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# Are these visual symptoms due to migraine?

## A guide for general practice

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### INTRODUCTION

Visual aura occurs in approximately 30% of migraine patients. The challenge for a GP is knowing when visual symptoms are entirely consistent with migraine and when instead there may be another cause requiring urgent investigation or consultation.

### AURA CHARACTERISTICS

The most characteristic aura of migraine is an aura that gradually evolves over more than 5 minutes. This evolution reflects the migrating wave of excitation and inhibition across the cortex, most commonly beginning in the visual cortex. The wave travels at 3 mm per minute and the evolution of symptoms reflects this.[1]

The descriptions patients give can be fascinating. One patient may describe 'funny vision' for an hour followed by headache — an easy diagnosis, if not illuminating. Whereas one of this author's more eloquent and analytical patients described the onset as distortions to the left of centre of her vision, then door frames appearing to be on a slant, then the door itself appearing to undulate, as if breathing, then a feeling of certitude of knowledge, of having great mathematical ability, then speech disturbance. This case points to one of the other clues that visual symptoms are migrainous, namely the presence of non-visual symptoms and involvement of multiple vascular territories.

The International Headache Society criteria for migraine with aura require at least three of six characteristics, as listed in Box 1.[2]

It is important to note that these criteria were developed in part for research purposes to enable more tightly defined groups of patients to be studied. Many patients fall outside of these criteria. It is also a diagnosis of exclusion — one needs to think about alternative diagnoses.

Common visual symptoms include zigzags, small bright dots, looking through semi-transparent glass, heatwaves over asphalt on a sunny day, trickling water on a window, fading colours, and a fusion of colours.[3,4] Others experience more complex hallucinations such as things appearing closer or further away, smaller or enlarged. Some speculate that aspects of *Alice in Wonderland* were inspired by Lewis Carroll's migraines.

### Box 1. International Headache Society criteria for migraine with aura[2]

1. At least one aura symptom spreads gradually over ≥5 minutes.
2. Two or more aura symptoms occur in succession.
3. Each individual aura symptom lasts 5–60 minutes.
4. At least one aura is unilateral.
5. At least one aura is positive.
6. The aura is accompanied, or followed within 60 minutes, by headache.

### MIGRAINE VERSUS TRANSIENT ISCHAEMIC ATTACK

Transient ischaemic attacks (TIAs) typically lead to negative symptoms, that is, loss of function. With the visual system, this means darkening or loss of vision. In contrast, migraine typically leads to positive symptoms, for example, flashing lights. Similarly, with sensory involvement ischaemia would be expected to cause loss of sensation, whereas in migraine it causes tingling or a feeling of swelling. However, the distinction is not absolute and migraineurs may have negative symptoms. Rarely one can have positive symptoms in ischaemia.

Sometimes it will not be possible to discriminate between migraine and TIA, and migraine becomes a diagnosis of exclusion. Neurologists have it easier here, with the patient usually having been to A&E or seen a stroke physician and had normal imaging.

Another diagnostic clue is speed of onset. Ischaemic symptoms typically come on suddenly and with little evolution, whereas a more gradual evolution is typical of migraine. However, migraine aura symptoms can come on suddenly and last a short time, for example, for a few minutes.[5] They may also last longer than an hour and occur during or rarely after the headache.

In a case presenting with short-duration aura, one would require additional evidence to reassure that this was not ischaemia, for example, a decrease in visual perception with darkening of vision lasting 1 minute, but then followed by a spread of tingling across the face over 5 minutes, then a feeling like the tongue was swollen, then 5 minutes later some expressive dysphasia. This pattern would reassure one that the whole episode was a migrainous aura.

A further clue is the frequency of attacks. If a patient describes 2 minutes of visual disturbance followed by headaches occurring once a year over the last 20 years, one can be reassured, whereas urgent investigations are required if occurring daily over the last week.

## OTHER DIFFERENTIAL DIAGNOSES

Other differential diagnoses include giant cell arteritis, retinal detachments, raised intracranial pressure, occipital seizures, and hypoperfusion.

Occipital seizures are rare and as with other epilepsies cause a rapid spread of symptoms over seconds, with the whole episode lasting minutes, although occipital seizures in children can merge into a migrainous headache.

Giant cell (temporal) arteritis should be considered in those aged >50 years. Urgent investigation is required if headache-only symptoms are present, but emergency input is needed with visual symptoms because of the risk of an arteritic optic neuropathy and irreversible blindness. There can be brief positive visual symptoms before fixed symptoms occur.

Patients with raised intracranial pressure may describe brief episodes of blurring of vision, similar to how people describe a faint. These are typically brought on by changes in posture, such as bending down or getting up. Although this can occur with tumours, one would usually expect other symptoms and signs with tumours, except rarely if the tumour is in the posterior fossa and blocking cerebrospinal fluid flow with secondary hydrocephalus. The commonest cause of raised intracranial pressure with visual disturbance is idiopathic intracranial hypertension. From a GP perspective, the important thing is to look for papilloedema. This is a difficult skill to master and in a non-emergency case, an increasingly common practice is to ask the patient to visit an optician. With retinal imaging becoming ubiquitous, more cases of asymptomatic mild papilloedema are being identified, particularly in overweight females. Ophthalmologists and neurologists are still working out what to do with the subsequent referrals.

Brief positive visual phenomenon lasting <1 minute may arise from vitreous traction, and momentary phosphenes can occur in normal individuals with rapid eye movements.

## SUMMARY

In summary, although visual symptoms plus headache are likely to be migraine, this is a diagnosis of exclusion and one should think about alternatives. With detailed history taking, one can derive insight in to how all our brains function and very often provide diagnostic reassurance.


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### Competing interests

Paul Goldsmith is a consultant neurologist for Royal Victoria Infirmary, is a non-executive director for the Medical Defence Union, and is on the Cases Committee for the Medical Defence Union. Goldsmith is an employee and/or shareholder in Closed Loop Medicine Ltd, Ieso Digital Health Ltd, Vastrata Ltd, and Summit plc.

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