Salus at Drexel University
The Eye Institute

Pennsylvania College of Optometry
The Focal Point
September 2024 Edition

Ryan Feng
Scholars Class of 2026

Hometown: New York
Undergrad: City University of New York, Hunter College
Major: Chemistry, Art History
Favorite Animal: Giant Turtles
Optometry Goal: Getting the Bag
Favorite instrument: Maracas
Hobby: Treading Water
Last Show I binged: How to make a focal point - Youtube

Lauren White, OD
Pennsylvania College of Optometry 2019

Hometown: Virginia Beach, VA
Undergrad: Old Dominion University
Major: Biological Sciences
Favorite Diagnostic Instrument: manual keratometry
Hates: everything about coffee
Hobby: weight lifting, scuba diving, circus sports

The Case of Afferent Findings: How an Optic Neuropathy Stole the Spotlight from a Retinal Hole

Some details of the case have been changed to protect patient confidentiality. Though the NBEO PAM-Style format is utilized for the case write-up, there is no

Demographics

52 y/o Black Female

Chief complaint: blurry vision OU

History of present illness

Character/signs/symptoms: blurry vision
Location: OU
Severity: moderate
Duration: 6 months
Frequency: random with no pattern
Exacerbations/remissions:cool compresses aid with symptoms
Relationship to activity or function: none
Accompanying signs/symptoms: burning and pain

Patient ocular history

(+) “Black eye” OS in 20s secondary to assault (-)Glaucoma
(-)Ocular Surgery

Family ocular history

Mother: unknown
Father: Glaucoma

Patient medical history: Hypertension, Hypercholesterolemia, Pre-Diabetes, Sleep Apnea, Pulmonary Nodule, Heart Stent (2019)

Medications taken by patient: AIRSUPRA, atorvastatin, Brilinta, escitalopram, Kapspargo Sprinkle, montelukast, Vazalore, baby aspirin

Patient allergy history: Disomin, Hesperidin, Shellfish derived

Family medical history

Mother: unknown
Father: diabetes Type 2, hypertension

Review of systems

Constitutional/general health: denies
Ear/nose/throat: denies
Cardiovascular: denies
Pulmonary: Asthma, Pulmonary Nodule (-) shortness of breath
Endocrine: denies
Dermatological: denies
Gastrointestinal: denies
Genitourinary: denies
Musculoskeletal: denies
Neurologic: denies
Psychiatric: denies
Immunologic: denies
Hematologic: denies

Mental status

Orientation: oriented to person, place, and time
Mood/Affect: normal

Clinical findings

BVA:

	Distance	Near
OD:	20/50 PH: 20/30	0.4/0.6M
OS:	20/60 PH: 20/40	0.4/0.6M

Pupils: PERRL (+) 1.5-1.8 log units APD OS;
Bright Illumination: 4/4;
Dim Illumination: 6/6;
Direct response: reduced reactivity OS

EOMs: Full and Smooth OU, (-) diplopia, (-) eye pain

Confrontation fields: OD: Full to Finger Count and OS: mild constriction inferior temporal

Color Vision: 14/14 OD, 14/14 OS (Method: Ishihara Color Testing Plates)

Red Saturation: 40% Red Desaturation OS

Subjective refraction:

		VA Distance	VA Near
OD:	plano -1.50 x 095 ADD +2.00	20/20	0.4/0.4 M
OS:	-0.50 -1.50 x 080 ADD +2.00	20/25	0.4/0.4 M

Slit lamp:

Lids/lashes/adnexa: lids and lashes normal OU
Conjunctiva: bulbar conjunctival melanosis OU, limbal melanosis OU, palpebral conjunctival papillae OU, palpebral conjunctiva inclusion cyst OS
Cornea: normal tear film stroma, and endothelium OU; scattered punctate epithelial erosion OU
Anterior chamber: deep and quiet OU; VH 4 OU
Iris: flat and intact OU (-) NVI OU
Lens: clear lens capsule, cortex, and nucleus OU
Vitreous: syneresis and synchysis OU

IOPs/method: 11 OD, 13 OS / iCare

Fundus OD:

C/D: 0.2/0.2 well perfused, margins distinct with no elevations (-) NVD
Macula: flat and intact (-) dot blot hemorrhages (-) DME, (-) exudates, (-) cotton wool spots
Periphery: temporal llattice with pigmentation (-) retinal holes (-) NVE; retinal intact 360 with no retinal detachment/breaks

Fundus OS:

