

SWOLLEN OPTIC NERVES: NOW WHAT?

Nate Lighthizer, O.D.

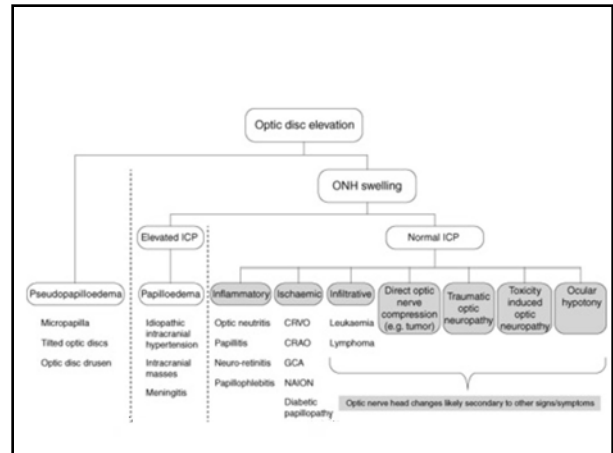
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- ## Disclosures
- ▣ Aerie Pharmaceuticals
 - ▣ Biotissue
 - ▣ Diopsys
 - ▣ Ellex
 - ▣ EyePromise
 - ▣ Ivantis
 - ▣ Lumenis
 - ▣ Maculogix
 - ▣ Nidek
 - ▣ Nova Ocular
 - ▣ Novartis
 - ▣ Optovue
 - ▣ Quantel
 - ▣ Reichert
 - ▣ RevolutionEHR
 - ▣ Sight Sciences
 - ▣ Shire
 - ▣ Sun Pharma

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- ## Expected Learning Objectives
- ▣ To enable the ON to increase their comfort level in managing swollen optic nerves
 - ▣ At end of session, attendees should be able to:
 - To become familiar with the key signs to help differentiate pseudoswelling of the ONH with true swelling of the ONH.
 - To become more familiar and update the signs, symptoms, differential diagnosis and treatment for optic neuritis and MS.
 - To become more familiar and update the signs, symptoms, differential diagnosis and treatment for non-arteritic anterior ischemic optic neuropathy
 - To become more familiar and update the signs, symptoms, differential diagnosis and treatment for arteritic ischemic optic neuropathy
 - To become more familiar and update the signs, symptoms, differential diagnosis and treatment for papilledema/ pseudotumor cerebri.
 - To become more familiar and update the signs, symptoms, differential diagnosis and treatment for neuroretinitis.

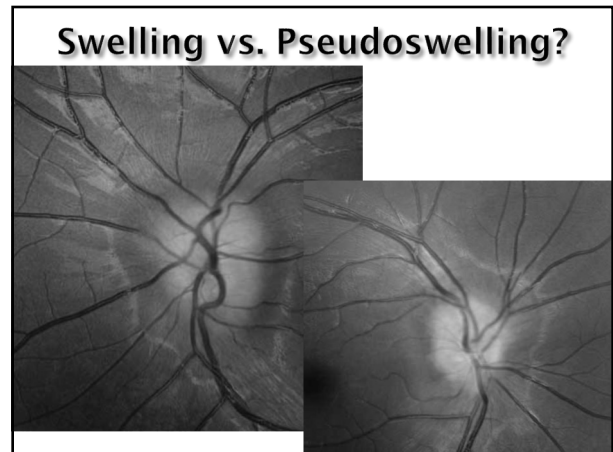
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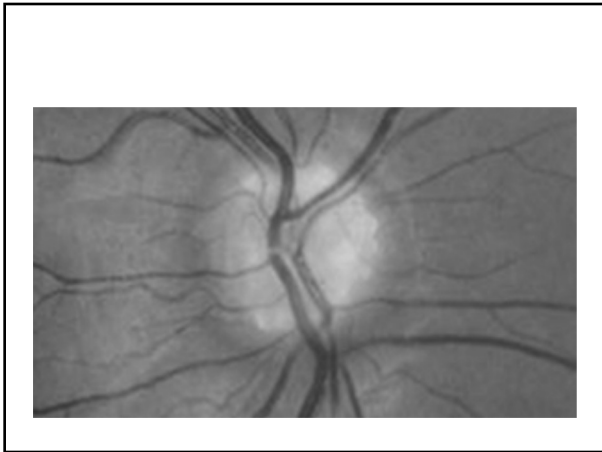
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- ## SWELLING VS. PSEUDOSWELLING
- ▣ Ways to differentiate:
 1. Direct viewing of the ONH
 - ▣ Are the vessels blurred as they cross the disc margin?
 - ▣ Is there SVP?

