

Transient Visual Loss –

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Biousse V, Nahab F, Newman NJ. Management of Acute Retinal Ischemia: Follow the Guidelines! *Ophthalmology*. 2018 Oct;125(10):1597-1607

Acute retinal arterial ischemia, including vascular transient monocular vision loss (TMVL) and branch (BRAO) and central retinal arterial occlusions (CRAO), are ocular and systemic emergencies requiring immediate diagnosis and treatment. Guidelines recommend the combination of urgent brain magnetic resonance imaging with diffusion-weighted imaging, vascular imaging, and clinical assessment to identify TMVL, BRAO, and CRAO patients at highest risk for recurrent stroke, facilitating early preventive treatments to reduce the risk of subsequent stroke and cardiovascular events. Because the risk of stroke is maximum within the first few days after the onset of visual loss, prompt diagnosis and triage are mandatory. Eye care professionals must make a rapid and accurate diagnosis and recognize the need for timely expert intervention by immediately referring patients with acute retinal arterial ischemia to specialized stroke centers without attempting to perform any further testing themselves. The development of local networks prompting collaboration among optometrists, ophthalmologists, and stroke neurologists should facilitate such evaluations, whether in a rapid-access transient ischemic attack clinic, in an emergency department-observation unit, or with hospitalization, depending on local resources.

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Transient Visual Loss:

TVL: Evaluation

Try to determine if one eye or two (sometimes difficult)

[Clues to binocular TVL: unable to read; visual loss off to one side; positive visual phenomena described as zig-zag or fortifications; slowly expanding scotoma or scintillations]

Transient monocular visual loss (TMVL)

Related to ocular, retinal or optic nerve dysfunction

Patient characteristics:

- Age, vascular risk factors, associated diseases
- Measure blood pressure, pulse, palpate temporal arteries (in patients >50yo)

Characteristics of visual loss:

- Single isolated event or recurrent (date of last episode)
- Sudden onset or slow onset
- Blurry vision or blackout; complete or partial (curtain, constriction)
- Positive visual phenomena (phosphenes, brightness, scintillations)
- Progression of vision loss or of positive visual phenomena
- Duration of vision loss
- Precipitating factors (posture, light, eating, exercise, hypotension, arrhythmia, heat)
- Associated symptoms (headaches, eye pain, neck pain, neurologic focal symptoms, symptoms of giant cell arteritis, palpitations)

Ocular examination looking for specific abnormalities:

- Visual acuity, color vision, visual field testing (automated perimetry)
- Slit lamp examination (corneal edema, corneal dystrophy, hyphema, cells, narrow anterior chamber, pigment, iris transillumination defects, iris neovascularization, lens position)
- Intraocular pressure; gonioscopy if suspicion of narrow angle or pigment dispersion syndrome
- Pupils looking for relative afferent pupillary defect, Horner syndrome, tonic pupil
- Dilated funduscopy: retinal ischemia, cotton wool spots, retinal hemorrhages, arterial emboli, arterial narrowing, dilated veins, optic nerve head edema, crowded optic nerve, optic nerve head drusen, glaucomatous cupping, vitreopapillary traction, vitreomacular traction, severe hypertensive retinopathy
- Retinal fluorescein angiography (FA) may be helpful when examination is normal and there is a high suspicion of vascular TMVL
- Optical coherence tomography (OCT) macula may be helpful to demonstrate inner retinal edema in very acute CRAO and to look for vitreopapillary or vitreomacular traction

Transient binocular visual loss

- Suggests lesions involving the chiasm or retrochiasmal visual pathways (rarely, bilateral ocular or optic nerve disorders can result in binocular TVL, but usually asymmetrically in the two eyes)
- Most often related to: migraine, occipital stroke, occipital seizures, hypoglycemia

Unsure if monocular or binocular

Evaluate as TMVL and make sure to include brain MRI/MRA

Do not use the term "amaurosis fugax" which is confusing and should only refer to "retinal arterial transient ischemic attack"

Transient Visual Loss:

Evaluation, Mechanisms, Diagnosis and Management of Visual Loss, What to do

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Transient Monocular Visual Loss

Mechanisms and diagnosis of visual loss



This is NOT migraine!

