

Principals of Ocular Pain Control in an Optometric Office

Common causes and management of ocular pain in the optometric practice

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INTRODUCTION

■ Introduction:

- Dr. Tyler
 - Disclosure: Shire Optometric Educators Virtual Advisory Board
 - Credentials: Associate Professor, Chief of Primary Care at The Eye Care Institute
- Case-based presentation:
- Focus → *Non-traumatic, non-infectious causes of ocular pain*
- Included → Latest recommendations for oral & topical pain management

FYI: CDC Guideline for Prescribing Opioids for Chronic Pain – United States, 2016

- <https://www.cdc.gov/mmwr/volumes/65/rr/rr6501e1.htm>

The Showman

53 year old Hispanic female

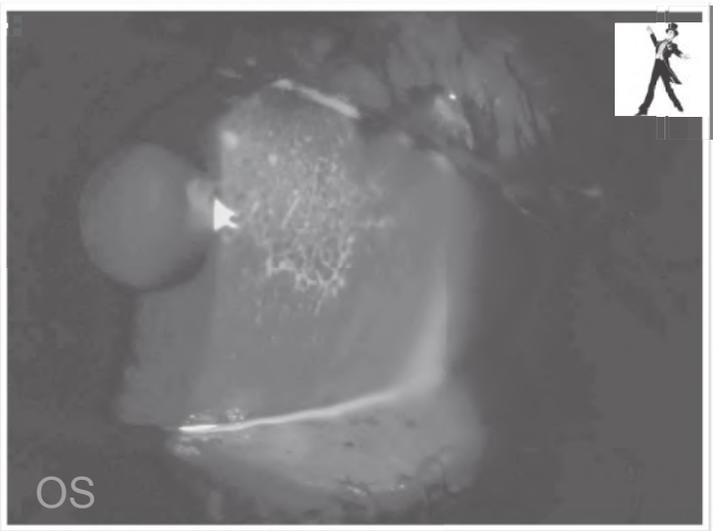
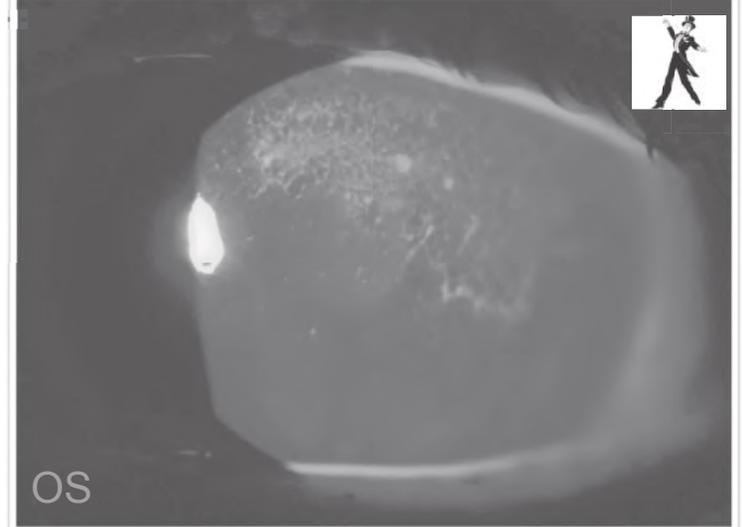
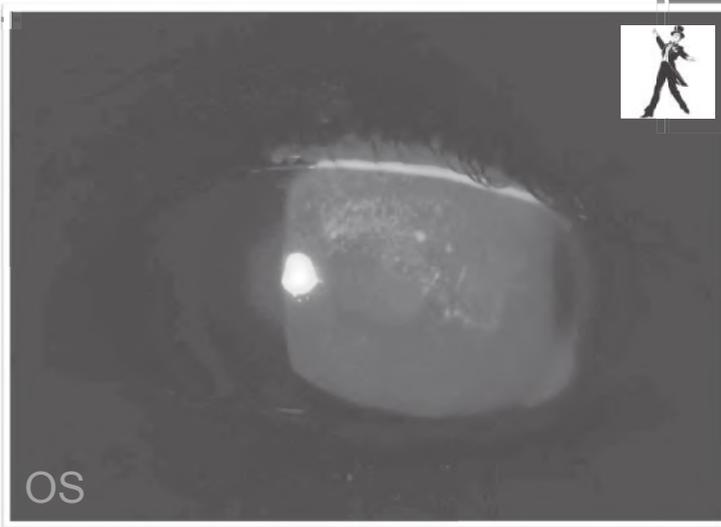
- Complains of:
 - Eye pain, left eye only, longstanding
 - Blurry vision left eye only, 1 week duration
- Constant, blur is somewhat alleviated when using Systane Ultra AT

