

THE DISKY DIVAS

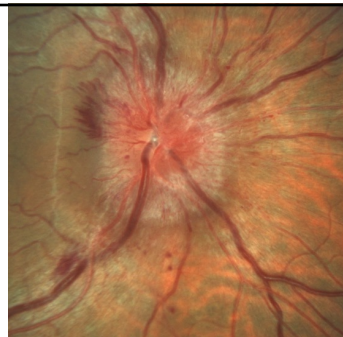
Roberto (Bobby) Saenz, O.D., M.S., F.A.A.O.

1

Disclosures

- Carl Zeiss Meditech - consultant

2



3

What can cause optic disc swelling or optic disc edema?

The Disky Divas

...but who are the Disky Divas?

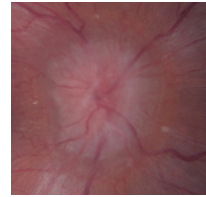
4



5

Meet The Divas

- O**cular Hypotony
- C**ompressive
- H**ereditary
- I**nflammatory
- I**nfiltrative
- I**nfectious
- I**schemic
- T**rauma
- T**oxic

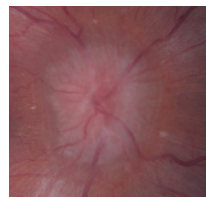


The slide lists nine causes of optic disk edema, each starting with a bold letter. To the right is a fundus photograph showing a blurred optic disk, characteristic of optic disk edema.

6

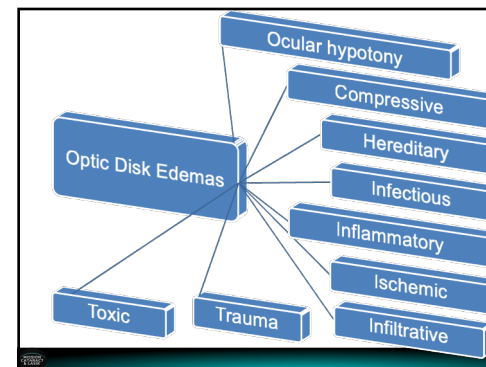
Meet The Divas

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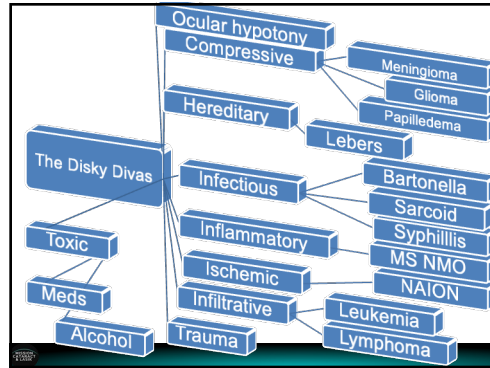


This slide is identical to slide 6, listing the nine causes of optic disk edema and including a fundus photograph of optic disk edema.

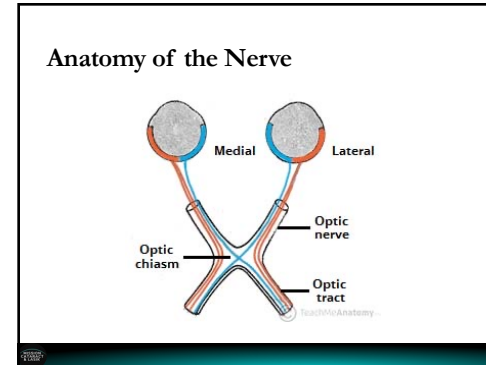
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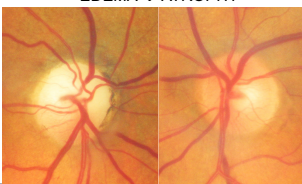


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Definitions

- Optic disc edema
- Optic neuritis
- Papilledema

EDEMA → ATROPHY



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Papilledema – bilateral optic disc edema secondary to elevated intracranial pressure

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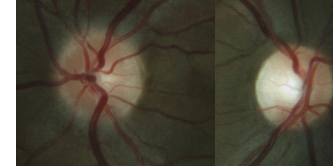
Important Information for finding the Divas

- Age of Patient
- **Side (Unilateral or Bilateral)**
- History
 - Symptoms (tingling of extremities, poor bladder control)
- Medical History (meds, htn, dm)

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Unilateral or Bilateral

- Optic Neuritis
 - Unilateral
- Papilledema
 - Bilateral
- NAION
 - Unilateral



Can all three of these be bilateral?

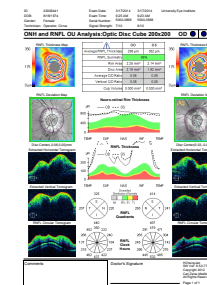
14

Important Clinic information

- Visual Acuity
- Color testing
- **Pupillary Testing**
- Ophthalmoscopy
- Ancillary Testing
 - **OCT**
 - Visual Field
 - Neuroimaging

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OCT to determine disc edema



16

HVF

- Subjective measure of central and peripheral vision
- Useful in diagnosis and follow up
- Papilledema = Big blind spot
- Optic Neuritis = Diffuse and paracentral
- NAION = inferior altitudinal and inferior nasal

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Neuroimaging

- Optic Neuritis
 - FOCAL enhancement
 - Brain: Periventricular, Infratentorial, Juxtacortical
- Papilledema
 - Empty sella
 - Flattening of the posterior aspect of the globe
 - Tortuous optic nerve
 - Transverse venous sinus stenosis
- NAION
 - What will MRI show?

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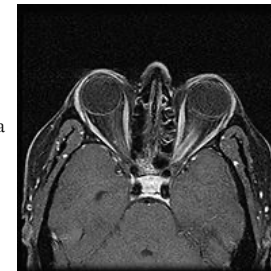
Meet The Divas

Ocular Hypotony
Compressive →→→→→→→**Papilledema**
Hereditary
Inflammatory
Infiltrative
Infectious/Infiltrative
Ischemic
Trauma
Toxicity

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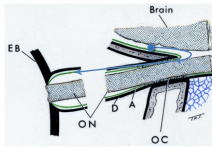
Compressive

- Glioma
- Meningioma
- Pituitary Adenoma
- Papilledema



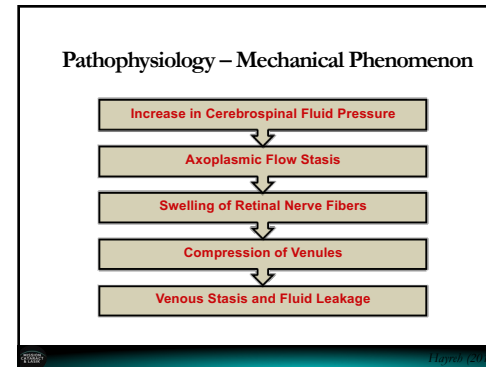
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Dr. Hayreh's study



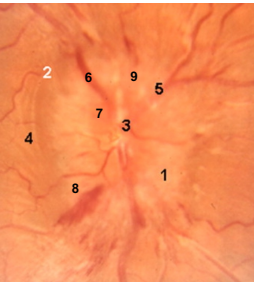
- Papilledema occurs when increased peripapillary CSF pressure
- 1st – Elevation/Blurred Disc margins
- 2nd – Vascular Changes

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Papilledema



- 1 Blurring of disc margins
- 2 ONH elevation
- 3 Filling in of optic disc cup
- 4 Retinal & choroidal folds
- 5 Edema of RNFL
- 6 Venous congestion
- 7 Hyperemia of ONH
- 8 Splinter hemorrhage
- 9 CWS & Exudates

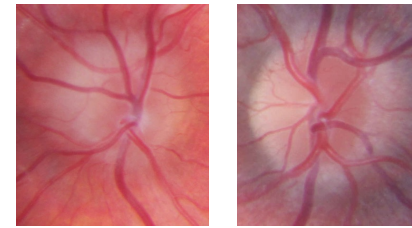
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- Retinal Venous Pulsation: **The absence of venous pulsation at the optic disc, as a sign of early optic disc edema, has been very much stressed in textbooks.** It has also been said that if a venous pulsation cannot be elicited by gentle pressure on the eyeball, the diagnosis of optic disc edema due to raised intracranial pressure is strongly suggested (Lynn, 1959; Walsh and Hoyt, 1969). In contrast, some authors did not consider absence of venous pulsation on the optic disc a reliable criterion for the diagnosis of increased intracranial pressure (Williamson-Noble, 1952; Huber, 1961; Ramsey, 1976).
- In normal persons spontaneous retinal venous pulsation is seen in at least one eye in 90% of the population (Lorentzen, 1970; Ramsey, 1976). **In my experimental study, some eyes with well-developed optic disc edema still showed definite venous pulsation on the optic disc, and its incidence did not seem to be in any way different from that in the normal eyes. Unfortunately, this sign has been very much abused in clinical practice.**

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The most difficult decision optometrists face (clinically) is differentiating between MILD papilledema and pseudopapilledema

