DECISIONS

A 65-year-old man with transient monocular vision loss

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A 65-year-old man describes transient and painless vision loss in his right eye. He has had three episodes over the past month, each lasting one to two minutes. His ocular history is unremarkable, and his medical history includes poorly controlled hypertension and a 30-pack-year history of smoking.

What are the possible causes of the vision loss in this patient?

Transient monocular vision loss, previously known as amaurosis fugax, has numerous causes. These include thromboembolic events (e.g., valvular heart disease and atherosclerosis of the carotid artery), hypoperfusion (e.g., stenosis of the carotid artery and ocular ischemic syndrome), ocular causes (e.g., impending or partial occlusion of the retinal artery or vein, intermittent angle-closure glaucoma and optic disc edema or anomaly) and vasospasm (e.g., ophthalmic migraine)^{1,2} (Box 1).

Box 1: Causes of transient monocular vision loss^{1,2}

Ischemic

- Thromboembolism: cardiac, carotid artery, ophthalmic artery or other small vessel

Stenosis: aortic arch, carotid artery, ophthalmic artery

Vasospasm: migraine, retinal artery vasospasm

Vasculitis

Systemic hypoperfusion

- Coagulopathy

Optic nerve disease

- Papilledema
- Optic nerve compression

Uhthoff phenomenon

- Optic disc drusen may be seen

Ocular

- Uveitis–glaucoma–hyphema syndrome
- Intermittent chronic angle-closure glaucoma
- Ocular surface disease
- Exudative retinal detachment

What clinical clues help determine the cause of the vision loss?

Transient monocular vision loss typically lasts from a few seconds to minutes, followed by a complete recovery.² The amount of vision loss can range from mild blurriness to, less commonly, total blindness and can affect either a portion or all of the visual field. Although the cause cannot be determined solely from the patient's history, transient monocular vision loss due to papilledema typically lasts only a few seconds, whereas the duration is minutes or longer when caused by thromboembolic events.²

In most patients (> 50%), the vision loss is secondary to ischemia induced by stenosis or embolism of the carotid artery or its tributaries.³ These patients usually have major risk factors for cardiovascular disease, such as smoking and dyslipidemia, and a carotid bruit may be heard on auscultation.² Neck pain or ipsilateral Horner syndrome is suggestive of carotid dissection.²

In younger patients, ophthalmic migraine is the most common cause of transient monocular vision loss.² In these patients, the vision loss is typically associated with positive phenomena, such as scintillations.²

It is important to consider a diagnosis of giant cell arteritis, particularly in older patients. Although the clinical presentation is highly variable, patients with giant cell arteritis may have temporal headache, jaw claudication, scalp tenderness, fever, weight loss and anorexia. Patients with carotid artery disease do not experience these symptoms.^{1,4}

What initial investigations should be done for this patient?

In patients over 50 years old and younger patients with major cardiovascular risk factors, urgent ultrasonography of the carotid artery is required to determine if stenosis or dissection is present.² If the findings are equivocal, magnetic resonance angiography, computed tomography angiography or catheter angiography may be considered. Transthoracic echocardiography is

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used to rule out a cardiogenic source of emboli, such as left atrial or ventricular thrombi or valvular disease. If a cardiogenic source is strongly suspected and test results are negative, transesophageal echocardiography is recommended because it is more sensitive.^{2,5}

If giant cell arteritis is suspected, urgent tests to obtain complete blood count, erythrocyte sedimentation rate and C-reactive protein level are needed.⁴ Because no single test can exclude this diagnosis, systemic steroid therapy should be started immediately if the clinical suspicion is high, followed by a biopsy of the temporal artery within 7–14 days.⁴

All patients presenting with transient monocular vision loss require urgent ophthalmic evaluation to rule out ocular causes.^{2,4} The evaluation should include visual acuity assessment, measurement of intraocular pressure to rule out glaucoma and testing of the visual field. Dilated funduscopic examination can show retinal emboli, signs of retinal ischemia and optic nerve disease.^{2,4}

If carotid artery stenosis is found, what are the treatment options?

All patients with carotid artery disease require modification of their risk factors through weight loss and exercise and, if indicated, statin therapy, glycemic control, antihypertensive therapy and smoking cessation counselling. Antiplatelet treatment with acetylsalicylic acid (ASA) is generally recommended.⁵ Because transient monocular vision loss in a patient with carotid stenosis is associated with an annual stroke rate of 2.2% (95% confidence interval 1.5%–3.0%), options for carotid revascularization should be considered.^{5–7}

The traditional method used for revascularization is carotid endarterectomy. This procedure is recommended in symptomatic patients at low to moderate surgical risk within six months if the stenosis is between 70% and 99%.⁵ Asymptomatic patients with 70%–99% stenosis also benefit from revascularization if they are low-risk candidates for surgery. Revascularization is not advised in patients with less than 50% stenosis or total occlusion.⁵

Stenting of the carotid artery is an alternative method for the treatment of carotid stenosis, particularly if the patient's surgical anatomy is unfavourable or the risk of surgery is too high. Although the safety and efficacy of stenting versus endarterectomy is still being evaluated, current data suggest that patients at low to average surgical risk can undergo either procedure with similar efficacy and low overall mortality and morbidity.⁷

Case revisited

The patient's C-reactive protein level and erythrocyte sedimentation rate were within normal limits, and carotid ultrasonography showed a 90%

stenosis of his right carotid artery. The patient was referred to a neurosurgeon, who determined that the location of the lesion was surgically inaccessible. The patient underwent carotid artery stenting, which was well-tolerated, and the patient is now asymptomatic. After stenting, the patient was given dual antiplatelet treatment with clopidogrel and ASA. In addition, his major cardiovascular risk factors were optimized: he was counselled to quit smoking, and his blood pressure was controlled successfully with hydrochlorothiazide and an angiotensin-converting-enzyme inhibitor.

References

1. Amaurosis Fugax Study Group. Current management of amaurosis fugax. *Stroke* 1990;21:201-8.
2. Biousse V, Trobe JD. Transient monocular visual loss. *Am J Ophthalmol* 2005;140:717-21.
3. Donders RC; Dutch TMB Study Group. Clinical features of transient monocular blindness and the likelihood of atherosclerotic lesions of the internal carotid artery. *J Neurol Neurosurg Psychiatry* 2001;71:247-9.
4. Rucker JC, Biousse V, Newman NJ. Ischemic optic neuropathies. *Curr Opin Neurol* 2004;17:27-35.
5. Brott TG, Halperin JL, Abbara S, et al. 2011 ASA/ACCF/AHA/AANN/AANS/ACR/ASNR/CNS/SAIP/SCAI/SIR/SNIS/SVM/SVS guideline on the management of patients with extracranial carotid and vertebral artery disease: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines, and the American Stroke Association, American Association of Neuroscience Nurses, American Association of Neurological Surgeons, American College of Radiology, American Society of Neuroradiology, Congress of Neurological Surgeons, Society of Atherosclerosis Imaging and Prevention, Society for Cardiovascular Angiography and Interventions, Society of Interventional Radiology, Society of NeuroInterventional Surgery, Society for Vascular Medicine, and Society for Vascular Surgery. *J Am Coll Cardiol* 2011;57:e16-94.
6. Wilterdink JL, Easton JD. Vascular event rates in patients with atherosclerotic cerebrovascular disease. *Arch Neurol* 1992;49:857-63.
7. Brott TG, Hobson RW II, Howard G, et al. Stenting versus endarterectomy for treatment of carotid-artery stenosis. *N Engl J Med* 2010;363:11-23.

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