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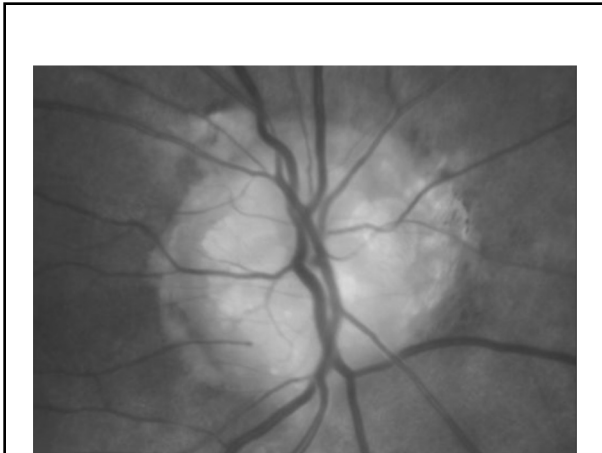
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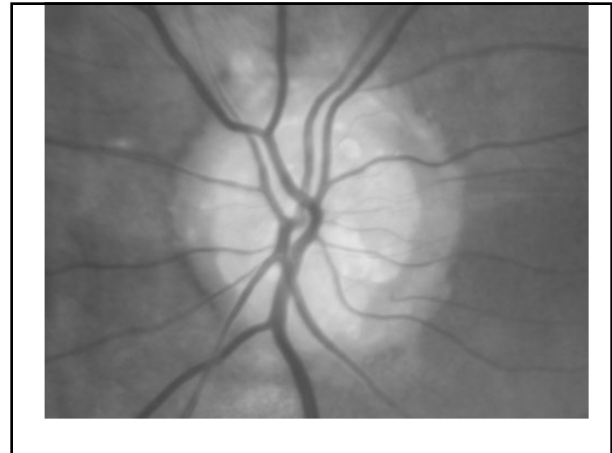
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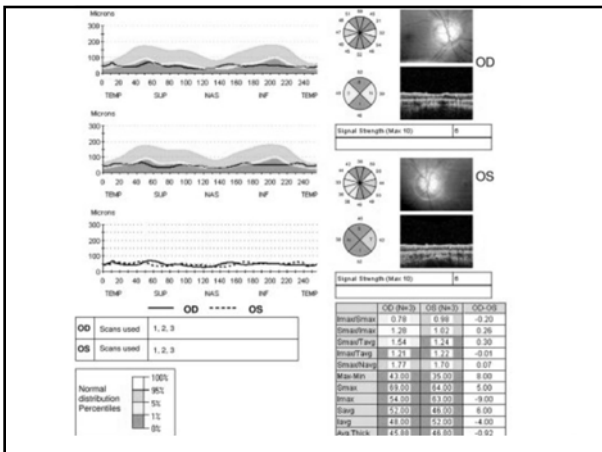
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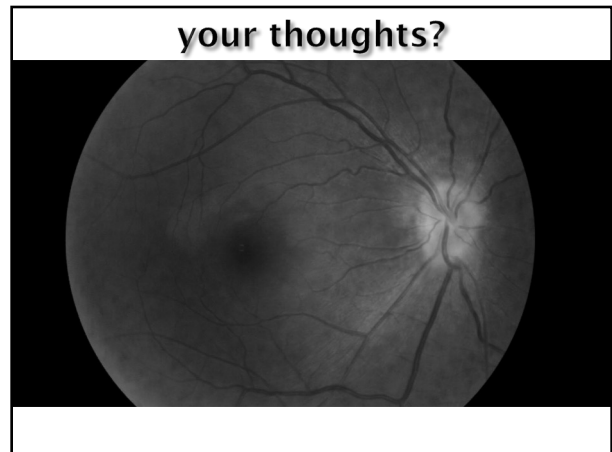
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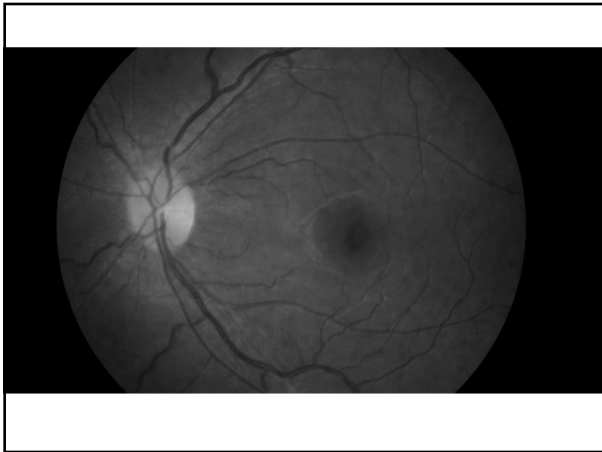
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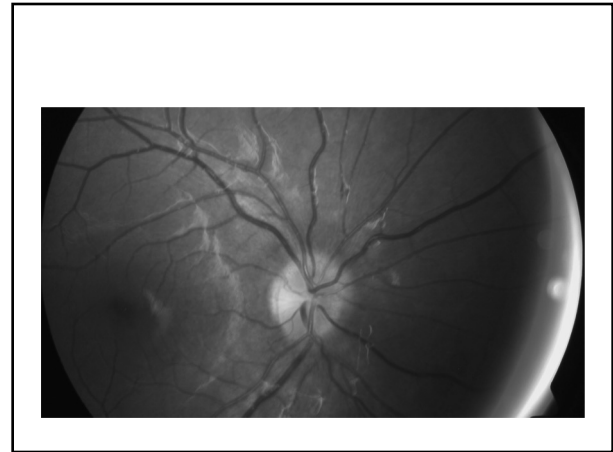
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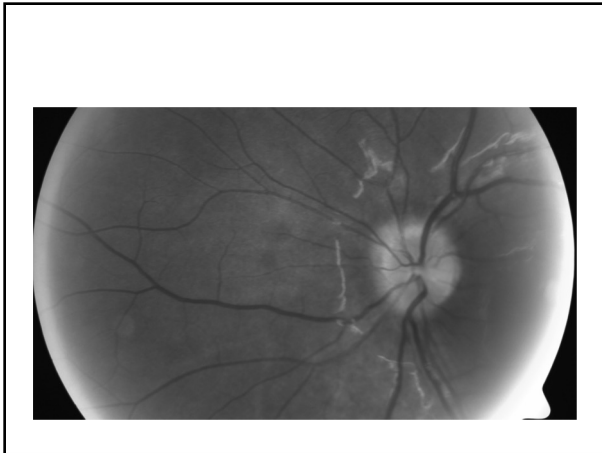
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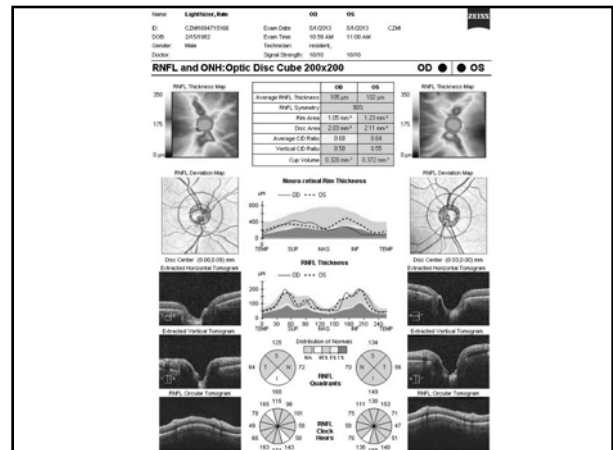
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SWELLING VS. PSEUDOSWELLING

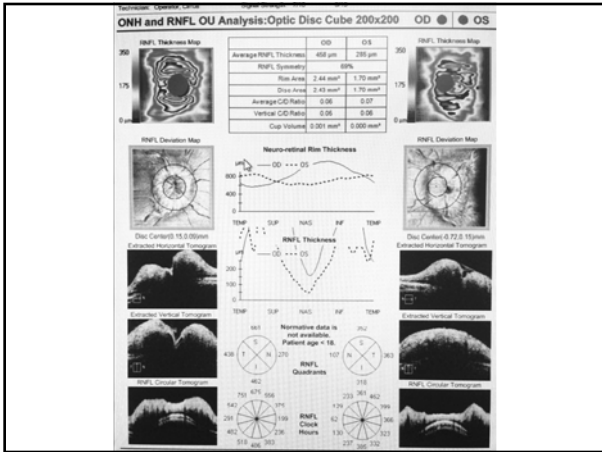
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2. OCT
 - rNFL thickness - normal or elevated or thin?
 - Is there a splitting of retinal layers deep in the retina?

