

Glaucoma Cross-Examination

1 hour

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Course Description: Through a case-based presentation, learn to differentiate an optic neuropathy from another mimicking condition and gain insight into the clinical features and presentations more likely associated with glaucomatous vs non-glaucomatous optic neuropathy, or perhaps a combination of both.

Course Learning Outcomes:

1. Explain how to conduct an examination oriented to the detection of glaucomatous vs non-glaucomatous optic neuropathy.
2. Identify the clinical features that suggest a glaucomatous vs non-glaucomatous optic neuropathy.
3. Classify the differential diagnoses for potential optic neuropathy presentations.
4. Describe the necessary diagnostic testing for glaucomatous vs non-glaucomatous etiologies of optic neuropathy.
5. Explain the differences in management plan for glaucomatous vs non-glaucomatous optic neuropathies.
6. Discuss the possibility of overlying glaucomatous and non-glaucomatous optic neuropathies.

Course Outline:

BACKGROUND

- A. Function is determined by structure
 - a. Structure
 - i. Optic disc assessment
 - ii. OCT
 - iii. Neuroimaging
 - b. Function
 - i. Visual acuity
 - ii. Color vision
 - iii. Red desaturation
 - iv. Testing for RAPD
 - v. Visual fields
- B. Visual field review
 - a. Matching the field to the disc
 - i. Papillomacular bundle inserts temporally
 1. Cecocentral defect
 - ii. Proximal superior arcuate bundle inserts superior temporally

1. Proximal inferior arcuate defect
 2. Respects horizontal (due to raphe)
 3. May be better seen on 10-2 VF
 - iii. Distal superior arcuate bundle inserts superior temporally (more superiorly)
 1. Distal inferior arcuate defect
 2. Respects horizontal (due to raphe)
 - iv. Proximal inferior arcuate bundle inserts inferior temporally
 1. Proximal superior arcuate defect
 2. Respects horizontal (due to raphe)
 3. May be better seen on 10-2 VF
 - v. Distal inferior arcuate bundle inserts inferior temporally (more inferiorly)
 1. Distal superior arcuate defect
 2. Respects horizontal (due to raphe)
- b. Glaucoma is a disease of the arcuate bundles
- i. Types of glaucomatous VF defects
 1. Nasal step
 2. Proximal arcuate (Bjerrum) scotoma
 3. Distal arcuate scotoma
 - ii. Glaucomatous defects are mainly nasal
 - iii. Be suspicious of “glaucomatous defects” that are mainly temporal
 1. Work-up is needed to rule out other causes

C. Optic neuropathy

- a. Glaucomatous
- b. Non-glaucomatous

QUESTIONS TO ASK TO DETERMINE IF IT IS GLAUCOMA OR SOMETHING ELSE (CASE BASED)

D. Is it an Optic Neuropathy at all? (10 minutes)

- a. Use of 10-2 to try to pick up defect of proximal arcuate bundles
- b. Matching optic disc to OCT and VF
- c. Importance of OCT of not only ONH but also retina
- d. Glaucoma has a large impact on inner retinal layer thickness, but does not affect outer retinal layer thickness
- e. Axons of ganglion cells become RNFL and then NRR

E. If it is an optic neuropathy, does the VF match the optic disc and is it consistent with glaucoma? (10 minutes)

- a. Glaucomatous VF loss should never be
 - i. Only temporal
 - ii. Mainly temporal
 - iii. More temporal than nasal
 - iv. Respecting vertical meridian
 1. Any of these suggest a suprasellar lesion
 - a. Neuroimaging warranted
- b. Field defects suggesting chiasmal location
 - i. Anterior chiasm
 1. Junctional scotoma
 - ii. Middle chiasm
 1. Bitemporal denser superiorly
 - iii. Posterior chiasm

1. Central bitemporal
 2. Bitemporal denser inferiorly
 3. Non-congruous homonymous hemianopia
- c. IOP itself is not diagnostic of glaucoma
- i. Elevated IOP does not have to be the cause of the vision loss
 1. Can have both glaucoma and another optic neuropathy
 - ii. IOP can be normal
 1. NTG is a diagnosis of exclusion
- F. Does cupping mean is it glaucoma? (10 minutes)
- a. Disc appearance in glaucoma
 - i. NRR remains pink
 - ii. Cupping
 - iii. Polar notching
 - iv. Rim obliteration
 - v. Peripapillary atrophy
 - b. Disc appearance in non-glaucomatous optic neuropathy
 - i. NRR pallor
 - ii. Cupping
 - c. Causes of cupping
 - i. Glaucomatous
 - ii. Non-glaucomatous
 1. Ischemic
 2. Compressive
 3. Inflammatory
 4. Traumatic
 5. Mitochondrial
 - d. Work-up needed if NRR pallor or disc does not match VF
 - i. Lab testing
 - ii. Neuroimaging
 - iii. Carotid ultrasound (in some cases)
- G. If it is truly unilateral, is it really glaucoma? (5 minutes)
- H. Causes of optochoroidal shunt vessels
- a. Causes of optochoroidal shunt vessels
 - i. Advanced glaucoma
 - ii. RVO
 - iii. Chronic papilledema
 - iv. Congenital
 - v. Meningioma
 1. Optic nerve sheath
 2. Sphenoid wing
- I. Can it be a combination of glaucomatous and non-glaucomatous optic neuropathy? (10 minutes)
- a. Features suggesting non-glaucomatous component
 - i. Enhancement of optic nerve on neuroimaging
 - ii. Rapid worsening of VF
 - iii. Pain
 - iv. NRR pallor
 - v. Underlying inflammatory condition
 - b. Features suggesting an inflammatory glaucomatous component
 - i. Rapid worsening of VF despite maximum medical therapy

- ii. IOP elevated despite maximum medical treatment
- iii. Uveitis
- iv. Underlying inflammatory condition
- c. Management
 - i. Treat underlying inflammatory disease
 - ii. Maximum medical therapy for IOP control
 - iii. Glaucoma filtering surgery
 - 1. Possibility of temporary diplopia

Q&A / DISCUSSION