

Title: Optic Nerve Disease Across Ages

1. Objectives:

- I. Provide an overview of optic neuropathies that present in different age groups.
- II. Review how to assess a patient with suspected optic neuropathy
- III. Describe the different characteristics of the optic neuropathies and key features to recognize
- IV. Discuss the different treatment/management for these conditions of the optic nerve

2. Optic Nerve Assessment

- I. Case History
- II. Entrance Testing
 - i. Visual Acuity
 - ii. Color Vision
 - iii. Pupil testing
- III. Ocular Health Assessment
- IV. Special testing
 - i. Threshold visual field testing
 - ii. Fluorescein angiography
 - iii. Electrodiagnostics
 - iv. Imaging Studies

3. Under 20yo

- I. Papillitis
 - i. Prevalence / Etiology
 1. Most cases are due to viral infections or post-immunization
 - ii. Characteristics
 1. Commonly associated with headache
 2. Children may not notice vision changes
 3. Vision changes are worse by days 2-3 to 2-3 weeks. Visual recovery starts soon thereafter.
 4. Majority of posterior segment findings involve only the optic nerve
 - iii. Treatment / Management
 1. Visual prognosis is good without treatment
- II. Leber's Hereditary Optic Neuropathy
 - i. Prevalence / Etiology
 1. Inherited from maternal mitochondrial DNA
 - a. All of the children of the mother will receive the trait, but only the female children are able to transmit the trait to the next generation.
 2. 9:1 (men over women)
 3. Age of onset is in an individual's teens or twenties.
 - ii. Characteristics
 1. Painless, vision loss with central scotoma are typically the first symptoms.

2. Initially present unilaterally but over a period of weeks to months becomes bilateral
3. Fundus findings include: circumpapillary telangiectasia but 1/3 will have normal ONH appearance.
4. Visual field defect – typically a central scotoma

III. Treatment / Management

- i. None at this time

4. 20yo thru 40yo

I. Optic Neuritis associated with Multiple Sclerosis (MS)

i. Prevalence

1. Young health adults
2. Female > Male
3. Incidence of MS associated with Optic Neuritis is highest in people living at higher latitudes (Northern US, Northern & Western Europe, New Zealand, and Southern Australia) and reduced significantly closer to the equator.

ii. Etiology

1. Is an inflammation of the optic nerve secondary to demyelinating Disease
2. Other systemic conditions that can cause optic neuritis in this age group are: systemic lupus erythematosus, sarcoidosis, and syphilis.
 - a. Typically observe perineuritis and/or neuroretinitis

iii. Characteristics

1. Sudden unilateral vision loss
2. Pain or discomfort with eye movement (90%)
3. Optic nerve appears normal in 2/3 of patients
4. Optic disc edema in 20-40% of patients (*does not correlate with severity of the disease process)
5. Variety of visual field defects
6. Uhthoff's sign - worsening of symptoms when the body gets overheated

iv. Treatment / Management

1. Optic Neuritis Treatment Trial
2. CHAMPS Study

5. 40yo thru 60yo

I. Non-arteritic Anterior Ischemic Optic Neuropathy (NAION)

i. Prevalence

1. Males = Females

ii. Etiology

1. Inefficient blood supply to the ONH
2. Prognosis > AION

iii. Characteristics

1. Unilateral sudden painless (pain in 10%) vision loss

2. Dyschromatopsia
 3. Altitudinal visual field defect
 4. Crowded optic nerve appears swollen with sectorial hemorrhaging
 5. Medical hx demonstrates h/o HTN, hypercholesterolemia, DM, obstructive sleep apnea, or other vascular risk factors.
- iv. Treatment / Management
1. Manage the systemic condition

6. Over 60yo

- I. Arteritic Anterior Ischemic Optic Neuropathy (AION)
- i. Prevalence
 1. Females > Males
 - ii. Etiology
 1. Due to Giant Cell Arteritis (GCA)
 2. Strong association with Polymyalgia Rheumatica
 - iii. Characteristics
 1. Severe Vision Loss
 2. Jaw Claudication
 3. Scalp Tenderness
 4. Arthralgia
 5. Headache
 6. Amaurosis fugax
 7. Fever
 8. Weight loss
 - iv. Additional information
 1. Diagnosis is made with laboratory testing: C-reactive protein / Westergren ESR.
 2. Temporal artery biopsy
 - v. Treatment / Management
 1. Systemic corticosteroids