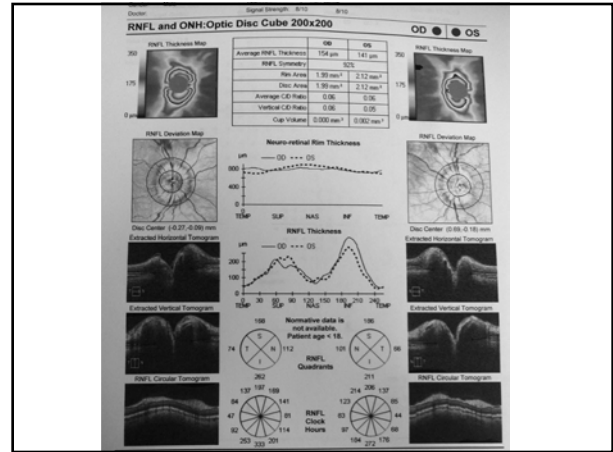
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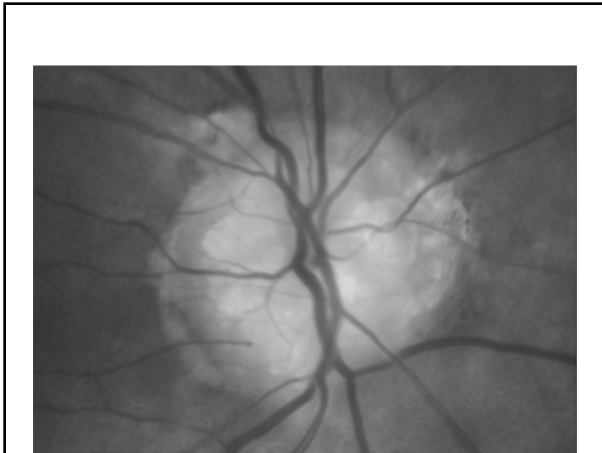
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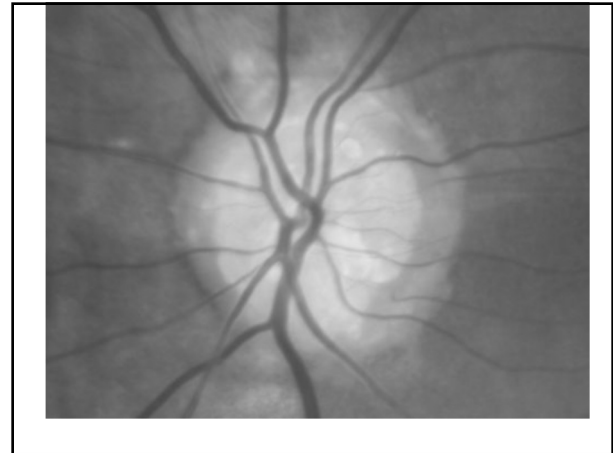
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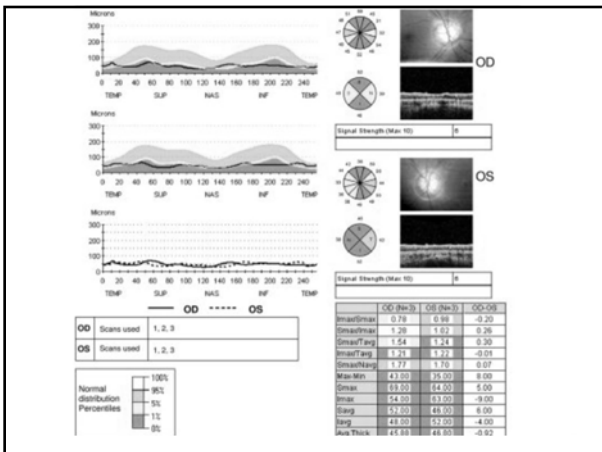
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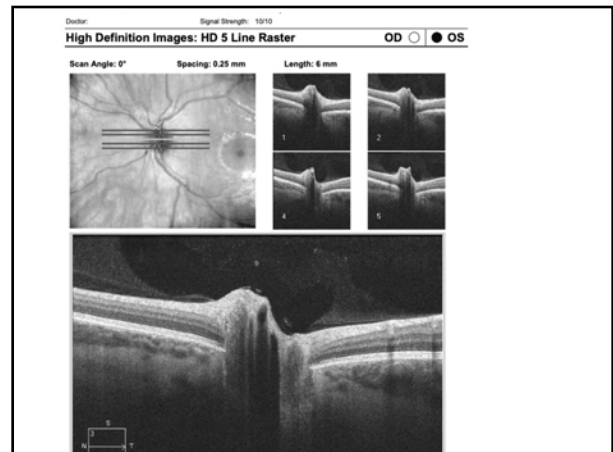
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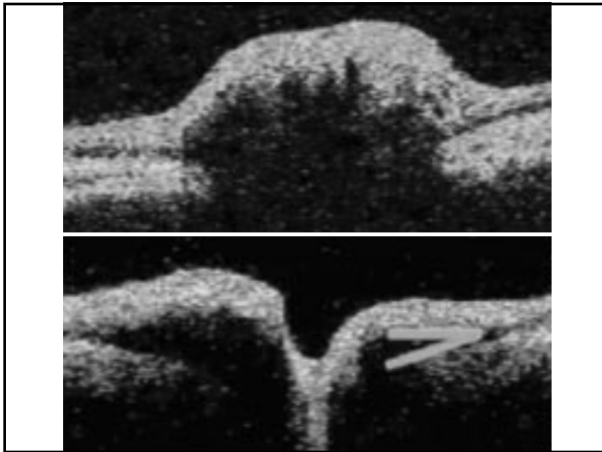
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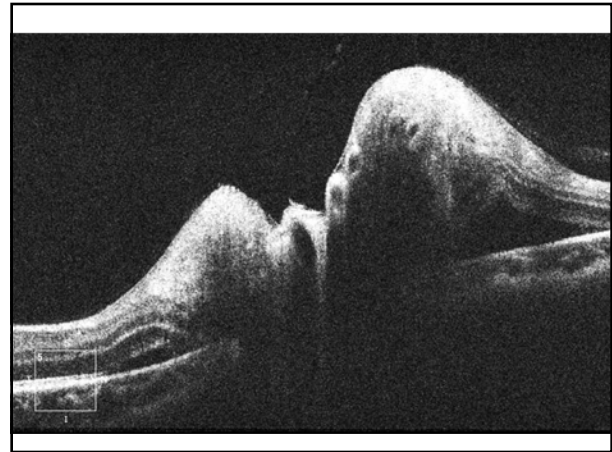
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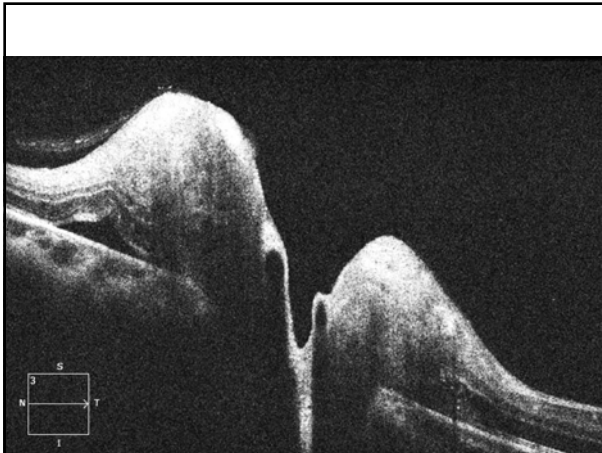