C/D: 0.35/0.35 1+ diffuse pallor, 2+ sectoral pallor superior temporal– ***see image 1***
macula: flat and intact (-) dot blot hemorrhages (-) DME, (-) exudates, (-) cotton wool spots
periphery: white without pressure inferior temporal; retinal hole and vitreous traction inferiorly otherwise no retinal detachment/breaks

Case Images

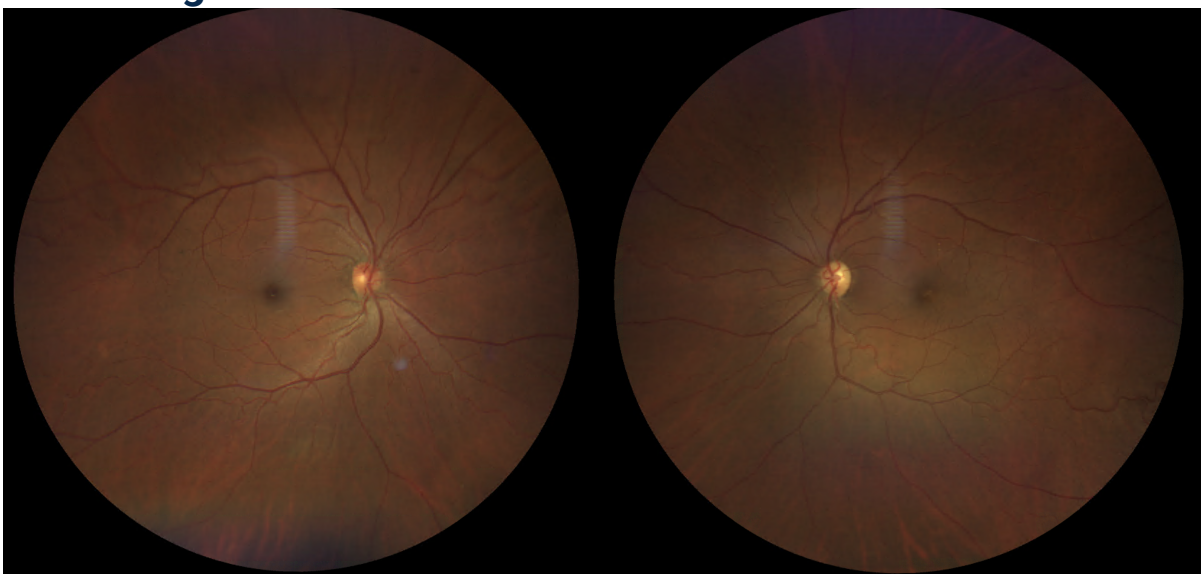

Image 1: Colored Clarus fundus photograph of the right and left eye, respectively.

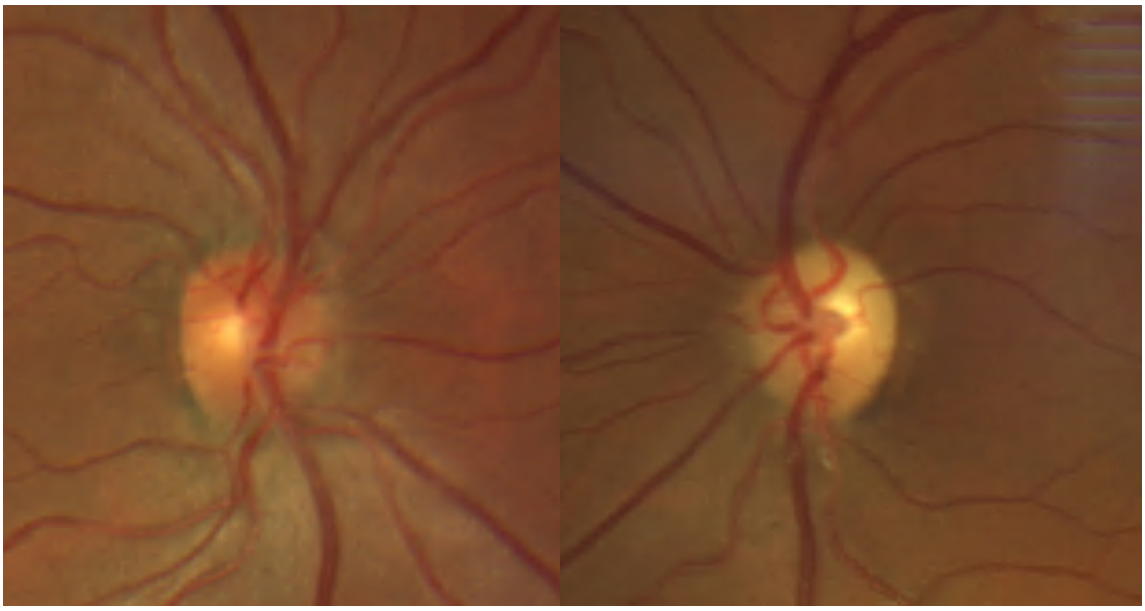

Image 2: Magnified colored Clarus photograph of the right and left optic nerve, respectively. Note asymmetric color or optic nerve and C/D ratio OS>OD.

