Neurological and Systemic Disease Presenting in Primary Care Optometry

Jacqueline Theis, OD, FAAO
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Washington DC

Background

• Training
  - BS Biochemistry – Bucknell University
  - OD – UC Berkeley School of Optometry
  - Residency – Binocular Vision, Neuro-Optometry, Vision Therapy – UC Berkeley School of Optometry

• Current
  - Director, Clinic Chief – UC Berkeley Sports Vision Clinic
  - Clinical Care and Research for Vision Problems in Concussion
  - Clinical Instructor – UC Berkeley School of Optometry
  - Clinical Research Funding – UC Regents, NIH SBIR
  - Neuro-Optometrist – Kaiser Permanente

Financial Disclosures

• C. Light Technologies
• Clinical Research Consultant

Outline

• Diplopia
  - Taking a History
  - What to Examine
  - Cases

• Atypical Vision Complaints
  - Taking a History
  - What to Examine
  - Cases

Why does diplopia scare us?

• Etiology/Vast Differential Diagnosis
  - Benign vs. Life Threatening
  - Rare vs. Common

• Time for a full workup
  - It’s not a 20 minute complaint!

• Multidisciplinary
  - Eyes
  - Brain
  - Systemic

Five to Fear*

1. Pupil-involving CN III Palsy (Large, unreactive pupil)
   - Dx: Aneurysm
   - DDx: Hypertension, Diabetes

Pupil-Involving CN III Palsy

“Rule of the Pupil”

• Complete CN III
  - Pupil-Sparing → likely ischemic
  - Pupil-Involving → likely Compressive

• Incomplete CN III
  - Pupil-Sparing → ???
  - Pupil-Involving → Compressive

Compressive lesions:
  - Most common – aneurysm
  - Less common – tumor, trauma, congenital, uncal herniation, cavernous sinus mass, pituitary apoplexy, orbital disease, varicella zoster virus, ischemia, leukemia

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2. Multiple Problems with Lid, Pupil, Ocular Motility
   - Dx: Horner Syndrome (ptosis, miosis),
     CNIII (ptosis, mydriasis), inflammatory disease

3. Multiple CN Palsies
   - Dx: Intracranial tumors, meningitis, polyneuropathy, cavernous sinus lesion

Carotid Dissection

Intimal wall disruption → invasion of blood → intramural hematoma

Multiple CN Palsies

**Five to Fear**

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3. Multiple CN Palsies
   - Dx: Intracranial tumors, meningitis, polyneuropathy, cavernous sinus lesion
4. Weakness/Fatigue
   - Dx: Myasthenia Gravis *Pupil sparing

**Ocular Manifestations**

- Ptosis
  - variable, worse with fatigue
- Diplopia/EOM involvement/
  Ophthalmoplegia
  - variable, worse with fatigue
- Orbicularis weakness
- Normal pupils
- Cogan's Lid Twitch

*Difficulty swallowing or breathing (Myasthenic Crisis)*


**Giant Cell Arteritis**

- Most common systemic vasculitis affecting adults >50yo
  - Rare in people <50yo
  - Average age of onset is 74-76yo
  - For each decade after 50, incidence increases from
    - 2.0 (50-60yo)
    - 11.8 (61-70yo)
    - 31.3 (71-80yo) per 100,000 persons/year
  - Women affected 2-3x more than men
  - More common in whites, Nordic/Northern European ancestry, and other northern latitudes

*Systemic Symptoms*

- Jaw Claudication (48%)
- Neck Pain (17%)
- Headache (57%)
- Scalp Tenderness (20%)
- Weight Loss (40%)
- Anorexia (31%)
- Myalgia (28%)
- Malaise (37%)
- *MAY BE ABSENT (20%)

*Testing*

- Lab Work
  - ESR
  - CRP
  - CBC with Differential
  - Fluorescein Angiography
  - Temporal Artery Biopsy


**Notes and References**

[Image links and citations provided for additional context and information.]
### Five to Fear