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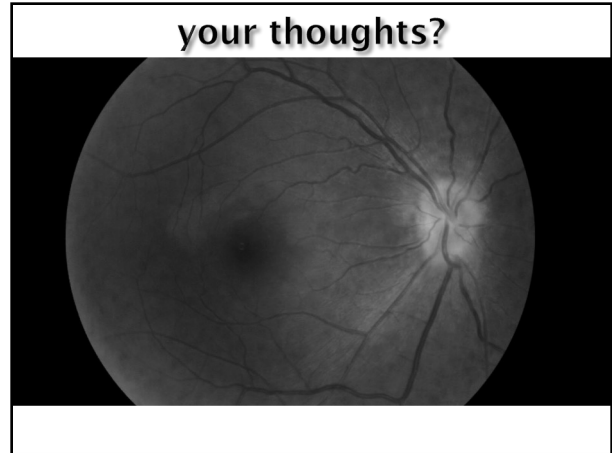
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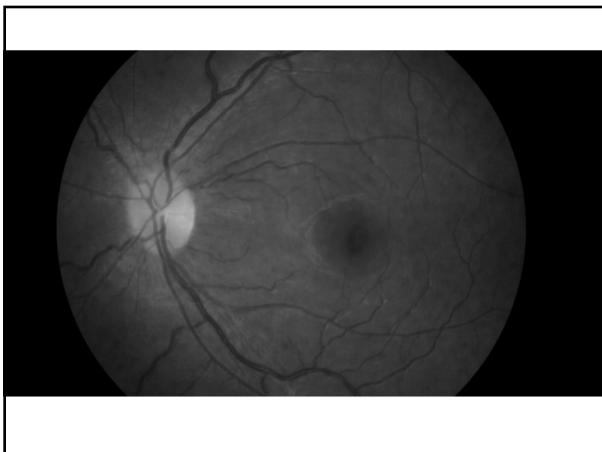
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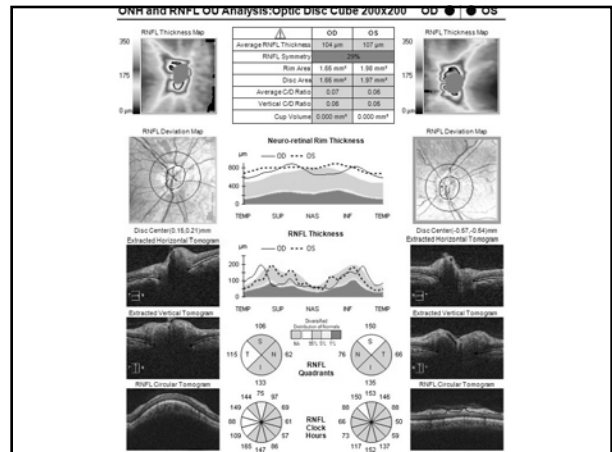
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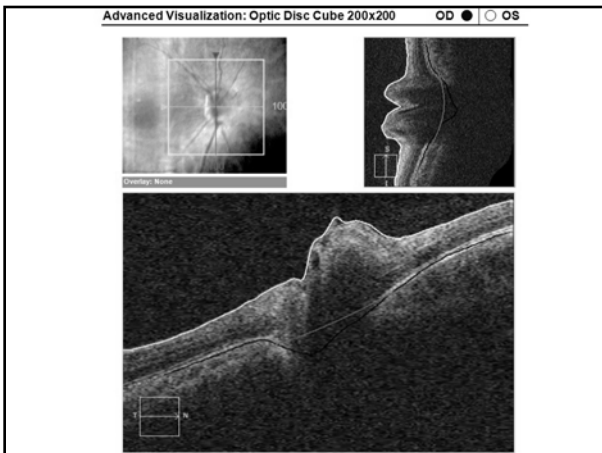
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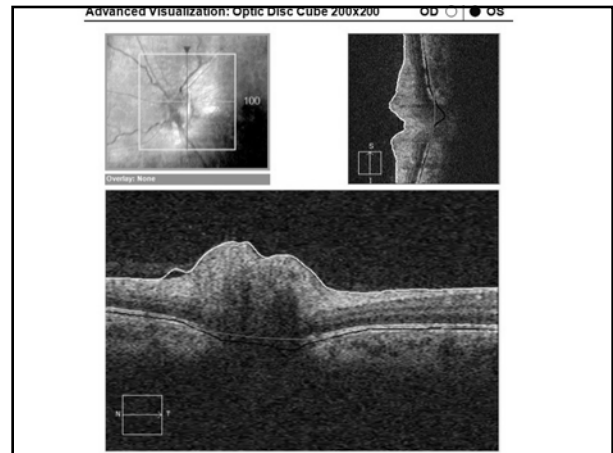
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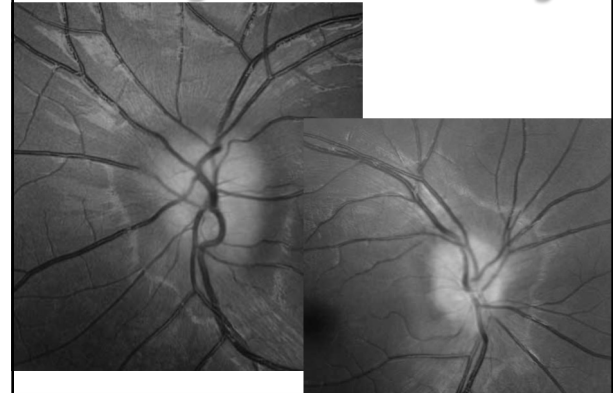
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SWELLING VS. PSEUDOSWELLING