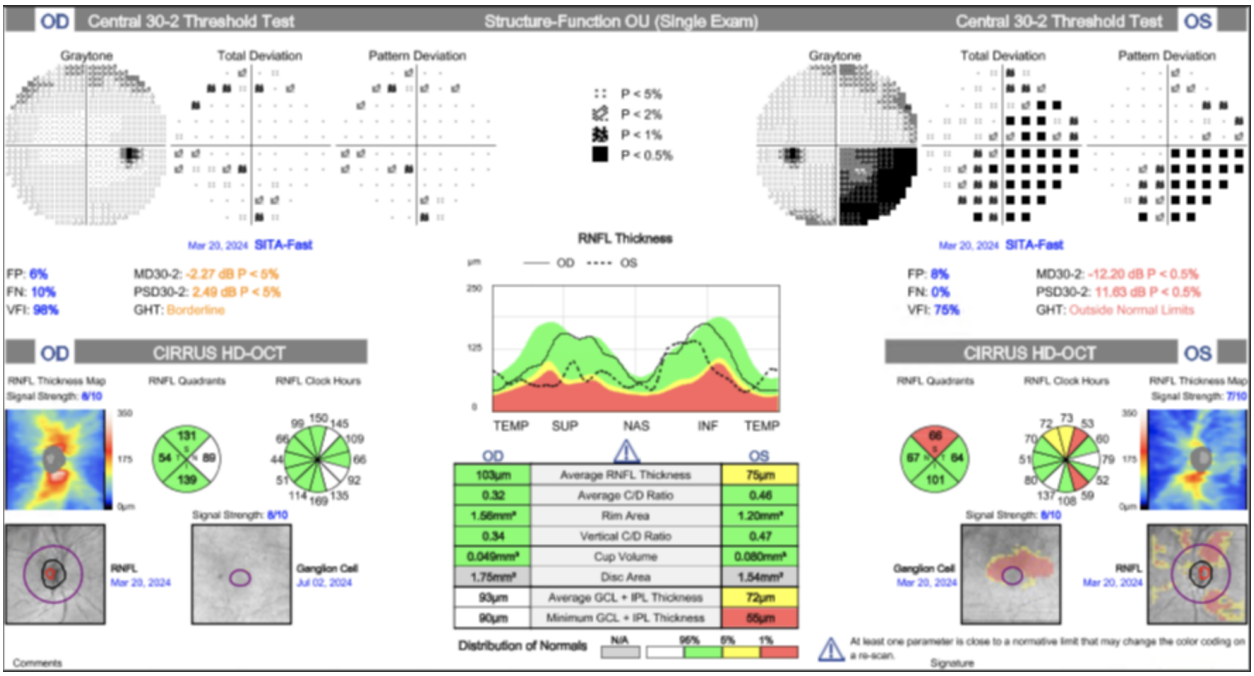

Image 3: Humphrey Visual Field 30-2 in conjunction with Cirrus OCT RNFL of the right and left eye, respectively. Note superior temporal>inferior temporal thinning OS paired with inferior nasal>superior nasal field loss.

Case Management Summary

Assessment 1: Other Disorders of Optic Nerve, NEC, left eye (H47.092)

- Patient history is significant for trauma at age 20 from a mugging attack
- Patient's BCVA 20/20 OD and 20/25 OS; slight reduced vision on the left eye with best correction
- (+) APD OS 1.5 - 1.8 log units with 40% red desaturation
- Dilated fundus exam: optic nerve head pallor with cupping OS
- HVF 30-2: inferior nasal>superior nasal defect OS
- OCT RNFL reveals NRR and RNFL thinning located at the superior temporal > inferior temporal quadrant

Plan 1: Other Disorders of Optic Nerve, NEC, left eye (H47.092)

- Patient was educated on today's exam findings. Informed the patient that further testing is needed to differentiate long-standing (traumatic) optic neuropathy versus progressive etiology. Patient was referred to NEURO service for further evaluation.

Assessment 2: Round hole, left eye (H33.322)

- Fundus Examination reveals a retinal hole that was observed in the inferior far periphery with mild traction and without subretinal fluid OS

Plan 2: Round hole, left eye (H33.322)
- Patient was educated on today's findings. Patient was educated on the increased risk of retinal detachment. Patient was referred to a retinal specialist for further evaluation.