History

- Medical history:
 - Hypothyroidism (synthroid 25 mcg per day)
- Family history: unremarkable
- Social history: Non-smoker, non-drinker, no caffeine use
- Not currently working
- ROS: Generally unremarkable except for persistent cough x several years

Exam Findings

- Entrance testing:
 - All unremarkable; *patient appears uncomfortable and photophobic OS*
- Retinoscopy/refraction:
 - Difficult due to patient discomfort OS > OD
- BVA: 20/25 OD, 20/100 OS



+ Returning to the history

- “Have you ever had ANY systemic conditions?”
- “Oh yeah.....something about....Showman’s syndrome?”
- “Did you ever take any special eyedrops for it? Might have been kind of expensive?”
- “Now that you mention it, I used to put these little packets of ‘Re State It’ in my eyes....”

+ Our management

- Reinstigate Restasis BID
- Prescribe Azasite BID (*off label*) until follow up
- Suggest rheumatology workup for Sjogren’s
 - Possible medical management w/ Salagen 5 mg TID

WHAT “NEW” Developments to consider?

- #1: Shire’s, Xiidra (Lifitegrast 5%)
- #2: Pre-authorizations....

+ Xiidra (lifitegrast 5%)



- Prescription medication
- LFA-1 antagonist, approved by the FDA for dry eye disease (7/2016)
- SIGNS & SYMPTOMS of DES: dryness, redness, irritation, pain; as well as increasing tear production
- What we know:
 - Dosing = BID
 - Expected improvement = ~2 weeks for relief to begin
 - No known contraindications with excellent safety profile
 - Side effects= blurry vision upon instillation; unpleasant taste
- What we don’t know: Role in management versus Restasis

+ Sjogren's Syndrome



Differential Diagnosis:

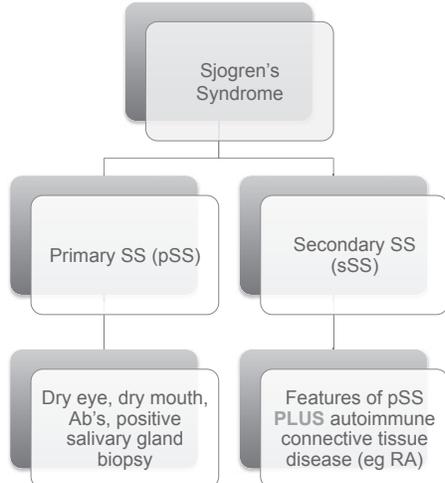
- **Dry Eye secondary to lid disease/blepharitis**
 - Evaporative (much more common, ~80%)
 - Considerations → Demodex
- **Medicamentosa**
 - Look at history of patient, types of drops used, preservatives
 - **Bilateral, diffuse PEK following the use of a therapeutic medication**
 - Especially concerns for patients with glaucoma on chronic medications

+ Sjogren's Syndrome



- Multisystem disease
- Prevalence 0.1% - 3%
- Characterized by lymphocytic infiltration of exocrine glands & other organs
 - Lacrimal glands
 - Salivary glands
- Lymphoma associated
- Compared to general population:
 - Greater likelihood of greater pain, fatigue, and disability; mood/affective/cognitive disorders

+



+

+ Ms. Showman: The follow Ups



- **FIRST** return, after 2 weeks using:
 - Azasite BID, Systane Ultra q2h, Restasis BID
- *Symptoms significantly improved*
- *Staining significantly improved*
- Other signs of DES...
- **No significant improvement**

+

+ Ms. Showman: The follow Ups



- After first return, Remanded to q8-10 wk follow up
- **Referred to rheumatology, patient declined**

+

+ Treatment Goals for PAIN



- First → Treat the CAUSE
- Second → Adequately & effectively treat the pain

+ Oral Options for pain management:



- NSAIDS/Ibuprofen
- Naproxen Sodium
- Meloxicam
- Celecoxib

All oral NSAIDS listed are pregnancy category C

- Category C medications have animal reproductive studies that have shown adverse effects on the fetus but without human studies

+ Oral Options for pain management:



- Acetaminophen
- Aspirin



+ Oral Options for pain management: NSAIDS/ Ibuprofen



- Analgesic, *antipyretic*, anti-inflammatory*
- Analgesic dose is 200-400mg q 4-6 hrs
- "Therapeutic dose"* is 600-800mg q4-6 hrs
- Pregnancy category C
- Uses:
 - Ocular surface injuries
 - Moderate-severe episcleritis
 - Mild scleritis
 - Others...

