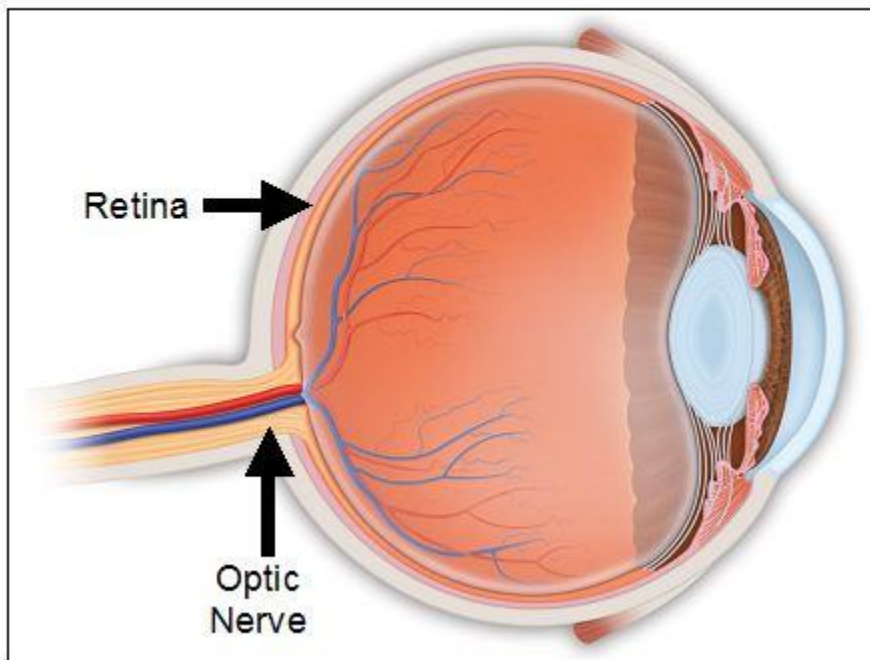


What You Should Know About Central Retinal Artery Occlusion

By David J. Browning MD, PhD

A central retinal artery occlusion is a blockage of the main artery to the retina, the lining of the back of the eye. This lining receives the light focused by the lens of the eye much as the film in a camera receives the light focused by the camera lens. The retina is nerve tissue, generating a signal in response to the light focused on it. This signal travels to the brain through the optic nerve as shown in Figure 1.

Figure 1. Anatomy of the Eye Interior



Like all nervous tissue, the retina requires large quantities of oxygen delivered by the bloodstream in order to function properly. Interruption of blood supply even for a few minutes impairs vision, and unless the blood supply is restored within 90 minutes, permanent damage to the retina with loss of part of the visual field results.

A central retinal artery occlusion is analogous to a stroke of the brain, the difference being that the function impaired is vision rather than movement

of muscles, ability to speak, or some other brain function. Central retinal artery occlusions are painless and cause sudden visual loss in one eye.

What Causes Central Retinal Artery Occlusions?

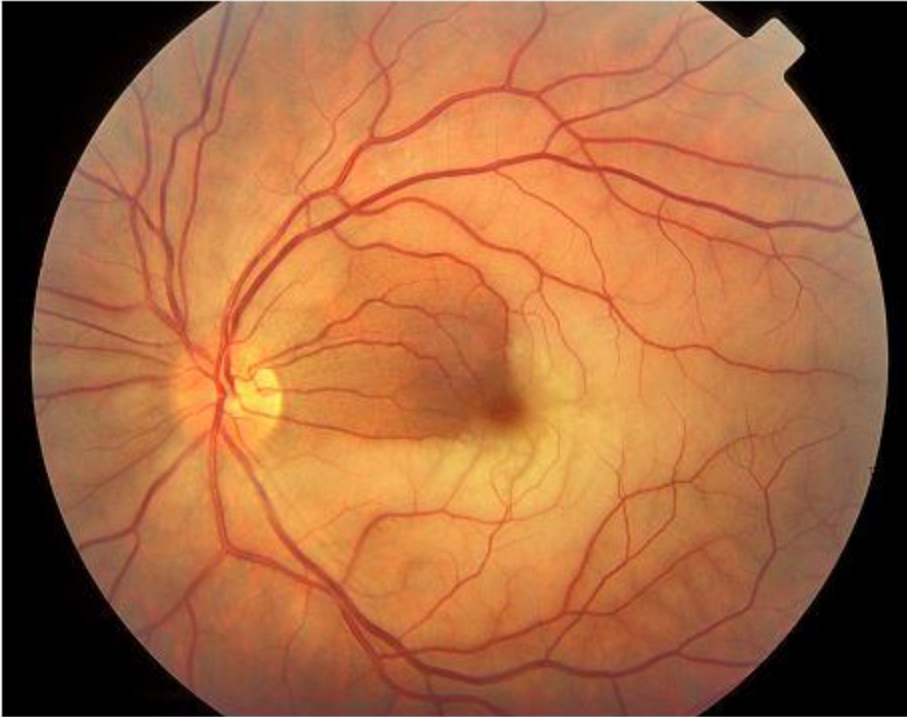
In 85% of cases, central retinal artery occlusions are caused by emboli, particles which travel in the bloodstream and lodge in a small artery, blocking its bloodflow. The most common blocking particles are pieces of cholesterol from plaques lining large arteries of the chest and neck. Less commonly the particles may be clumps of platelets, which build up on such plaques or sometimes pieces of calcium breaking off diseased heart valves. The factors that lead to cholesterol deposits in arteries or to valvular heart disease are thus the underlying risk factors for most central retinal artery occlusions.