Assessment 3: Type 2 Diabetes Melitus without complication (E11.9)
- Patient is currently monitored for pre-diabetes by her primary care provider. Patient reports to visit her primary care provider q6months frequently.
- Patient does not recall her HbA1c or record her fasting blood sugar.
- Ocular health examination reveals no signs of diabetic retinopathy, (-) NVI, NVE, NVD.

Plan 3: Type 3: Diabetes Melitus without complication (E11.9)
- Patient was educated on today's finding. Continue to monitor in 1 year.

Assessment 4: Keratoconjunctivitis sicca, not specified as Sjogren's, bilateral (H16.223)
- Patient reports of burning OU and eye pain on the right eye.
- Slit lamp examination reveals punctate epithelial erosions and papillae.

Plan 4: Keratoconjunctivitis sicca, not specified as Sjogren's, bilateral (H16.223)
- Patient was educated on today's findings. Patient was advised to instill artificial tears PRN OU. Continue to monitor in 1 year.

Assessment 5: Presbyopia (H52.4)
- Presbyopia OU. Patient was dispensed Rx with correction for compound astigmatic myopia with presbyopia,
- BCVA: OD 20/20 OS 20/25

Plan 5: Presbyopia (H52.4)
- Patient educated with today's findings. Rx was dispensed. Patient was advised to return to the clinic if difficulty with adaptation occurs. Will continue to monitor in 1-2 years.

Visit #2: Neuro Ophthalmic Disease Service

Pertinent Clinical findings

BVA: Distance
OD: 20/30 +2
OS: 20/50-2

Pupils:
PERRL (+) 1.8 log units APD OS;
Bright Illumination: 3.5/3.5
Dim Illumination 4.5/4.5

EOMs: Full and Smooth, (-) diplopia, (-) eye pain

Confrontation fields:

OD: Full to Finger Count. (-)red desaturation

OS: absolute defect inf nasal construction to near central (+)"orange" cap in remaining

field
Bright Saturation: 30% Bright Desaturation OS
Color Vision: 14/14 OD, 14/14 OS (Method: Ishihara Color Testing Plates)

Exophthalmometry: Base 105 OD: 20mm OS: 21.5mm
Ductions: 100% throughout OU
Cover test in 9 Positions of Gaze: 2XP distance primary gaze; ortho elsewhere
Eyelid: 9/9mm palpebral aperture; 5/5mm lid crease; 17/17mm levator function

