CONDITION

Retinal artery occlusion

Retinal artery occlusion is a sudden blockage of blood flow to the retina, causing painless loss of vision.

WHAT IT IS
Blocked blood flow to the light-sensing retina

BODY SYSTEM
Eyes, heart and circulation

MAIN SYMPTOMS
Sudden vision loss, blurred vision, missing visual field

WHAT CAUSES IT
Blood clot, artery inflammation, or rarely other blockage

HOW IT IS DIAGNOSED
Dilated eye examination, retinal imaging, and circulation tests

MAIN TREATMENT
Emergency stroke assessment and cause-specific care

CAN IT BE CURED?
No - retinal damage is often permanent

IS IT AN EMERGENCY?
Yes - any sudden vision loss

LONG-TERM OUTLOOK
Vision loss may persist; future stroke risk is increased

Overview

Retinal artery occlusion happens when blood flow through an artery supplying the retina becomes blocked. The retina is the light-sensitive layer at the back of your eye. It needs a constant supply of oxygen to produce vision.

A blockage can affect the main retinal artery. This is called central retinal artery occlusion , or CRAO. It can also affect a smaller branch, causing branch retinal artery occlusion , or BRAO. CRAO often causes major loss of vision in one eye. BRAO may cause loss of only part of the visual field.

Retinal artery occlusion is sometimes described as an "eye stroke." Like a stroke in the brain, it is usually caused by interrupted blood flow and may be linked to a clot or narrowed artery elsewhere in the body. It can be a warning of an increased risk of stroke, heart attack, or

another circulation problem.

Sudden vision loss from a possible retinal artery occlusion is an emergency. Rapid assessment is important even if your sight improves, because treatment options are time-sensitive and the underlying cause needs to be found.

Symptoms

Symptoms usually begin suddenly and affect one eye. They are generally painless.

You may notice:

With a central blockage, only a small area of central vision may remain. With a branch blockage, you may lose vision above, below, or to one side while the rest remains clear.

Some people have brief episodes called amaurosis fugax , in which a curtain or shadow passes over one eye and then clears. This may be caused by a temporary interruption in blood flow. It still needs urgent assessment.

Retinal artery occlusion caused by giant cell arteritis may occur with a new headache, scalp tenderness, pain in the jaw while chewing, fever, unusual tiredness, or aching around the shoulders and hips. Giant cell arteritis is inflammation of medium and large arteries, usually in adults older than 50. It requires immediate treatment to protect the other eye and reduce other complications.

- Severe dimming or loss of vision in one eye
- A missing section of your visual field
- Blurred, grey, or shadowed vision
- Brief loss of sight before a more lasting episode

Causes and risk factors

Most retinal artery occlusions occur when material carried in the bloodstream becomes lodged in a retinal artery. This material is called an embolus . It may contain cholesterol, calcium, or a blood clot.

An embolus may come from a narrowed artery in the neck, particularly the carotid artery. It can also come from the heart, including when an irregular heart rhythm such as atrial fibrillation allows blood clots to form.

Conditions associated with retinal artery occlusion include:

Less commonly, an inflamed artery blocks blood flow. Giant cell arteritis is the most important inflammatory cause because it can quickly affect the other eye.

In younger adults or people without common circulation risks, investigations may look for less common causes. These include certain blood-clotting conditions, autoimmune conditions, inflammation of blood vessels, or heart abnormalities. Testing is guided by your age, medical history, examination, and the type of occlusion.

- High blood pressure
- High cholesterol
- Diabetes
- Smoking
- Carotid artery narrowing
- Atrial fibrillation and some heart valve conditions
- Previous stroke, transient ischaemic attack, or heart disease

Diagnosis

An eye specialist examines your pupils and the retina after using drops to widen, or dilate, the pupil. A recent occlusion can cause the retina to look pale or swollen. The blocked artery or material within it may sometimes be visible.

Optical coherence tomography , usually called OCT, takes detailed cross-sectional images of the retina. It can show swelling and damage in the retinal layers. Fluorescein angiography may be used to photograph blood flow after a fluorescent dye is injected into a vein.

The eye examination confirms the retinal circulation problem, but further tests are needed to look for its source. Because retinal artery occlusion may be linked to stroke, assessment often includes:

If giant cell arteritis is possible, urgent blood tests measure signs of inflammation. An ultrasound or biopsy of the temporal artery may help confirm the diagnosis. Treatment may begin before these results are available because delay can put the other eye at risk.

- Brain imaging and imaging of arteries in the head and neck
- An electrocardiogram to check heart rhythm
- Blood pressure, cholesterol, and diabetes testing
- Heart monitoring or an ultrasound scan of the heart when appropriate

Treatment and management

There is no treatment proven to restore vision reliably after retinal artery occlusion. Retinal cells can be damaged quickly when their oxygen supply stops, so emergency assessment should not be delayed.

A stroke team and eye specialist may assess whether a treatment that breaks down blood clots, called thrombolysis , is appropriate. Intravenous thrombolysis may be considered for selected people with central retinal artery occlusion who reach a suitable stroke centre very soon after symptoms begin, generally within the same time window used for some brain strokes. It is not suitable for everyone, carries a risk of serious bleeding, and its benefit for retinal artery occlusion remains uncertain.

Procedures once used to move the blockage, such as firm eye massage, removing fluid from the front of the eye, or medicines intended to lower eye pressure, have not shown reliable benefit. They should not delay stroke assessment.