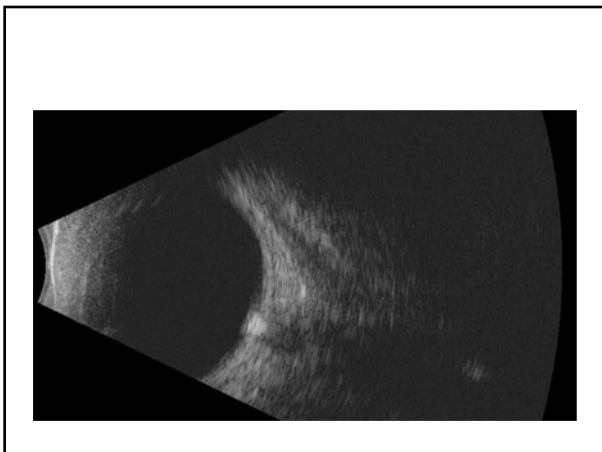
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 2. OCT
 - rNFL thickness - normal or elevated?
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 3. Symptoms?
 4. History?
 5. B-scan
 - Drusen???

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Swelling vs. Pseudoswelling?



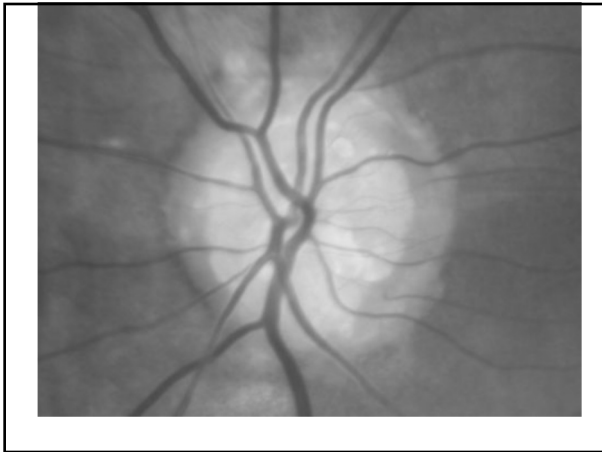
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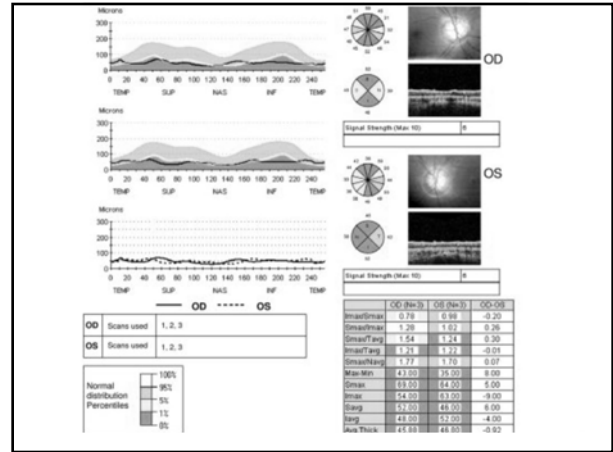
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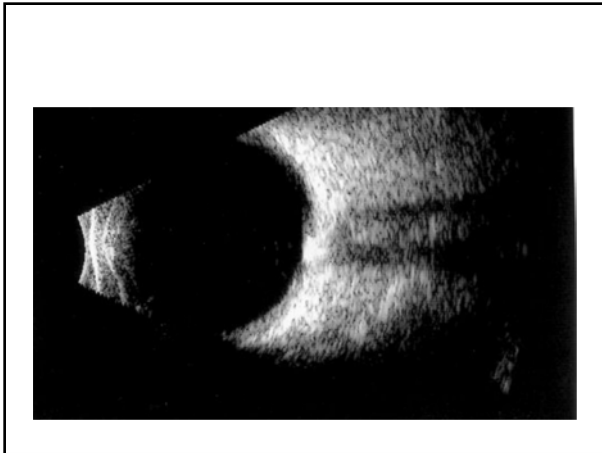
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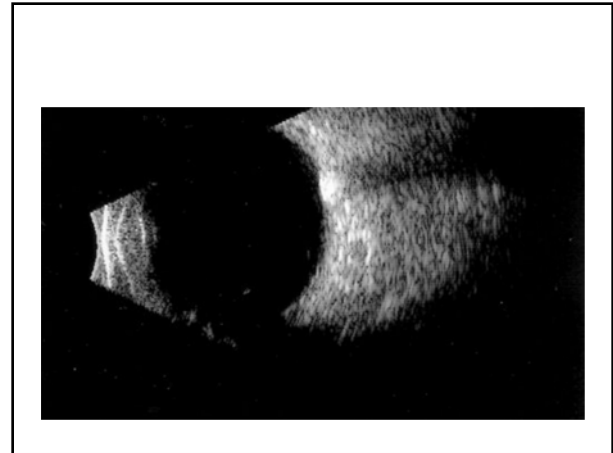
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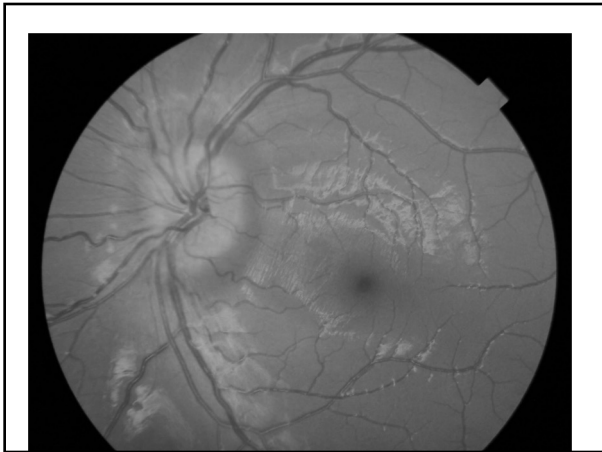
True swelling vs. Pseudotumor case????

