



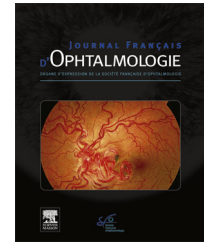
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GENERAL REVIEW

# Transient monocular blindness: Vascular causes and differential diagnoses<sup>☆</sup>

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## KEYWORDS

Transient monocular blindness;  
Stroke;  
Transient ischemic attack;  
Retinal ischemia

**Summary** Transient monocular blindness is an acute episode of ischemic origin in which one eye has profound visual loss, followed by full recovery within one hour. Transient monocular blindness most often occurs in the setting of retinal ischemia secondary to carotid embolism, but other mechanisms have been reported, including thrombosis (most often in the setting of giant cell arteritis), hemodynamic disorders (secondary to severe carotid stenosis), or vasospasm. Transient monocular blindness is considered a transient ischemic attack originating in the carotid arteries, and must be managed the same as transient ischemic attack involving the brain, in order to prevent a subsequent stroke.

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## Introduction

Transient monocular blindness (TMB) or amaurosis fugax refers to severe, brief, unilateral visual loss of sudden onset, most often lasting a few minutes to one hour, followed by complete spontaneous recovery. This term often leads to

confusion, since for the majority of clinicians, it is synonymous with transient retinal artery occlusion. In reality, other mechanisms may be encountered. In addition, this term is very often used both for transient monocular “blindness” in the true sense of the term, i.e. a complete and transient loss of vision in one eye (the infamous “black curtain”), as well as for transient severe monocular visual field cuts (without necessarily “blindness” per se).

The majority of patients presenting with transient visual disturbances have benign pathology, such as dry eye or a migraine-related visual aura. However, particularly when it is their first episode, ischemic causes are the first, which must be ruled out urgently, due to the risk of possible complications such as a stroke in the short term without proper management.

<sup>☆</sup> See this article unabridged, illustrated and detailed, with electronic enhancements in EMC-Ophtalmologie : Bidot S, Biotti D. Cécité monoculaire transitoire. EMC – Ophtalmologie 2017;14(4):1–11 [Article 21-452-C-40].

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For the purposes of this article, for practical reasons although there is no consensus, TMB is defined as any severe monocular visual loss (involving all or part of the visual field), of sudden onset, with complete recovery, generally within less than one hour, of ischemic origin.

## Approach to transient visual disturbances (excluding diplopia)

### History

Transient monocular versus binocular visual disturbance: first, transient monocular visual disturbances must be distinguished from binocular, by asking the patient if he or she covered each eye alternately during the episode. A monocular visual disturbance indicates prechiasmatic involvement (eye or ipsilateral optic nerve), while a transient binocular visual disturbance is secondary to either chiasmatic involvement, unilateral (or more rarely bilateral) involvement of the retrochiasmatic visual pathways or occipital cortex, or a rare simultaneous bilateral prechiasmatic involvement. The patient's response must be clear and unequivocal. If not, difficulty reading or a visual field defect respecting the vertical meridian suggests binocular involvement.

### Signs of transient visual disturbances

A transient visual disturbance manifests itself through associated "negative" and/or "positive" visual phenomena, the respective importance of which depends on the patient and the pathology.

Transient visual disturbances are most often "negative" phenomena, i.e. visual loss of highly variable severity, from minimal (blur, foggy vision) to a black or gray veil partially or totally obscuring the visual field, to even complete blindness.

Positive visual phenomena result from the creation of false images by the visual system. These may be illusions, resulting from abnormal perception of a real image, or hallucinations, resulting from the perception of an image in the absence of an external stimulus. Most often, these are elementary hallucinations, in the form of phosphenes or photopsias (sparks, bright spots, white or colored flashes...) or geometric hallucinations (lines or geometric shapes). More rarely, they may be more complex hallucinations (people, animals...).

### Other historical elements

Besides duration, the manner in which the transient visual disturbance came on and resolved, the associated signs

(signs of giant cell arteritis, focal neurologic signs...) and the circumstances in which the episode occurred (Table 1) must be specified.

Note that the duration of a transient visual disturbance is only important if it is very short (of the order of a few seconds) or very long (several hours), which makes a thromboembolic cause unlikely.

### Ophthalmologic examination

The history most often suggests a diagnosis. Since the disturbance is by definition transient, the ocular examination is often normal. It may however sometimes confirm a proposed hypothesis, or even determine the cause if the history was non-contributory. It should look for ocular surface disease, pathology predisposing to acute intraocular pressure spikes, retinal ischemia, and optic disk abnormalities. It also should include a neuro-ophthalmologic examination.

## Transient monocular blindness due to retinal ischemia of arterial origin

A transient ischemic attack (TIA) is defined as "a brief episode of focal neurologic dysfunction caused by cerebral, spinal cord or retinal ischemia, without signs of infarct" (on cerebral imaging or fundus exam) [1]. This definition thus includes TMB due to retinal ischemia within the classification of TIA, with the former representing ≈25% of carotid TIA's [2]. In this chapter only, out of necessity for clarity, we will use the term TMB to more specifically designate TMB due to retinal ischemia (synonymous with retinal TIA).

### Clinical features

#### Symptoms

The visual disturbance is typically painless, sudden and monocular, in the form of a black or gray veil or shadow, covering the visual field partially or totally within a few seconds, from high to low ("falling curtain"), from low to high, or in the form of a very rapid fade [2–5]. When the visual loss is partial, it generally respects the horizontal meridian, most often in the form of a superior or inferior altitudinal defect [3]. Positive visual phenomena such as photopsia are sometimes associated, but this sign has never been systematically studied [4,5]. The transient visual disturbance is generally short, most often 1 to 10 minutes, and generally does not last beyond one hour (beyond that, the visual disturbance generally becomes permanent) [2,5]. Recovery often takes place in the reverse order from the onset.

**Table 1** Differential diagnoses of transient visual disturbance depending on circumstances of occurrence.

Circumstances of occurrence	Diagnoses
On exertion	Pigment dispersion syndrome or Uhthoff's phenomenon
Postprandial	Severe carotid stenosis
Exposure to bright light	Severe carotid stenosis
Eye movement	Orbital mass ("gaze-evoked amaurosis")
Postural changes	Optic nerve head abnormalities (visual eclipses)

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