

Teaching NeuroImages: Marked reduced apparent diffusion coefficient in acute multiple sclerosis lesion

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A 24-year-old woman presented with sudden right-sided weakness and aphasia. Brain MRI was performed 5 hours after symptoms onset. On diffusion-weighted imaging (DWI), the lesion showed a marked increase in signal intensity and an approximately 70% mean apparent diffusion coefficient (ADC) decline as compared with the contralateral hemispheric white matter (figure). The patient met diagnostic criteria for multiple sclerosis and other etiologies were excluded.

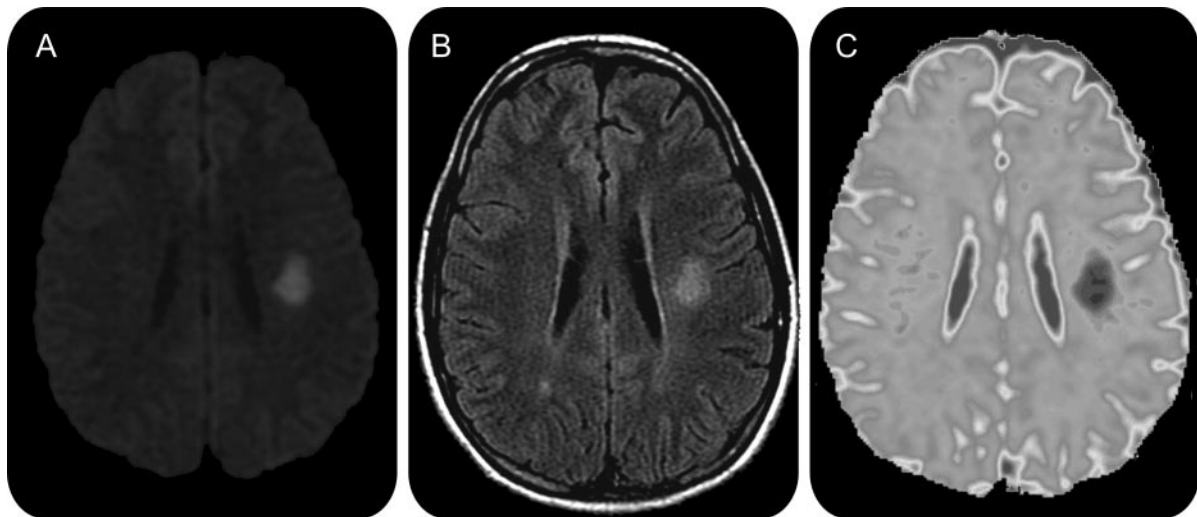
ADC decline in acute multiple sclerosis lesions, suggesting a diagnosis of ischemic stroke, has been previously reported.^{1,2} However, the decline in ADC values (22% to 40% decrease) was not as

pronounced as our observation. Thus this fourth case of reduced ADC in acute demyelinating lesion indicates that the ADC drop may be important and close to that observed in the core of an acute brain infarction.

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Figure Brain neuroimaging



(A) Diffusion-weighted imaging showing high signal intensity of left centrum semiovale. (B) Fluid-attenuated inversion recovery sequence showing a second smaller high signal intensity in the posterior right centrum semiovale close to parietal cortex. (C) Apparent diffusion coefficient (ADC) mapping showing marked reduced ADC of the left centrum semiovale ($19.5 \times 10^{-5} \text{ mm}^2/\text{s}$ for the region of interest vs $71.8 \times 10^{-5} \text{ mm}^2/\text{s}$ for apparently normal white matter).

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