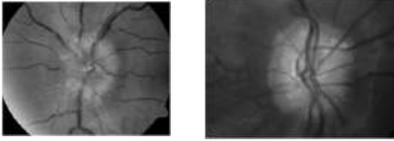


Papilledema, Pseudopapilledema & Idiopathic Intracranial Hypertension



Leonard V. Messner, OD, FAAO
Professor of Optometry
Vice President for Strategy & Institutional
Advancement
Illinois College of Optometry



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Disclosure Statement:

- King-Devick Technologies (board of directors)
- Heidelberg Engineering (professional advisory board)
- Amgen/Horizon Therapeutics (professional advisory board)

All relevant relationships have been mitigated

2

Key Points

- Defining papilledema vs. pseudopapilledema
- Stages of papilledema
- Clinical and OCT features of papilledema
- Clinical and OCT features of pseudopapilledema
- Evaluation and Management of IIH

3

Definition of Papilledema

- Swelling and elevation of the optic nerves due to elevated intracranial pressure (ICP)

4

Definition of Pseudopapilledema

- An anomalous elevation of one or both optic nerve without optic disc swelling and typically with a small or absent optic cup (may or may not be associated with optic disc drusen)

5

Stages of Papilledema (Frisén Grading Scale)



Lars Frisén, MD, PhD

Frisén L. J Neural Neurosurg Psychiatry 1982

6

Grade I

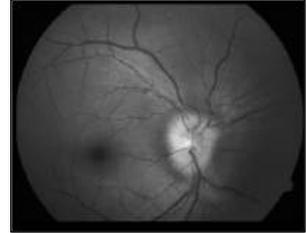
- C-shaped halo of optic disc edema with sparing of the temporal papillomacular bundle fibers



7

Grade II

- Circumferential halo of optic disc edema



8

Grade III

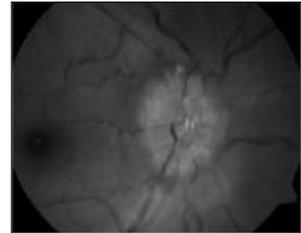
- All of Grade II findings + obscuration of major vessels as they leave the disc



9

Grade IV

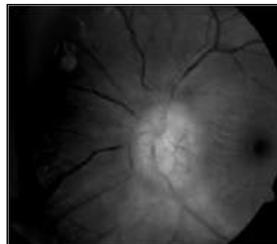
- All of Grade III findings + obscuration of major vessels on the surface of the disc



10

Grade V

- All of Grade IV findings + obscuration of all vessels on the surface of the disc



11

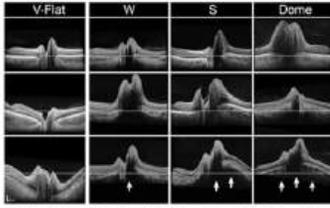
OCT Analysis of Papilledema

- Increased NFL/MRW thickness:
- Elevation of nerve head
- Maintenance of central cup (until late disease)
- Subretinal hyporeflective space between photoreceptor layer and RPE (recumbent "lazy V")
- Peripapillary retinal / choroidal folds & creases
- *Inward deflection of RPE/BM (N>T)*
– 67% with papilledema

Reggie SN, et al. *Eye* 2021
Flores-Rodriguez P, et al. *Ophthalmic Physiol* 2012
Lee KM, et al. *Ophthalmology* 2011
Kupersmith MJ, et al. *IOVS* 2011

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Patterns of Bruchs Membrane Line (BML) Deflection



Reproducible, clear patterns of BML deflection (BMD) were observed in 100% of eyes with AMD. The patterns were categorized into four types: V-Flat, W, S, and Dome. The V-Flat pattern was characterized by a sharp, V-shaped deflection of the BML. The W pattern was characterized by a wide, shallow deflection. The S pattern was characterized by a sharp, S-shaped deflection. The Dome pattern was characterized by a dome-shaped deflection. The BMD patterns were associated with different stages of AMD. The V-Flat pattern was associated with early AMD, the W pattern with intermediate AMD, and the S and Dome patterns with late AMD. The BMD patterns were also associated with different retinal thicknesses. The V-Flat pattern was associated with normal retinal thickness, the W pattern with thinning, and the S and Dome patterns with thickening. The BMD patterns were also associated with different retinal vascular patterns. The V-Flat pattern was associated with normal retinal vascular patterns, the W pattern with capillary non-perfusion, and the S and Dome patterns with choroidal neovascularization.

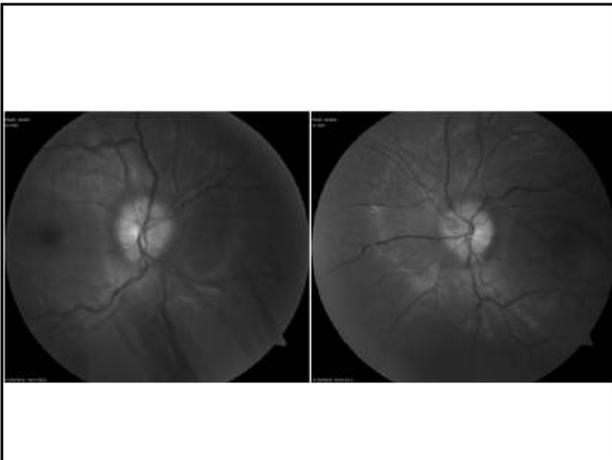
Sibony P, et al. *J Neuro-Ophthalmol* 2021

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32 y/o Female

- C/o progressive headaches am > pm
- BMI: 41
- BVA:
 - 20/20 OD
 - 20/20 OS

14

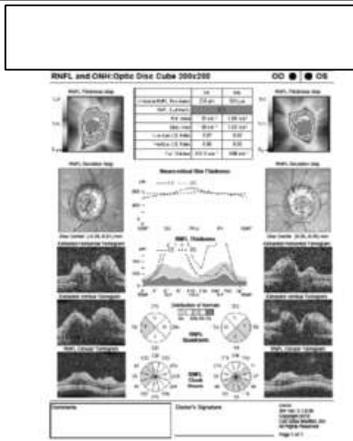


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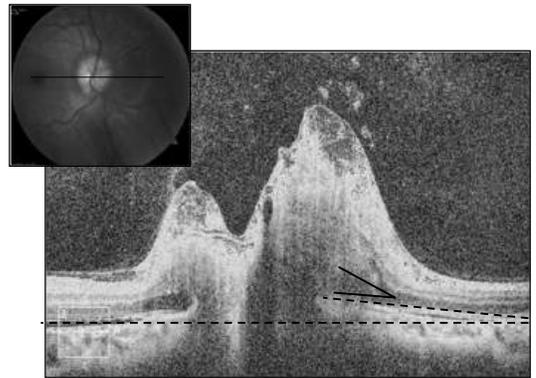


16

NFL:
228 OD
161 OS



17

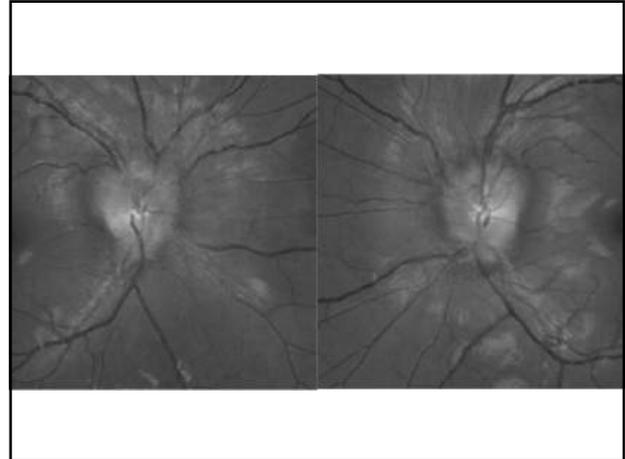


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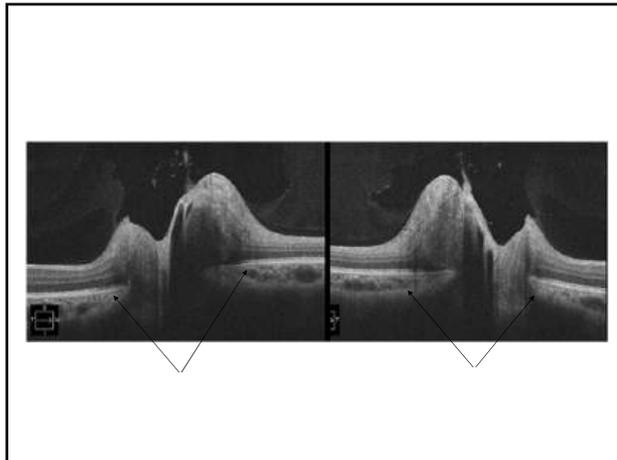
25 y/o Female

- C/o progressive headaches
- + SPT
- BMI: 39
- BVA:
 - 20/20 OD
 - 20/20 OS

19



20



21

Peripapillary Wrinkles, Folds & Creases

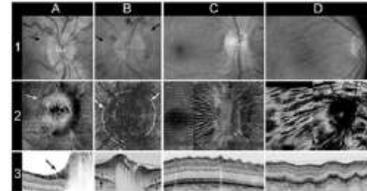


Fig. 36. Four types of folds in glaucomatous (A-D) versus with progressive (row 2), or acute (row 3), and acute (row 4) optic atrophy. **A.** Retinopapillary folds (PPF) of Healy's type are closely spaced (<100 µm) and oriented tangential to the optic nerve head (ONH) surface. The pattern is usually confined to the upper disc or may appear around the margin. PPF can occur in any form of optic disc atrophy and may be associated with acute (row 2) or chronic (row 3) optic atrophy. **B.** Peripapillary outer retinal folds or wrinkles are widely spaced (>100 µm) and appear to be tangential. They are commonly associated with acute (row 2) or chronic (row 3) optic atrophy. **C.** Inner retinal folds (>200 µm) appear to be oriented in a vertical line on the horizontal axis. **D.** Outer retinal folds (>200 µm) appear to be oriented in a horizontal line on the horizontal axis. **E.** Four panels of horizontal folds in the macular region. They are best imaged with an OCT (E) or encephalographically oriented line scan OCT or cross tomogram. **F.** Choroidal folds are widely spaced (>100 µm) and appear to be oriented horizontally or vertically across the macular area (E). **G.** and **H.** are fundus photographs associated with the PPF syndrome (P). In patients with structural hypertension, choroidal folds correlate with structural damage and anterior tissue apposition of the peripapillary tissues. They are best imaged with a peripapillary swept-subsectional OCT (G) or cross tomogram. OCT, optical coherence tomography; PPF, retinal pigment epithelium.