Visit Imaging

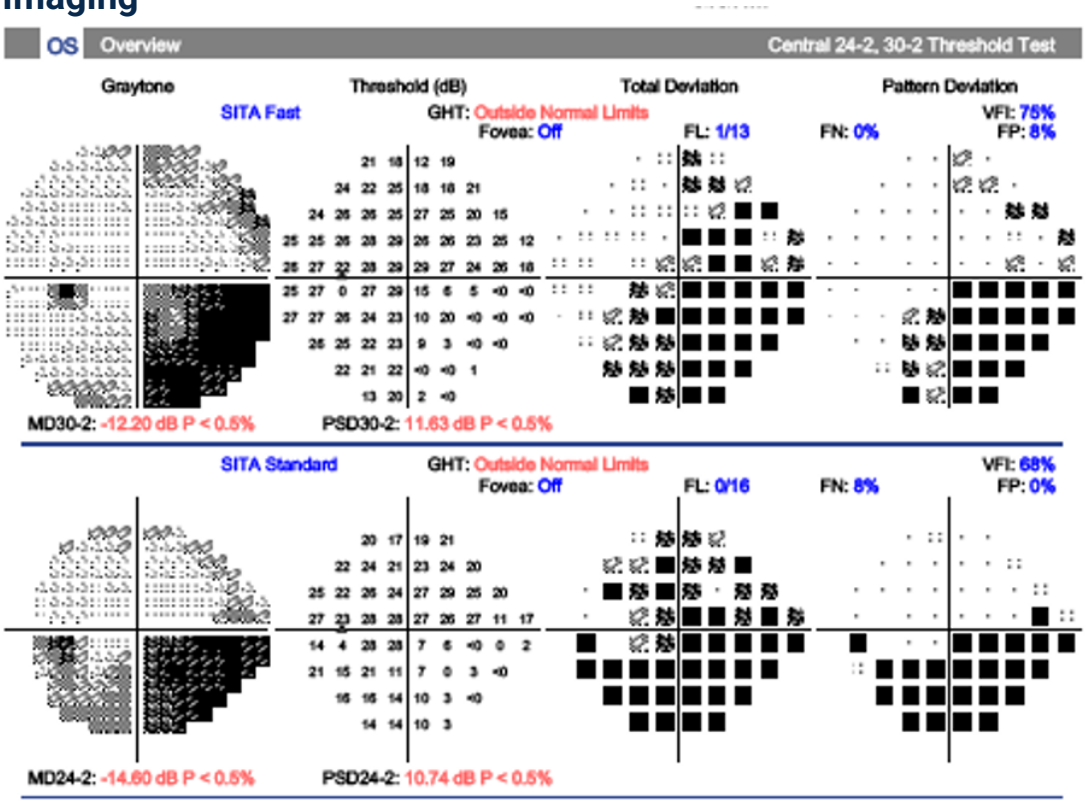

Image 4: Humphrey Visual Field 30-2 OS from initial visit superior and 24-2 from Neuro visit inferior. Review of Progression Analysis indicated possible worsening of inferior HVF OS.

Case Management Summary

Assessment 1: Other Disorders of Optic Nerve, NEC, left eye (H47.092)
"It is our impression that this patient presents with an optic neuropathy OS>>OD. This is evidenced on exam by a large APD OS and inferior visual field defect which correlates to thin RNFL/pallor superior in the left eye. She does have a history of trauma which may be contributing; however, OCT is suspicious for progression of RNFL ST and ***there is possible correlating worsening on VF****. pachy 516/526"*

Plan 1: Other Disorders of Optic Nerve, NEC, left eye (H47.092)

“pt was educated on today's findings. Despite history of trauma, given suspected progression of optic neuropathy in the setting of normal IOP, we feel as though further testing is indicated to rule out some potentially treatable non-glaucomatous etiologies.

Specifically we have recommended blood work including CBC, platelet, ESR, CRP, Vitamin B12, folate, homocysteine, methylmalonic acid, ACE, ANA, RPR, FTA-ABS, Lyme titer, SPEP, and BUN/Creatinine. Pending kidney function tests, we would then like to proceed with an MRI of the brain and orbit preferably w/w/o contrast to rule out compressive lesion. She does have a cardiac stent and provided card that noted MRI conditional for 1.5/3 Tesla Unit. Will be sure that she shares information with radiology and we will upon scheduling.

Lastly we have recommended a carotid ultrasound to rule out contributing stenosis. Educated to contact the office if pt completes testing and does not hear from us regarding results within a weeks time. Educated on importance of compliance with follow up care as if her IOP elevates loss of vision can result.

Suspicion for glaucomatous etiology is lowered due to APD, pallor and normal pressures and therefore we have not started IOP lowering drops, but as her father had glaucoma and her nerve may be more fragile from history of trauma, if additional testing is unrevealing for nonglaucomatous etiology will consider and discuss treatment with IOP lowering drops
She will return for monitoring in 3 months or sooner should she notice any changes to her vision or ocular status”

Pertinent Systemic Work-up Results:

Carotid Doppler: 50% stenosis bilaterally

Labs: CBC, platelet, ESR, CRP, Vitamin B12, folate, homocysteine, methylmalonic acid, ACE, ANA, RPR, FTA-ABS, Lyme titer, SPEP, and BUN/Creatinine
FTA-ABS: Not performed
Her eosinophils were mildly above expected (5%, normative 1-4%), likely consistent with allergies.
Her lymphocytes were additionally mildly elevated (44%, normative 20-40%)
All other testing was WNL

MRI Results pending

Case Pearls

- **History, history, history.** History doesn’t stop when you start VA testing. In this case, we were initially dismissive of the traumatic history. However, after abnormal unilateral findings, it helped inform our top differential diagnosis.
- **Supporting and aligning your clinical findings.**
    - If you start to identify abnormal findings on entrance testing, in this case VAs, pupils, and confrontations, don’t forget to reach for extra testing such as red desaturation, brightness desaturation, and color vision to complete the afferent work-up.

    - And, once you have a lot of clinical data, make sure it aligns into a cohesive narrative. For example, in our patient with inferior nasal field loss, aligned with the appearance of the optic nerve and OCT results.
    - Finally, align your clinical findings to your differential diagnoses. While glaucoma is a differential in this case, it is lower on our list of suspects because glaucoma does not usually present with an APD, red desaturation, or optic pallor unless the patient is in an advanced-stage. This does not match our supporting clinical data.
- **Don't be myopic.** Although the examination ended up focusing on the afferent tests leading to a diagnosis of optic neuropathy, it is important to assess the entire eye. In this case, the retinal hole could have easily been overlooked in favor of further testing for optic neuropathy.