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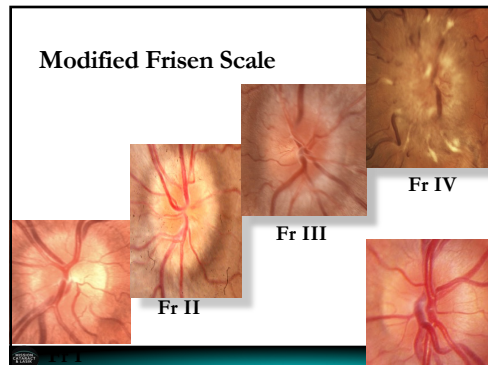


pseudo

MILD PE

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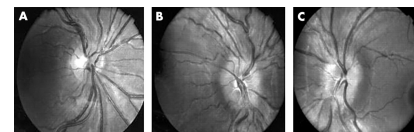
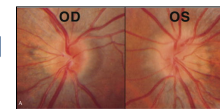
Modified Frisen Scale



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Pseudopapilledema (PPE)

- Small, crowded discs
- Tilted/Oblique Insertion
- Drusen



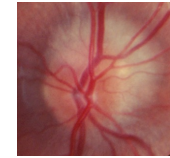
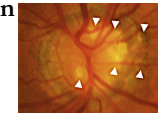
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Optic Nerve Head Drusen

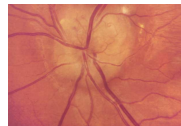
- Incidence: 3.4 – 24 per 1,000 adults
- Calcific acellular bodies anterior to lamina cribrosa
- Alteration in axoplasmic flow → axonal degeneration → deposition of calcium
- Other theories: vasculature & scleral canal



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Optic Nerve Head Drusen

- Most often bilateral
- Small or Large
- Surface or **Buried**
- Begin in younger as buried drusen and move to surface as they age.
- Symptomatic
 - TVOs or Visual Field defects



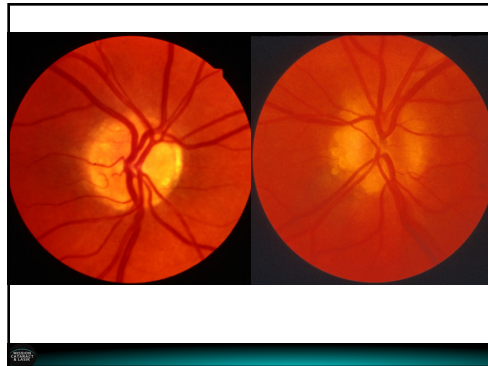
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Optic disc drusen gets mistaken for:

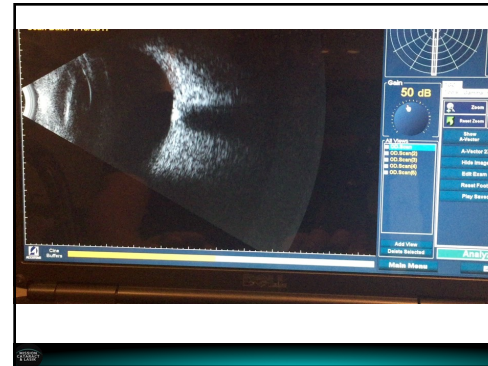
- Papilledema
- Glaucoma. Why?
- Any treatment?



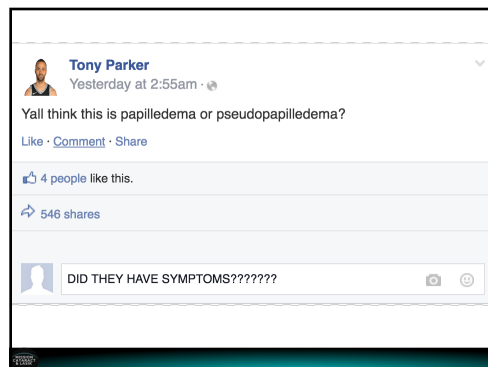
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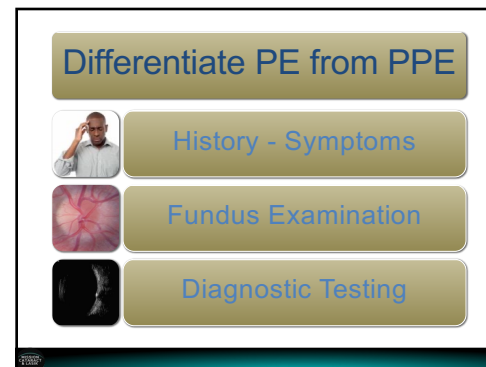
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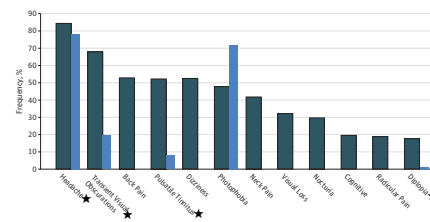


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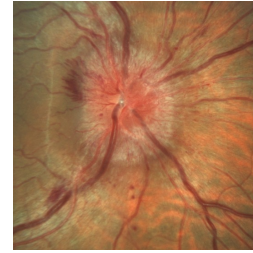
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Symptoms in PE and PPE



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Fundus Examination



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Diagnostic Testing

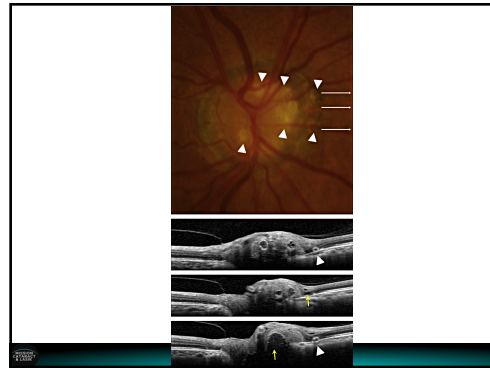
- Orbital Ultrasound
 - A scan Optic Nerve Sheath Diameter (ONSD)
 - A scan 30° test
 - B scan Detection of Drusen
- Optical Coherence Tomography (OCT)
 - Quantitative measurements
 - Qualitative measurements

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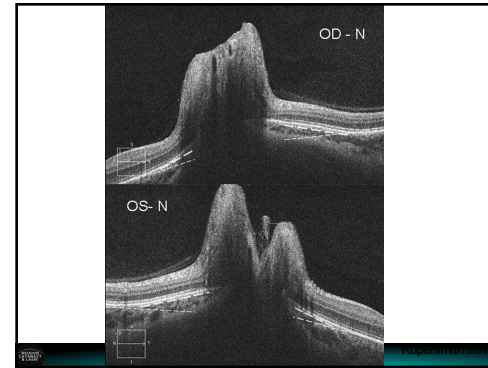
OCT

- Quantitative
 - **Retinal Nerve Fiber Layer Thickness (RNFLT)**
 - Peripapillary Elevation
 - Total Retinal Thickness
- Qualitative
 - Angulation of Bruch's membrane
 - Internal contour irregularities
 - Presence of hyper/hypo reflective mass

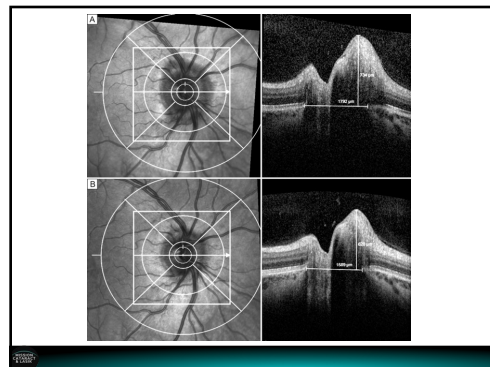
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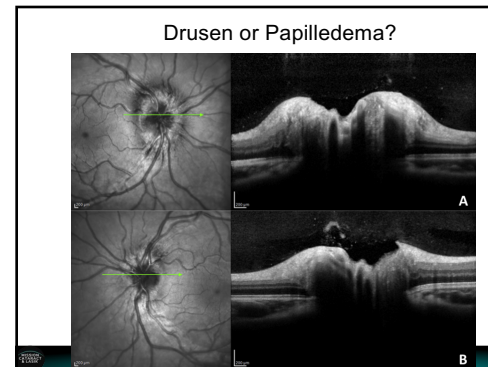
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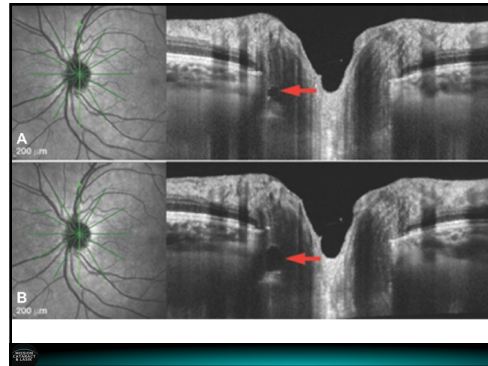
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Differential diagnosis of papilledema vs. pseudopapilledema using customized optical coherence tomography parameters

Laura Pardon

Academy Home / Knowledge Base Article

Abstract

Purpose: Objective measures of the optic nerve head (ONH) and peripapillary tissue with optical coherence tomography (OCT) are useful for the clinical diagnosis of papilledema (PE) but limited to retinal nerve fiber layer (RNFL) thickness from a circular scan path centered on the ONH. The purpose of this study was to evaluate the use of additional OCT-derived ONH and retinal nerve fiber layer (RNFL) measures in differentiating PE from pseudopapilledema (PPE).