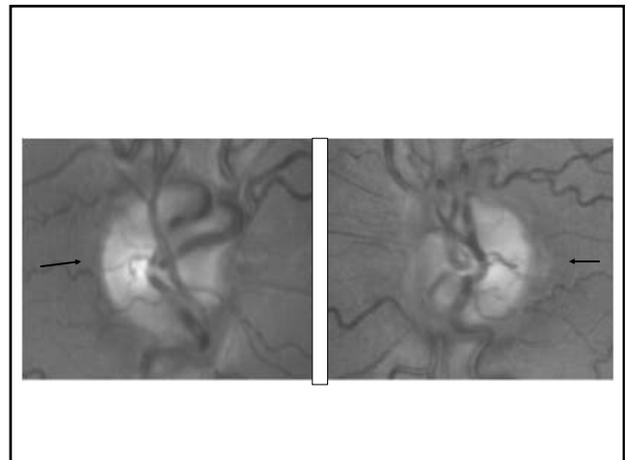
Sibony PA, et al. J Neuro-Ophthalmol 2023

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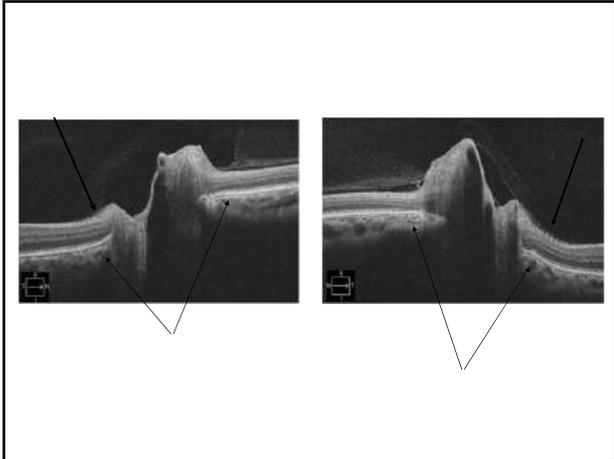
41 y/o Female

- C/o chronic daily headaches
- + SPT
- BMI: 46
- BVA:
 - 20/20 OD
 - 20/20 OS

23



24

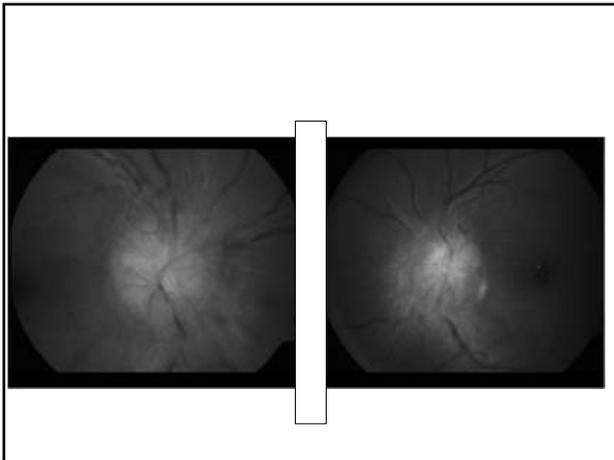


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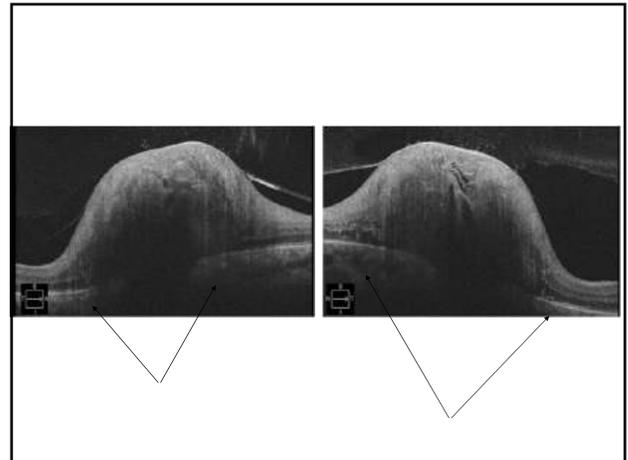
40 y/o Female

- C/o chronic daily HAs
- + SPT
- BMI = 44
- BVA:
 - 20/40 OD
 - 20/40 OS

26



27

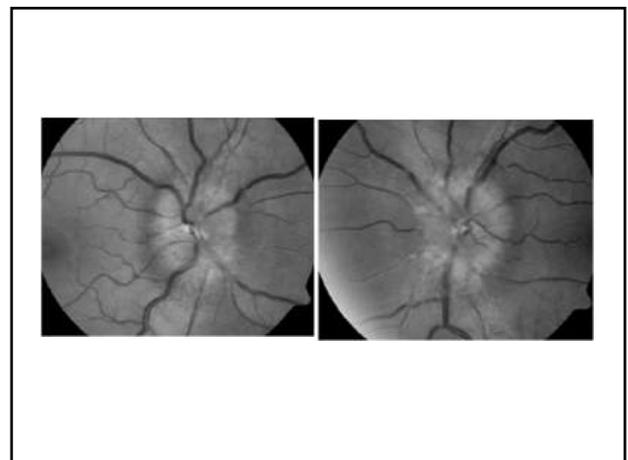


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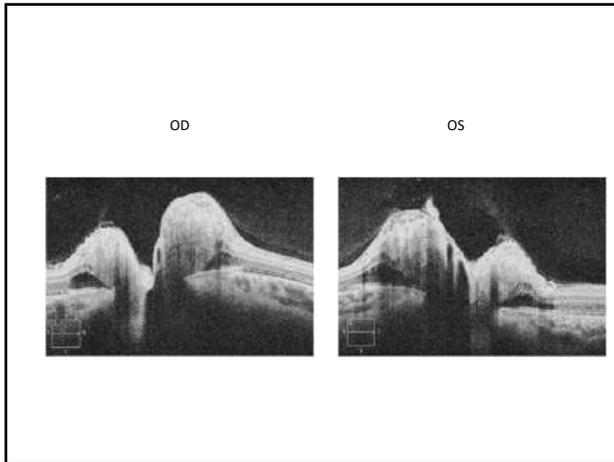
32 y/o Female

- c/o progressive, debilitating headaches x 2 mos.
- + SPT
- Normal neurologic exam
- BVA:
 - 20/20 OD
 - 20/20 OS
- BMI: 38

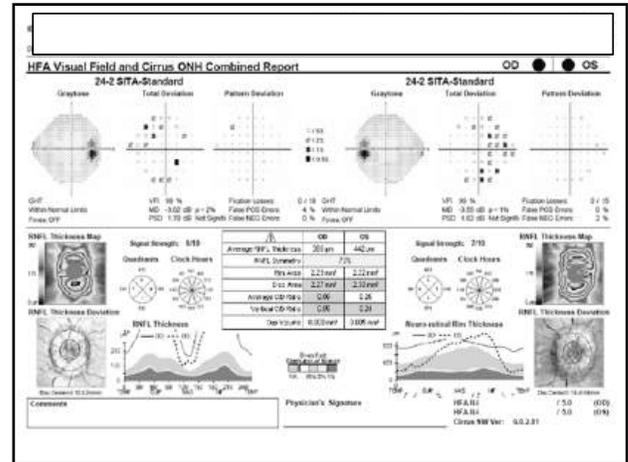
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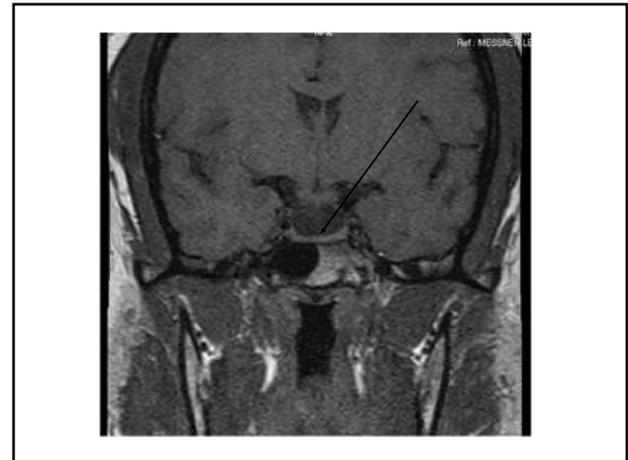
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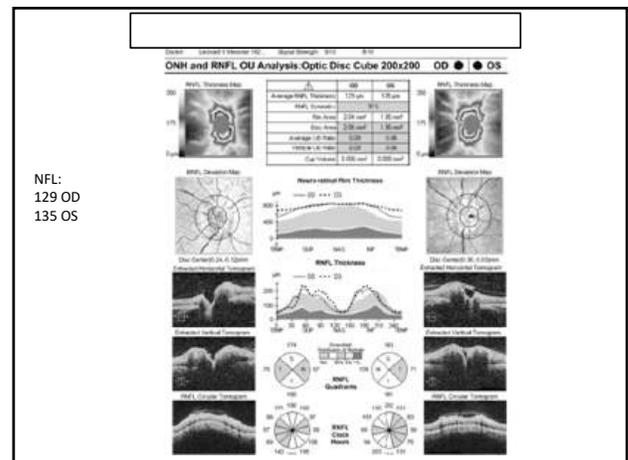


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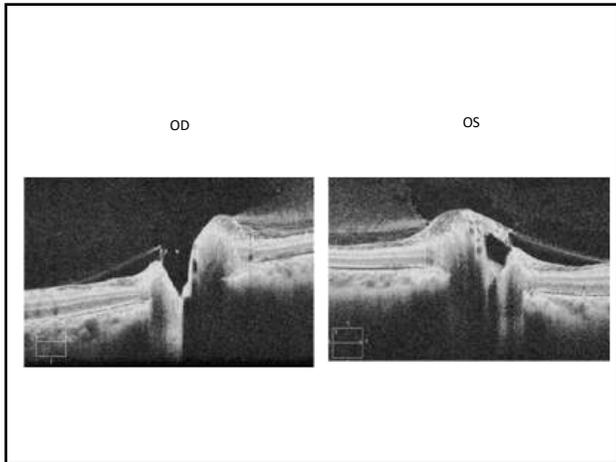
F/U x 6 mos

- Rx acetazolamide (500 mg BID)
- Weight loss (approx. 25 lbs.)
- Improvement in headaches

35



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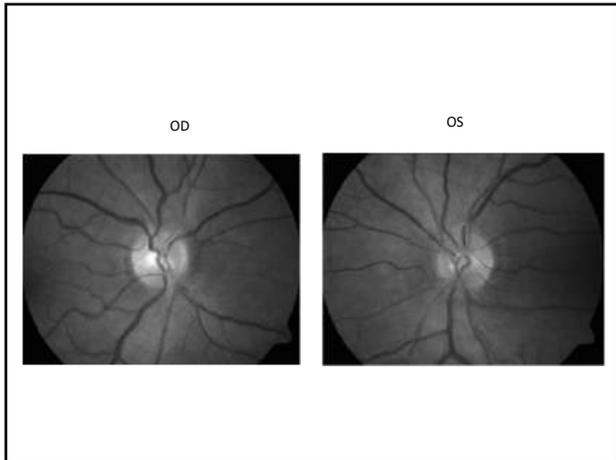


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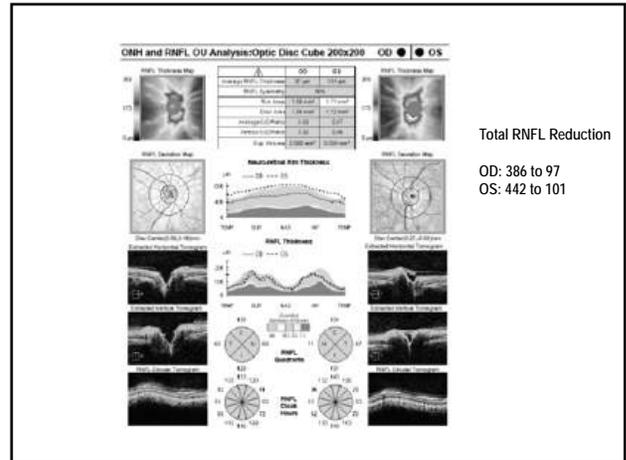
F/U x 14 mos

