Cerebral Microbleeds Identified by Diffusion Weighted MR Imaging in A Case of Acute Ischemic Stroke

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Key words: diffusion weighted MR, cerebral microbleeds, gradient-echo T2*-weighted images

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Picture 1. Diffusion-weighted image (TR4500, TE105) showed a hyperintense lesion in the left striatum and multiple small hypointense lesions in the brain stem, the cerebellum, and the thalamus (Picture 1 A-D). Gradient-echo T2*-weighted image (TR540, TE18) demonstrated multiple hypointense lesions in the same areas as the DWI showed multiple hypointense lesions (Picture 1 E-H). T2-weighted image (TR5630, TE120) revealed hypointense lesions only in the brain stem and the cerebellum (Picture 1 I-L).

We report a patient with acute cerebral infarction whose diffusion-weighted MR image (DWI) demonstrated not only an acute ischemic lesion by high signal intensity but also cerebral microbleeds (CMBs) as small hypointense lesions. A 90-year-old man with a past history of hypertension was admitted to our hospital because he suddenly developed dysarthria and the right hemiparesis. Brain 1.5T MR imaging, including DWI, and T1-, T2- and gradient-echo T2*- weighted images demonstrated a hyperintense lesion in the left striatum and multiple hypointense lesions in the brain stem, cerebellum, and thalamus. Gradient-echo T2*-weighted images showed multiple hypointense lesions in the same areas as the DWI. T2-weighted images revealed hypointense lesions only in the brain stem and cerebellum. Key words: diffusion weighted MR, cerebral microbleeds, gradient-echo T2*-weighted images.
weighted images, was performed on the third hospital day. The DWI showed a hyperintense lesion in the left striatum and multiple hypointense lesions in the brain stem, the cerebellum, and the thalamus (Picture 1A-D). He was diagnosed as having acute cerebral infarction in the left striatum. Gradient-echo T2*-weighed image also demonstrated multiple hypointense lesions in the same areas as the DWI showed multiple hypointense lesions (Picture 1E-H). However, low signal intensities in the basal ganglia could not be identified by T2-weighted image (Picture 1I-L).

Recent studies have revealed that gradient-echo T2*-weighted MRI is extremely helpful in the detection of lesions such as old hemorrhage and calcification. These multiple small hypointense lesions on gradient-echo T2*-weighted MR images are thought to represent foci of hemosiderin deposition from petechial microhemorrhages (CMBs) (1). Therefore, multiple small hypointense lesions on DWI in the present case were considered to be CMBs. Sato et al (2) also reported that small areas of signal loss observed by DWI might be CMBs. It is well known that DWI is useful for the diagnosis of an acute ischemic stroke, where acute ischemic lesions are confirmed by hyperintense signal. If hypointense lesions on DWI are simultaneously identified in patients with acute ischemic stroke, anti-thrombotic therapy should be carefully administered. We consider that DWI may be helpful in the detection of CMBs as a substitute in place of gradient-echo T2*-weighted imaging, especially in candidates for administration of tissue-type plasminogen activator.

References