- 12 yoM
- "In for annual eye exam". No complains, concerns or symptoms
- Ocular Hx:
 - Longstanding alternating esotropia
 - +3.25 with mild astigmatism OU
- VA:
 - OD - 20/20
 - OS - 20/20

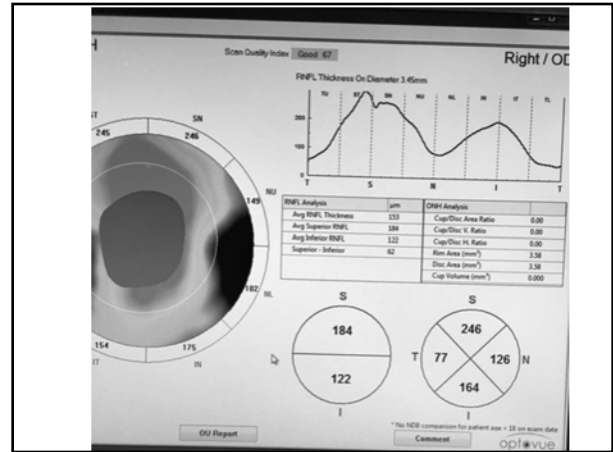
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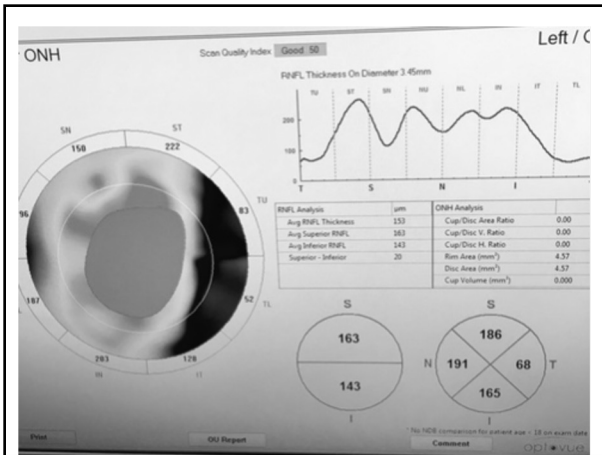
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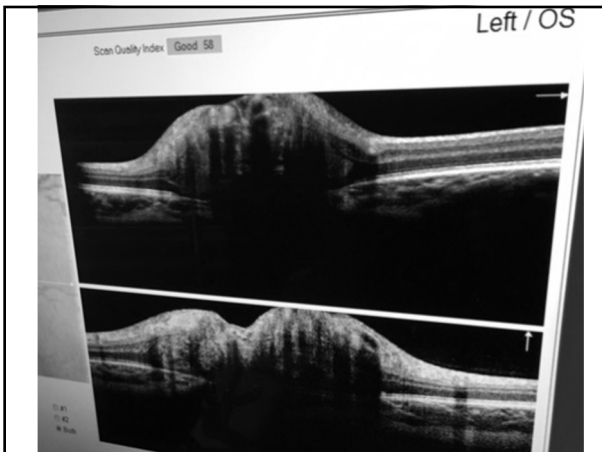
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**What do you think?
Pseudoswelling vs true swelling?**

A. Pseudoswelling
B. True swelling

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True swelling vs. Pseudoswelling case????

- ▣ My recommendation:
 - see a pediatric or neuro-ophthalmologist for a second opinion
 - Not overly concerned
- ▣ Pediatric ophthalmologist:
 - Diagnosis:
 - Pseudopapilledema
 - Monitor & see back in 4-6 weeks to monitor for stability

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 - Drusen???

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Pseudotumor Cerebri

- ▣ AKA
 - Idiopathic intracranial hypertension
- ▣ Elevated intracranial pressure
 - Not caused by tumor, infection, or obstruction of the ventricular system
 - Increased production vs. decreased absorption
- ▣ Etiology:
 - Idiopathic (young, obese females)
 - Medications
 - Oral contraceptives, Tetracyclines, too much vitamin A
 - Trauma

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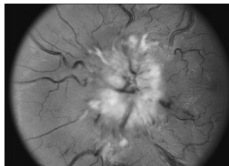
Pseudotumor Cerebri

- ▣ Symptoms:
 - HA's (90-98%)
 - Visual disturbances (72%)
 - Transient visual obscurations (TVO's)
 - Tinnitus (20-60%)
 - N&V (30-40%)
 - Diplopia (20-30%)
 - Blurred vision
 - Abnormal color vision - rare