- D/C acetazolamide x 3 months
- Weight loss (BMI reduction from 38 to 30)
- Headache free

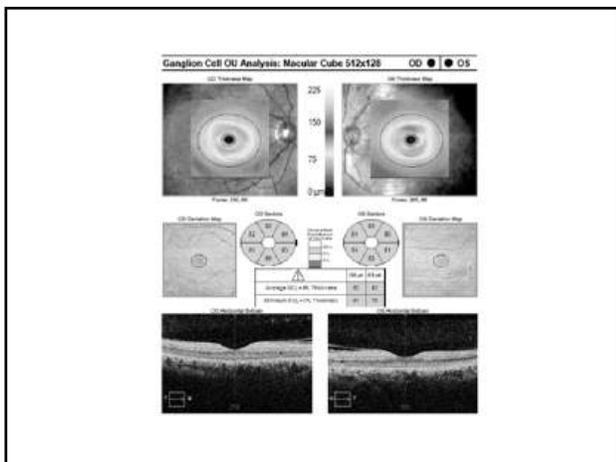
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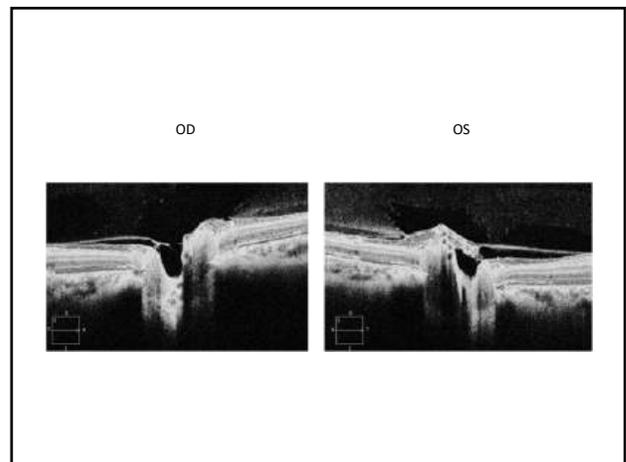
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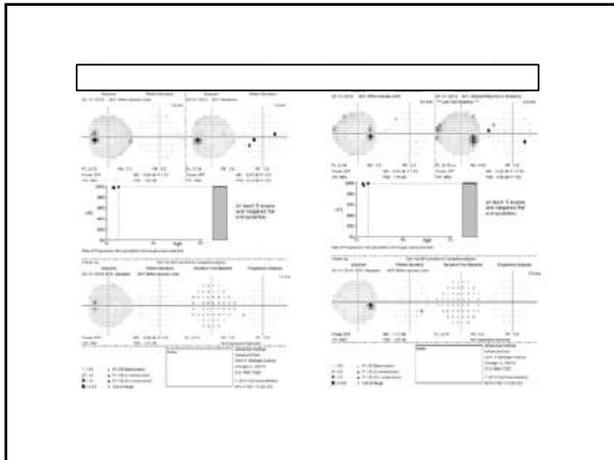
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41



42



43

OCT Analysis of “Pseudoapilledema”

- Increased NFL thickness (+/-)
- Elevation & crowded optic disc
- Lumpy, irregular internal nerve contour (disc drusen)
- No “lazy V” hyporeflective pattern
- Absence of central cup
- Neutral / negative RPE/BM deflection

Flores-Rodriguez P, et al. *Ophthalmic Physiol* 2012
 Lee KM, et al. *Ophthalmology* 2011
 Kupersmith MJ, et al. *IOVS* 2011

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Optic Disc Drusen

- Colloid bodies within substance of optic nerve head (anterior to lamina cribrosa)
- Degeneration of NFL axons (owing to narrow posterior scleral foramen/Bruchs membrane opening)
- Axonal stress → elevated axonal phosphate → intracellular and extracellular mitochondrial calcifications– optic disc “kidney stones”
- NFL may be thickened (typically < 7 clock hours) or thinned

Joyce Liao MD NANOS 2023

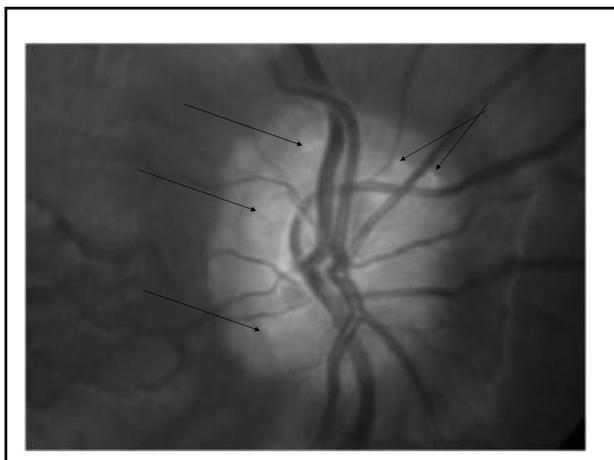
45

OCT Characteristics of Optic Disc Drusen

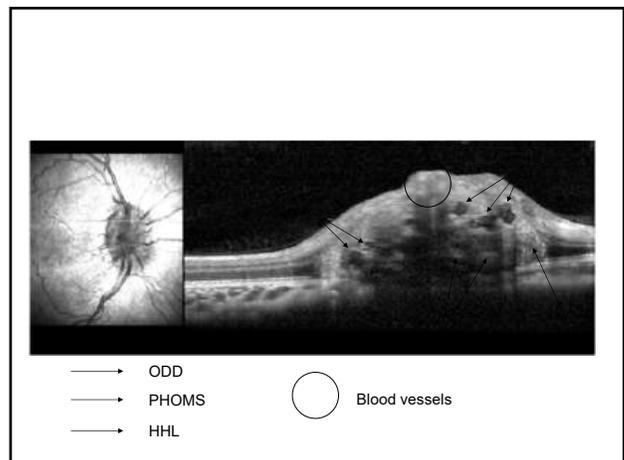
- Always located above the lamina cribrosa
- Always have signal-poor core (albeit with small, internal hyperreflective spots)
- Often seen with hyper-reflective margin (most prominent superiorly)
- Sometimes seen as conglomerates of multiple ODD with internal reflectivity of the signal-poor core
- Hyper-reflective horizontal lines may be precursor to ODD
- Peripapillary hyper-reflective ovoid mass-like structures (PHOMS) representing bulging axons and should not be considered as ODD
 - (evident 360 degrees-corresponding “blurred” disc margins)
 - Associated with CVO, myopic disc tilt, optic neuritis, other optic neuropathies)

Malmqvist L, et al. *J Neuro-ophthalmol* 2018
 Fraser C. *NANOS* 2021
 Sibony PA, et al. *J Neuro-Ophthalmol* 2023

46



47

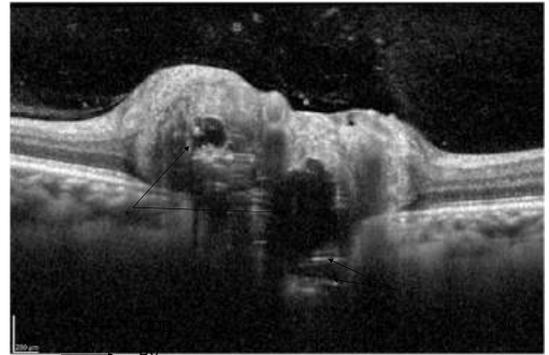


48

33 y/o Female

- Consult for evaluation of ODE OS
- BVA
 - 20/20 OD
 - 20/20 OS
- Normal neurologic exam
- No HAs, synchronous pulsatile tinnitus, diplopia or transient vision loss

49

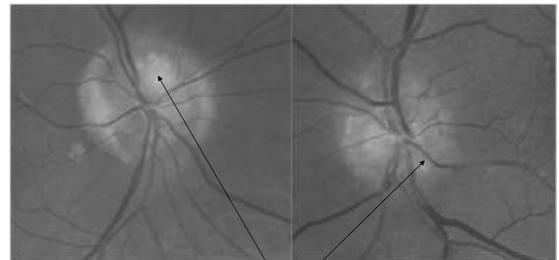


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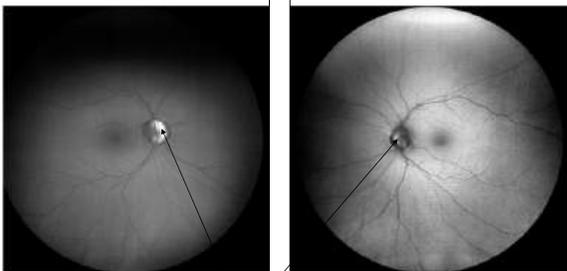
64 y/o Male

- BVA
 - 20/20 OD
 - 20/20 OS
- Normal neurologic exam

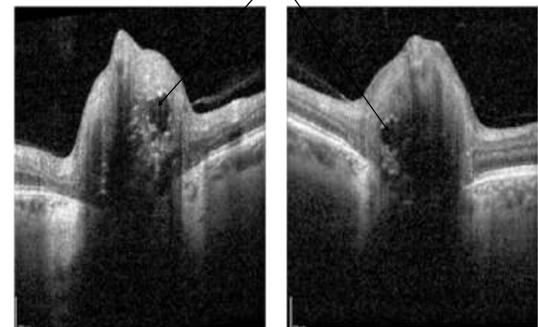
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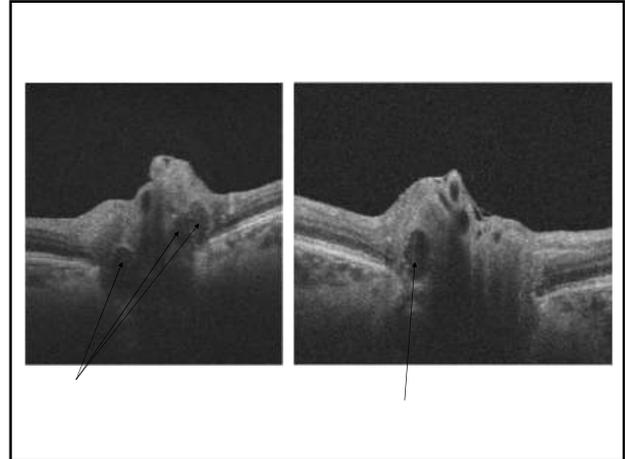


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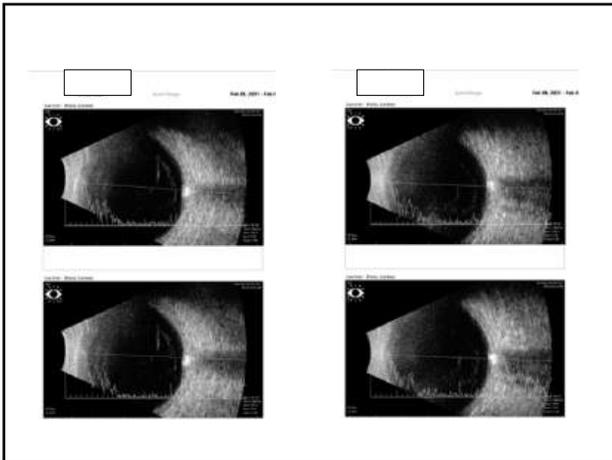
62 y/o Female

