

What You Should Know About Anterior Ischemic Optic Neuropathy (AION)

By David J. Browning, MD, PhD

The optic nerve is the main “cable” that transmits all visual information received by the eye to the brain.

Anterior ischemic optic neuropathy (AION) is a disease where the blood vessels that supply nutrition to the optic nerve become closed off. This results in an irreversible loss of vision. Simply put, anterior ischemic optic neuropathy is a stroke that affects only the eye. There are two causes of anterior ischemic optic neuropathy: nonarteritic (NAION) and arteritic (A-AION). In the United States there are approximately 5700 cases of NAION per year. Caucasians (whites) are affected more often than people of African ancestry. Most patients (73%) notice visual loss on awakening in the morning. Certain contributing factors predispose a patient to this disease. Some of these are related to overall health. Increased age, presence of high blood pressure, presence of diabetes mellitus, bleeding peptic ulcer, high cholesterol, and smoking can increase the chance of developing this condition. Certain anatomic characteristics of the eye also increase the likelihood of NAION. The most important is an optic nerve with a small central cup, reflecting a small entrance hole for the nerve in the sclera, the tough white outer layer of the eye. This congenital factor is out of the patient’s control. Finally, certain physiologic events can predispose to NAION. A sudden loss of blood, or profound drop in blood pressure under general anesthesia for an operation, can lead to the problem. A gradual onset of anemia (lowered red blood cell count) can predispose to NAION when coupled with a smaller drop in blood pressure, for instance, the drop that commonly occurs during sleep. Sleep apnea increases the chance of NAION. Taking certain types of medications, such as beta-blockers, may blunt the body’s reflex adjustments to loss of blood and make the condition more likely. In many cases, more than one of these possible predisposing factors may pertain to explain the cause of the stroke.

Distinguishing Nonarteritic from Arteritic Ischemic Optic Neuropathy

Strokes of the optic nerve can also occur from inflammation caused by an abnormally functioning immune system. In the elderly, a condition called temporal arteritis can lead to inflammation of blood vessel walls, frequently first in arteries to the optic nerve. In these cases, certain blood tests, called erythrocyte sedimentation rate and C-reactive protein will be elevated, and often patients will complain that their jaws get tired when chewing meat, that they have weakness of the shoulders or thighs, and that they have headaches or double vision. Since the treatment for this condition, prednisone, is quite different from the treatment for NAION, your doctor will draw this blood test to rule out temporal arteritis. In non-clear cut cases, a biopsy of the temporal artery, found just below the skin in front of the ear, may be recommended to make the distinction. Arteritic ION is much less common than NAION, accounting for 6% of cases of ischemic optic neuropathy.

What can I do if I have Nonarteritic Ischemic Optic Neuropathy?

If patients smoke, they are helped to stop. Keeping blood sugar well controlled within the normal range helps patients with diabetes. Patients with uncontrolled high blood pressure are treated with medicines to gradually lower blood pressure to the normal range. Patients with sleep apnea should start continuous positive airway pressure or other treatment.

Patients on too much blood pressure medicine may need to have some medications stopped. An aspirin daily or Plavix, a different medicine for preventing platelet stickiness and blood clotting, may be recommended. There is no treatment for the nerve that has suffered the stroke. Healing occurs over one to two months and is monitored to determine the ultimate stable loss of visual field. The optic nerve looks paler after one to two months and a color picture of its final appearance maybe obtained as a new baseline for later comparison.



Figure - This photograph of the optic nerve in an acute case of nonarteritic ischemic optic neuropathy shows that the top half of the nerve has a blurred margin and some dilated capillaries.

The Risk of Developing NAION in the Fellow Eye

Although it is possible for a second stroke to occur in the same eye, it is rare (4% risk over the first 5 years), usually because the first attack causes “uncrowding” of the nerve resulting from death of some of the nerve fibers. Second eye involvement is not rare, however. Since the same factors that caused the problem in the first eye often cause the same problem in the second eye, patients are justified to be concerned. In fact, this concern is the main motivator for lifestyle changes aimed at reducing the odds of second eye involvement. Statistically, the chances of the second eye having an identical problem are 19% at five years. However, for any particular patient, successful risk factor modification can probably reduce the odds and make the patient’s prospects better.

After you read this brochure, we encourage you to browse our website, including the Questions section, where patients may share their experiences with one another. If you have a focused question for which you cannot find an answer, we welcome you to ask Dr. Browning at www.retinareference.com. Also, an excellent resource for medical literature is Pubmed, on the National Library of Medicine website, accessible at www.pubmed.com.