Methods: OCT ONH volume scans (Cirrus HD-OCT) were acquired from 48 subjects, 21 with confirmed PE and 27 with PPE. Scan data were exported, and Bruch's membrane opening (BMO) height, minimum rim width (MRW), and RNFL thickness from the BMO to 250 μm eccentricity (RNFL250) were calculated using a MATLAB program. Receiver operator characteristic (ROC) analysis was performed to compare the performance of these parameters with that of 1.73 mm radius circular scan average RNFL thickness in differentiating PE from PPE.

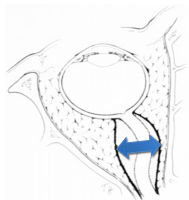
Results: Average RNFL thickness had an area under the ROC curve (AUC) of 0.87 for differentiating PE from PPE. While BMO height, MRW, and RNFL250 demonstrated improved AUCs of 0.96, 0.88, and 0.92, respectively, only BMO height was significantly different compared to RNFL thickness ($p = 0.039$). At 95% specificity, sensitivity and cutoff values for average RNFL thickness, BMO height, MRW, and RNFL250 were 0.57 (151 μm), 0.71 (14.2 μm), 0.43 (657 μm), and 0.52 (373 μm), respectively.

Conclusion: Using OCT volumetric data, additional parameters describing the ONH position, ONH tissue thickness, and immediate peripapillary tissue can be calculated and provide valuable measures for differentiating PE from PPE. Research investigating multimodal imaging (OCT, ultrasonography, etc.) will improve on these methods, establishing new metrics for the use of non-invasive clinical methods in accurate PE diagnosis.

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Orbital Ultrasound

- 1) A scan for **ONSD**

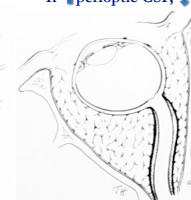
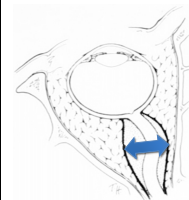


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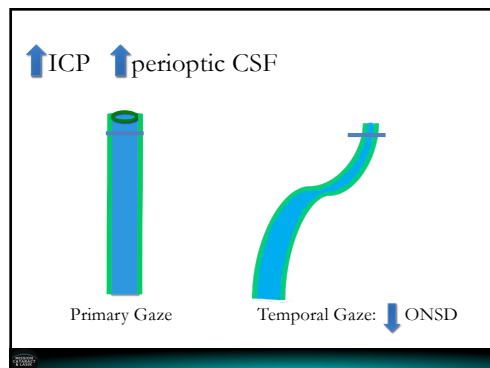
Orbital Ultrasound

- 1) A scan for **ONSD**
- 2) A scan for **30° test**

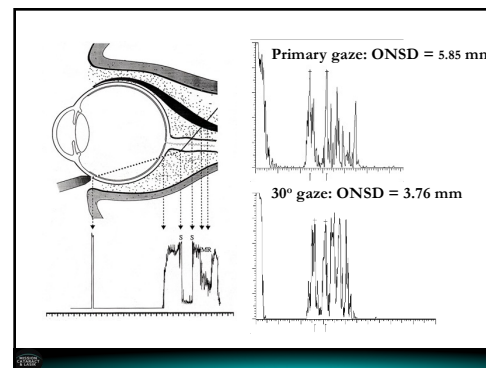
ONSD measured 30° temporally
If ↑perioptic CSF, ↓ONSD



48



49



50

Optom Vis Sci. 2017 Dec;94(12):1081-1088. doi: 10.1097/OPX.0000000000001148.

Use of A-scan Ultrasound and Optical Coherence Tomography to Differentiate Papilledema From Pseudopapilledema.

Saenz B,¹ Cheng H,¹ Prager TC,² Fishman LJ,³ Tano RA.¹

1) Author Information

Abstract

SIGNIFICANCE: Differentiating papilledema from pseudopapilledema reflecting tilted/crowded optic discs or disc drusen is critical but can be challenging. Our study suggests that spectral-domain optical coherence tomography (OCT) peripapillary retinal nerve fiber layer thickness and retinobulbar optic nerve sheath diameter (ONSD) measured by A-scan ultrasound provide useful information when differentiating the two conditions.

PURPOSE: To evaluate the use of A-scan ultrasound and spectral-domain OCT retinal nerve fiber layer thickness (RNFLT) in differentiating papilledema associated with idiopathic intracranial hypertension from pseudopapilledema.

METHODS: Retrospective cross-sectional analysis included 23 papilledema and 28 pseudopapilledema patients. Ultrasound-measured ONSD at primary gaze, percent change in ONSD at lateral gaze (30° test), and peripapillary RNFLT were analyzed. Receiver operating characteristic curves were constructed using one eye from each subject.

RESULTS: Compared with pseudopapilledema, papilledema eyes showed larger mean ONSD (5.4 ± 0.6 vs. 4.0 ± 0.3 mm, $P < .0001$), greater change of ONSD at lateral gaze ($22.4 \pm 8.4\%$ vs. $2.8 \pm 4.8\%$, $P < .0001$), and thicker retinal nerve fiber layer (219.1 ± 104.6 vs. 102.4 ± 20.1 μ m, $P < .0001$). Optic nerve sheath diameter and 30° test had the greatest area under the receiver operating characteristic curve, 0.98 and 0.97, respectively, followed by inferior quadrant (0.90) and average RNFLT (0.87). All papilledema eyes with Friesen scale greater than grade II were accurately diagnosed by ONSD, 30° test, or OCT. In mild papilledema (Friesen scale grades I and II, $n = 15$), area under the receiver operating characteristic curve remained high for ONSD (0.95) and 30° test (0.93) but decreased to 0.61 to 0.71 for RNFLT. At 95% specificity, sensitivities for ONSD, 30° test, and RNFLT were 91.3%, 91.3%, and 56.5%, respectively, for the entire papilledema group and 80.0%, 60.7%, and 13.3% for the mild papilledema subgroup.

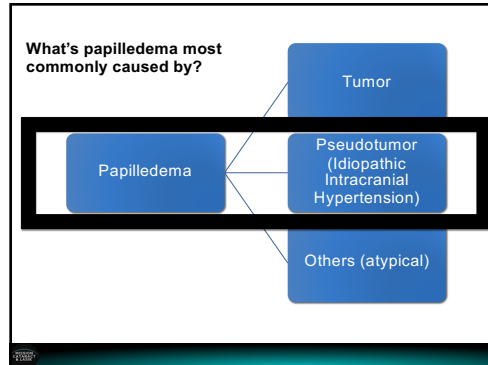
CONCLUSIONS: Retinal nerve fiber layer thickness can potentially be used to detect moderate to severe papilledema. A-scan may further assist differentiation of mild papilledema from pseudopapilledema.

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Orbital Ultrasound

- 1) A scan for ONSD
- 2) A scan for 30° test
- 3) B scan for Drusen

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OPTOMETRISTS WILL BE RELIED UPON TO MANAGE IIH. WHY?

-WE CAN ORDER MRI AND LP!

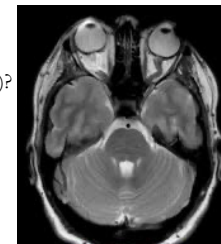
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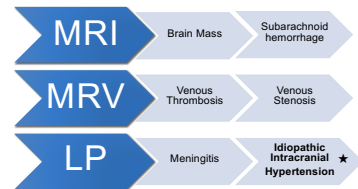
Idiopathic Intracranial Hypertension aka Pseudotumor Cerebri

- 20 – 40 year old
- Obese female
- What's their VA (initially)?
- CN VI palsy



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Papilledema Work Up



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What are the “others”?

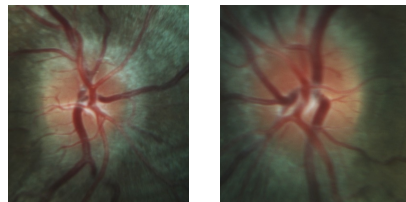
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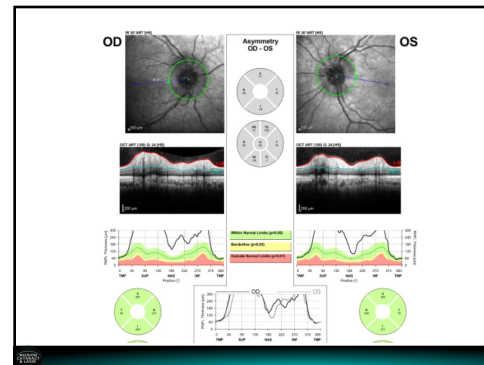
Case 1

18 HF – obese – (-) HA, TVO, tinnitus, diplopia

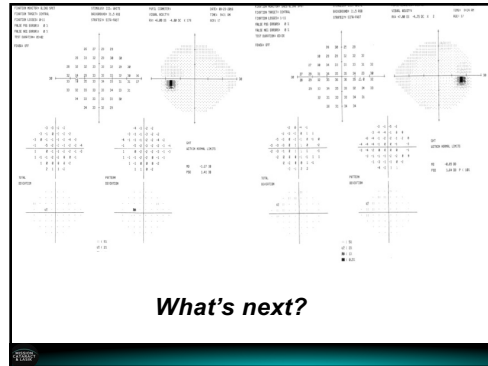
MEDS: none MH: unremarkable BP: WNL



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60



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Parkhurst Nuvision
Roberto Saenz, O.D., M.S., F.A.A.O.
USA # 12345 • LC # 90210

Location (1)

Name DOB

Address Date

R MRI of brain and orbits with and without contrast and MRV
H47. 11

REFILL NR 1 2 3 4 5 O.D., M.S., F.A.A.O.