- C/o blurry vision OD > OS over past year
- H/o DED (Tx = ATs)
- BVA
 - 20/25 OD
 - 20/25 OS
- No headaches, synchronous pulsatile tinnitus, diplopia or transient vision loss

63



64



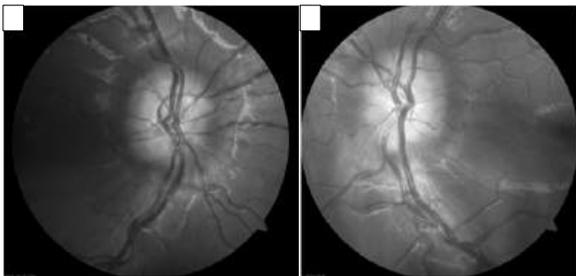
65

7 y/o Male

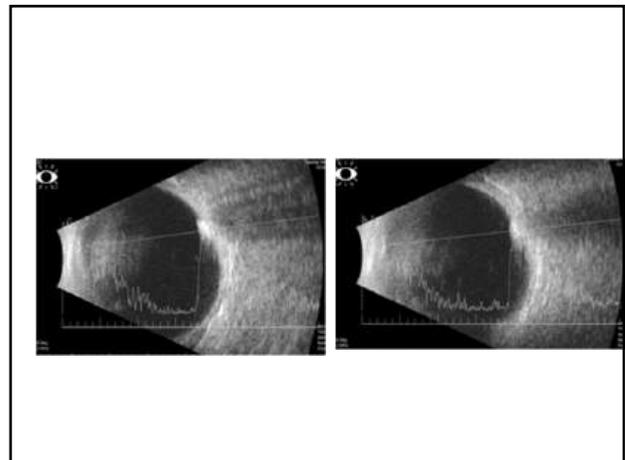
- BVA
 - 20/20 OD
 - 20/20 OS
- Normal neurologic exam
- No headaches, synchronous pulsatile tinnitus, diplopia or transient vision loss

66

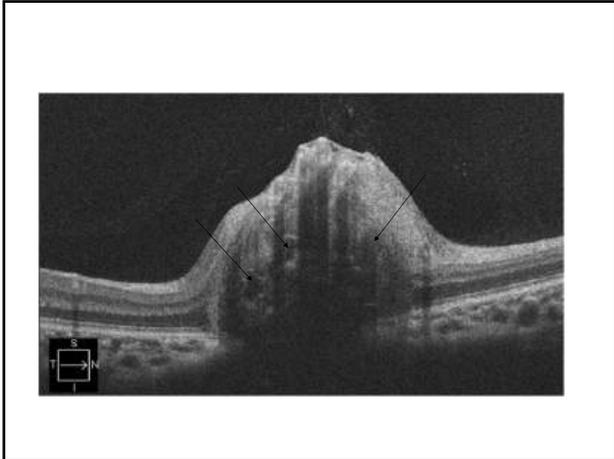
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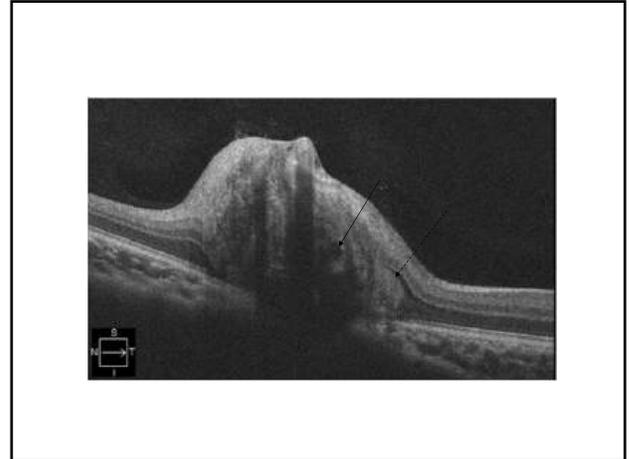
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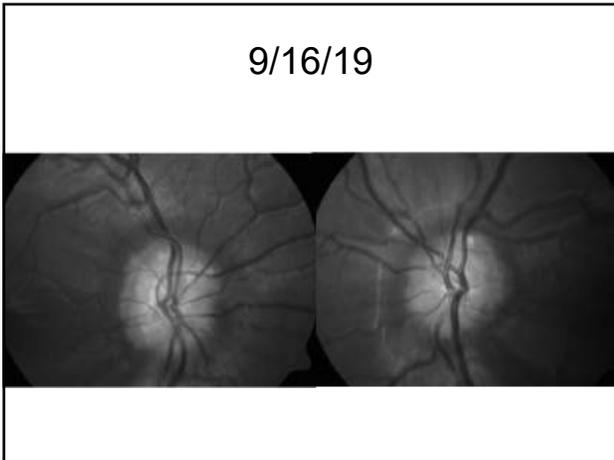
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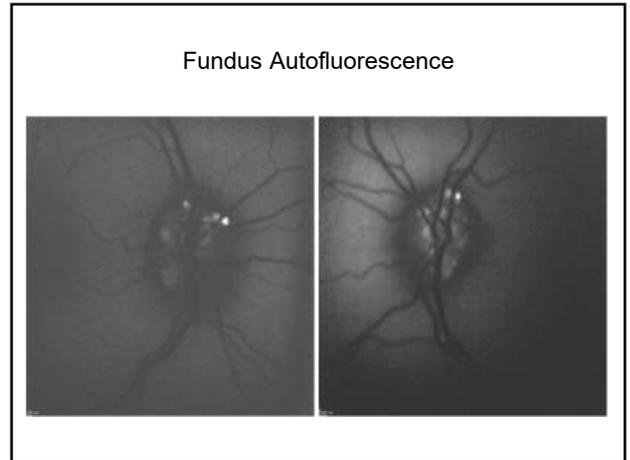
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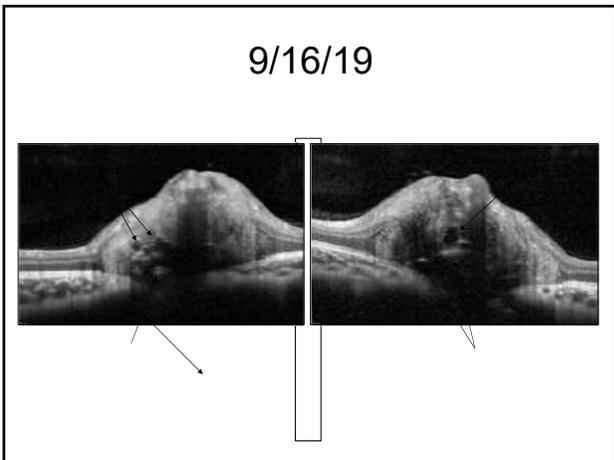
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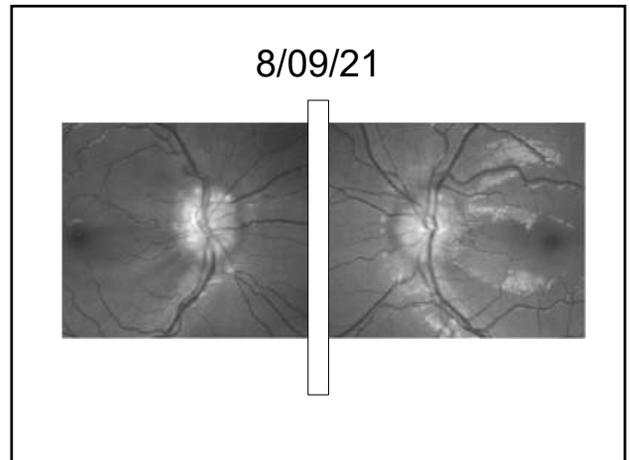
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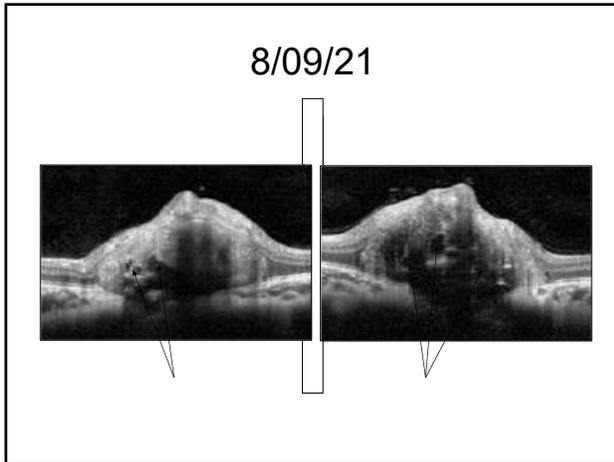
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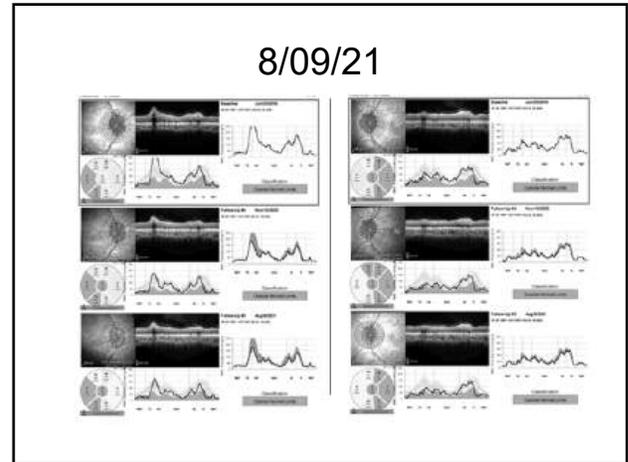
73



74



75



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Complications of ODD

- Progressive NFL thinning – visual field defects
- AION (50% of NAION under 50 yrs.)
- BRVO
- CNV

Steffan Hamaan MD NANOS 2024

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What is that white ring around the disc?

