2H**, ADC), although without absolute recanalization of the straight sinus on the following magnetic resonance venography (**Figure 2I**). Clinically, CVT patients may have protean clinical manifestations that may interfere with early diagnosis. However, vasogenic edema presenting as high-signal intensities on ADC is highly indicative of CVT. In summary, thrombosis of the vein of Galen is an identifiable clinical disorder, which may present as symmetric thalamic lesions. Prompt diagnosis and initiation of anticoagulant therapy may warrant a good recovery in these patients.

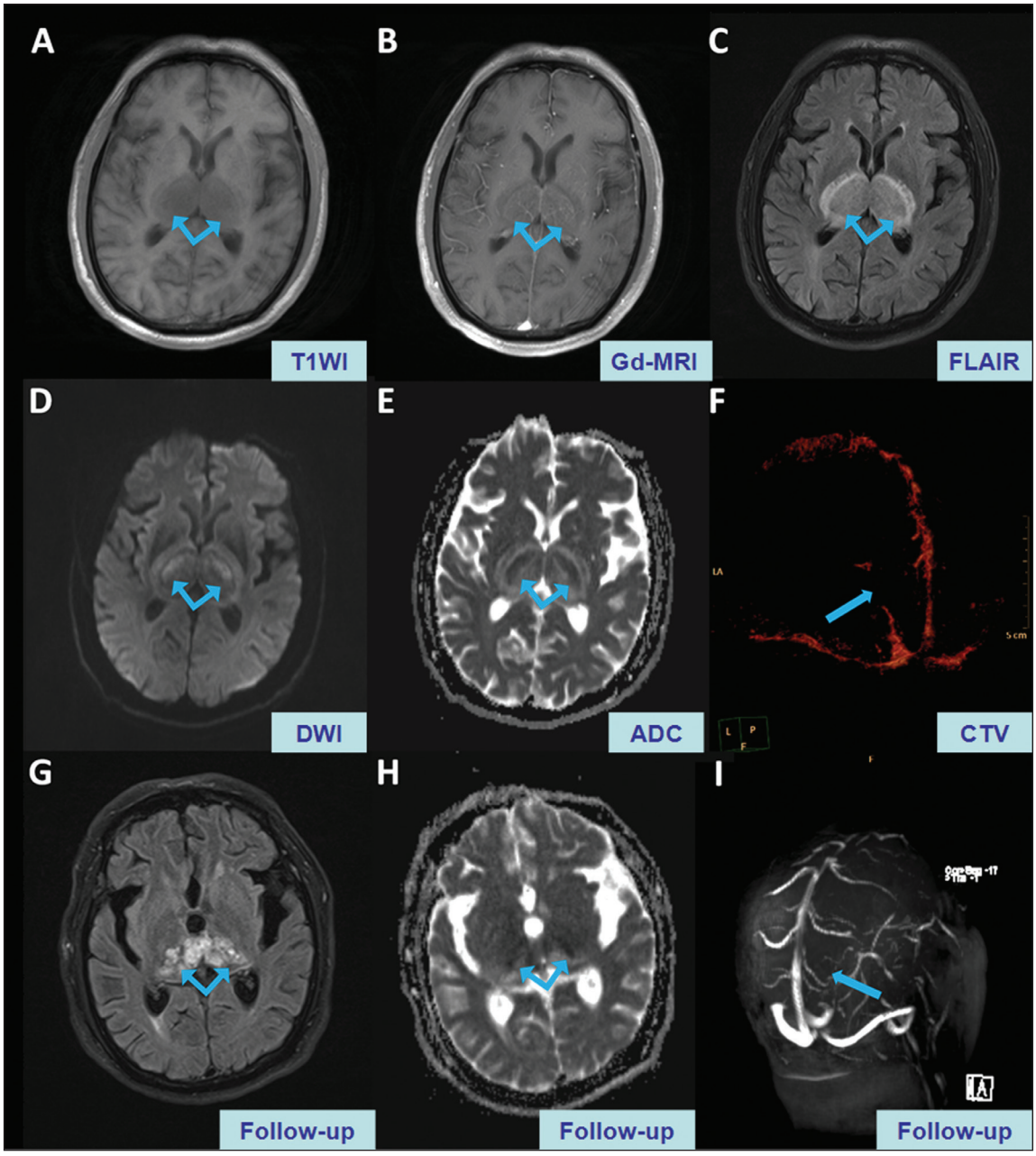

Figure 2. Magnetic resonance imaging showed abnormal signal intensity in the bilateral thalamus. The T1WI decreased (A); T2WI increased and FLAIR increased (C); DWI showed mixed intensity (D); and the ADC increased (E); Gd-MRI revealed mild enhancement (B). The straight sinus and the vein of Galen were inconsistently seen on CTV (F). Low-molecular-weight heparin was used and the patient gradually recovered. Magnetic resonance imaging re-examination performed 2 months later showed alleviated edema (G, FLAIR; and H, ADC), without the presence of the straight sinus on magnetic resonance venography (I).

Abbreviations: T1WI: T1-weighted image; Gd-MRI: gadolinium-enhanced magnetic resonance imaging; FLAIR: fluid-attenuated inversion recovery; DWI: diffusion-weighted imaging; ADC: apparent diffusion coefficient; CTV: computed tomography venography; T2WI: T2-weighted image.

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