OTC & Rx

+ Oral Options for pain management:



- NSAIDS/Ibuprofen
- Naproxen Sodium
- Meloxicam
- Celecoxib

All oral NSAIDS listed are pregnancy category C

- Category C medications have animal reproductive studies that have shown adverse effects on the fetus but without human studies

+ Options for pain management- Other Oral NSAIDS: Naproxen sodium



- Branded as Aleve, Anaprox, Naprosyn
- OTC formulation of 220mg naproxen sodium contains 200mg naproxen

Dosing for Adults:

- OTC → 220 mg q8h, not to exceed 2 caplets in any 8-12 hr period
- Rx → 250, 275, 375, 500, 550 mg; XR 375, 500, 750 mg (once daily)

OTC & Rx

+ Oral Options for pain management:



- NSAIDS/Ibuprofen
- Naproxen Sodium
- Meloxicam
- Celecoxib

All oral NSAIDS listed are pregnancy category C

- Category C medications have animal reproductive studies that have shown adverse effects on the fetus but without human studies

+ Options for pain management- Other Oral NSAIDS

- **Meloxicam**– typically for arthritis, Osteo- & RA
 - **Available Rx only** – Dosed QD:
 - 7.5 and 15 mg tabs
 - 7.5 mg/5mL suspension
- **Celecoxib (Celebrex)** - COX-2 inhibitor
 - **Available only Rx only:**
 - 50, 100, 200, & 400 mg
 - **Adult dose:**
 - 400 mg initially then 200 mg q12h

Rx only

+ Oral NSAIDS- Risks, Warnings and Contraindications

Cardiovascular risk

- All NSAIDS may increase risk of MI & stroke

GI risk:

- **Increase risk of bleeding, ulceration, and gastric or intestinal perforation**

Contraindications (CI):

- ASA allergy, chronic hepatitis, pain from coronary artery bypass graft surgery

+ Oral NSAIDS- Risks, Warnings and Contraindications

Caution in:

- CHF, HTN, asthma, GI ulcer, renal impairment
- All oral NSAIDS listed are pregnancy category C

+ Oral Options for pain management:

- Acetaminophen
- Aspirin



+ Options for pain management- Acetaminophen

- **AKA, Tylenol**
 - Available OTC
 - 325, 500 tabs; 325, 500, 650 caplet
 - 500 capsule and gelta
 - 80 mg chewable and dissolvable tab
 - various concentrations in liquid
- **Available in many combination products Rx**

OTC & Rx

+ Options for pain management- Acetaminophen

- **AKA, Tylenol**
 - Due to multiple sources of tylenol in combination with other medications...need to be careful
 - Usual adult dose 325 – 500 - 650 mg 1-2 tabs q6h **NOT to exceed 4 grams/day**
 - Main CI: Liver insult → **the leading cause of acute liver failure in the U.S. and Canada!**

+ Options for pain management- Acetaminophen

AKA, Tylenol

- Main CI: Liver insult → the leading cause of acute liver failure in the U.S. and Canada!



Part of the challenge...
More than 900 products in US

- Sept 16, 2016: <http://www.cbc.ca/news/health/acetaminophen-toxicity-health-canada-1.3764672>

+ Options for pain management - Oral NSAIDs: Aspirin

More CI: pregnant/breastfeeding women

- **Risk of Reye's Syndrome** when used to treat flu- and cold-like symptoms – can be deadly
- **FDA recommends that ASA & ASA-containing products not be used in pts under age 19 during episodes of fever-causing or viral illnesses**

+ Options for pain management - Oral NSAIDs: Aspirin

- Analgesic, anti-pyretic, **blood thinner**, mild anti-inflammatory
- Cost-effective
- Usual dose for pain and fever:
 - Adults 325–650mg q4-6h, not to exceed 4g/dy

CI: allergy to other NSAIDs, recent stomach or GI bleeding, bleeding disorder, Coumadin use, heavy alcohol use

+ Other options for pain in our pt

- Acupuncture
- Punctal occlusion
- Moisture chamber devices at night
- Nutritional supplementation → **DREAM STUDY**
 - *Omega-3 supplements (FISH OIL vs. OLIVE OIL control): traditional ~ 1500mg DHA+EPA for "regular" dry eye/ 3000mg for Sjogren's*
- Autologous serum eye drops
- Transdermal Refresh PM
- Lipiflow or Miboflow
- EXTREME: Tarsorrhaphy