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PHACOMES

- Herniated axons that overlap the scleral foramen
- Optic disc “love handles”

Alex J. Fraser MD NANOS 2024

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Idiopathic Intracranial Hypertension

(Pseudotumor Cerebri Syndrome)

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Papilledema is the most common cause of optic disc edema

IIH is the most common cause of papilledema

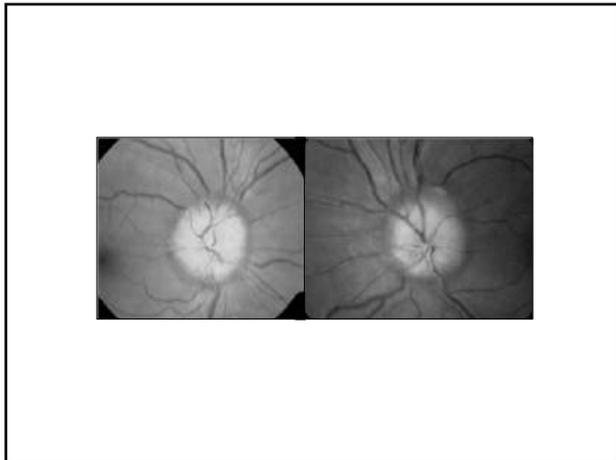
Jhaveri A, et al. J Neuro-ophthalmol 2025

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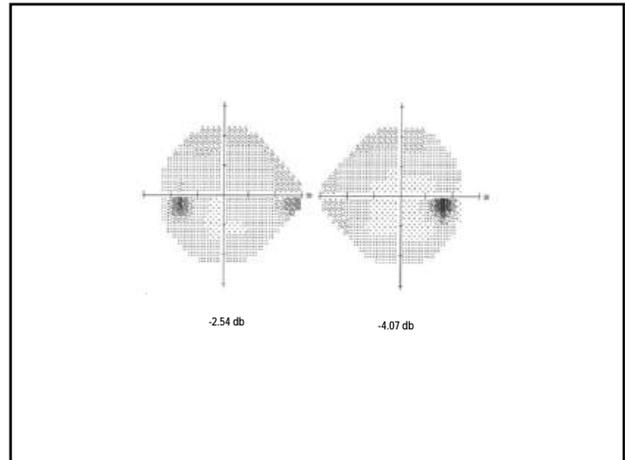
34 y/o Woman

- VA = 20/20, OU
- + HA x 2 yrs.
- Normal neuro exam
- BMI: 39

82



83



84

DURING the past seven years there have gradually accumulated 22 cases in each of which the signs and symptoms of intracranial pressure have been indubitable, and yet in none has there been an intracranial tumor or a space occupying lesion of any kind. Almost without exception a clinical diagnosis of an unlocalized brain tumor has been made; but by ventriculography a brain tumor has been excluded. All of these patients have complained of headache.

Dandy WE. Ann Surg 1937

85

Editorial Comments

Whence Paratubercle Cerebri?

1. Signs and symptoms of increased ICP (notably HA and papilledema)
2. No localizing neurologic findings (with the exception of CN VI palsy)
3. Elevated ICP with normal cytology
4. Normal neuroimaging (predominantly by CT) with no evidence of ventriculomegaly or structural lesion.

Smith J. J Clin Neuro-ophthalmol 1985

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Revised Diagnostic Criteria for the Pseudotumor Cerebri Syndrome in Adults and Children

1. Signs and symptoms of increased intracranial pressure
2. Absence of localizing findings on neurologic examination
3. Absence of definite displacement or distortion of the ventricular system and other intracranial neuroanatomic findings, except for evidence of increased CSF pressure (>200 mm water) abnormal reformatting occurs for empty sella, torcula, optic nerve sheaths with filled out CSF spaces, and sheaths with non-flow related venous sinus stenosis or collapse should lead to another diagnosis
4. Awake and alert
5. No other cause of increased intracranial pressure present

For CSF opening pressure of 200-250 mm water required at least one of the following:

- Pulse synchronous fontus
- VI patry
- Proun grade II papilloedema

• Echography for thromboembolism and no other disc anomalies involving disc hernia present

• Magnetic resonance venography with lateral sinus collapse/stenosis preferably using auto triggered elliptic centric ordered technique

• Partially empty sella on coronal or sagittal views and optic nerve sheaths with filled out CSF spaces next to the globe on T2-weighted axial scans

Wall M, et al. Neurology 2014

87

Imaging Protocol for IIH

- MRI brain and orbits with and without contrast
- MRV

88

Neuroradiology Findings with IIH

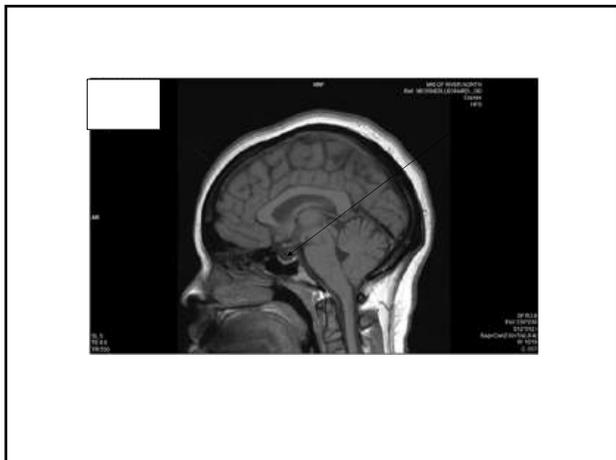
- Empty sella
- Posterior scleral flattening
- Optic nerve distension
- Ectopic displacement of cerebellar tonsils
- Dural venous sinus stenosis

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Neuroradiology Findings with IIH

- Empty sella
- Posterior scleral flattening
- Optic nerve distension
- Ectopic displacement of cerebellar tonsils
- Dural venous sinus stenosis

90



91

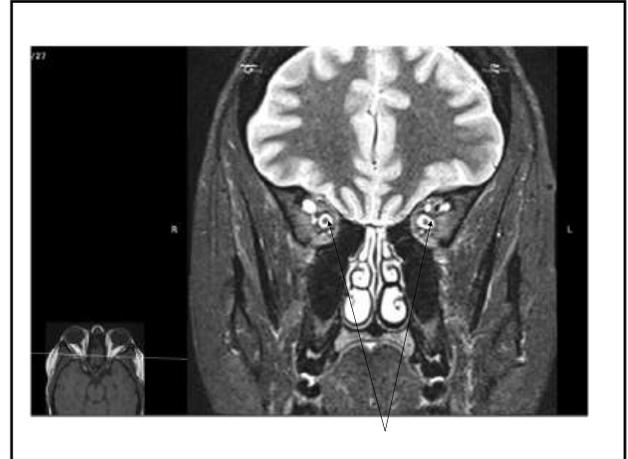
Neuroradiology Findings with IIH

- Empty sella
- Posterior scleral flattening
- Optic nerve distension
- Ectopic displacement of cerebellar tonsils
- Dural venous sinus stenosis

92



93



94

Neuroradiology Findings with IIH

- Empty sella
- Posterior scleral flattening
- Optic nerve distension
- Ectopic displacement of cerebellar tonsils (21%)
- Dural venous sinus stenosis

Aiken AH, et al. Am J Neuroradiol 2012

95



96

Neuroradiology Findings with IIH

- Empty sella
- Posterior scleral flattening
- Optic nerve distension
- Ectopic displacement of cerebellar tonsils
- Dural venous sinus stenosis (90%)

Farr R, et al. Neurology 2003

97

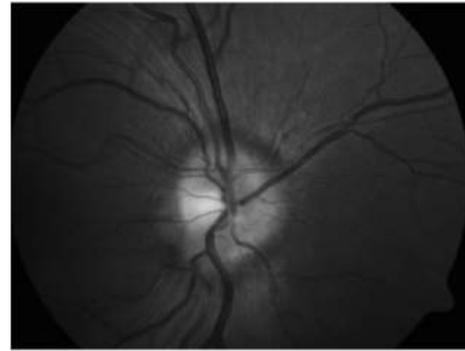


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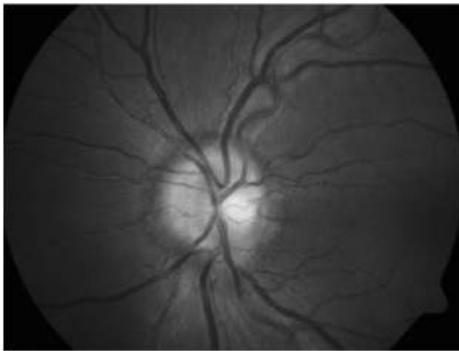
27 y/o AA Woman

- c/o moderate, progressive headaches x 1-2 month
- Normal neurologic exam
- BVA:
 - 20/20 OD
 - 20/20 OS
- BMI: 58

99



100



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Epidemiology of IIH

- 85 - 90 % female
- 15 to 44 years
- Obesity
- MAI = 0.9-1.7/100,000
 - 7.9-20.2/100,000 if obese female 15-44 yrs.

Glusoff V, et al. *Neurology* 1991
 Ireland B, et al. *Arch Neurol* 1990
 Radhakrishnan K, et al. *Arch Neurol* 1993

104

Pathogenesis of IIH

- Increased cerebral blood volume - *Raichle' 1978*
- Increased arachnoid resistance to CSF drainage - *Aisenberg' 1980*
- *Increased intra-abdominal pressure with cerebral venous hypertension - Sugerman' 2001*
- *Reduced CSF absorption by extracranial lymphatics - Johnston' 2006*

105

Baseline Clinical Profile (IIHTT)

- Headache (84%)
- Back pain (53%)
- Pulsatile tinnitus (52%)
- Vision loss (86%)
 - Transient vision loss (68%)
 - Symptomatic vision loss (32%)
 - Visual fields (5% > 15db) (86%)
 - Enlarged blind spot
 - Inferior nasal nerve fiber bundle defects

Wall M., et al. *JAMA Neuro* 2014

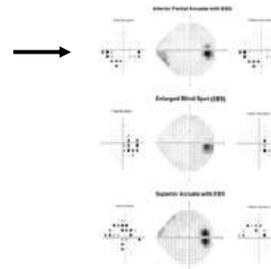
106



- 60% of baseline fields showed evidence of nerve fiber bundle-type VF loss
- Partial arcuate defects combined with enlarged blind spot most common (31.5% of all fields)
- Inferior hemifield loss most common

Keltner JL, et al. *IOVS* 2014

107



Keltner JL, et al. *IOVS* 2014

108

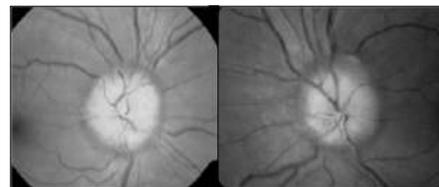
IIHTT Visual Field Performance Failures

- PF was identified in 21% of participants and in 2.7% of the total number of VF examinations and was reversible on repeat testing
- When perimetric worsening appears to have occurred in someone with papilledema who otherwise is clinically stable or improving, retesting is likely to reveal that the apparent worsening is due to poor performance rather than true worsening of the condition

Cello KE, et al. *J Neuro-ophthalmol* 2016

109

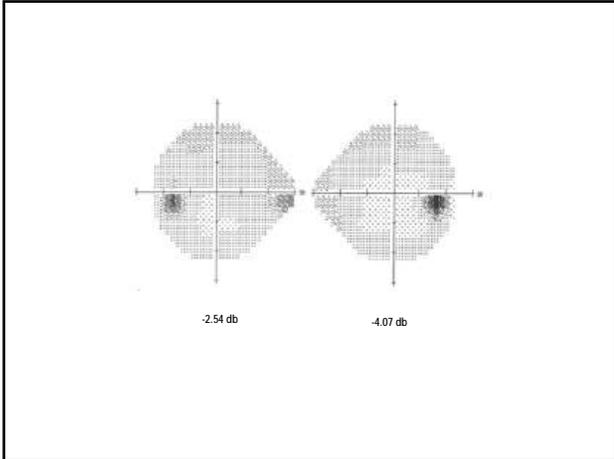
The rest of the story...



