Central Retinal Artery Occlusion From Carotid Dissection Diagnosed by Cervical Computed Tomography

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Background
Carotid dissection may lead to many different types of neurological deficits, both transient and permanent. Case Description We present a patient with an isolated central retinal artery occlusion who was found to have an ipsilateral carotid dissection by neck computed tomographic scan, later confirmed by angiography.

Conclusions
This is the first reported case of carotid dissection causing central retinal artery occlusion without any other neurological deficits. It demonstrates the diagnostic usefulness of computed tomographic imaging in such cases.

Key Words
• blindness • dissection • tomography

Carotid artery disease is known to cause a variety of ischemic ocular syndromes secondary to embolism or perfusion failure. Dissection of the internal carotid artery (ICA) is known to cause amaurosis fugax and other ocular ischemic syndromes with a good functional outcome. There has been one report of central retinal artery occlusion as a sequela of ICA dissection, but the two patients involved had other neurological deficits as well. We describe a patient with traumatic ICA dissection who developed an ipsilateral isolated central retinal artery occlusion.

Case Report
A previously healthy 36-year-old man was involved in a motor vehicle accident and sustained head trauma; the right side of his head hit the windshield. There was no loss of consciousness. Immediately after the accident, the patient reported pain in his right eye, without visual symptoms. A few days later he developed pain in his neck and increasing pain in the right eye, which was not relieved with nonsteroidal anti-inflammatory agents. The day before presentation he complained of a severe headache and right eye pain, which was associated with the impression of a shade coming down over the right eye that progressed to complete blindness.

On examination the patient had scalp tenderness over the right side of his head. His neck was supple without tenderness or bruits. Neurological examination was significant for an afferent pupillary defect and light perception only in the right eye. Funduscopic examination revealed opacification of the retina with a cherry red spot. The remainder of the neurological examination was normal.

Computed tomographic (CT) scan of the neck done with contrast revealed an intimal thrombus and narrowing of the cervical portion of the right ICA (Figure). This was confirmed by carotid angiography, which demonstrated diffuse narrowing of the cervical ICA. CT scan of the brain was negative.

The patient was anticoagulated with heparin, then discharged to his home on warfarin. After 6 months there had been no improvement in his vision and no new neurological symptoms.

Discussion
Spontaneous and traumatic dissections of the ICA have been well described in the literature. Carotid artery dissection most commonly presents with the abrupt onset of unilateral headache followed, at times, by vascular events that can be transient or permanent. Forty percent to 50% of patients have an ipsilateral Horner's syndrome. Transient monocular visual loss and neck pain are a common occurrence. The extracranial segment is the most commonly involved portion of the ICA. Motor vehicle accidents are thought to be the most common causative factor. Patients who sustain combinations of head, facial, and cervical injuries are at greatest risk. As a rule, patients with traumatic extracranial carotid dissections have a "lucid interval" of hours to days before the abrupt onset of symptoms. Ocular strokes due to carotid artery dissection are exceedingly rare. The literature contains only one other case of an isolated permanent monocular visual loss related to carotid dissection, and this was a case of posterior ischemic optic neuropathy. Two cases of central retinal artery occlusion secondary to carotid dissection were associated with other neurological deficits. Another case of permanent monocular blindness caused by carotid dissection was due to ophthalmic artery occlusion, but this case was also associated with
Neck computed tomographic scan with contrast shows an intimal thrombus and narrowing of the lumen of the right internal carotid artery due to dissection (arrows).

ophthalmoparesis. To our knowledge, this is the first case of a carotid dissection resulting in an isolated central retinal artery occlusion. Early diagnosis is important because conservative treatment with anticoagulants may prevent future ischemic events.

Our patient's presentation with right neck pain, scalp tenderness, and monocular blindness after a motor vehicle accident was highly suggestive of a traumatic carotid artery dissection. In this case the dissection was demonstrated on CT scan of the neck with contrast, which revealed narrowing of the lumen and an intramural hematoma in the right cervical ICA. This was confirmed by angiography. The CT scan enables the physician to examine not only the lumen of the carotid artery but also the vessel wall, revealing hematomas and pseudoaneurysms. While angiography remains the "gold standard" for the diagnosis of dissection and magnetic resonance imaging may prove quite useful, CT scans are noninvasive and may reveal persistent dissections even after the angiogram appears normal. Therefore, it has been proposed that CT scans are a useful means of following the progression of a dissection and determining when anticoagulation can be safely discontinued. They may also be useful for delineating the full extent of a pseudoaneurysm before surgical repair.

In conclusion, ocular strokes are a rare but serious complication of carotid artery dissection. Carotid dissection should be considered in the differential diagnosis of patients who present with acute monocular visual loss, especially in the setting of recent trauma or unilateral head and neck pain. Neck CT scans with contrast can serve as an important diagnostic tool in suspected carotid artery dissection.

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References
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