Acta Neurol. Belg., 2010, **110**, 213

Subacute post-traumatic diffuse axonal injury presenting on MRI as multiple enhancing nodules

Chia-Yuen CHEN[1,2], Min-Szu YAO[1], Wing P. CHAN[1,2]

[1]Department of Radiology, Taipei Medical University–Wan Fang Hospital; [2]Department of Radiology, School of Medicine, Taipei Medical University

Clinical history

A 33-year-old man complained of left leg weakness and numbness following a motor vehicle collision two weeks earlier. Brain MRI 19 days after the accident revealed minimal cortical hemorrhages in the right temporal and frontal lobes. Post-gadolinium study showed at least 11 small nodular enhancements (Fig. 1). This patient was discharged from hospital eight days later, and had no neurological complaint after a 2-year follow-up.

Discussion

Diffuse axonal injury (DAI) constitutes one of the major primary intra-axial lesions in patients with brain injury and is associated with significant morbidity. Hemorrhagic and non-hemorrhagic DAI lesions present as a variety of MRI signals on T1-weighted, T2-weighted, and FLAIR images, and, at greater sensitivity, on T2* gradient-echo images (1). Nodular enhancements as in our case has seldom been reported. We postulate that they are due to blood-brain-barrier breakdown around subacute small hematomas and degenerated white matter tracts. The differential diagnosis includes tumoral and inflammatory lesions. Tuberculomas, for instance, can present as hypointense lesions on T2-weighted images, and as a central isointensity surrounded by a slightly hyperintense rim internal to a hypointense rim on T1-weighted images, with rim enhancement after gadolinium injection (2). In our case, however, no nodules were detected on pre-contrast T1-weighted images. Moreover, in addition to other data, the spontaneously favorable clinical outcome allowed to exclude an inflammatory or neoplastic process.

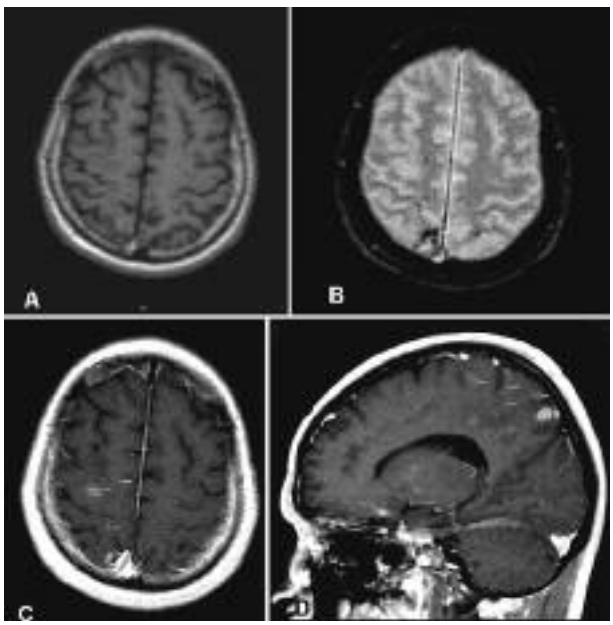

Fig. 1. — MRI (A) Pre-contrast T1-weighted image showing no obvious brain lesions. (B) T2* gradient-echo images with several dark dots in sub-cortical white matter, indicating petechial hemorrhages (arrows). (C, D) Post-gadolinium T1-weighted images revealing many enhancing nodules (arrows).

REFERENCES

1. Topal NB, Hakyemez B, Erdogan C. *et al*. MR imaging in the detection of diffuse axonal injury with mild traumatic brain injury. Neurol Res. 2008;30: 974-8.
2. Kim TK, Chang KH, Kim CJ. *et al*. Intracranial tuberculoma: comparison of MR with pathologic findings. AJNR Am J Neuroradiol. 1995;16:1903-8.

W. P. Chan, MD.,
Department of Radiology,
Taipei Medical University,
Wan Fang Hospital,
111 Hsing-Long Road,
Section 3, Taipei 116,
Taiwan, Republic of China.
E-mail: wingchan@tmu.edu.tw