

[PICTURES IN CLINICAL MEDICINE]

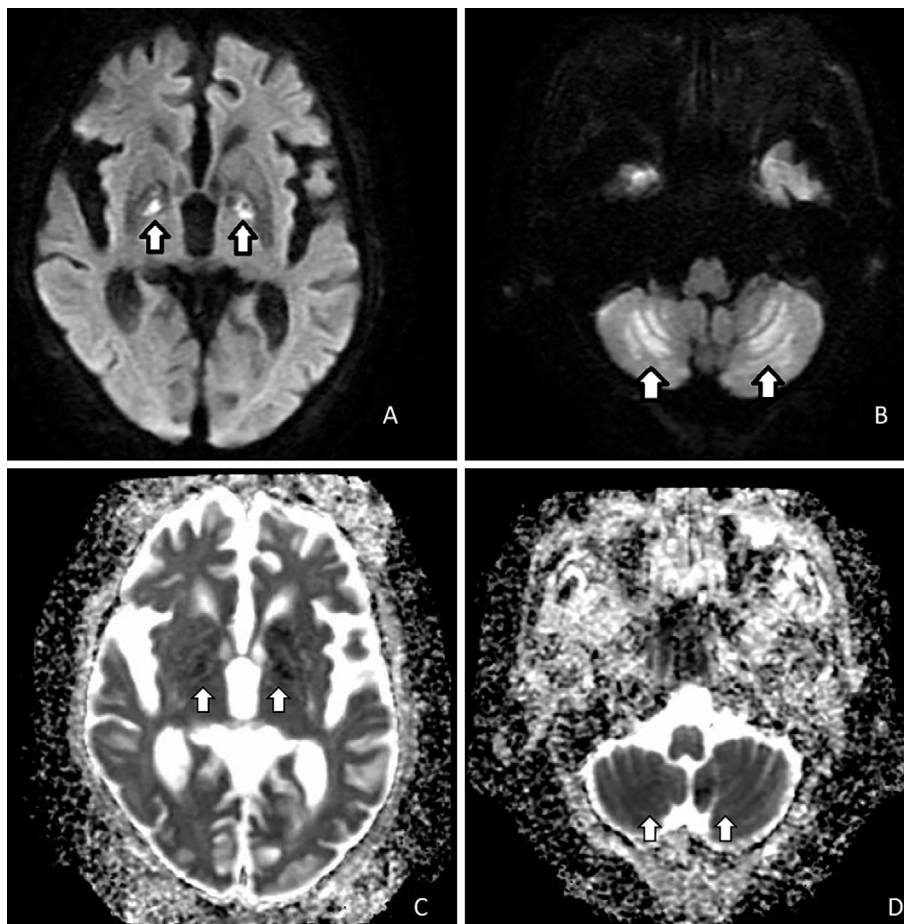
Heat Stroke Lesions in the Globus Pallidus

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Key words: heat stroke, cerebellum, hyperintensity

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Picture.

An 89-year-old man presenting with consciousness disturbances and a temperature of 104 °F was admitted to our hospital. He did not need help performing activities of daily living, and he had no dementia and no relevant medical history. Blood test and urinalysis findings, carbon monoxide levels, cerebrospinal fluid, blood cultures, and head computed tomography and electroencephalography findings were all normal. His state of consciousness gradually improved

after cooling. However, a neurological examination revealed truncal ataxia, disorientation, and abulia; therefore, brain diffusion-weighted magnetic resonance imaging (DW-MRI) including measurement of the apparent diffusion coefficient (ADC) was performed on day 7, revealing hyperintensity and a reduced ADC value in the bilateral cerebellar hemispheres and globus pallidus (Picture). Severe heat stroke is often accompanied by neurological complications, particu-

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larly cerebellar ataxia. DW-MRI findings often include hyperintensities in the bilateral cerebellar hemispheres (1). Globus pallidus dysfunction causes disorientation and abulia (2, 3), while cerebellar hemispheres dysfunction causes truncal ataxia; thus, both of these conditions may have caused the patient's symptoms. Recently, DW-MRI findings in the bilateral caudate nuclei, hippocampus, splenium of the corpus callosum, thalami, hippocampi, basal ganglia, splenium, temporo-occipital lobes (4), and globus pallidus (the present case being the first case) have been reported in association with heat stroke. Although cytotoxic, excitotoxic, or ischemic mechanisms associated with vascular endothelial damage-induced hypoperfusion may be involved, the details are unclear.

The authors state that they have no Conflict of Interest (COI).

References

1. Albukrek D, Bakon M, Moran DS, et al. Heat-stroke-induced cerebellar atrophy: clinical course, CT and MRI findings. *Neuroradiology* **39**: 195-197, 1997.
2. Siegel JS, Snyder AZ, Metcalf NV, et al. The circuitry of abulia: insights from functional connectivity MRI. *Neuroimage Clin* **6**: 320-326, 2014.
3. Nelson S, Toma H, LaMonica H, et al. Major cognitive changes and micrographia following globus pallidus infarct. *Case Rep Neurol Med*: 252486, 2014.
4. Sudhakar PJ, Al-Hashimi H. Bilateral hippocampal hyperintensities: a new finding in MR imaging of heat stroke. *Pediatr Radiol* **37**: 1289-1291, 2007.

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