

Widespread Watershed Infarct in Patient with Malignancy-Related Hypercoagulation

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Case Summary: This 78-year-old woman had no other apparent vascular risk factors except for the age and developed acute right hemiplegia and aphasia four days prior to admission.

Rapid deterioration of consciousness followed soon after admission. Brain magnetic resonance image (MRI)

study showed relative enlargement of the left lateral ventricle, and acute infarctions in bilateral middle cerebral artery (MCA)-anterior cerebral artery, MCA-posterior cerebral artery territories and cerebellum with hemorrhagic transformation. (Fig. 1). However, magnetic resonance angiography revealed no significant stenosis

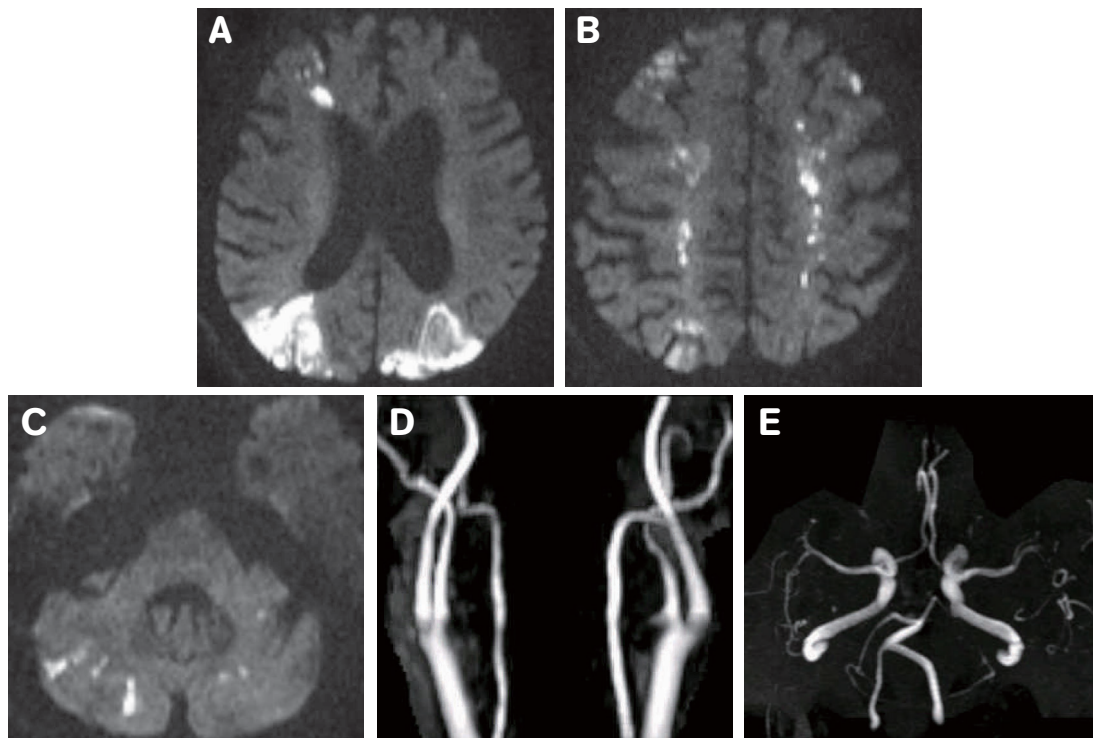


Figure 1. Diffusion-weighted imaging revealed acute diffuse watershed infarcts in bilateral middle cerebral artery (MCA)-anterior cerebral artery (1A,1B), MCA-posterior cerebral artery (1A) territories and cerebellum (1C) with hemorrhagic transformation. Extracranial (1D) and intracranial (1E) magnetic resonance angiography showed no significant stenosis of large arteries.

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of bilateral internal carotid arteries, middle cerebral arteries or basilar artery. Transthoracic cardiac echography and electrocardiography studies were negative for sources of embolism. There was neither history of acute blood loss nor hypotension prior to the MRI study. Further work-up of coagulation profile revealed elevated D-dimer and fibrin degradation products. No evidence of deep vein thrombosis was found. Tumor marker screening showed an extremely high CA-199 level (222687 units, normal range 0~37). Pancreatic tumor with liver metastasis was confirmed by computer tomography study.

Watershed infarcts are common in patients with hypotension, internal carotid artery (ICA) stenosis⁽¹⁾ or patients who received cardiac surgery⁽²⁾. Microemboli had also been postulated as another pathogenesis of watershed infarcts because of difficult emboli-clearance in watershed areas^(1,3). Malignancy-related hypercoagulation causes systemically emboli synthesis and often induce multiple infarcts in different vascular territories⁽⁴⁾. Malignancy-related stroke also associates with elevated D-dimer concentration⁽⁴⁾. When patients presented as

widespread watershed infarcts without conventional etiology of ischemic stroke such as hypotension, ICA stenosis or evidence of cardioembolism, occult malignancy-related hypercoagulation should be taken into one of the prior considerations.

REFERENCES

1. Torvic A. The pathogenesis of watershed infarcts in the brain. *Stroke* 1984;15:221-223.
2. Gottesman RF, Sherman PM, Grega MA, Yousem DM, Borowicz LM Jr, Selnes OA, Baumgartner WA, McKhann GM. Watershed strokes after cardiac surgery: diagnosis, etiology, and outcome. *Stroke* 2006;37:2306-2311.
3. Caplan LR, Hennerici M. Impaired clearance of emboli (washout) is an important link between hypoperfusion, embolism, and ischemic stroke. *Arch Neurol* 1998; 55: 1475-1482.
4. Kim SG, Hong JM, Kim HY, Lee J, Chung PW, Park KY, Kim GM, Lee KH, Chung CS, Bang OY. Ischemic stroke in cancer patients with and without conventional mechanisms: a multicenter study in Korea. *Stroke* 2010;41:798-801.