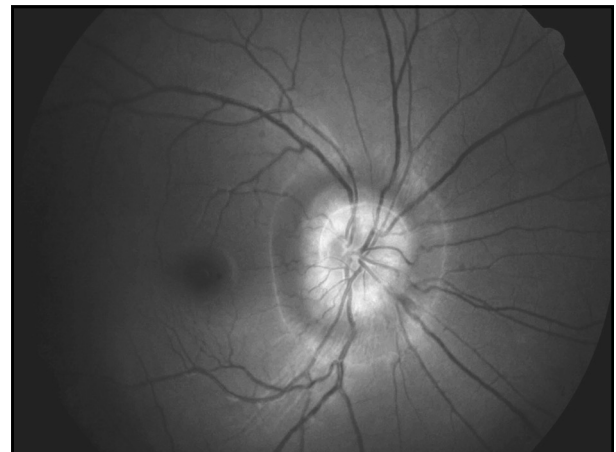
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Pseudotumor Cerebri

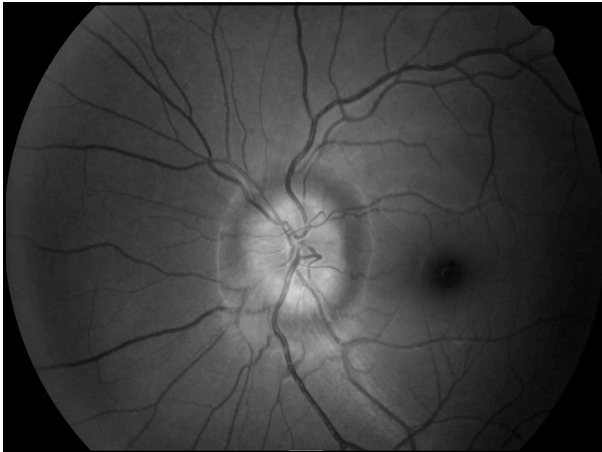
- ▣ Signs
 - Papilledema - hallmark sign of PTC
 - Increased intracranial pressure -> slowing axonal transport -> accumulation of axonal contents in the NFL -> elevated ONH's
 - Bilateral disc edema
 - Blurred disc margins
 - Obscuration of blood vessels*
 - Hyperemia of the disc
 - Venous dilation
 - Peripapillary hemorrhages & CWS
 - Paton's lines



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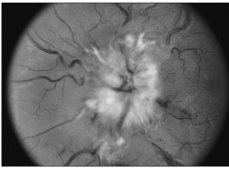
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Pseudotumor Cerebri

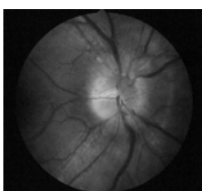
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Pseudotumor Cerebri

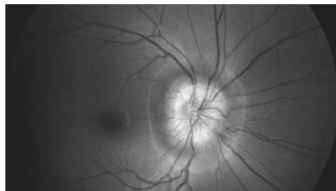
- ▣ Other signs
 - Enlarged blind spot
 - 6th nerve palsy
 - Tends to subside as treatment is effective



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Pseudotumor Cerebri


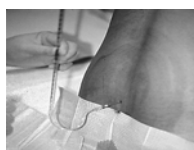
- ▣ Differential Diagnosis:
 - Intracranial tumor/mass
 - Intracranial bleed
 - Hydrocephalus
 - Venous sinus thrombosis
 - IIH



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Pseudotumor Cerebri

- ▣ Diagnosis:
 - Clean MRI/MRV
 - Lumbar puncture
 - Elevated ICP > 250mmH₂O in an obese pt
 - > 200mmH₂O in a non-obese pt
 - Normal CSF composition
 - No other neurological findings
 - Exception -> 6th nerve palsy
 - SVP
 - Yes -> not Pseudotumor
 - No -> ?????

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Pseudotumor Cerebri

- ▣ Treatment:
 - Weight Loss*
 - Papilledema resolution with weight loss of 6% of total body weight
 - Diamox (acetazolamide)
 - 500 mg Sequels BID-QID
 - Taper as the sx's stabilize
 - Lumbar-peritoneal shunt (CSF shunting)
 - Optic nerve sheath fenestration/decompression

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Non-arteritic Ischemic Optic Neuropathy (NAION)

- ❑ Lack of perfusion to the ONH or embolic disease that affects the arteries/arterioles that supply the ONH
- ❑ Mean age of onset = 61-66 years old

- ❑ Associated risk factors:
 - HTN, atherosclerosis, DM, nocturnal hypotension, sleep apnea

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Non-arteritic Ischemic Optic Neuropathy (NAION)

- ❑ SYMPTOMS:
 - Sudden, unilateral, painless loss of vision
 - "I woke up and I can't see out of this one eye"

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	Date	Time	BP	Diastolic
Wed	10/5	11:30 a	114/70	103
Thurs	10/6	8:30 a	117/71	86
		8:30 p	115/75	85
Fri	10/7	1:30 p	115/75	78
		10 p	120/73	80
Sat	10/8	6 a	119/77	71
		8 p	117/70	86
Sun	10/9	7 a	123/78	
		8 a	124/79	84
	10/10	6:50 p	126/80	82
		4 p	115/74	86
	10/13	8:30 p	108/69	
	10/14	7 p	115/70	
	10/15	9:30 p	112/72	84
	10/16	7:30 a	114/56	80
		8 p	117/71	88
	10/17	8 a	118/71	87
	10/18	7 a	116/73	81
		9 p	109/68	77
	10/19	8:30 p	107/65	
	10/21	10 a	119/70	84
	10/23	9:30 p	114/71	81

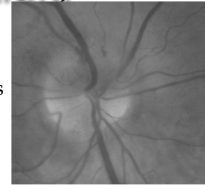
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Non-arteritic Ischemic Optic Neuropathy (NAION)

- ❑ SIGNS:
 - Diffuse or segmental disc edema
 - Peripapillary flame-shaped hemes
 - Retinal arterial attenuation

 - (+) APD
 - VF defect - often inferior altitudinal

 - What does the other eye look like?
 - Small nerve?
 - Small cup?