20/20

20/20

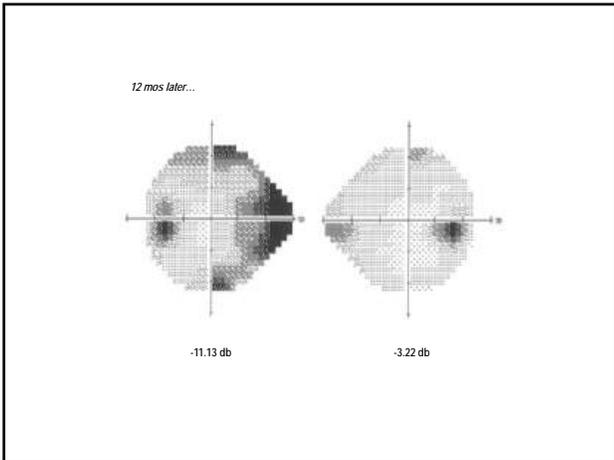
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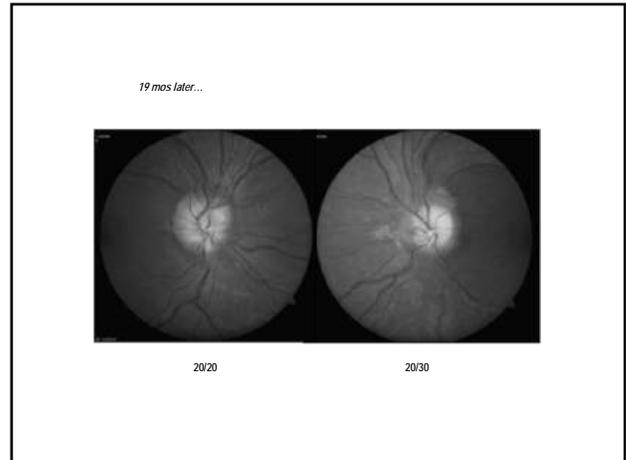
111

- MRI/V consistent with IIH
- LP = 32 cm H2O (normal cytology)
- Rx: acetazolamide 250 mg bid
- Lost to follow-up...

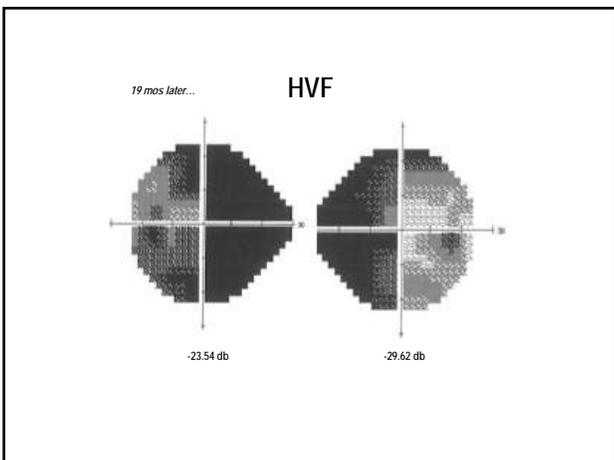
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115

Risk Factors for Poor Visual Prognosis

- Male gender
- African American
- Morbid obesity
- Marked weight gain
- Obstructive sleep apnea
- Concomitant medications
- Rapid onset of signs and symptoms of elevated ICP (fulminant IIH)
- Severe papilledema (Frisén grades 3-5)
- Lack of headaches
- Lack of ophthalmic oversight

Brousse V. NANOS 2013
Wall M, et al. Neurology 2015

116

Gender

- Men represent approx. 10% of all IIH
- Less likely to have headache ("estrogen factor")
- Less likely to seek care

Digne & Corbett Arch Neurol 1989
Bruce BB, et al. Neurology 2009

117

Race

- No strong influence on development of IIH
- African Americans = more aggressive disease:
 - 3X more likely to have severe vision loss
 - 5X more likely to develop blindness

Bruce BB, et al. Neurology 2008

118

Obesity

- NORDIC IIHTT ave. BMI = 39
- Increased severity of papilledema and visual loss if BMI ≥ 40
- Recent weight gain (5-15%) even in non-obese patients

Szewka AJ, et al. J Neuroophthalmol 2013
Wall & George. Brain 1991

119

Medications

- Many meds proposed to induce IIH, few test-retest data
- Tetracycline derivatives (minocycline)
- Leuprolide (Lupron), cyclosporine, lithium, nalidixic acid, nitrofurantoin, oral contraceptives, levonorgestrel, danaxol, and tamoxifen

Friedman DL. Am J Clin Dermatol 2005
Fraser CL, et al. Arch Neurol 2012

120

14 y/o Female

- HAs x 2-3 weeks
- Rx minocycline x 1 month for acne
- VA: 20/20 OU
- BMI: 23

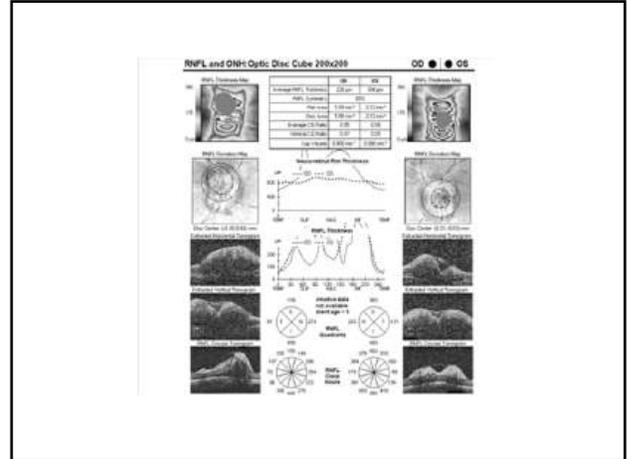
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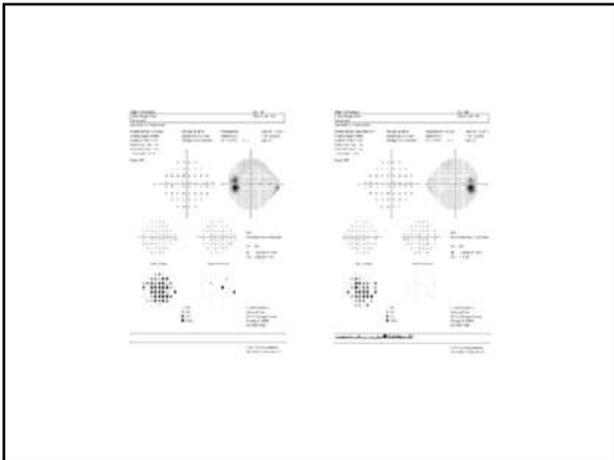
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123



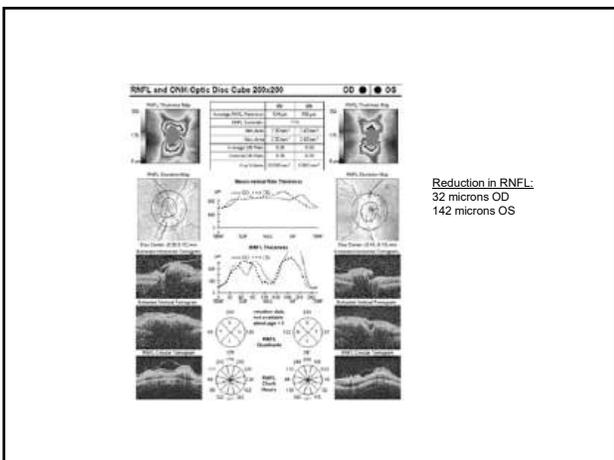
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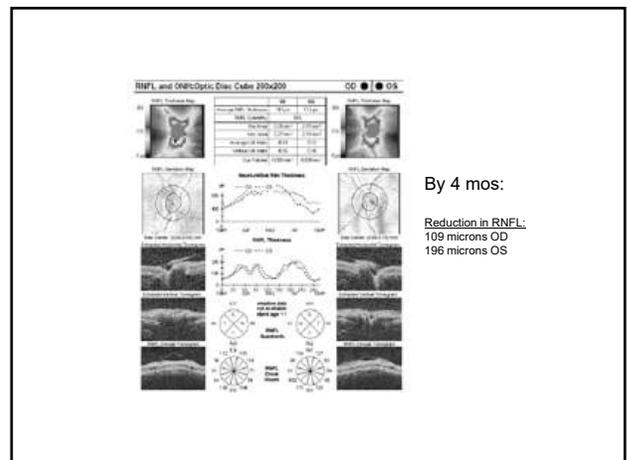
125

- MRI / MRV normal
- D/C minocycline
- Follow-up x 3 weeks...

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128

Co-Morbidities

- Anemia
- Hypertension
- Obstructive sleep apnea

Biousse V, et al. Am J Ophthalmol 2003
Wall M. Neurol Clin 2010

129

Other Clinical Findings Predictive of Poor Outcomes

- Absence of headaches
- Severity of papilledema (Frisén grade 3-5)
- Marked visual field defects at presentation
- Rapid onset of signs and symptoms (fulminant IIH)

Biousse V. NANO 2013

130

Management of IIH

- Observation
- CAI's / diuretics
 - Acetazolamide
 - Furosemide
 - Topiramate
- Surgery
 - VP/LP shunting
 - Optic nerve sheath fenestration
 - Venous sinus stenting
- Low sodium weight reduction program
 - 5-10% BMI

Wall M, et al. UpToDate 2021

131

A comparison of lumboperitoneal and ventriculoperitoneal shunting for idiopathic intracranial hypertension: an analysis of economic impact and complications using the Stavroside Register Study

Author(s): Menger RP, et al. Neurosurg Focus 2014

Conclusions: The presented results appear to call into question the selection of LP shunt placement as primary treatment for IIH, as this procedure is associated with a significantly greater likelihood of need for shunt revision, increased LOS, and greater overall charges to the health-care system.

Menger RP, et al. Neurosurg Focus 2014

132



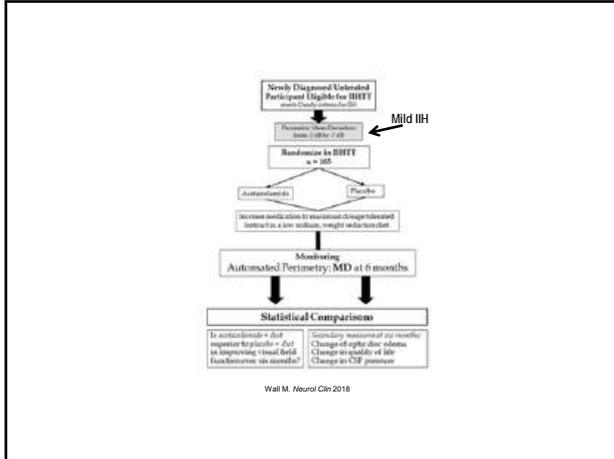
133

NORDIC IIH Treatment Trial



- Specific Aim 1: The trial is focused on determining the efficacy of low sodium diet with or without acetazolamide to reduce or reverse visual loss.
- Specific Aim 2: (a) To identify proteomic and genetic risk factors for IIH by screening a large cohort of IIH patients and controls.

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IIHTT 6-Month Results

- Acetazolamide better than diet alone for visual field improvement (PMD reduction of 1.43 vs. 0.71 db)
 - Greatest benefit with advanced papilledema (Frisen grade 3-5)
- Acetazolamide arm showed better weight reduction than diet alone
- Acetazolamide arm showed better resolution of papilledema, reduction in ICP & improvement of QOL scores vs. diet alone

Wall M, et al. JAMA Neurol 2014

136

The Idiopathic Intracranial Hypertension Treatment Trial: A Review of the Outcomes

Study Design: A multicenter, randomized, controlled trial.
 Population: Newly diagnosed, unselected participants with idiopathic intracranial hypertension.
 Interventions: Acetazolamide (4g daily) vs. diet alone.
 Outcomes: Visual field improvement, weight reduction, resolution of papilledema, reduction in ICP, and improvement in quality of life.

