# Sudden right eye shadow

*Eye series 1*

A 70 year old male presents to your practice. He describes the appearance of a sudden shadow across his right eye. He does not describe any pain and has not noticed any flashes or floaters. There is no history of previous eye problems. On examination the patient's vision is 6/12 in the right eye and 6/6 in the left eye. The eye looks sound and pupils react normally.
He is currently being treated for both hypertension and hyperlipidaemia.

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### Question 1

How would you differentiate this condition from other eye conditions and what other tests would you perform at this time?

### Question 2

What is your diagnosis?

### Question 3

What would be the appropriate initial response?

### Question 4

Name the possible causes.

### Question 5

What would be the long term risks?

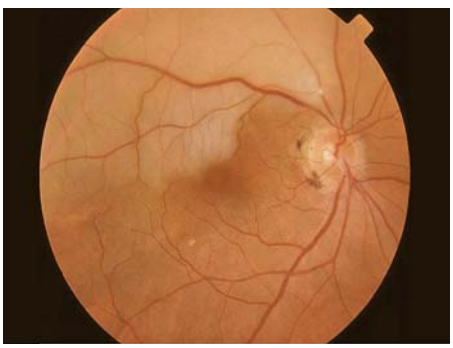

**Figure 1.**

## Answers

### Answer 1

The sudden onset and absence of redness, discharge or pain would preclude conditions such as cataracts, infection or iritis. Glaucoma loss is mostly gradual however an acute attack is possible in this age group. An acute glaucoma episode would be accompanied by the classically described symptoms of halos around lights and severe pain (this would represent an ocular emergency). Patients describe blurred vision rather than a shadow, as the visual loss is due to the cornea becoming swollen. Although rare, simultaneous artery occlusion can occur in an acute glaucoma attack.

Diabetic maculopathy and age related macular degeneration typically present as a gradual deterioration of central vision rather than a shadow across the field of vision. In some cases though, sudden involvement of the macula may cause acute distortion and blurred vision.

Retinal detachments (RD) are usually

## Answers

accompanied by many flashes or floaters, due to the vitreous pulling away from the retina, followed by a 'veil' over the vision. However, a RD should always be considered in a patient complaining of a shadow across their visual field, even in the absence of floaters and flashes. Tumour related field loss also tends to be slow in onset.

### Answer 2

Ophthalmoscopy of the right eye reveals branch retinal artery occlusion (BRAO) (Figure 1). An occlusion of the retinal arteries will cause a sudden and painless loss of visual field. Central retinal artery occlusion presents with vision of count fingers or less. Branch occlusions present with a shadow in one area of the visual field and blurred vision if the macula is involved.

The occlusion of retinal arteries can be divided into three main groups:

- embolisation
- vaso-obliteration, and
- raised intraocular pressure (IOP).

The ophthalmic artery as the first branch of the internal carotid artery allows a direct and relatively common route for embolic materials from both the heart and carotid arteries and as such represents the most common cause of retinal circulation obstruction. Hypertension and hyperlipidaemia are closely associated with emboli development. Vaso-obliteration is uncommon and due to carotid artery disease (ocular ischaemic syndrome) or vasculitis, eg. giant cell arteritis.

### Answer 3

Treatment of an occlusion is aimed at restoring circulation as the retinal suffers irreversible ischaemic damage after 90 minutes. Acutely lowering the intraocular pressure induces dilation of the retinal vessels with the hope of dislodging the embolus. If it breaks up and moves downstream, the area of retina damaged by ischaemia is minimised. Unfortunately, recovery of vision is uncommon.

The patient should lie flat as this helps to maintain circulation. Rebreathing $CO_2$ (breathing into a paper bag) intravenous acetazolamide 500 mg, timolol 0.5% topically (if there is no history of asthma or congestive cardiac failure), brimonidine (Alphagan) topically and globe massage with lids closed are all further options however, there is only anecdotal evidence to support the success of these therapies. Immediate referral to an ophthalmologist is required for further assessment and management of both vision and ocular health.

### Answer 4

Embolisation from the carotid arteries may come in the form of cholesterol, fibrinoplatelets or calcific origins. Similarly embolisation directly from the heart can be calcific, vegetative (through valve vegetations in the SBE), thrombus or myxoma in origin. Several systemic conditions have been linked to retinal artery occlusion and as such are associated as possible risk factors. These include:

- hypertension (65% increase in risk of BRAO)
- carotid atherosclerosis (45%)
- diabetes (25%), and
- cardiac valvular disease (25%).

Smoking has also been shown to increase the chance of retinal artery occlusion.

### Answer 5

Retinal artery embolisation is a significant risk factor for a major cerebrovascular accident. The risk of further CVA is 3% with central retinal artery occlusion compared to 1.5% if the patient is in atrial fibrillation, and 8% following a cerebral TIA. A full systemic vascular workup including blood pressure, lipids, blood sugar level, carotid (and possibly cardiac) ultrasound is indicated.

## Further reading


1. Mead G E, Lewis S C, Wardlaw J M, Dennis M S. Comparison of risk factors in patients with transient and prolonged eye and brain ischaemic syndromes. Stroke 2002; 33(10):2383–2390.
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6. Beatty S, Au Eong K G. Acute occlusion of the retinal arteries: current concepts and recent advances in diagnosis and management. J Accid Emerg Med 2000; 17(5):324–329.


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