

## Optic Neuritis

### What is optic neuritis?

Optic neuritis is inflammation of the optic nerve [See figure 1]. As the photo demonstrates, the optic nerve becomes swollen and the blood vessels become distended. This inflammation can cause loss of vision because the optic nerve is responsible for carrying visual information from the eye to the brain to produce visual images. In chronic disease, the optic nerve may appear paler.



**Fig. 1:** Optic nerve swelling in a patient with optic neuritis.

### What are the symptoms of optic neuritis?

The first symptom of optic neuritis in a child is most commonly a rapid, often profound decrease in vision (visual acuity less than 20/400). It can occur in one eye or both eyes. Many children are unaware of the loss of vision if only one eye is affected, but involvement of both eyes is more common in children. Patients may also have headaches and pain with eye movement. There may be a decrease in color perception, brightness, and/or in the field of view (side vision). Some children have other neurologic symptoms in other parts of the body, such as weakness or numbness. Many children with optic neuritis have a history of a fever, flu-like illness, or immunizations 1-2 weeks prior to the onset of the decreased vision.

### What causes optic neuritis?

Optic neuritis is thought to be an autoimmune disorder, in which the immune system mistakenly attacks the body's own optic nerve tissue. The attack of the immune system causes inflammation, swelling and impaired function of the optic nerve. The trigger for this immune reaction may be a



viral illness, recent immunization, infection around the optic nerve, multiple sclerosis, or other neurological problems.

### **How is optic neuritis diagnosed?**

A careful history including asking about recent illness, fever, neurological symptoms, or recent immunizations is helpful. The Eye physician checks vision (which is usually markedly decreased) and evaluates optic nerve function including the pupil reactions, color vision, and peripheral vision. The Eye physician also examines the optic nerve closely for swelling and dilated blood vessels. An ultrasound of the optic nerve, called ocular coherence tomography (OCT) may further define the swelling, give clues to the diagnosis, and be used to look for improvements over time. Other tests performed may include an MRI, a spinal tap (lumbar puncture), and blood tests looking for infectious causes of inflammation. Tests for specific antibodies including myelin oligodendrocyte glycoprotein (MOG-Abs) and aquaporin 4 (AQP4-IgG or NMO-IgG) may lead to a more specific diagnosis with altered treatment.

### **What is the prognosis and treatment for optic neuritis?**

Fortunately, most children with optic neuritis recover much of their vision. This usually occurs spontaneously, and treatment may not be necessary. Recovery usually begins within a few weeks and can continue for several months. Intravenous corticosteroids may speed the recovery of vision, but probably do not improve the final visual outcome. If a specific disease is thought to cause the optic neuritis, treatment is modified. Unfortunately, a small percentage of children do not recover vision.

### **What are the differences between optic neuritis in children and adults?**

Both eyes are usually affected in children, while adults usually have only one eye affected. Children with optic neuritis usually have a history of recent illness or immunization and adults do not. Both adults and children have an increased risk of multiple sclerosis if they develop optic neuritis, but children have much less risk. The Pediatric Optic Neuritis Prospective Outcomes Study preliminary data revealed 76% of children regained 20/20 vision at 6 months, but more specific data should be forthcoming.

Lock JH, Newman NJ, Biousse V, Peragallo JH. Update on pediatric optic neuritis. *Curr Opin Ophthalmol* 2019(6): 418-425

**Updated 10/2019**