PHOTO ESSAY

Oculomotor Nerve Palsy Associated with Duplication of Middle Cerebral Artery, Anterior Communicating Artery Aneurysm, and Parietal Meningioma

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ABSTRACT

A 61-year-old male presents with diplopia of acute onset and progressive course. He has a history of previous intracranial haemorrhage that was surgically evacuated 7 years ago and was also associated with diplopia. Examination revealed left complete oculomotor nerve paralysis with a fixed and dilated left pupil. Computed tomography (CT) revealed encephalomalacia, evidence of previous craniotomy, and an incidental left parietal convexity meningioma. CT angiography of the brain revealed a left tortuous duplicate middle cerebral artery with fenestration of its proximal part, an anterior communicating artery aneurysm, and a characteristic capillary blush of the meningioma. Possible mechanisms of oculomotor nerve involvement are discussed.

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Photo essay

A 61-year-old male presents with diplopia of acute onset and progressive course for 2 days. He also states that he has had a headache for 1 week. He has a history of intracranial haemorrhage that was surgically evacuated 7 years ago. The patient claims that he also had diplopia at that time which resolved post-operatively but with no reported cause. His past medical history includes hypertension which is controlled by medication. Examination of the patient revealed left complete oculomotor nerve paralysis (Figure 1). Pupillary examination revealed left fixed and dilated pupil. Corrected distance visual acuity was 20/40 in both eyes. Anterior segment and posterior segment examination was unremarkable in both eyes. Computed tomography (CT) scan of the brain revealed encephalomalacia, evidence of previous craniotomy, and an incidental left parietal convexity meningioma (Figure 2). There was no evidence of aneurysm clips. CT angiography of the brain revealed a left tortuous duplicate middle cerebral artery (MCA), fenestration of the proximal part of the duplicate MCA, an anterior communicating artery aneurysm, and a characteristic capillary blush of the meningioma (Figure 3). Cerebral vasculature on the right side was normal.

Compression of the left oculomotor nerve by a tortuous duplicate MCA was suspected and the patient was referred for neurosurgical consultation.

Isolated oculomotor nerve paralysis occurs most commonly due to diabetes mellitus, hypertension, neoplasia, or intracranial aneurysms, particularly a posterior communicating artery aneurysm.^{1,2} Anterior communicating artery aneurysms have been rarely reported to cause oculomotor nerve paralysis; however, an associated intracranial hematoma was usually present in these cases.^{2,3} Fetal-type posterior cerebral artery, a relatively common variant of the posterior cerebral circulation in which the posterior cerebral artery directly originates from the internal carotid artery, is another rarely reported cause of oculomotor nerve paralysis that is postulated to compress the oculomotor nerve when it becomes more tortuous with aging and atherosclerosis.⁴ Meningiomas have seldom been recognized as the cause of oculomotor nerve paralysis, presumably by causing cerebral oedema and increased intracranial pressure.⁵ Duplicate MCA is a rare variant of the cerebral circulation that has a reported prevalence of 0.2–2.9% and can be smaller or equal in size to the main MCA.^{6,7} It has not been previously reported to be associated with oculomotor nerve paralysis. MCA

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Figure 1. Examination showing left complete oculomotor nerve paralysis.

Figure 2. Computed tomography of the brain showing encephalomalacia (solid white arrow), evidence of previous craniotomy (white arrowhead), and left parietal convexity meningioma (hollow white arrow).

fenestration has also been very rarely reported.⁸ The authors suspect that the oculomotor nerve palsy in the presented case may have been caused by compression of the oculomotor nerve by the tortuous duplicate MCA on two separate occasions. This compression could have been precipitated by the other associated conditions. Intraoperative confirmation is warranted.

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Figure 3. Computed tomography angiography of the left internal carotid artery (lateral view) showing a tortuous duplicate middle cerebral artery with fenestration (solid white arrow), anterior communicating artery aneurysm (white arrowhead), and meningioma capillary blush (hollow white arrow).

Declaration of interest

The authors declare that there are no conflicts of interest. The authors alone are responsible for the writing and content of the article.

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