1. Pupil-involving CN III Palsy (Large, unreactive pupil)
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   - Dx: Intracranial tumors, meningitis, polyneuropathy, cavernous sinus lesion
4. Weakness/Fatigue
   - Dx: Myasthenia Gravis *Pupil sparing
5. New Onset Headache, Scalp Tenderness, Jaw Claudication
   - Dx: Giant Cell Arteritis

### Taking a History

**CC: Diplopia**

- Monocular or Binocular?
- Horizontal, Diagonal, Vertical?
- Gaze Dependent? – Left vs. Right, Up vs. Down, Distance vs. Near?
- Onset – When did it start? Sudden or Gradual? What were you doing?
- Frequency – Is it getting better, worse or staying the same since it started?
- Duration – How long does it last? Intermittent or Constant? Last seconds, minutes, hours, days?
- Timing – Is it worse at the beginning or end of the day?
- What makes it better?
- First time or happened before? – Childhood strabismus, previous surgery (strab/Lasik)

### Monocular vs. Binocular

**Monocular**

- Refractive
- Ocular Media
  - Tear film – Dry eye
  - Cornea – irregular, keratoconus, LASIK, scars
  - Iris – LPI, damage
  - Lens – cataract, IOL decenteration
  - Retina – ERM, CNVM, macular disease
- Cerebral cortical dysfunction

**Binocular**

- Orbital Disorder
  - Orbital Disease/Displacement (TTTI)
  - Trauma, Tumor, Thyroid, Infection
  - EOM Restriction – Thyroid, Tumor, EOM entrapment, EOM iatrogenic injury
  - EOM Weakness – Myopathy/Dystrophy
- Neurological Disorder
  - Neuromuscular Junction Dysfunction – MG, botulism
  - CN Palsy – III, IV, VI
  - Brain stem injury
  - Supranuclear injury

### Taking a History

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### What is a “Decompensating” Phoria?

- Phoria – Relative misalignment of eyes when binocular fusion is disrupted
  - Alternating Cover Test
- Tropia – Strabismus, manifest misalignment of eyes relative to one another
  - Unilateral Cover Test
- “Decompensating” – what you use to compensate for your ocular posture (ie vergences) is not working!
  - Frequency of deviation increases
  - Magnitude stays the same!
  - Diagnosis of Exclusion!
Taking a History Cont’d

Other History of Present Illness (HPI) to Ask!
• Pain
• Vision Changes (CNII)
• Headaches
• Tingling – limbs, fingers, toes
• Numbness/weakness – facial (CNV/VII), extremities
• Nausea/vomiting
• Imbalance/vertigo
• Photophobia
• Hearing loss
• Jaw classification, neck stiffness, temporal artery pain
• Recent Weight Loss/Gain
• Recent Fever
• Hx of Trauma, Vasculopath (HTN, DM, HyperChol), Cancer

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Examination

• Visual Acuity
• Pinhole
  - Auto-refraction if not 20/20

Exam

Cover Test - Size Matters

Distance Cover Test Target
- Isolated Supra-threshold Target
(2-3 lines above Threshold)

Examination

Ocular Posture
• Primary Gaze
  - Distance Cover Test
  - OD Fixating
  - OS Fixating
  - Right Tilt
  - Left Tilt
  - Near Cover Test
• Eccentric Gazes

Duane White Classification

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<tr>
<th></th>
<th>DCT=NCT</th>
<th>NCT&gt;DCT</th>
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<tr>
<td>Convergence Excess</td>
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Cover Test/Ocular Motility

Clinical H
- Restriction - ductions
- Endgaze nystagmus
- Stability of gaze

Cover Test/Maddox Rod in 9 fields of Gaze
- Distance – patient moves head
- Near – patient moves their eyes
Comitancy

- Comitant Strabismus – nonparalytic, deviation remains similar in different gazes and relative to each eye
- Clinical Tests of Comitancy
  - Primary vs. Secondary Angle
  - CT in 9 Fields of Gaze
- Incomitant Strabismus – Difference in deviation >5pd
  - Anomalous head posture is not a clinical diagnostic test of comitancy

Comitancy

- 4L Hyper / 4Eso
- 5L Hyper / 6Eso
- 8L Hyper / 8Eso
- 10L Hyper

Comitancy Following Diplopia

- Day 1 – Incomitant ET worse in Right Gaze
- Differential Diagnosis – Right LR or Left MR
- Diagnosis – Right LR / Right CNVI Palsy

When to Image a CN Palsy?