IN ORDER FOR A BRAND NAME PRODUCT TO BE DISPENSED, THE PRESCRIBER MUST HAND WRITE "BRAND NECESSARY" OR "BRAND MEDICALLY NECESSARY" IN THE SPACE ABOVE.

SCRIPT 1

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Parkhurst Nuvision
Roberto Saenz, O.D., M.S., F.A.A.O.
USA # 12345 • LC # 90210

Location (1)

Name DOB

Address Date

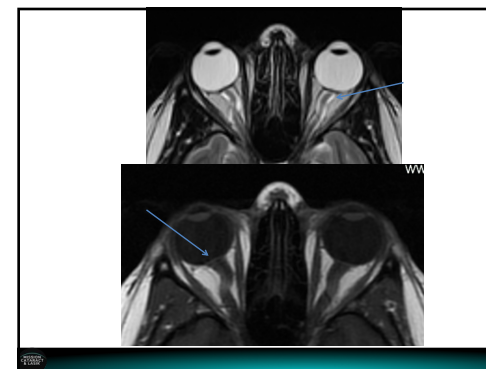
R Lumbar puncture opening pressure and CSF analysis
ICD 10 H47. 11

REFILL NR 1 2 3 4 5 O.D., M.S., F.A.A.O.

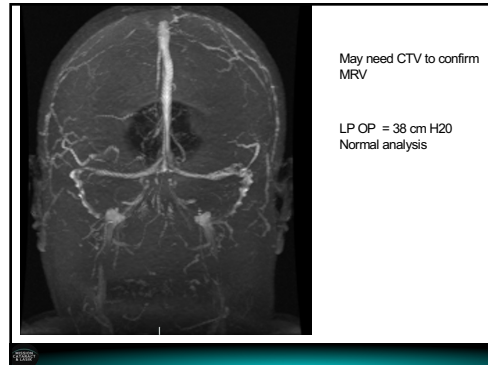
IN ORDER FOR A BRAND NAME PRODUCT TO BE DISPENSED, THE PRESCRIBER MUST HAND WRITE "BRAND NECESSARY" OR "BRAND MEDICALLY NECESSARY" IN THE SPACE ABOVE.

SCRIPT 1

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Treatment

- Therapeutic LP
- Oral
 - Diamox
 - + low Na diet
 - Topomax
- Surgical
 - ONH fenestrations?
 - LP or VP shunts

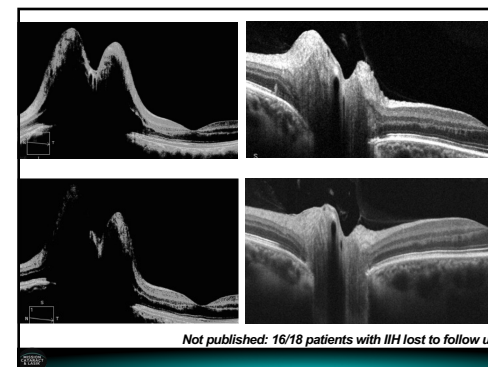


66

Case 1: Management

- Co-management: Call/Letter to Neurologist
- See back 3-4 weeks after LP OP
- Will see back q3 weeks until compliant/stable
 - then q3mo
 - then q6mo

67



68

Did you know?

- Some patients with Idiopathic Intracranial Hypertension can NOT have any optic disk swelling

69

Case 2: 12 WF – new onset diplopia

PMH: Crohn's

h/o oral steroids for 8 months last year.

MEDS:

- Imuran
- Iron
- Lialda
- Remicade
- Vitamin D3

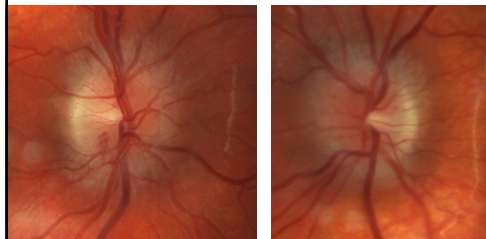
(+) osteopenia

Has **gained 50lbs** over the past 8 months.

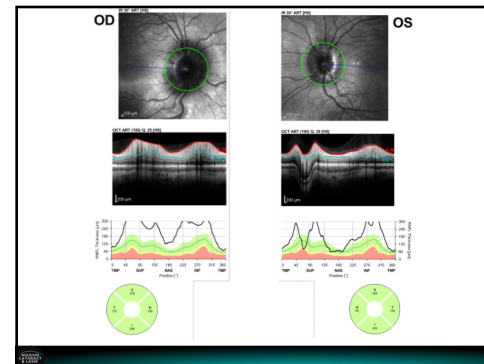
70

Case 2

6th nerve palsy – then we dilate



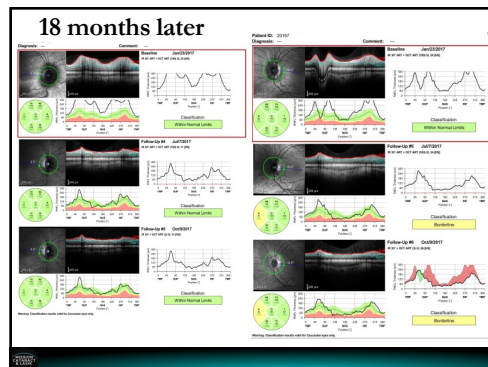
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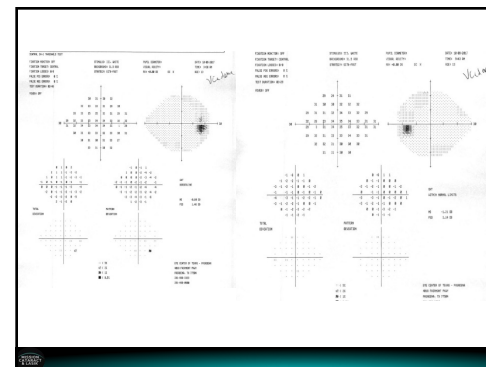
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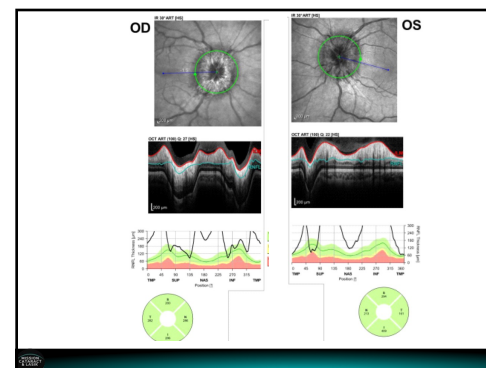
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Case 3: 26 AAF & THIN – (+) HA & TVO

- Bilateral Disc Edema OU
- What do we order?
- MRI/MRV – normal

Do we really have to do lumbar puncture?

Come back to this later?

81

Meet The Divas

Ocular Hypotony
Compressive →→→→→→→*Papilledema*
Hereditary
Inflammatory
Infiltrative
Infectious/Infiltrative
Ischemic
Trauma
Toxicity

82

Case 4

26yo WF – sudden vision loss OD

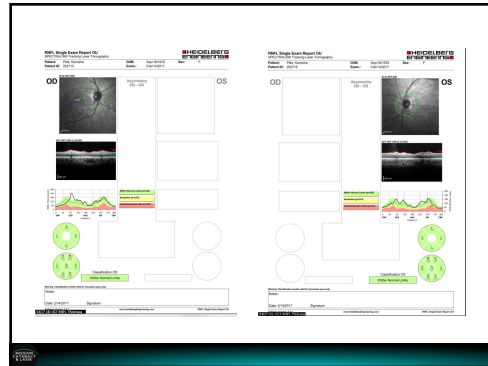
- 5 days prior
- Pain on eye movements
- Medical history unremarkable
- VA OD CF OS 20/20
- (+) APD OD

83

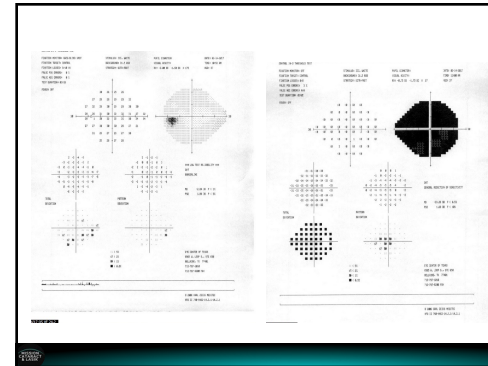
You look in.....

Everything is normal....

84



85



86

What tests do we order?

87

So now what....

- 1) Do you have to order the MRI?
- 2) Do we have to do any treatment?
- 3) Do we have to send to the ER?

