Optic atrophy is not a diagnosis

Andrew G. Lee, MD

- Professor of Ophthalmology, Neurology and Neurosurgery, Weill Cornell Medical College
- Chair, Department of Ophthalmology, Houston Methodist Hospital, Houston, TX
- Adjunct Professor, University of Iowa Hospitals & Clinics, Iowa City, Iowa, Baylor COM, UTMB, UTMDACC

Five steps: Overview

- Step 1: Make sure that it is real optic atrophy (vs. physiologic pallor)
- Step 2: Directed history and exam
- Step 3: Think common etiologies first
- Step 4: Consider imaging vs. observation
- Step 5: Direct laboratory evaluation based upon your pretest likelihood of disease (i.e. your clinical suspicion)
Visual loss in ophthalmology: Augenblick diagnosis: “Eye glance”

Optic Atrophy
Not Augenblick!
Is this nerve pale? Mild pallor? Temporal pallor? Optic atrophy?

Look for clinical signs of optic neuropathy (RAPD, visual field, fellow eye, OCT)

Always check the RAPD yourself
Our perception of color is biased by surround

Myopic fundus
Normal or pale

Determination of Pallor vs No Pallor
OCT can see better than me

Why optic atrophy is dangerous?

- 50 patient clinic day
- Patients #1-49
  - Dx: Cataract; Plan: CE/IOL OD
  - Dx: ARMD (dry); Plan: AREDS vitamins
  - Dx: NPDR; Plan: Glucose control
  - Dx: RD; Plan: SB
- Patient #50: Dx = optic atrophy
- THIS IS NOT A DIAGNOSIS!
Always do a formal visual field in unexplained optic atrophy

HM OD but what if the fellow eye (OS) had superotemporal loss

Hand motions OD
Remember to fish for the junctional scotoma in the fellow eye

- If you don’t test for it you won’t find it!
Junctional scotoma

Monocular nasal hemianopic loss OD
Junctional scotoma of Traquair
Bitemporal hemianopsia

Chiasmal compression by craniopharyngioma
Common things are common

- Is it old AION
- Is it old optic neuritis?

The alphabet soup shotgun approach

- CBC
- ESR, CRP
- ANA, ANCA
- ACE
- CXR
- FTA, RPR, Lyme titer
- LP
- CT
- MRI
Round up the usual suspects

Differential diagnosis

- DDx ≠ Not a laundry list
  - Infectious
  - Inflammatory
  - Demyelinating
  - Infiltrative
  - Hereditary
  - Toxic-nutritional
  - Compressive

- DDx ≠ Not a single diagnosis either!
- Usual suspects yes but rank order them (don’t put unusual suspect at top of list unless obvious)
Uncommon presentations of common diseases are COMMON

Dad’s rules of DDx

- If it sounds like a duck, looks like a duck, & acts like a duck then it’s a &#@! Duck
- Is it old AION?
  - Disc edema
  - Vasculopathy
  - Older patient
  - Static course
- Is it old ON?
  - Younger
  - Recovered
  - MS history
If not AION or ON then more history & exam

- Bilateral progressive central-cecocentral scotoma => B12/folate/Leber’s hereditary optic neuropathy/ethambutol toxicity
- Uveitis (old or new): Sarcoid, syphilis

If history & exam come up short then image unexplained optic atrophy

- Optic nerve
  - Intraocular
  - Intraorbital
  - Intracanalicular
  - Intracranial component
- MRI head/orbit fat suppression and gadolinium
- Optic atrophy can always be a tumor!
If scan is negative then directed labs only

- Determine pre-test likelihood of disease
- Look for footprints of disease
- Risk factors (e.g., tick bite, cat scratch, sexually transmitted disease, tuberculosis exposure)
- Distinctive signs (anterior/posterior uveitis)
- Immunosuppression (HIV, steroid use)
- Endemic populations (Lyme, syphilis, TB)

Directed evaluation vs. shotgun
The diagnostic yield of the evaluation for isolated unexplained optic atrophy

- Retrospective review of 1110 charts
- 91 (8%) with isolated unexplained optic atrophy
- 18 (20%) had a compressive lesion
- Five of 18 had progressive visual loss
- Three had hemianopic visual field loss
- Other laboratory testing did not produce an etiologic diagnosis in the absence of a suggestive history or examination

Directed labs!

- Determine pre-test likelihood of disease
- Look for footprints of disease
- Risk factors (e.g., tick bite, cat scratch, sexually transmitted disease, tuberculosis exposure)
- Distinctive signs (anterior/posterior uveitis)
- Immunosuppression (HIV, steroid use)
- Endemic populations (Lyme, syphilis, TB)
Lyme disease in USA

12 states = 95% of cases
Connecticut, Delaware, Maine, Maryland, Massachusetts
Minnesota, New Hampshire, New Jersey
New York, Pennsylvania, Rhode Island, & Wisconsin

National Lyme disease risk map with four categories of risk
When do I order Lyme titer?

- Endemic area
- Tick bite
- Erythema chronic migrans (other rashes more common)
- Uveitis with optic neuropathy
- Cardiac, joint, neurologic signs/symptoms
Tuberculosis worldwide

Estimated Rates of New Cases of Tuberculosis, 1997

- 2.5 cases/100K population
- N = 7,177 cases
- 50% US cases in 2003 were in 19 counties
- Most syphilis from less than 1% of 3,140 counties

Syphilis in USA is localized (Southeast, urban)

- 2.5 cases/100K population
- N = 7,177 cases
- 50% US cases in 2003 were in 19 counties
- Most syphilis from less than 1% of 3,140 counties
Resurgence of the old enemy

Syphilis in USA: Men vs. women
When do I order syphilis serology?

- Unexplained neuro-ophthalmic finding with negative structural imaging
- Ask about risk factors
  - Male to male sex transmission
  - Drugs
  - Prior sexually transmitted disease
  - Uveitis

Sarcoidosis

- Swedes (55/100K) & Danes = highest prevalence
- US risk: 2.4% African Americans vs. 0.85% for Whites (35/100K)
- African American 3 to 17 X risk vs. Whites
- Detroit incidence (per 100K)
  - Highest in AA females 39.1
  - AA males 29.8
  - White females 12.1
  - White males 9.6
When do I order sarcoid work up

- Unexplained optic atrophy in younger patient (i.e., can’t blame it on NAION)
- Prior history or exam evidence of uveitis
- Medical history suggestive of sarcoid
- Steroid responsive or steroid dependent course
Pretest likelihood of disease = clinical suspicion

Be a doctor first, ophthalmologist second
When to order an ANA or ANCA?

- If there is PRETEST likelihood for Systemic lupus erythematosus (SLE) or Wegener’s granulomatosis or other collagen vascular disease
- 14 ACR Criteria for SLE
- A positive ANA with nothing else is NOT SLE
- If you send this patient to rheumatology they will come back with no diagnosis

When do I order B12/folate?

- Central or cecocentral scotoma OU
- I don’t order for unilateral optic atrophy
- History of nutritional deficiency risk factor (gastric surgery, ETOH)
- Consider Leber testing as well
Cecocentral or central scotoma

I only have one glass of alcohol per day
Round up the usual suspects but.....

Compressive
Ischemic
Demyelinating
Infectious
Inflammatory
Toxic-nutritional

Five steps: Summary

- Step 1: Make sure that it is real optic atrophy (vs. physiologic pallor)
- Step 2: Directed history and exam
- Step 3: Think common etiologies first
- Step 4: Consider imaging vs. observation
- Step 5: Direct laboratory evaluation based upon your pretest likelihood of disease (i.e. your clinical suspicion)
Thanks for your time and attention