- Multiple CN Palsies
- Age <50yo
- No vasculopathic risk factors
- Absence of improvement in 3months for isolated palsy.
- Its atypical

Examination: Eye Movements

- Fixation: +/- Nystagmus
- Pursuits
- Saccades
- Versions
- Ductions

Examination

Afferent Visual Pathway
- Visual Acuity
- Color Vision
  - Ishihara/AOHRR
  - Red Cup Test
- Visual Field
  - Confrontation
  - FDT/HVF
  - Amsler
- Pupils
  - Size in Dark/Light
  - Direct/Indirect Response
  - +/−RAPD
  - Accommodative Response


Visual Fields – The Afferent Visual Pathway

Examination

Orbital Testing
- Eyelid Measurements
  - Palpebral Aperture ~9-12mm
  - MRD1~4.5mm
  - MRD2
  - Prolonged upgaze
- Exophthalmometry
  - Basal, mm OD, mm OS
  - >2mm difference of >21mm abnormal

Pupils

PHYSIOLOGICAL
<1mm Difference Light=Dark

Greater Difference in Lit Room
Greater Difference in Dark Room
Abnormal Pupil
Abnormal Pupil

- Traumatic
- Horner Syndrome
- Ailla’s Pupil
- CN III Palsy
- Pharmacologic

Ritter J, Stark C. With Eye Manual: Office and Emergency Room Diagnosis and Treatment of Eye Disease. Lippincott Williams & Wilkins. 27 ed.

Examination

Other Cranial Nerve Testing
- CN1 – Olfactory Nerve
- CN2 – Optic Nerve
- CN3 – Oculomotor Nerve
- CN4 – Trochlear
- CN5 – Trigeminal
- CN6 – Abducens
- CN7 – Facial Nerve
- CN8 – Acoustic Nerve
- CN9 – Glossopharyngeal Nerve
- CN10 – Vagus Nerve
- CN11 – Accessory Nerve
- CN12 – Hypoglossal Nerve

Other Cranial Nerve Testing

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- CN11 – Accessory Nerve
- CN12 – Hypoglossal Nerve
Pearl #1 – Divergence Insufficiency is not Normal

Case 1 – CC: Diplopia

- 27yo Caucasian male
  - POHx: LASIK 2-3 years ago
  - PMHx: Normal
- HPI
  - Binocular
  - Horizontal
  - At distance= near
  - Started 10 days ago
  - Was intermittent but becoming more constant
  - Mild tingling in his feet

Running DDx
- Refractive
- Decompensating Phoria

Ocular Posture
- Distance CT: 14 Alternating ET (OD=OS Fixating)
- Near CT: SEP
- DW: Divergence Insufficiency Type
- Inconstant in nine fields of gaze

Ocular Motility
- Endgaze nystagmus in left>right gaze
- Mild abduction deficit OS
- Unable to maintain levoversion (OS drifts inward)

Divergence Insufficiency Esodeviations
- Must be differentiated from Divergence Paralysis
- When sudden onset, Differential Diagnosis includes:
  - Pontine tumors
  - Neurologic trauma
  - Elevated Intracranial pressure

Management – Lab Work/ Imaging
- ESR
- CRP
- CBC
- HBA1C
- Lipid Panel
- RPR
- FTA-ABS
- Lyme
- Myasthenia Panel
- Thyroid Panel
- MRI with Gadolinium of Brain/Organs