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Non-arteritic Ischemic Optic Neuropathy (NAION)

- ❑ DIAGNOSIS:
 - Normal ESR & CRP
 - (-) symptoms of GCA

- ❑ DIFFERENTIAL DIAGNOSIS:
 - AAION

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Non-arteritic Ischemic Optic Neuropathy (NAION)

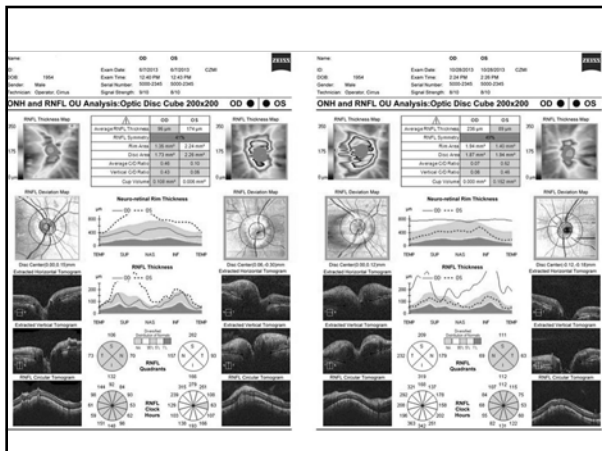
- ❑ TREATMENT:
 - No proven effective treatment

 - Options?
 - Aspirin
 - Lower IOP??
 - Intraocular VEGF treatment

 - ❑ Prognosis:
 - unilateral.....
 - guarded.....but it depends on many factors



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Non-arteritic Ischemic Optic Neuropathy (NAION)

- **TREATMENT:**
 - No proven effective treatment
 - Options?
 - Aspirin
 - Lower IOP??
 - Intraocular VEGF treatment
- Prognosis:
 - unilateral.....
 - guarded.....but it depends on many factors

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Giant Cell Arteritis

- Chronic inflammatory disorder affecting the medium-large sized cranial blood vessels
- Inflammatory mediators cause:
 - proliferation, thickening, and fibrosis of vessel walls
 - > inflammatory occlusion
- Risk factors:
 - Age
 - Females
 - Scandinavian
- Accounts for 6% of ischemic optic neuropathy cases

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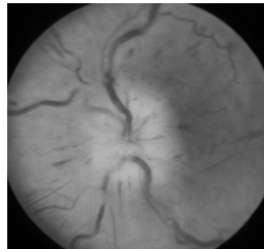
Giant Cell Arteritis

- Symptoms:
 - New onset HA
 - Jaw claudication
 - Scalp tenderness/pain
 - Flu-like sx's/weight loss
 - Pain and stiffness in the shoulders, hips, torso
 - Polymyalgia Rheumatica (PMR)
 - Sudden, severe, painless vision loss
 - Usually unilateral
 - Diplopia

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Giant Cell Arteritis

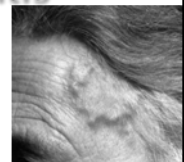
- Signs:
 - Sudden, severe, painless vision loss
 - (+) APD
 - Pale, swollen optic disc
 - Flame shaped hemes
 - CWS's
 - CRAO
 - Ocular ischemic syndrome
 - EOM problems



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Giant Cell Arteritis

- Diagnosis:
 - Clinical symptoms
 - Prominent temporal artery
 - Lack of temporal artery pulsation
 - CBC with differential & platelets
 - ESR males = age/2 females = (age+10)/2
 - CRP
 - Platelets
 - Temporal artery biopsy



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Giant Cell Arteritis

- ▣ Treatment:
 - Refer
 - IV and/or oral steroids
 - IV 250 mg i.v. q6h (1g/day) for 3 days and/or
 - Oral 1-2mg/kg/day
 - Baby aspirin
- ▣ Prognosis:
 - Extremely poor

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Optic Neuritis

- ▣ Patient is typically < 45 years old
- ▣ Females > males
- ▣ **SYMPTOMS:**
 - Acute vision loss – most often unilateral
 - Eye pain in/behind the eye (80-90%)
 - worsens with eye movements

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Optic Neuritis

- ▣ **SIGNS:**
 - Visible ONH swelling (33%)
 - (+) APD
 - Color vision abnormalities
 - red cap test
 - Brightness reduction
 - brightness comparison test
 - Visual field defect – often central
- ONH pallor – 4-12 weeks after onset of symptoms

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Optic Neuritis

- ▣ **DIAGNOSIS:**
 - MRI with gadolinium

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Optic Neuritis

- ▣ **TREATMENT:**
 - MRI results? Already diagnosed with MS?
 - ONIT (Optic Neuritis Treatment Trial)
 - No oral steroids
 - IV methylprednisolone (1g/day) X 3 days
 - oral steroids (1mg/kg/day) X 10-14 days
 - Taper oral steroids over 4-7 days

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Optic Neuritis

- ▣ **TREATMENT:**
 - MRI results? Already diagnosed with MS?
 - Controlled High-Risk Subjects Avonex MS Prevention Study (CHAMPS)
 - IV methylprednisolone (1g/day) X 3 days
 - Avonex (interferon beta-1a)

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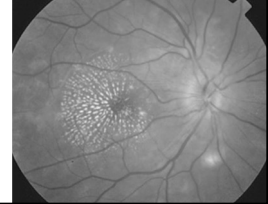
Neuroretinitis

- ▣ Unilateral vision loss in the presence of an optic neuritis and macular star
- ▣ Etiology:
 - Idiopathic (25%)
 - Cat-scratch disease (60%)
 - *Bartonella henselae*
 - Syphilis, Lyme disease, Sarcoid, Toxo, TB
- ▣ Affects all ages, 10-40 year olds most affected
- ▣ Symptoms:
 - Painless, usually unilateral visual loss
 - Starts gradual
 - Becomes more severe after about 1 week
 - Prior viral-like illness (50%)

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Neuroretinitis

- ▣ Signs:
 - Usually unilateral:
 - Papillitis with peripapillary and macular edema
 - Macular star develops as the disc edema resolves
 - Other inflammatory signs (cell & flare, vitreous cells)
 - Parinaud's oculoglandular syndrome



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Neuroretinitis

- ▣ Diagnosis:
 - Clinical picture
 - History of cat scratch/bite/lick
 - Cat-scratch serology ELISA - very sensitive and specific
 - FTA-ABS, VDRL, Lyme titer, Toxo titer, ACE, ANA
- ▣ Treatment
 - Usually self limiting condition in immunocompetent individuals
 - Azithromycin 500 mg p.o. for 1 day, 250 mg/day X 4 days
 - Doxycycline 100 mg p.o. BID
 - Bactrim

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