Isolated cortical venous thrombosis

Case Studies [1] | July 01, 2009

A 38-year-old Chinese man presented after five days of sharp, continuous new-onset occipital headaches. Symptoms were only partially relieved by analgesics. No fever, nausea, vomiting, photophobia, or phonophobia was observed, but two short episodes of jerking of the left upper extremity without generalization or change in consciousness were recorded.

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No fever, nausea, vomiting, photophobia, or phonophobia was observed, but two short episodes of jerking of the left upper extremity without generalization or change in consciousness were recorded. The patient was normotensive and afebrile. His neurological exam was unremarkable.

FINDINGS

Routine lab tests, unenhanced CT, MR angiography, and electroencephalography were unremarkable. Brain MR consisted of unenhanced and gadolinium contrast-enhanced axial, T1, T2, gradient-echo sequences, coronal FLAIR, and diffusion-weighted imaging. Based on the MR scan, a small high parietal cortical hemorrhagic infarction was noted on the right side (Figures 1 through 3). A prominent hyperintense signal on the cerebral surface, detected with the sagittal T1-weighted sequence (Figure 4), suggested an acutely thrombosed isolated cortical vein. On MR venography (Figures 5 and 6), all major venous sinuses were patent and did not show any abnormal signals. Investigations for hypercoagulable states and connective tissue markers were unremarkable.

DIAGNOSIS

Isolated cortical venous thrombosis.

DIFFERENTIAL DIAGNOSIS

Intracranial vascular malformation, hemorrhagic transformation in ischemic infarction, bleeding into a tumor, cerebral arteritis, aneurysm rupture, or systemic hypertension.

DISCUSSION

Cerebral sinovenous thrombosis is a fairly uncommon and potentially life-threatening condition, accounting for 1% to 2% of strokes in young adults. Compared with dural venous thrombosis, isolated cortical vein thrombosis is an uncommon condition that is often difficult to diagnose, both clinically and radiologically. The clinical presentations are nonspecific, and the typically described "cord sign" is rarely seen.
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MRI is recommended because it provides direct visualization of the thrombosis in the affected superficial cortical vein as well as secondary changes of venous outflow obstruction, expressed by a swollen gyrus from venous congestion. The neuroimaging features of isolated cortical venous thrombosis include direct visualization of the clot itself, localized hemorrhage, or venous infarction. CT visualization of the clot within a thrombosed cortical vein is often described as the cord sign. MRI equivalent of the cord sign can be difficult to identify, especially during the early phase, because the clot tends to be isointense with brain on T1-weighted images and appears as a hypointense flow void on T2-weighted images. The clot becomes easier to identify three to seven days after thrombosis, as it becomes hyperintense on both T1- and T2-weighted images.

MRI and MRA can differentiate between cortical venous thrombosis and numerous differential findings. Conventional catheter angiography may be needed to identify subtle vasculitic changes, small arteriovenous malformations, or dural arteriovenous shunts. Condensed from Isolated cortical vein thrombosis—the cord sign (Journal of Radiology Case Reports 2009;3[3]:21-24). Full case can be reviewed online with interactive features at www.radiologycases.com/index.php/radiologycases/issue/view/35/. Contributing authors Drs. Vijay Sharma and Hock L. Teoh are affiliated with the division of neurology in the department of medicine at National University Hospital in Singapore.

BIBLIOGRAPHY


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