88

Assessment and Plan

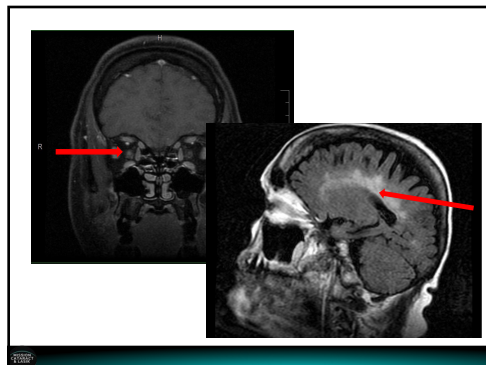
- Optic Disc Edema OD (likely optic neuritis)
- Order MRI of the brain and orbits with and without contrast with FLAIR sequencing

89

MRI

- Brain: White matter lesions involving the periventricular white matter
- Orbits: Abnormal focal enhancement of the right optic nerve

90



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Meet The Divas

Ocular Hypotony
Compressive →→→→→Papilledema
Hereditary
Inflammatory →→→→→MS/NMO
Infiltrative
 Infectious/Infiltrative
 Ischemic
 Trauma
 Toxicity

92

Optic Neuritis

- Inflammation of the optic nerve
- Anterior OR Retrobulbar
- Typical v Atypical
 - Hemes
 - Hard exudates
 - Vit cells
- VA not improving over 30 days or NLP

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Typical optic neuritis

- Caucasian female
- 20-45 years of age
- No signs of inflammation in the eye
- 5 per 100,000 individuals
- Women 2x more likely to be affected

94

Symptoms

- Unilateral, painful vision loss
- Pain on eye movements
- Altered colored vision
- Uthoff's phenomenon
 - Hot tub test
- Lhermitte's sign

In these patients we are worried about the relation between ON and ?

95



96

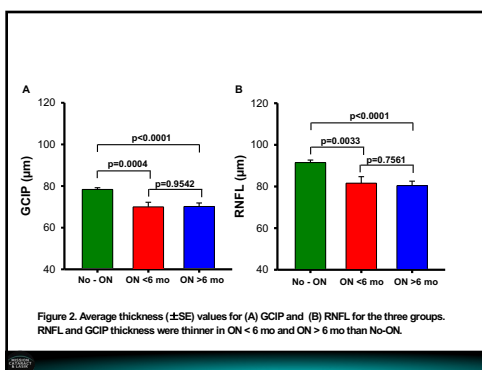
Do we have to do the MRI?

97

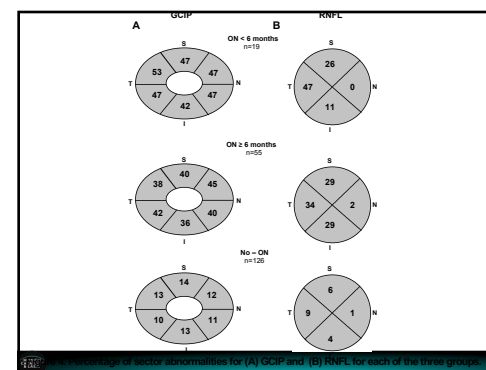
Background

- Multiple Sclerosis (MS) is a chronic demyelinating disease of the central nervous system.
 - Optic neuritis (ON), an acute demyelination of the optic nerve, occurs in more than 50% of MS patients.¹ Subsequent retrograde degeneration leads to retinal ganglion cell (RGC) axonal and neuronal loss.
 - Optical Coherence Tomography (OCT) provides a non-invasive clinical assessment of RGC axonal and neuronal integrity through measurements of the retinal nerve fiber layer (RNFL) thickness and the ganglion cell/inner plexiform layer (GCIP) thickness, respectively.
 - Recent studies suggested that GCIP might be more useful than RNFL in detecting and monitoring neurodegeneration in MS because GCIP, unlike RNFL, was not affected by swelling during acute stage of ON.^{2,3}
- GCIP could potentially be used as an outcome measure for neuroprotective clinical trials in MS.***
4

98



99



100

Among the 5 eyes measured between 3.5 to 6 months after the 1st acute ON, all showed abnormal GCIP while only one showed abnormal RNFL.

Table 2. GCIP and RNFL abnormality in 1st time acute ON (ON < 6 mo) eyes

Time from onset of ON	N	Number of eyes with abnormal GCIP	Number of eyes with abnormal RNFL
Less than 1 month	4	0	0
Between 1 and 3.5 months	3	0	0
Between 3.5 and 6 months	5	5	1

101

THESE TWO EXAMPLES ARE THE BEST WE HAVE...

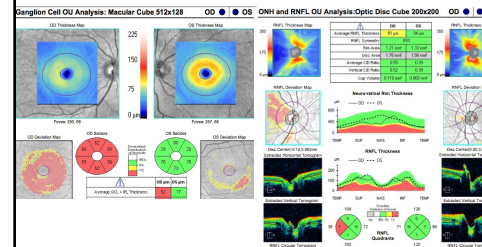


Figure 5. An example of GCIP showing abnormalities earlier than RNFL in a patient with a history of ON in the right eye 5 months prior to the exam.

102

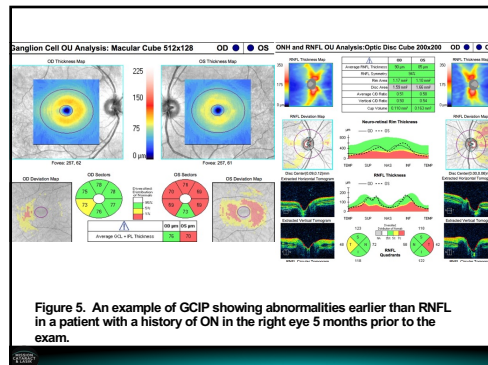


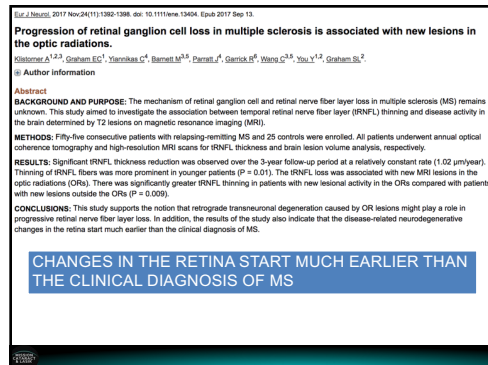
Figure 5. An example of GCIP showing abnormalities earlier than RNFL in a patient with a history of ON in the right eye 5 months prior to the exam.

103

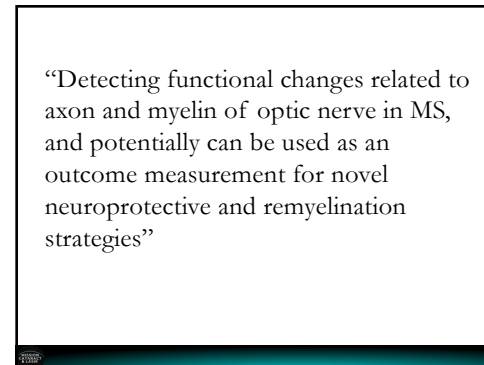
Conclusions

- GCIP showed more abnormalities than RNFL in all 3 groups of MS eyes possibly due to GCIP being less affected by axonal swelling than RNFL.
- In 1st time acute ON eyes, GCIP revealed abnormalities earlier than RNFL.

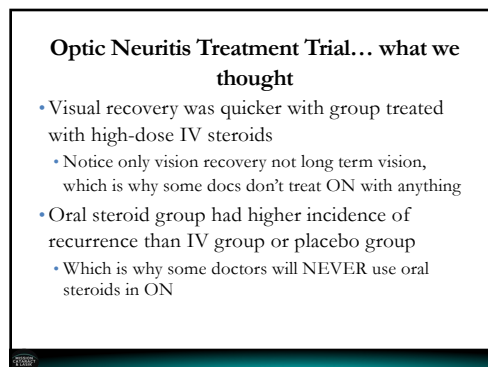
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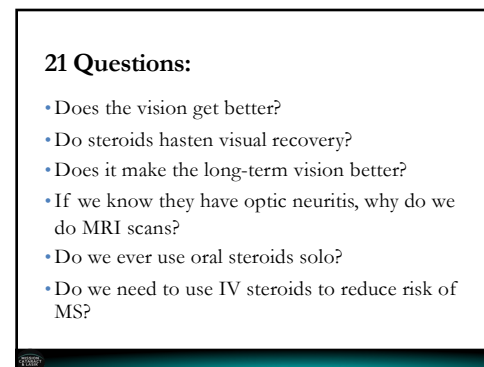
105