Case 1 - Continued

Afferent Visual Pathway:
- Visual Acuity: 20/20 OD/OS
- Pupils: PERRL(-) APD
- VFs (Confrontation/FDT) Normal
- Color Vision
  - Ishihara – Normal OD/OS
  - Red Cap – Mild Desaturation OS

Ocular Health
- Normal Ant/Post Segment
- Proptosis OS-OD by 1mm
- Exophthalmometry
  - 19.5mm OD
  - 20.5mm OS
  - Base 108

Case 1 - DDx

Differential Diagnosis
- Mass
- MS
- Posterior process
- Inflammatory
- Autoimmune
- Infectious

Management – Lab Work/ Imaging
- ESR
- CRP
- CEB
- CIC
- HBA1C
- Lipid Panel
- RPR
- PTA-ABS
- Lyme
- Myasthenia Panel
- Thyroid Panel
- MRI with Gadolinium of Brain/Organs
**MS**

- Inflammatory, demyelinating, neurodegeneration of CNS
- Peak Onset
  - 20-40yo
  - Women: Men 2:1
- Most common clinical signs and symptoms
  - Numbness/weakness of limbs (30%)
  - Partial/complete visual loss – optic neuritis (15%)
  - Acute/subacute motor dysfunction of the limbs (13%)
  - Diplopia (7%)
  - Gait Dysfunction (3%)

**Eye Movement Abnormalities in MS**

- Oscillopsia/Nystagmus
- Impaired smooth pursuits
- Diplopia/Ocular misalignment
  - Internuclear ophthalmoplegia (MLF Lesion)
  - Skew Deviation (Brainstem lesion)
  - CN III/IV/VI palsy – nuclear origin
- Gaze Paroxia (Ponstine lesion)
- Other Visual problems in MS
  - Optic neuritis
  - Chronic optic neuropathy
  - Post-chiasmal visual field defects
  - Visual perceptual abnormalities
  - Uveitis

**Pearl #2 - Vertical Deviations are Rarely Normal**

**Case 2 – CC: Diplopia**

- 65yo Caucasian Female
- CC: Diplopia
  - Binocular
  - Diagonal
  - Intermittent
  - At Distance>Near
- Started 2 years ago, but getting more frequent
- Goes away when reads for ~30 minutes
- POHs
  - Left Upper Lid Ptosis Dx 2010

**Case 2 – Previous Exam Findings**

**OS Prox OS Vertical Diplopia**

- **2010**
  - Ortho in primary gaze
  - Mild GPC
  - Hemil Base 92, 14mm OD, 18mm OS
  - PAS 10mm OD, 8mm OS
- **2013**
  - PAS 11mm OD, 9mm OS
  - CT 0.5-1LHypo
  - Accepts 1.5BU OS
- **2014**
  - CT 0.5-1LHypo
  - Accepts 2.0BU OS
Case 2 – Examination

- **Cover Test**
  - Distance: Left hypotropia
  - OD=OS Fixating
  - Near 5L Hypo (T) with 2XP
- **Ocular Motility**
  - Mild abduction restriction OS
- **Vertical Vergences from fusion point (4BU over OS)**
  - BU 4/0
  - BD 3/1
- **OS Ptosis**
  - PAS: 12mm OD, 10 mm OS
- **OS Proptosis**
  - Base 92 – 14mm OD, 21mm OS
- **Mild retropropion of globe with pressure OS>OD**
- **Ocular Health – Normal**

Orbital Tumors

<table>
<thead>
<tr>
<th>Symptoms</th>
<th>Signs</th>
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<tbody>
<tr>
<td>Persistent/progressive swelling of outer third of eyelid</td>
<td>Chronic eyelid swelling</td>
</tr>
<tr>
<td>Pain</td>
<td>+/- Proposis</td>
</tr>
<tr>
<td>Double vision</td>
<td>+/- Globe displacement</td>
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<td></td>
<td>Extraocular motility restrictions</td>
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<tr>
<td></td>
<td>Palpable Mass</td>
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</tbody>
</table>

