Case 984

Posterior cerebral artery infarction
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Case Type: Clinical Cases
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Patient: 31 years, male

Clinical History:
A 31-year-old man presented with sudden onset of right homonymous hemianopsia after awakening, with alexia and behavioral abnormalities. A noncontrast CT scan of the brain showed no abnormalities. An MRI examination was performed 48 hours after the insult.

Imaging Findings:
On the day of admission, the patient developed a sudden onset of visual disturbances, shortly after awakening. He was unable to read (alexia), and his wife noticed an altered mental status and behavioral abnormalities. The patient was transferred to the hospital. Clinical neurological examination upon admission revealed a right homonymous hemianopsia. A noncontrast CT scan showed no evidence of intracranial hemorrhage. An MRI examination of the brain was obtained 48 hours after the onset of symptoms. The MRI scan was performed on a state-of-the-art 1.5 Tesla system, with the following pulse sequences: axial turbo-FLAIR images, axial TSE T2- weighted images, axial diffusion-weighted sequence (trace images and ADC maps, with b=1000), MR angiography (MRA) with MIP reformation, sagittal TSE T1-weighted images. There was a well-circumscribed, but somewhat inhomogeneous-appearing lesion (hypointense on T1-wi, hyperintense on T2-wi) in the area supplied by the left posterior cerebral artery (PCA). Diffusion-weighted trace images revealed very high signal intensities. The absence of high signal on the corresponding apparent diffusion coefficient (ADC) images supports the diagnosis of an acute infarction with cytotoxic edema. MRA showed occlusion of the left PCA. The right PCA arose from the right internal carotid artery: fetal origin of the right PCA.

Discussion:
Infarcts in the territory of the posterior cerebral arteries are common. The great majority of pure PCA infarcts are embolic strokes from cardiac or intra-arterial origin. Intrinsic PCA disease, vasocostriction and coagulopathy are less common causes of infarction. In spite of thorough diagnostic evaluation, the etiology of a PCA territory infarction cannot be determined in at least one quarter of patients. Generally the PCA supplies the inferior aspect of the temporal lobe and the occipital lobe. Its penetrating branches supply the caudal half of the thalamus and much of the midbrain. The calcarine artery is a branch of major importance because it supplies the primary visual cortex. Hence, the patient with PCA syndrome often presents with homonymous hemianopsia, which may be the only finding, but may also be accompanied by a prominent sensory deficit, slight motor deficit, unilateral headaches, neuropsychological disturbances and loss of recent memory. With involvement of the left PCA, alexia without agraphia may result. CT and MRI are the imaging modalities of choice. MRA may provide imaging of the great
vessels in a manner comparable to X-ray contrast examination.

**Differential Diagnosis List:** Posterior cerebral artery infarction (of 48 hours duration).

**Final Diagnosis:** Posterior cerebral artery infarction (of 48 hours duration).

**References:**

Figure 1

Description: A sharply defined, inhomogeneous high signal intensity region, is seen in the medial aspect of the left occipital lobe, extending into the left temporal lobe. Note the abnormal signal intensity in the left thalamus, which is supplied by penetrating branches of the PCA. Origin:
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**Figure 3**

**Description:** a. Trace image reveals very high signal intensities in the medial aspect of the left occipital lobe, extending into the left temporal lobe. **Origin:**

**Description:** b. ADC map shows low signal intensities in the medial aspect of the left occipital lobe, extending into the left temporal lobe. **Origin:**
Description: These T1-weighted scans show an ill-defined hypointense region in the inferior and medial part of the left occipital and temporal lobes. There is no hemorrhage. Origin:
Description: These T1-weighted scans show an ill-defined hypointense region in the inferior and medial part of the left occipital and temporal lobes. There is no hemorrhage. Origin:
**Description:** This image reveals absence of flow in the left PCA. Note the fetal origin of the right PCA (normal anatomic variant). **Origin:**