Conclusions: In the first large, randomized, prospective trial, the IIHTT extensively expanded the available data on idiopathic intracranial hypertension treatment. Most importantly, it provided support for the safe use of acetazolamide up to 4 g daily with weight loss for effective treatment of visual vision loss in IHH, with associated improvements in papilledema, increased intracranial pressure, and quality of life.

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32 y/o Female

- c/o progressive, debilitating headaches x 2 mos.
- Normal neurologic exam
- BVA:
 - 20/20 OD
 - 20/20 OS
- BMI: 38

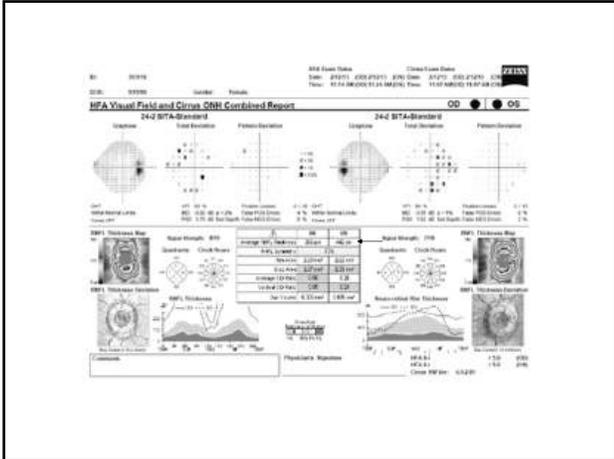
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139



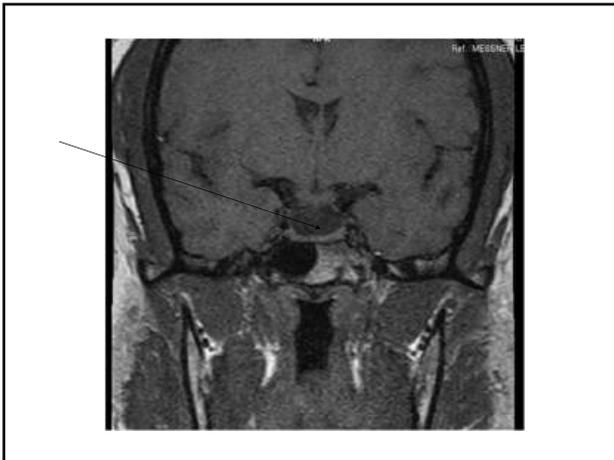
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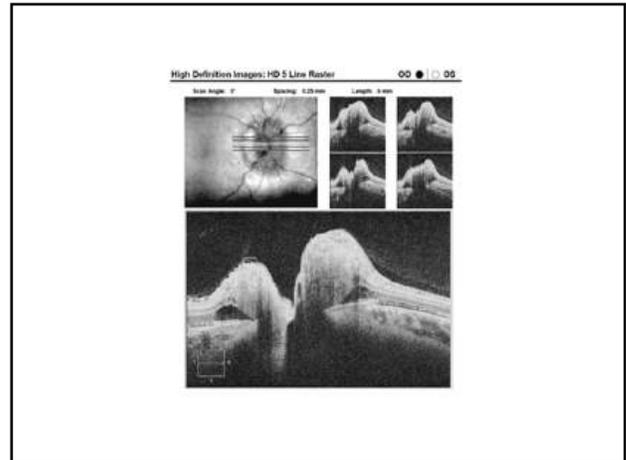
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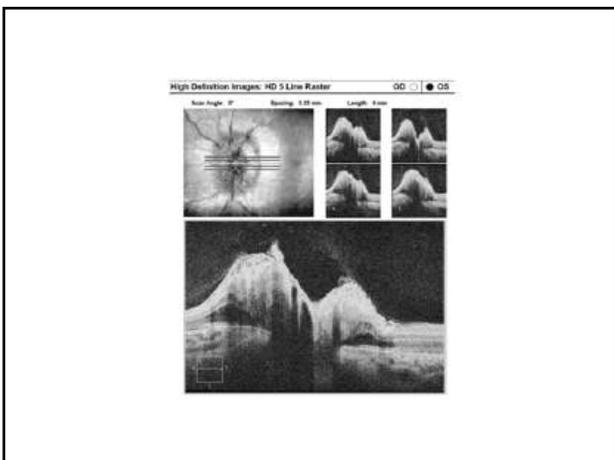
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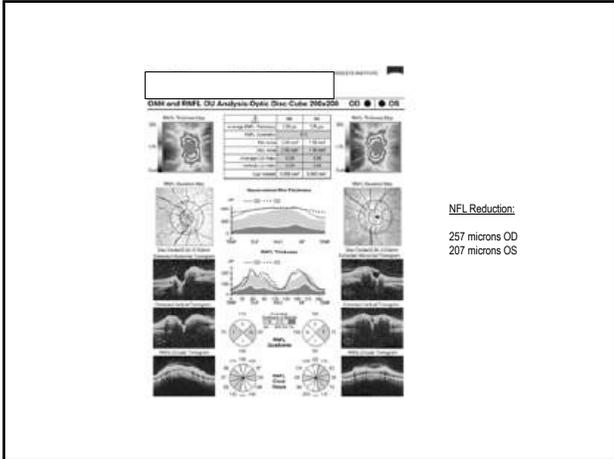


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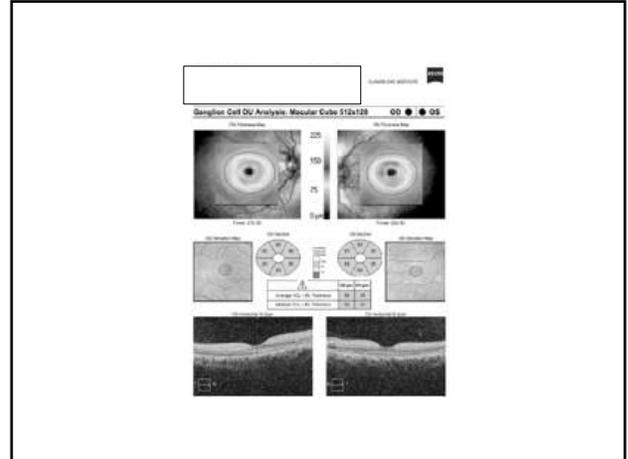
Rx acetazolamide 250 mg bid & weight loss program / 3-month follow-up

- Weight loss (approx. 25 lbs.)
- Significant improvement in headaches

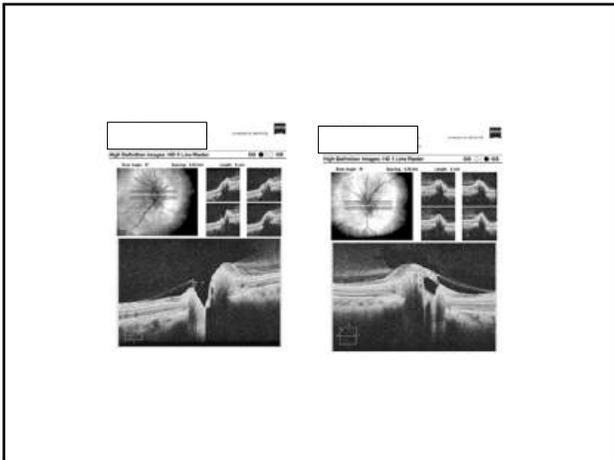
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150

F/U x 14 mos

- D/C acetazolamide x 3 months
- Weight loss (BMI reduction from 38 to 30)
- Headache free

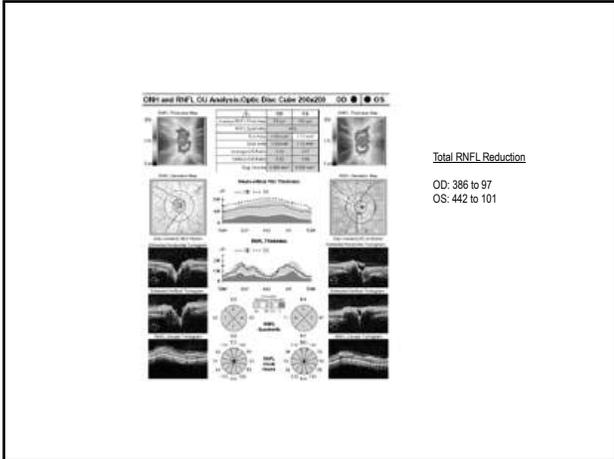
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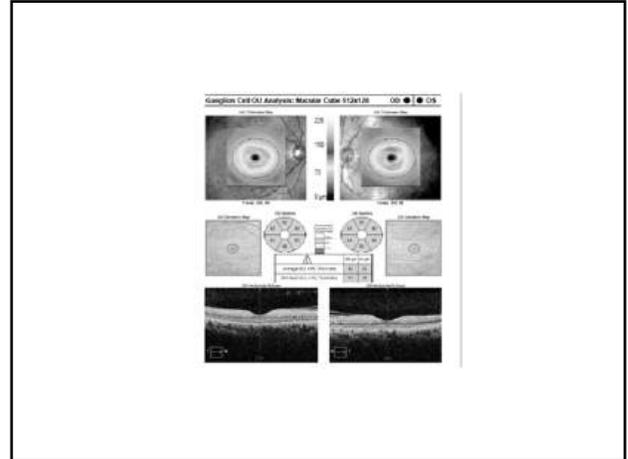
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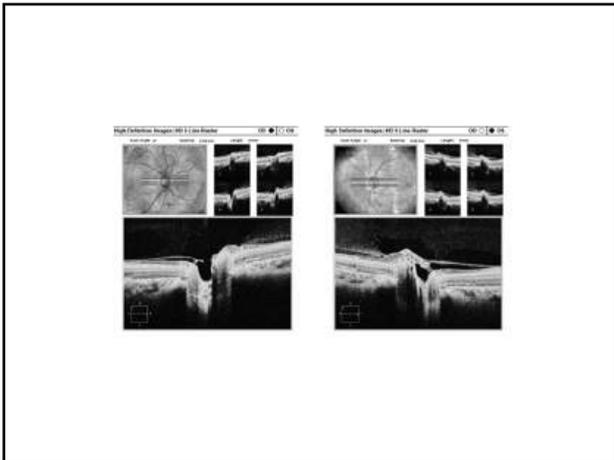
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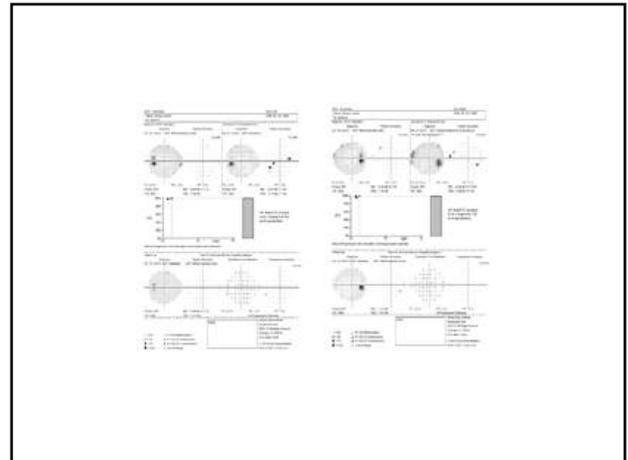
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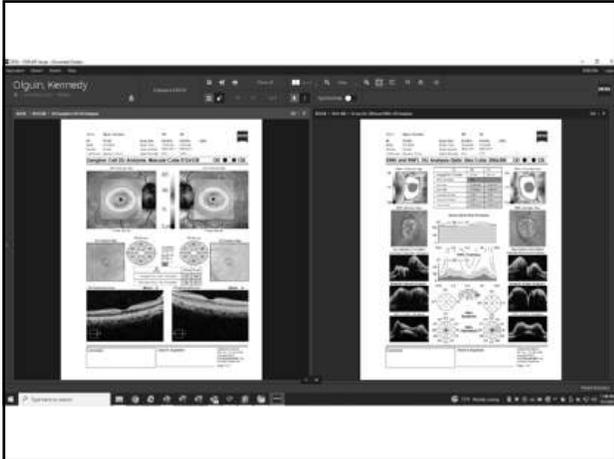
22 y/o Female