Orbital Tumor

- **Etiology/Differential Diagnosis**
  - Sarcoidosis
  - Orbital Inflammatory Pseudotumor
  - Infectious
  - Benign mixed epithelial tumor
  - Dermoid cyst
  - Lymphoid Tumor
  - Adenoid Cystic Carcinoma
  - Malignant mixed epithelial tumor
  - Lacrimal gland cyst

Pearl #3: Complicated Complaints – Focus on one thing at a time

Case 3 – CC: Triplopia

**CC: Triplopia**
- Both Monocular and Binocular
- Diagonal but changes constantly
- Constant
- Started for past few months
- Emergency craniotomy for removal of an epidermoid cyst in the 4th ventricle that extended into the foramen magnum and caused obstructive hydrocephalus
Case 3 - Examination

- VA: 20/20 OD/OS
  - Images move a lot when cover an eye
- Distance/Near Cover Test – Primary Gaze
  - OD Fixating 6-8L Hypotropia, 3 Esotropia
  - OS Fixating 4R Hypertropia, 3 Esotropia
- 10R Hyper/4 Exo Ortho 8 Exo
- 10R Hyper/4 Exo Ortho 8 Exo, variable Hyper
- 10R Hyper/4 Exo Ortho 8 Exp, variable Hyper

<table>
<thead>
<tr>
<th>Fixation: Intermittent, variable vertical nystagmus</th>
</tr>
</thead>
<tbody>
<tr>
<td>• At distance – appears downbeat (fine, amplitude, high frequency)</td>
</tr>
<tr>
<td>• At near – nystagmus varies with up vs. down beat</td>
</tr>
<tr>
<td>(+) Additional latent component</td>
</tr>
</tbody>
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Case 3 – Examination

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Case 3 - Skew Deviation

- Vertical misalignment
- Ocular Tilt
- (+) Neurological signs/symptoms
- Supranuclear disorder
- Common Etiology – ischemia of posterior paramedian pons, medial thalamus, or cerebellum
- Less Common Etiology – Demyelinating lesion, mass, infection, hemorrhage, or intracranial hypertension

Image from:  [http://schorlab.berkeley.edu/passpro/oculomotor/assets/images/Fig13-8.gif](http://schorlab.berkeley.edu/passpro/oculomotor/assets/images/Fig13-8.gif) with permission

Case 3

- Semicircular Canals and Eye Movements
- Upright-Supine Test
  - Vertical Deviation that decreases by >50% from upright to supine position suggests skew deviation

Image from:  [http://schorlab.berkeley.edu/passpro/oculomotor/assets/images/Fig13-8.gif](http://schorlab.berkeley.edu/passpro/oculomotor/assets/images/Fig13-8.gif) with permission

Pearl #4: Document, Document, Document!

Case 4 – CC: Diplopia

- Present to OD
- Diplopia x 2 days, when laying on left side
- Sent by PCP (seen upstairs same day)
- ENT 2 days prior
  - Sudden loss of hearing on right side
- Mild to moderate loss on left side
- Classified as: bilateral mixed loss
- PCP
  - Diagnosed - hypoglycemia/FEPV?
  - DM2 - noncompliant with metformin (stopped meds 3 months ago)
  - HTN 153/86
### Case 4 - Examination

#### Initial Exam
- **BCVA**
  - 20/20 – OD
  - 20/25+2 OS (with refraction)
- **Ocular Motility**
  - No diplopia in primary gaze or eccentric gaze
- **Cover Test**
  - Distance: Ortho
  - Near: 4X
- **Pupils, VFs**: Normal OU

#### Lab Work
- **Gluc**: 303 (Normal 85-126 mg/dL)
- **HbA1C**: 12.2% (Normal 4.6-6.0%)
- **Chol**: 405 (Normal <239mg/dL)