106



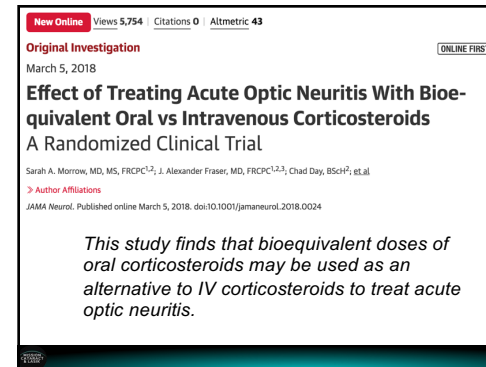
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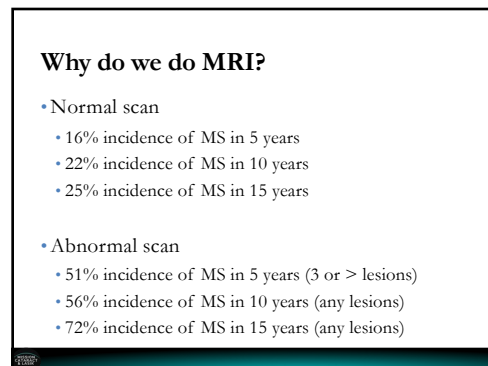
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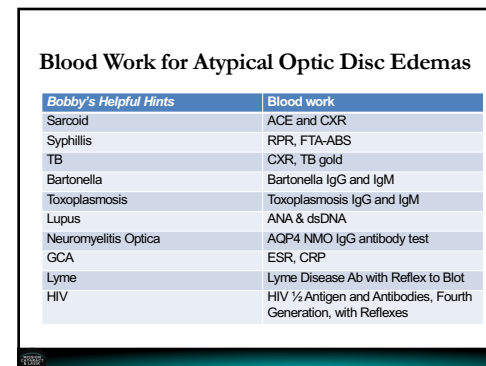
109



110



111



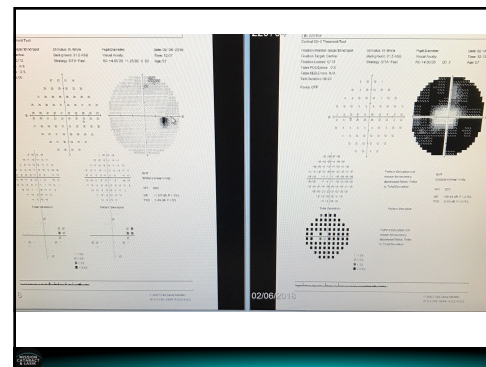
112

Case 5

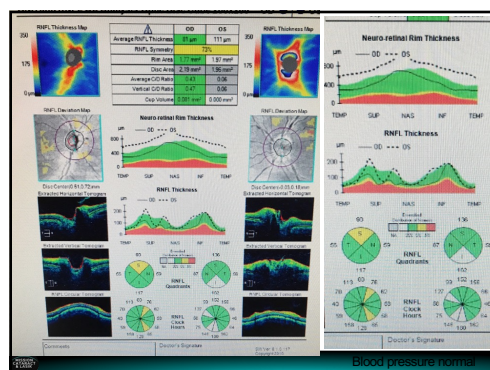
54yo WM – Vision loss OS

- Pain on eye movements OS
- **Happened day after dental surgery**
- 20/20 OU
- APD OS
- If someone complains of vision loss but is 20/20, they are really trying to tell you they have....

113



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115



116

Ddx:

- Optic Neuritis
- Infection causing orbital infiltration attacking the optic nerve
- Perioperative ischemic optic neuropathy

How do we figure out what this is?

MRI

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Intraorbital Optic Nerve Signal Hyperintensity on Magnetic Resonance Imaging Sequences in Perioperative Hypotensive Ischemic Optic Neuropathy

Valerie Purvin, MD, and Benjamin Kizma, MD

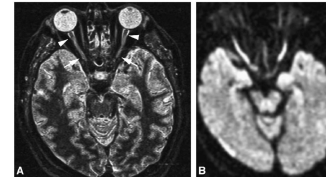


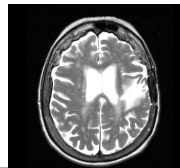
FIG. 1. A. Axial fluid-attenuated inversion recovery magnetic resonance image (MRI) obtained four days postoperatively demonstrates diffuse hyperintensity within both optic nerves extending posteriorly to the intra-canalicular segments (arrows). Note sparing of the immediately retrobulbar portion of the optic nerves (arrowheads). This distribution provides imaging correlation for the pathologic changes previously reported in this condition. B. Diffusion-weighted MRI reveals restricted diffusion (high signal) along the course of both intra-orbital optic nerves (arrows), consistent with acute infarction.

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MRI

- **Focal** enhancement of the optic nerve and periventricular white matter lesions

Optic Neuritis can be 20/20



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TABLE 1: 2010 McDonald MRI Criteria for Demonstration of DIS

DIS Can Be Demonstrated by ≥ 1 T2 Lesion^a in at Least 2 of 4 Areas of the CNS:

- Periventricular
- Juxtacortical
- Infratentorial
- Spinal cord^b

Based on Swanton et al 2006, 2007.^{22,27}

^aGadolinium enhancement of lesions is not required for DIS.

^bIf a subject has a brainstem or spinal cord syndrome, the symptomatic lesions are excluded from the Criteria and do not contribute to lesion count.

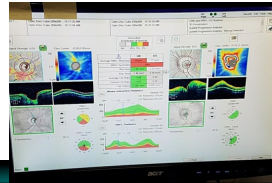
MRI = magnetic resonance imaging; DIS = lesion dissemination in space; CNS = central nervous system.

120

Case 6

Next Case: Know what's normal

- 26 HF sudden painful vision loss OS x 4 weeks
- OD HM OS 20/25
- Atrophy OD and Disc edema OS



121

Meet The Divas

- Ocular Hypotony
- Compressive → Foster Kennedy Syndrome
- Hereditary
- Inflammatory → NMO
- Infiltrative
- Infectious → Bartonella and Syphilis
- Ischemic
- Trauma
- Toxic

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NMO

- NMO is demyelinating disease that attacks the OPTIC NERVE and SPINAL CORD
- Aquaporin 4 channels
- POOR prognosis
- Relapses
- **Now have a serum test**
- Quest: NMO IgG autoantibody test (90382)

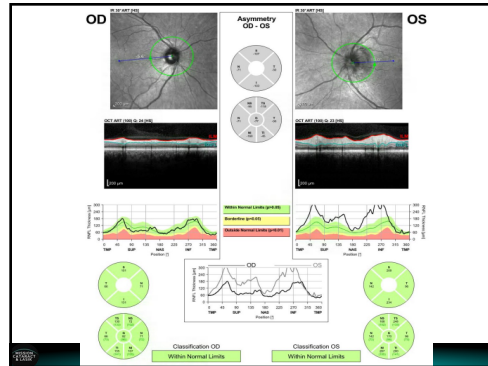
123

Case 7

50yo white female – sudden vision loss

- “optic disc edema eval”
- No pain on eye movements
- (+) HTN – Lisinopril
- VA 20/20 OS CF @ 1m
- APD OS

124



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Meet The Divas: Unilateral 50 WF

~~Ocular Hypotony~~
~~Compressive~~
~~Hereditary~~
 Inflammatory → MS/NMO [NO PAIN]
 Infiltrative
 Infectious → Syphilis/Bartonella/Toxo [MAYBE HERE?]
 Ischemic → NAION [well controlled HTN?]
 Trauma
~~Toxic~~

126

NAION?

- (+) HTN
- Order MRI of brain and orbits with and without contrast with flair sequencing
- Order blood work
- The last question we asked.....

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Do you have any CATS

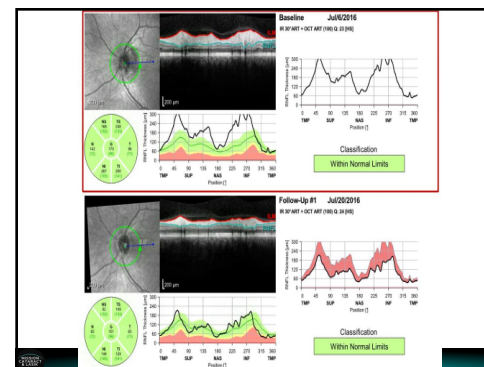
128

Visit 2 – 2 wks later

- VA OD 20/25 OS 20/150
- Blood work ordered (+) B. Henselae
- Start Doxy 100mg BID x 28 days

DOES THE VISION COME BACK?

129



130

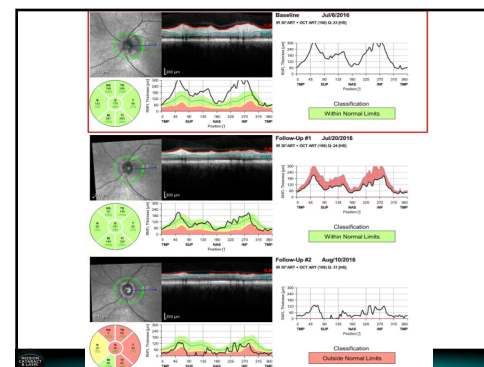
Visit 3 – 5 weeks later

- VA OD 20/25 OS 20/150

NOT HAPPY VISION ISN'T IMPROVING
WANTS SECOND OPINION



131



132

ENCOURAGE
AND
DOCUMENT

133

Second opinion:

- Order MRI of brain and orbits with and without contrast to rule out optic nerve enhancement or compressive ICM.
- “My concern is that despite her risk factor for NAION of HTN and age, **she does not have a small C/D ratio** in the left eye. In addition, patients with neuroretinitis usually have **spontaneous improvement of vision over time which this patient did not have**. I will have the patient follow up earlier if the MRI findings are abnormal. The different diagnosis in this patient with optic neuropathy consists of NAION, infectious/inflammatory, demyelinating disease, compressive lesion, glaucoma, etc.”