.Migrainous visual aura is always binocular (originates in the occipital cortex: cortical depression). Often described as “on the side”
.Positive visual phenomena: expanding zig-zag lines often followed by an enlarging scotoma (scintillating scotoma) highly suggestive of occipital origin
.Lasts 20-30 minutes; changes sides with attacks; followed by headaches but may remain isolated. Typically recurrent with no sequelae

Ocular causes of TMVL (non-vascular)

- Related to ocular, retinal or optic nerve dysfunction
- Refractive error** (accommodative spasm, hyperglycemia)
 - Ocular surface disease** (dry eyes, blepharitis, epiphora, contact lens)
.Blurry vision, fluctuates, worse when focusing, better when blinking
 - Corneal edema, corneal dystrophy**
.Blurry vision, common upon awakening
 - Anterior chamber inflammation/hyphema***
 - Phakodonesis***
 - Intermittent angle closure**
.Ocular pain common, but may be absent
 - Pigment dispersion syndrome***
.Young, myopic, blurry vision with exercise
.Krukenberg spindles on cornea, pigmented angle
 - Vitreous hemorrhage*, vitreous floaters***
 - Incomplete retinal detachment**
.Moving curtain
 - Vitreomacular traction**
 - Vitreopapillary traction***
 - Nocturnal pressure on the eye** (obstructive sleep apnea)
 - Smartphone blindness**
 - Orbital mass (or thyroid eye disease)***
 - Orbital vascular malformation**
 - Abnormal optic nerve head** (papilledema, optic nerve head drusen, crowded disc)
.Transient visual obscurations*: very brief (seconds) blackouts of vision (often bilateral, but usually asymmetrically in the two eyes)
 - Previous optic neuropathy (usually optic neuritis)**
.Uhthoff’s phenomenon: decreased vision (minutes to hours) precipitated by increased body heat (hot bath, exercise)

*Blurry vision precipitated by changes in position or eye movements

Vascular causes of TMVL

- Related to arterial or venous ischemia of the retina, choroid, optic nerve or the entire eye.
- Retinal arterial transient ischemic attack**
.Brief (minutes, not seconds), sudden, often complete blackout of vision, or curtain or constriction
.Spasm of central retinal artery may produce isolated brief (minutes, not seconds), recurrent episodes of complete blackout of vision in young healthy people (diagnosis of exclusion)
 - Choroidal ischemia**
.TMVL is often described as “rain”, “fog”, “web”, sometimes with purple colors (lasts often longer than retinal arterial ischemia)
.Retinal fluorescein or indocyanine green (ICG) angiography helpful
.Highly suggestive of vasculitis such as giant cell arteritis (GCA)
 - Impending central retinal vein occlusion**
.TMVL is longer (20-30 min) and incomplete, often described as “fog” or diffusely blurry
.Dilation of retinal veins with often normal retina and optic nerve
 - Ocular ischemic syndrome**
.TMVL lasts longer (30 min) and often precipitated by orthostasis, hypotension, post-prandial, exercise, exposure to bright light.
.Phosphenes, impaired dark adaptation common
.May have ocular pain improving when lying down
 - Ischemic optic neuropathy**
.Optic nerve head edema if anterior ischemic optic neuropathy
.Highly suggestive of vasculitis such as GCA (non-arteritic ischemic optic neuropathy never presents with TMVL)
.May be isolated or with cotton wool spots, choroidal ischemia (GCA)

Transient Monocular Visual Loss

TMVL: Management

Do NOT make a falsely reassuring diagnosis of migraine!
Do NOT assume it is central retinal artery vasospasm until other causes are ruled out

Slow down and take the time to take a good history (see Evaluation)

Ask patients to draw what they saw: if they draw fortifications/zig-zags, it may be binocular (migraine)

Slow down and perform a detailed ocular examination

Check the pupils yourself! Obtain a visual field if examination is normal. Consider retinal FA and OCT

Look for associated symptoms: eye pain, headache, neck pain, giant cell arteritis, neurologic symptoms
Measure blood pressure, check pulse for arrhythmia

Ocular or orbital cause

Patient > 50 yo

Think giant cell arteritis (GCA)

Obtain immediate CBC, platelets, ESR and CRP

Abnormal

Normal

Treat as GCA

.Intravenous high dose steroids
.Temporal artery biopsy

Vascular causes of TMVL – Is it?:

- Retinal arterial transient ischemic attack
- Choroidal ischemia
- Impending central retinal vein occlusion
- Ocular ischemic syndrome / Venous stasis retinopathy
- Ischemic optic neuropathy (GCA)

Retinal examination normal or shows retinal emboli, retinal ischemia, ocular ischemic syndrome

Retinal arterial transient ischemic attack

Follow the guidelines!

Immediate referral to closest emergency Stroke Center
Find it at: <https://hospitalmaps.heart.org/AHAMAP/map/qimap.jsp>