#### PCP/Neurology
- **Imaging**
  - Duplex Ultrasound
  - MRI Brain
- **3 days later**
  - MRI Brain
  - NEW acute right middle cerebellar peduncle infarct

#### Case 4 – 4 weeks later
- **CC**: Intermittent vertical diplopia in left gaze, getting better
- **BCVA**
  - 20/20 – OD
  - 20/25-1 OS (with pinhole)
- **Ocular Motility**: full
- **Cover Test**
  - Distance: Ortho
  - Right tilt=left tilt = reclined
  - Near: 6EP
- **Pupils, VFs**: Normal OU

### Pearl #5: Follow up is encouraged!

### Case 5 – CC: Diplopia

<table>
<thead>
<tr>
<th>My 34yo Caucasian Male</th>
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<tbody>
<tr>
<td>CC: Binocular Diplopia</td>
</tr>
<tr>
<td>Horizontal</td>
</tr>
<tr>
<td>Intermittent</td>
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<tr>
<td>Started 1 week ago</td>
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<tr>
<td>Initially presented to the ER</td>
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<tr>
<td>Normal MRI</td>
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<tr>
<td>Referred to OPT</td>
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<tr>
<td>Other Symptoms</td>
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<tr>
<td>- Headache</td>
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<tr>
<td>- Nausea</td>
</tr>
<tr>
<td>- History of diplopia development</td>
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<tr>
<td>- Migraine 2-3 severe side injection 1 week ago</td>
</tr>
<tr>
<td><strong>POH</strong>: High accommodation</td>
</tr>
<tr>
<td><strong>PMHs</strong>: Diplopia, Schizophrenia Disorder</td>
</tr>
<tr>
<td><strong>Meds</strong>: Serotopil, Haloperidol, Lamotrig, Cogentin</td>
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<tr>
<td><strong>BCVA 20/20 OD/OS</strong></td>
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<tr>
<td><strong>Refraction</strong>:</td>
</tr>
<tr>
<td>- OD: -3.75+2.00x027</td>
</tr>
<tr>
<td>- OS: -5.00+3.50x155</td>
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<tr>
<td><strong>Fixation</strong>: Steady (no) Nystagmus</td>
</tr>
<tr>
<td><strong>CT</strong>: Primary Gaze</td>
</tr>
<tr>
<td>- Distance: 2-4XP</td>
</tr>
<tr>
<td>- Near: 10XT OD Fixating</td>
</tr>
<tr>
<td>- 6XT OS Fixating</td>
</tr>
<tr>
<td><strong>Vergences – Distance</strong></td>
</tr>
<tr>
<td>- BE x/10/8</td>
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<tr>
<td>- BO: x/2/0</td>
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<tr>
<td><strong>12XT(1) 8XT(1) Ortho</strong></td>
</tr>
<tr>
<td><strong>10XT(1) 6XT(1) Ortho</strong></td>
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<tr>
<td><strong>3mm OD, 3.5mm OS</strong></td>
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<tr>
<td><strong>4mm OD, 7mm OS</strong></td>
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<tr>
<td><strong>Negative APD</strong></td>
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<tr>
<td><strong>Mild Ptosis OD</strong></td>
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<tr>
<td><strong>Mild Hyper R/O Hyper in dextroversion/dextroversion</strong></td>
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<tr>
<td><strong>VF</strong>: FTFC</td>
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<tr>
<td><strong>Pupils</strong>: Anisocoria OS=OD</td>
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<tr>
<td>- Light: 3mm OD, 3.5mm OS</td>
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<tr>
<td>- Dark: 6mm OD, 7mm OS</td>
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<tr>
<td><strong>Meds</strong>: Seroquel, Haldol, Lamictal, Depakote, Cogentin</td>
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<tr>
<td><strong>3mm OD, 3.5mm OS</strong></td>
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</table>

|Mild Hyper R/O Hyper in dextroversion/dextroversion* |
Case 5

- DDx:
  - Inflammatory
  - Mild papill-sparing Right CNIII Palsy
  - Mild Left CNVI Palsy
  - Ophthalmoplegic Migraine
- Mx: Rx 4fl prism