Most patients suffering central retinal artery occlusions are over the age of 60 years. When they occur in younger patients, the cause is more likely to be a blood clotting disorder or a congenital heart abnormality. No matter the age of the patient, the heart and the carotid vessels are examined. The blood tests that are ordered will be different for young and old patients with central retinal artery occlusion. Very rarely, central retinal artery occlusions may occur as complications of various injections into the body that pass into arteries. It is also rare, but possible for central retinal artery occlusions to occur as complications of migraine headaches or other diseases with arterial spasm, or as a consequence of drug abuse with cocaine or injected substances.

How Are Central Retinal Artery Occlusions Discovered?

Typically an affected patient has sudden, painless loss of vision in one eye, which brings him to the ophthalmologist. The pupils are dilated and the occlusion can be recognized as a pale area of the retina. In 20% of cases the particle blocking the artery is visible. Figure 2 illustrates such a situation.

Figure 2. Image of Retina with Central Retinal Artery Occlusion



What Should Be Done For Central Retinal Artery Occlusions?

Patients with central retinal artery occlusion need to be evaluated for atherosclerosis (cholesterol plaques) of the major vessels of the chest and neck. A radiologist does a carotid Doppler and an ultrasound study. An echocardiogram is performed to check for calcification of heart valves or congenital heart wall defects. For younger patients and patients with reasons to be suspicious, blood testing for clotting abnormalities are done, such as a test of the level of serum homocysteine.

For patients over the age of 50, a blood test called a Westergren sedimentation rate is checked to discover an underlying condition called temporal arteritis. Older patients are quizzed regarding symptoms such as headache, fatigue of jaw muscles while chewing, weakness and pain in the thighs and shoulders, unexplained fevers, and night sweats. These can be signs of temporal arteritis and if present, may require a biopsy of the temporal artery to look further into that diagnosis. Treatment for temporal arteritis is quite different than for other causes of central retinal artery occlusion. Temporal arteritis must be treated with high doses of steroids to prevent other artery blockages.

What Is the Follow-up Care?

If the patient is examined shortly after the occlusion, the ophthalmologist may attempt to dislodge the embolus from its position blocking the artery. Ocular massage, drawing off some ocular fluid, breathing higher concentrations of oxygen, and many other interventions may be tried. However, there is no reliable evidence that any treatment is beneficial, despite what has been printed in the medical literature. Sometimes the patient is started on aspirin to reduce the chance that platelets will clump on cholesterol plaques in the walls of large arteries. Sometimes stronger blood thinners such as warfarin are prescribed if a tendency to blood clotting is determined to exist. Rarely patients may need an operation called endarterectomy to clean out large arteries in the neck.

Consultation with a vascular surgeon is required to make these decisions. If the patient has diabetes, hypertension, or high cholesterol and lipids, then these conditions need to be optimized. Smokers should quit with the help of medicines, support groups, and other aids. Patients with temporal arteritis are treated with steroids.

What is the Prognosis?

Most patients with central retinal artery occlusion do not regain useful vision. Eighty percent of patients eventually end up with visual acuity in the involved eye worse than 20/100. Unlike many tissues, dead retina does not regenerate, explaining the permanent visual deficit. Rare patients have a second blood supply to part of the retina, and these patients may fare better.

After reading about central retinal artery occlusions here, if you wish to pursue further information, an excellent site on the World Wide Web is Pubmed, a search engine for the National Library of Medicine at: <http://www.ncbi.nlm.nih.gov/entrez/query.fcgi>. If you have questions you would like to discuss, call me at 704-295-3180.

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