- c/o progressive, debilitating headaches x several months with lower back pain
- + SPT (worse in prone position)
- Normal neurologic exam
- BVA:
 - 20/20 OD
 - 20/20 OS
- BMI: 42

158



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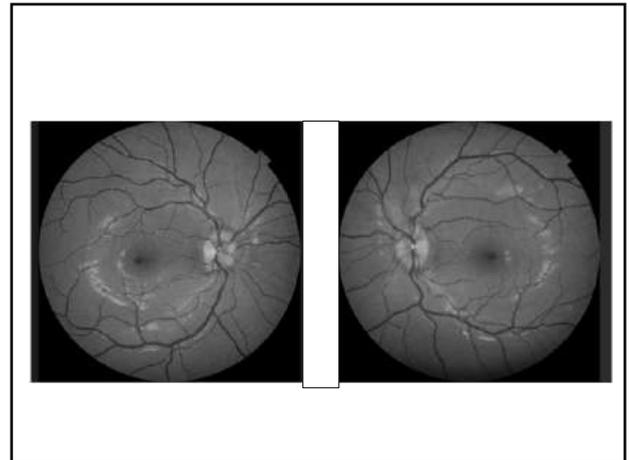
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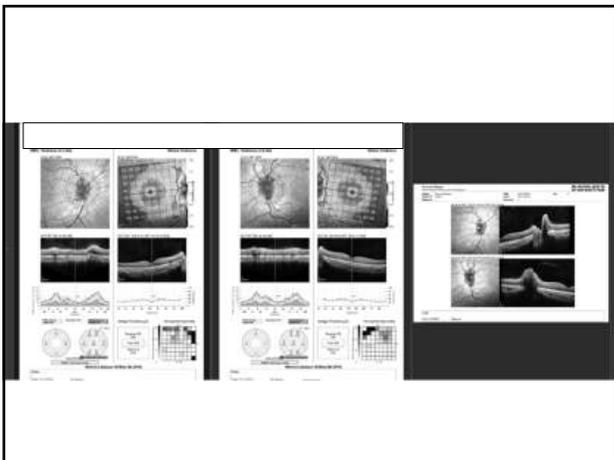
161

- Neuroradiology consistent with IIH
- Rx acetazolamide 250mg tid
- f/u X 6 months...

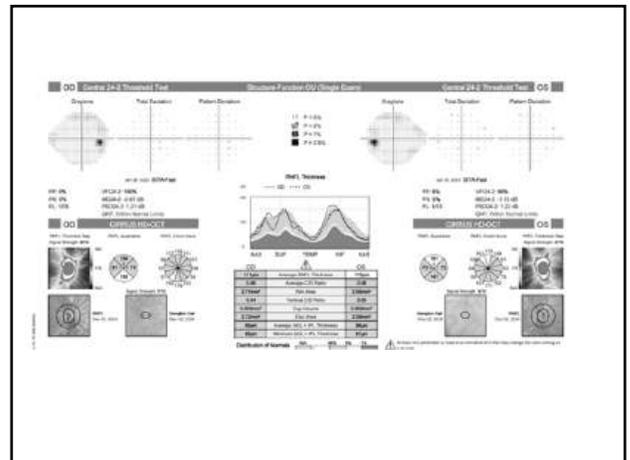
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163



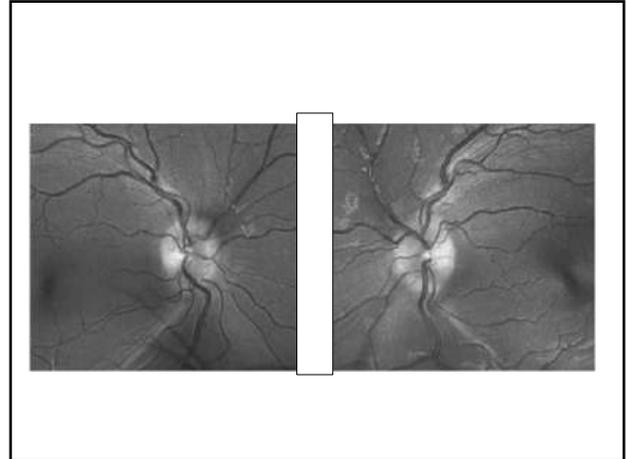
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165

- Significant improvement of headaches, SPT & back pain
- Reduced acetazolamide to 250mg qd
- f/u x 6 months...

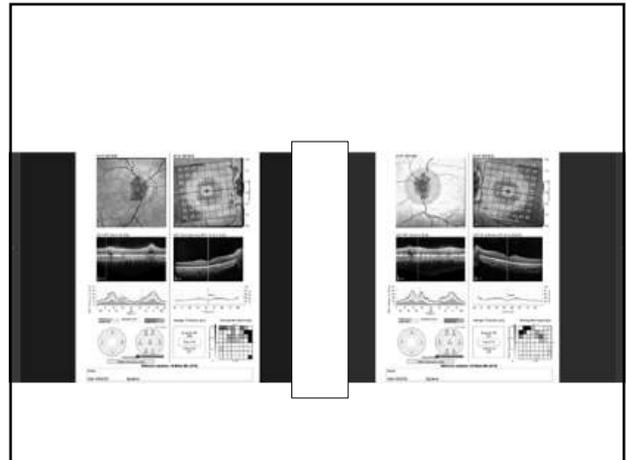
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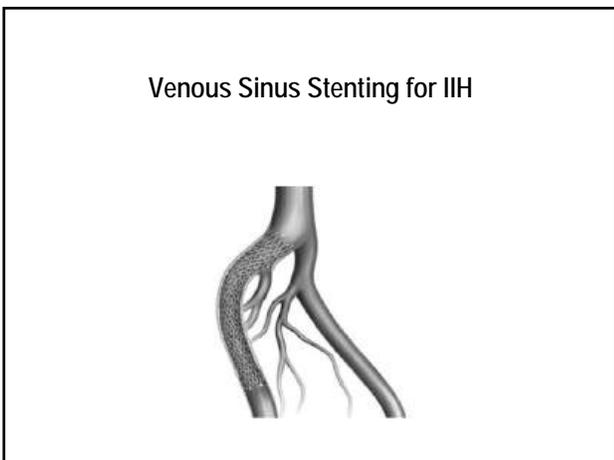
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STATE-OF-THE-ART REVIEW

Idiopathic Intracranial Venous Hypertension: Toward a Better Understanding of Venous Stenosis and the Role of Stenting in Idiopathic Intracranial Hypertension

Dirkin, Marc L, MD, Focalsalinas, Brian MD, MPH
Editor(s) Cavafis, Flora MD, FRCPC, FRCPC, FRCPC, FRCPC, FRCPC
Author Information(s)

Journal of Neuro-Ophthalmology 43(2): 47-60, December 2023 | DOI: 10.1097/WNO.0000000000000488

- Meta analysis of 49 studies / 1626 subjects
 - 13.3 cm H2O average reduction in opening pressure (33 -19.7)
 - 84.7% reduction in SPT
 - 79.6 reduction in transient vision loss
 - 93% resolution of diplopia
 - 76.7% resolution/improvement in HA
 - 78.2% resolution/improvement in papilledema
 - 35.8% improvement in VF MD db (-7.35 to -4.72 db)

Dirkin M, et al. J Neuro-Ophthalmol 2023

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Indications for Venous sinus Stenting

- Patients who are refractory or intolerant of medical management
- Patients with “fulminant papilledema” with advanced vision loss at baseline
- Patients without papilledema with intractable HA

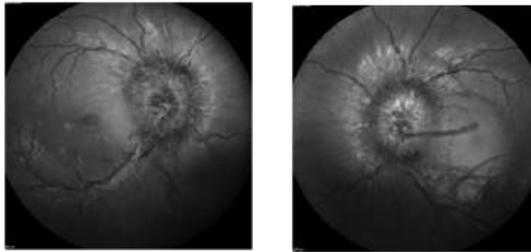
Dinkin M, et al. J Neuro-Ophthalmol 2023

172

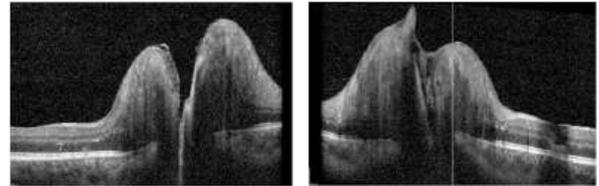
23 y/o Male

- c/o progressive headaches X several months.
- +SPT (> when lying down)
- Recently discharged from ED/hospital for accelerated hypertension. MRI done – read as “normal.”
- BVA:
 - 20/30 OD
 - 20/50 OS
- BMI: 29

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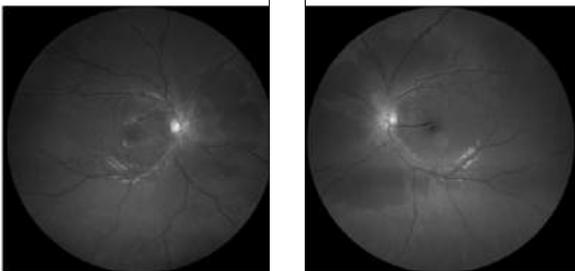


NFL: 408

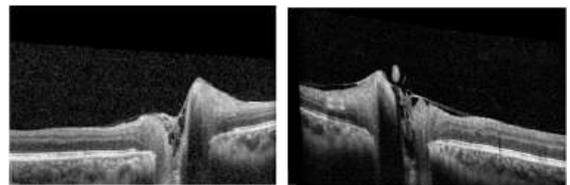
NFL: 330

175

1 month S/P VS stenting
Complete resolution of HAs and SPT
Normalization of BP



176



NFL: 130

NFL: 117

177

But what if I still have a headache?

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Headache with IIH

- Most common symptom with IIH (84% in IIHTT)
- 41% with prior history of migraine
- 2/3 persistent HA after remission of IIH (improvement of papilledema)
 - Sensitization of peripheral & central neurons over time

Friedman DI. NANOS 2019

179

Key Points

- Defining papilledema vs. pseudopapilledema
- Stages of papilledema
- Clinical and OCT features of papilledema
- Clinical and OCT features of pseudopapilledema
- Evaluation and management of IIH

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Thank you!



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