When giant cell arteritis is suspected, corticosteroid treatment is started urgently to reduce inflammation and help protect the other eye. This treatment usually cannot restore sight already lost from severe retinal damage.

Longer-term care focuses on the cause and future circulation risk. It may include treatment for high blood pressure, high cholesterol, diabetes, atrial fibrillation, or carotid artery narrowing. Antiplatelet or anticoagulant medicines may be recommended when appropriate, but the choice is based on the cause and your bleeding risk.

Vision rehabilitation can help if sight does not recover. Low-vision services may provide magnifiers, lighting advice, electronic reading tools, mobility training, and practical support for work or daily activities.

Complications

Permanent loss of some or most vision in the affected eye is the main complication. Central retinal artery occlusion usually causes more extensive loss than a branch occlusion, although outcomes differ between people.

Loss of depth perception can make steps, driving, pouring liquids, and judging distances harder. If the other eye sees well, the brain often adapts over time, but the missing vision does not always become less noticeable.

Retinal artery occlusion is also a sign of increased circulation risk. A stroke or transient ischaemic attack may occur around the same time or later, particularly if the underlying source

is not identified and managed.

Rarely, poor retinal blood flow triggers the growth of fragile new blood vessels. These can lead to bleeding or a painful rise in pressure inside the eye called neovascular glaucoma. Eye follow-up helps detect this complication.

Prevention

Retinal artery occlusion cannot always be prevented. A clot or inflammatory episode may occur even when known risk factors are being treated.

You can reduce some of the related circulation risks by not smoking and by following the agreed care plan for blood pressure, cholesterol, diabetes, heart rhythm problems, and cardiovascular conditions. Take prescribed medicines consistently rather than starting, stopping, or changing them because of the eye condition alone.

If investigations find narrowing in a carotid artery or a clot-forming heart condition, treatment of that problem may reduce the chance of another blockage or stroke. The appropriate treatment is based on the severity and source of the problem.

There are no eye exercises, supplements, or special diets proven to prevent a retinal artery occlusion. A balanced eating pattern and regular activity can support general heart and blood vessel health, but they do not guarantee prevention.

Living with it and what to expect

Vision may improve during the first days or weeks, especially when the blockage is incomplete or affects a smaller retinal branch. Major loss from a complete central occlusion is often permanent. It is not possible to predict an individual result from symptoms alone.

The affected area of vision may become easier to work around over several months as you learn to rely more on the other eye and use scanning techniques. This adaptation does not mean the damaged retina has healed.

Many people remain independent, particularly when the other eye has useful vision. Adjustments may still be needed for reading, screens, work, stairs, hobbies, and travel. Brighter even lighting, high-contrast markings, larger text, and low-vision technology can help.

Driving rules are based on vision in both eyes, including visual-field testing. Sudden loss in one eye may affect depth perception even if you still meet the legal standard. Avoid driving until your vision has been assessed and you understand the relevant licensing requirements.

Routine follow-up may include eye examinations and care from primary care, stroke, heart, or vascular teams. These visits focus on eye complications and management of the condition that caused the blockage. New vision changes between planned appointments need urgent assessment rather than waiting for routine follow-up.

When to get medical help

Call emergency services now for sudden, painless loss or dimming of vision in one eye. Do not wait to see whether it clears, and do not drive yourself. Note the exact time you were last able to see normally because it can affect treatment decisions.

Emergency help is also needed if vision changes occur with facial weakness, arm or leg weakness, difficulty speaking, severe imbalance, confusion, or a sudden severe headache. These can be signs of a stroke.

Seek immediate same-day assessment for sudden vision loss with a new headache, scalp tenderness, jaw pain while chewing, fever, or shoulder and hip aching, especially if you are older than 50. These symptoms can suggest giant cell arteritis.

After emergency assessment, contact your eye team promptly about new pain, redness, further loss of vision, or changes in the other eye. Stable vision problems, rehabilitation needs, and risk-factor reviews can usually be discussed during planned follow-up.

Common questions

Can vision return after a retinal artery occlusion?

Some improvement is possible, particularly after a partial blockage or branch occlusion. Severe loss after central retinal artery occlusion often remains. The amount of recovery cannot be predicted reliably at the start.

Is retinal artery occlusion the same as a stroke?

It affects the retina rather than the brain, but both result from interrupted blood flow. Central retinal artery occlusion is treated as an acute ischaemic stroke of the eye and needs emergency stroke assessment.

Can it happen in both eyes?

It usually affects one eye. A second eye can be affected later, especially if an underlying cause remains untreated. Giant cell arteritis creates a particularly urgent risk to the other eye.

Does stress cause retinal artery occlusion?

Stress alone is not considered a direct cause. The blockage is usually related to a clot, cholesterol or calcium material, narrowed blood vessels, heart problems, or artery inflammation.

Can I fly after a retinal artery occlusion?

The retinal blockage itself is not usually affected by cabin pressure. However, travel should not delay emergency assessment or investigations. Other recent treatments or medical conditions may affect whether flying is suitable.

Will I need treatment for the rest of my life?

The eye blockage itself is not usually treated with lifelong eye medicine. Long-term treatment may be needed for its cause, such as high blood pressure, cholesterol, diabetes, atrial fibrillation, or another blood vessel condition.

Sources

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