Case 5 – 3 Month FU

Initial Visit
- CT: Primary Gaze
- Distance: 2-4XP
- Near: 10XT OD Fixating
- 6XT OS Fixating

3 Month Follow Up
- CT: Primary Gaze
- Distance: 6XP
- Near: 8-10XP OD=OS Fixating

8 Follow Up Visits

Follow Up

- 8 visits later
  - CC: Newest Rx – has vertical diplopia intermittently and intermittent blurry vision throughout the day
  - Occurs once a day
  - Can fuse again after 15-20 min
  - Dry Eye?

- And he’s Back
  - Forgot eyedrops in the am, discontinued all caffeine for past 3 days
  - For the FIRST time, he has double vision occurring at the exam!!
  - CT:
    - Distance: 4XP
  - Near: 6XP
  - SLE

Meds

- Cogentin: Blurred vision, visual hallucinations, rare report of nystagmus <0.1%
- Haldol: Ocular “blurred vision”, neurologic-headache, vertigo
- Seroquel: blurred vision
- Lamictal: nystagmus 2-5%, visual disturbance 2-5%
- Depakote: Ophthalmic: diplopia >1-16%, visual disturbance: blurred vision 1-12%, nystagmus 1-8%, dry eye 1-5%

Pearl #6 – Amblyopia is a Diagnosis of Exclusion
To have Amblyopia… You need an Amblyogenic Factor!!

- Amblyopia is a diagnosis of EXCLUSION
- Amblyopia – functional vision loss
  - Refractive
  - Strabismic
  - Occlusion

Case 6 – CC: Blurred vision OS

- 36yo Caucasian female
- POHx: CL
- PMHx: Normal
- HPI
  - OS>OD
  - At distance and near
  - Noted for past 3 years
  - Headaches 3x/wk in frontal lobe, increasing in intensity/frequency over past few months

Case 6: Exam

- Entering Acuity cCL
  - OD: -1.75DS  20/20
  - OS: -2.50DS  20/40
  - Pinhole: No improvement
- BCVA: 20/20 OD, 20/40 OS
  - ?Amblyopia

DISC Photos

MRA
Arteriovenous Malformations (AVM)

- Complex vascular lesion
- "tangle" of abnormal vessels due to lack of capillary vessels
- Blood shunts directly from arteries to veins
- Often present with headache
- Prevalence 0.1% of population
- Occipital AVM
- Risk factor for headaches
- Concurrent visual symptoms – field cuts, blurring, scintillations, and/or diplopia

Pearl #7 – Trust your clinical intuition!

Case 7 – CC: Light Sensitivity OD>>OS

- CC: Photophobia OD>>OS
- OD aches when she rubs it
- Mild itch
- Constant tearing OD
- Od aches when she rubs it
- Onset same as light sensitivity
- Started 3 months ago, been getting worse
- Denies pain unless she pushes on it
- OD & Ptosis OS
- Color Vision (AOHRR, Red Cap: Normal)

Case 7 - Lab Work

- Mx
  - HVF 30-2
  - Lab Work – Thyroid
    - TSH <0.01 (0.10-5.50U/mL)
    - T4 4.0(H) (0.8-1.7ng/dL)
    - T3, Total 430 (H) (50-170ng/dL)

- Dx
  - Graves Disease

Case 7 – Examination

- BCVA 20/20 OU
- CT Ortho at D/N
- Ocular Motility: Full
- Color Vision (AOHRR, Red Cap: Normal)
- Eyelids – mild Retraction OD/Ptosis OS
- MRD2 2mm OD, 2mm OS
- MRD1 4mm OD, 2mm OS
- Ocular Health
  - RK scan OU – Absence of Nafl staining
  - Normal DFE/Posterior Segment

References