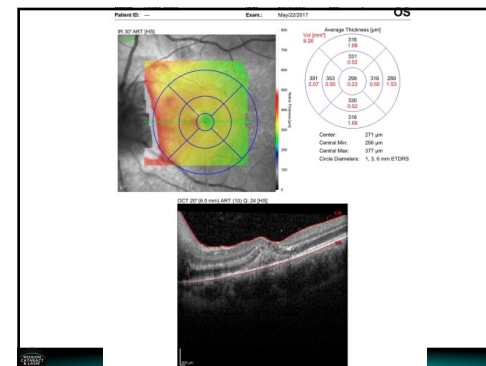
134

Case 8

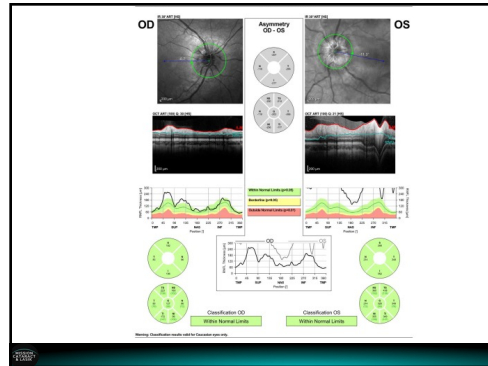
12yo female – sudden vision loss x 2wks

- h/o fever 4 weeks ago & weakness
- (-) headaches, No eye pain
- VA OD 20/20 OS 20/200

135



136



137

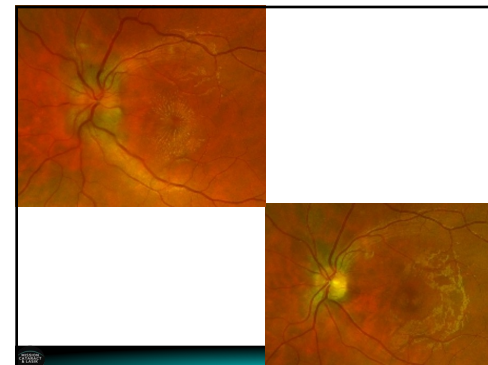


138

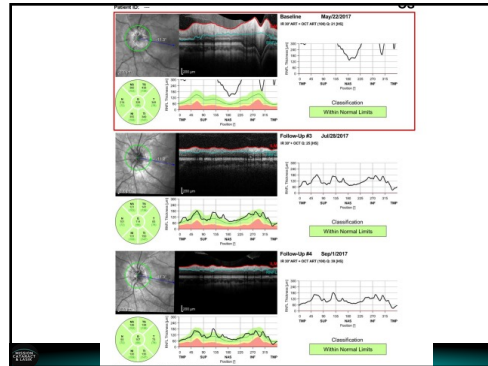
Visit 2 – 2 weeks later

- Week 2: VA OD 20/20 OS 20/100
- Week 6: VA OD 20/20 OS 20/80
- 4mo later: VA OD 20/20 OS 20/30

139



140



141

Treatment - Bartonella

- Doxy
- Bactrim
- Z pack

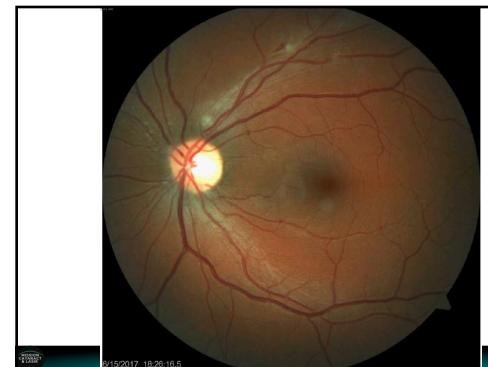


142

Bartonella

- Gram negative rod *B. Henselae*
- FLU LIKE symptoms prior to optic neuropathy
- Usually self-limiting with good visual prognosis
- Cat scratch optic neuropathy v neuroretinitis
 - Don't always need macular star
- Usually asymmetric and bilateral

143



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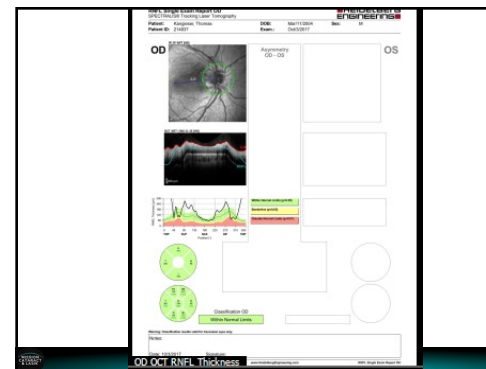
Case 9

14yo HF - blurred VA centrally x 1 week

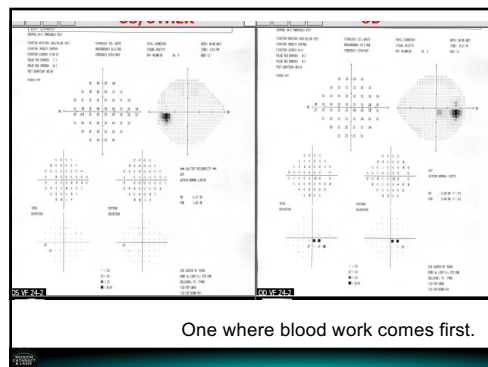
- OD 20/20 OS 20/70
- (+) APD OS
- Dull pain, not any worse with eye movements

BLOOD WORK

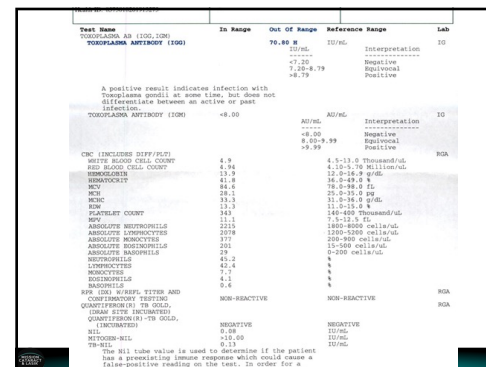
145



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147



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149

Meet The Divas

Ocular Hypotony

Compressive →→→→→→→→Papilledema

Hereditary

Inflammatory → → → → → → → → MS/NMO

Infiltrative

Infectious/Infiltrative →→→→→ Syphilis/Bartonella/Toxo

Ischemic

Trauma

Toxicity

KIDS

150

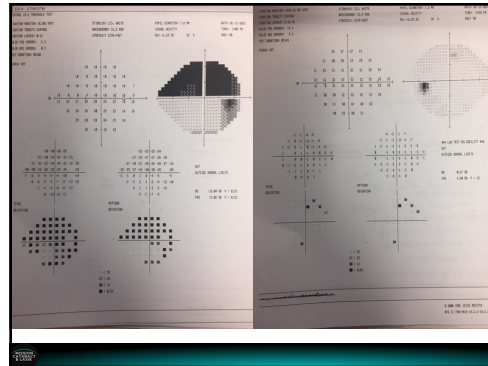
Case 10

50yo male

- Missing top area of VA in OD x 3 days
- (-) HTN, (-) diabetes (-) hypercholesterolemia
- (-) ED drugs
- (-) balance issues
- (-) numbness and tingling
- BP 134/88 pulse 106

151

152



153

A: Unilateral optic disc edema OD

- NAION v Optic Neuritis
- MRI and blood work
- Likely start IV steroids

ATYPICAL
MRI showed enhancement (NOT focal)

154

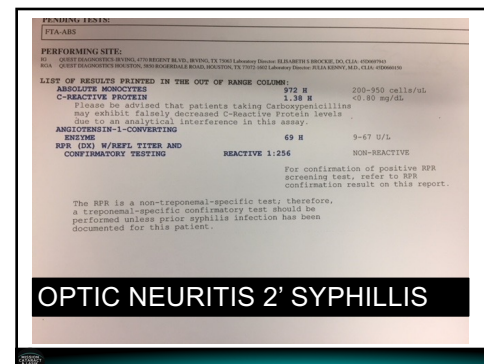
ONH swelling got better but VA didn't over 28 days....

So we know we aren't dealing with demyelinating optic neuritis

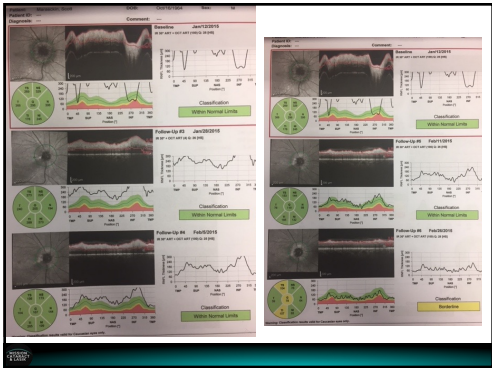


Order Blood Work!

