Optic Neuritis

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KEYWORDS

• Optic neuritis • Multiple sclerosis • Demyelination • Interferon
• Glatiramer acetate

The authors reserve the term optic neuritis for demyelinating optic neuropathy that is idiopathic or related to multiple sclerosis (MS). An understanding of the typical optic neuritis presentation, differential diagnosis, visual prognosis, and association with MS is essential to proper management of this common condition.

BACKGROUND

The bulk of our understanding of optic neuritis comes from the Optic Neuritis Treatment Trial (ONTT) and the follow-up Longitudinal Optic Neuritis Study (LONS). The inclusion criteria for the ONTT were acute unilateral optic neuritis in those aged 18 to 46 years, visual symptoms that began no more than 8 days before enrollment, a relative afferent papillary defect (RAPD), and visual field defect. Exclusion criteria included those with a prior history of optic neuritis, pallor in the affected eye, or macular exudates; those with painless anterior optic neuropathy (disc edema) with either retinal hemorrhage or an arcuate or altitudinal visual field defect; those with a history of glaucoma, with increased intraocular pressure, on medications known to cause optic neuropathy; and those with fellow eye optic neuritis that had been treated previously with steroids. The study enrolled 448 patients between 1988 and 1991 from 15 centers in the United States.[1] Of participants who were not diagnosed with probable or clinically definite multiple sclerosis (CDMS) at the beginning of the study, 389 were followed up for 15 years to determine the rate of and risk factors for conversion to CDMS. The data collected from these studies have been important in determining the immediate treatment, demographics, and prognosis for visual recovery and progression to CDMS.

EPIDEMIOLOGY

Demyelinating optic neuritis is the most common nonglaucomatous optic neuropathy in young people. Data collected in Olmsted county, Minnesota, show an incidence of 5.1 per 100,000 and a prevalence of 115 per 100,000.[2] The ONTT demonstrated

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Neurol Clin 28 (2010) 573–580
doi:10.1016/j.ncl.2010.03.001 **neurologic.theclinics.com**
0733-8619/10/$ – see front matter

a female to male ratio of approximately 3:1, with a mean age at onset of 32 years; 85% of subjects were white and 77% were women.[1]

SYMPTOMS

Typically, optic neuritis presents with acute unilateral vision loss progressing to nadir in hours to days. The most common visual symptoms are scotoma (45%) and blur (40%). Pain is present in approximately 92% of patients, may be constant, and is usually worse with eye movement. Pain helps distinguish optic neuritis from other optic neuropathies. In a study of patients with anterior ischemic optic neuropathy, only 5 of 41 (12%) had eye pain in sharp contrast to optic neuritis.[3] Positive visual phenomena, including fleeting colors and flashing lights, are reported in 30% of optic neuritis cases.[1]

SIGNS

Examination features of unilateral optic neuritis typically include an RAPD and may show decreased visual acuity, color perception, and abnormal visual fields. Visual acuity at ONTT entry ranged from 20/20 to no light perception. Dyschromatopsia is common, and patients often report that colors, particularly red, appear less intense in the affected eye. Similarly, light may appear dimmer in the affected eye when compared with the unaffected eye; this is easily assessed during the swinging light test. Various visual field defect patterns can be seen, the most common being diffuse, altitudinal, quadrantanopic, centrocecal, or hemianopic; in general, the nature of the visual field defect in optic neuropathies provides little information regarding the pathophysiology of the optic neuropathy.

The optic disc seems ophthalmoscopically normal acutely in two-third of cases (retrobulbar optic neuritis) and is edematous in one-third of cases (papillitis, bulbar, or anterior optic neuritis). When disc edema is present, the edema is typically mild, nonfocal, and only rarely associated with hemorrhage, retinal exudates, or vitreous cells. When severe edema or hemorrhage is present, the diagnosis of idiopathic optic neuritis is in question. These atypical features also have prognostic value (see later discussion).[1]

CLINICAL COURSE AND PROGNOSIS

Visual symptoms in most patients improve over time whether or not they receive acute steroid therapy. In the ONTT, approximately 80% of patients began improving within the first 3 weeks; if improvement does not begin within the first 5 weeks, the diagnosis of idiopathic optic neuritis should be questioned. Within the ONTT, approximately 95% of patients regained visual acuity of 20/40 or better by 12 months, regardless of treatment assignment. Although most patients note near-normal acuity over time, other optic nerve–related symptoms often remain, albeit mitigated. An RAPD, decreased intensity of light perceived in the affected eye, decreased color saturation, and difficulty with motion perception are common sequelae. Some patients experience transient recurrent blur with increased body temperature (Uhthoff phenomena). Optic atrophy is an end result of optic neuritis (or other optic neuropathy) and can be quantified and followed using optical coherence tomography (OCT).

EVALUATION AND MS CONCERNS

The evaluation of a patient with a first event of optic neuritis is important for diagnostic and prognostic reasons. The diagnosis of optic neuritis is primarily clinical, although ancillary testing may assist in eliminating other entities in the differential diagnosis.