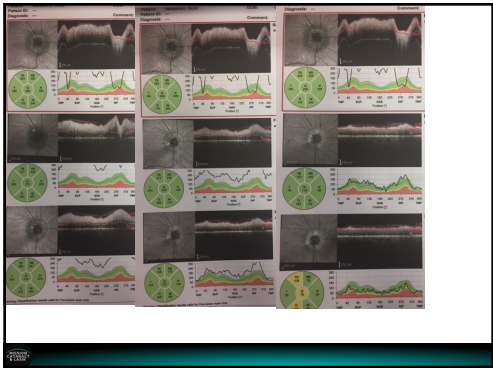
155



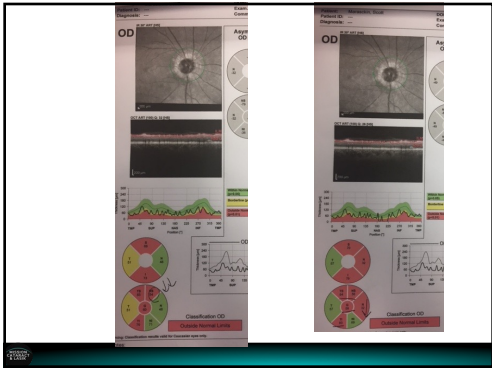
156



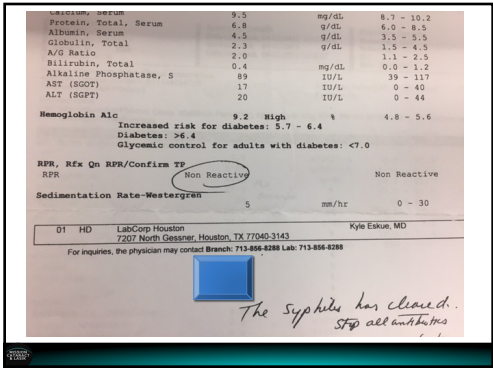
157



158



159



160

Meet The Divas

Ocular Hypotony
Compressive →→→→→*Papilledema*
Hereditary
Inflammatory →→→→→*MS/NMO*
Infiltrative
Infectious/Infiltrative →→→→→*Syphilis/Bartonella/Toxo*
Ischemic
Trauma
Toxicity

161

Back to this case: 26 BF THIN– (+) HA & TVO

- Bilateral Disc Edema OU
- MRI/MRV – normal

Do we really have to do lumbar puncture?

162

Called the patient to check on her

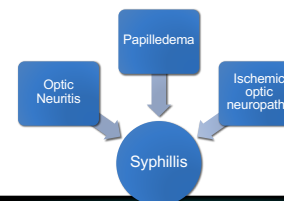
- “I reserve the right to not tell you what is happening:



163

CSF analysis

- Elevated protein level
- (+) RPR = neurosyphilis



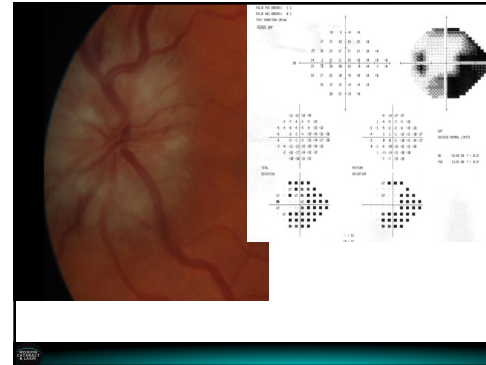
164

Case 11

52yo male – (+) “decently” controlled HTN

- VA OD 20/20 OS 20/20
- Film over left side of vision
- Optometrists said it's probably optic neuritis and I may have MS

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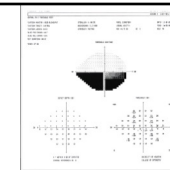
NAION Treatment?

- Do we need to order MRI?

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NAION

- Most common disc edema >50
- Avg age 61-65
- Segmental swelling
- Tx: Optic nerve sheath decompression Aspirin, hyperbaric chambers, vasodilators, and steroids? have proved to ineffective.
- Avg VA 20/20 to NLP, 25-50% improve by 3 lines
- VF defect present at 6mo likely present



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Risk Factors

- HTN
- DM
- Sleep apnea
- Nighttime dosing of blood pressure medications?
- ED meds?

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New treatment for NAION?

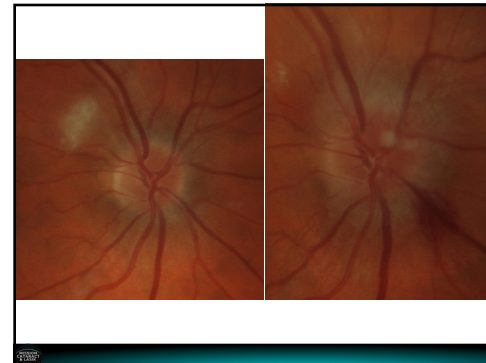
- Caspase 2
- Inhibits mRNA of caspase 2 gene
- Caspase 2 involved in death of ganglion cells
- Apoptosis via caspase 2 thought to be main cause of death following ischemic during NAION
- Ongoing clinical trial

170

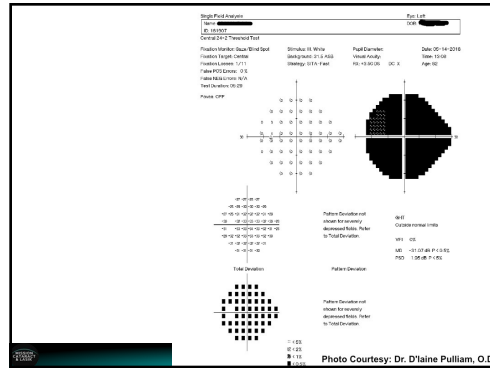
NAION

So if I have NAION can I manage this?
 Yes..... BUT! Make sure you know what you are doing.
 You can miss Bartonella.
 Don't miss GCA.
 Don't miss neurosyphilis.

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QUEST Diagnostics

Patient Information: [Redacted]

Physician Information: [Redacted]

Services: [List of services including Comprehensive Profile, Liver Profile, etc.]

Photo Courtesy: Dr. D'laine Pulliam, O.D.

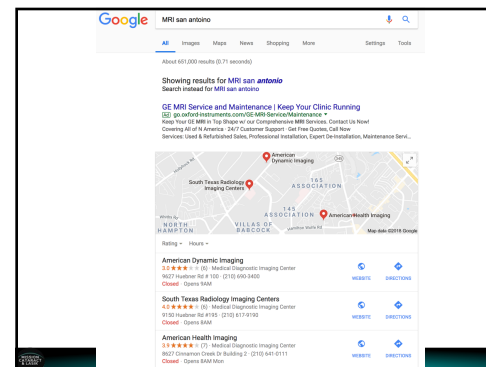
178

MCH	27.8		pg	32.0-36.0
MCHC	32.7	16.6 (U)	g/dl	10.0-15.0
RDW			%	150-450
Platelets	394		K/uL	7.5-11.5
MPV			fL	
NRBC/100 WBC			%	
CRP Inflammatory				
C-Reactive Protein, Quant		79.7 (H)	mg/L	0.0-5.0
Sedimentation Rate		55 (H)	mm/hr	0-20
Sedimentation Rate				

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Photo Courtesy: Dr. D'laine Pulliam, O.D.

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WESTBURY
CRANFORD
& LARK

184

J Ocul Pharmacol Ther. 1997 Oct;13(5):473-7.

Reversibility of ethambutol optic neuropathy.

Tsai RK¹, Lee YH.

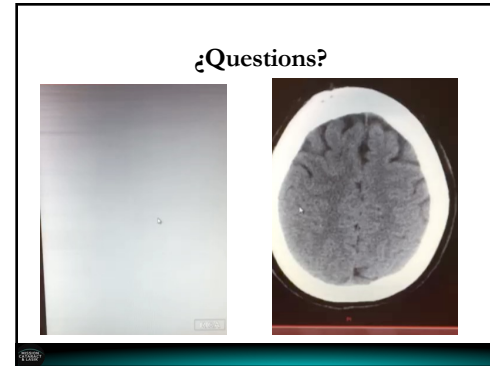
Author information

Abstract

Ethambutol hydrochloride is a first-line routinely used drug as the first line of anti-tubercular agents. The delayed onset of ocular toxicity is usually thought to be reversible following rapid withdrawal of the drug. We collected ten consecutive patients with severe visual defects due to ethambutol toxicity, and these patients had received presumably safe ethambutol dosages. Although ethambutol was stopped immediately in all patients, the visual defects did not improve in any of the patients. In 5 (50%) patients, the visual defects were permanent. In 5 (50%) had permanent visual impairment without recovery. There were no predisposing or risk factors to contribute to poor visual outcome. In the group over 60 years old, only 20% (1/5) experienced visual improvement; in the group less than 60 years old, 80% (4/5) had some visual recovery, the difference between these two age groups being statistically significant. We need more patient collections to answer whether the patients with ethambutol optic neuropathy have poor prognosis. Ethambutol optic neuropathy, if not follow-up study, is not always reversible in the older age group. The main cause of visual disability is irreversible. It is suggested that the patients should be reconsidered regarding the use of ethambutol as one of the first-line anti-tubercular drugs, especially in older patients.



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