+ Don't forget:

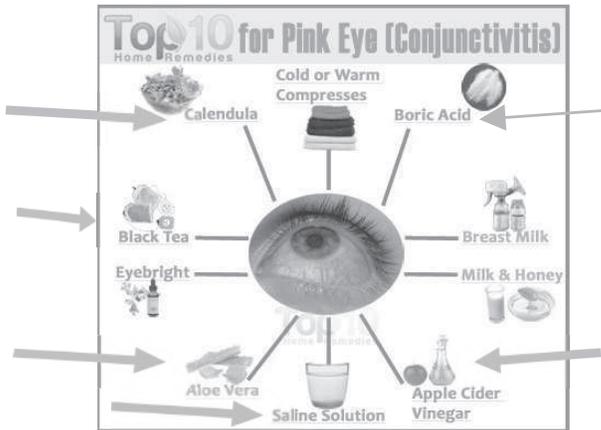
- **Proparacaine: dosing limitations**
 - Be cautious of patient's stealing drop
 - ** Recalcitrant "corneal sloughing"
 - Difficult to ascertain → pts usually don't "fess up" easily

+ General Options: pain management

Non-pharmacological / in-office

- Homeopathic remedies
 - Keep an open mind as ~ 50% of pts seek 'alternative' or 'complementary' care on the internet
- Caution with home-formulated remedies popularized on the internet
 - OFTEN combined with **tap water** → Increased risk of acanthamoeba

Homeopathic Remedies



An Unlikely Suspect

28 year old white male

- Complaints of intermittent blurred vision OU *with spectacles*
- Morning vision is 'perfect'
- Evening vision is terrible
- Self-measured using an iPad app at 20/80 – 20/100 vs 20/20 in the mornings

An Unlikely Suspect

Ocular History

- Soft contact lenses provide better, more consistent vision but patient is unable to wear due to discomfort
- Diagnosed with "CLARE" previously
 - AT therapy QID helped somewhat but not enough to resume CL wear

An Unlikely Suspect

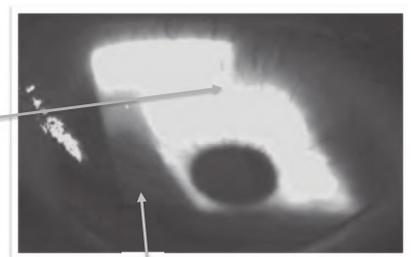
Systemic/Medical History

- (+) psoriasis → topical steroid cream prn
- Family Hx: Non-contributory

Exam findings

- VA w/ specs:
 - 20/200 OD
 - 20/80 OS
- VA w/ SCL (biofinity):
 - 20/40+ OD
 - 20/30 OS
- Staining and whorls on cornea OD>OS
- Immediate tear break-up time (TBUT) OU
- Minimal tear meniscus OU

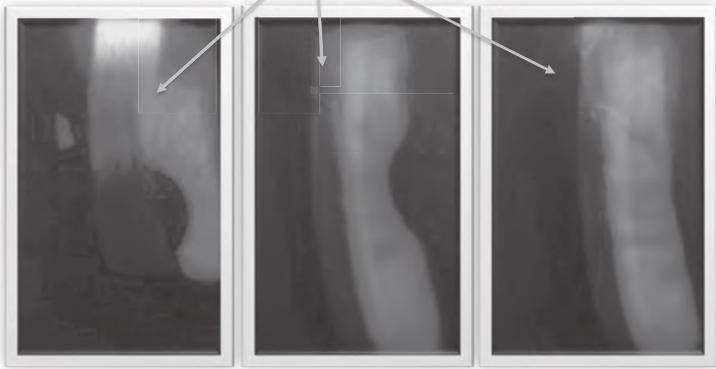
Superior Neovascularization



Epithelial Whorling



+ (+)NaFl staining in flame-shaped pattern



+ Diagnosis

- Severe dry eye syndrome
- **Possible contributory limbal stem cell deficiency**
 - Genetic
 - Ex, association with congenital aniridia
 - Acquired
 - Inflammatory
 - Infectious
 - Traumatic/Iatrogenic
 - Especially chemical (incl. mitomycin)
 - Tumors (ocular surface)

+ Limbal Stem Cell Deficiency

- Damage or dysfunction of limbal stem cells
 - *invasion of conjunctival epithelium onto cornea* → epithelial defects
- Unilateral or Bilateral
- Partial or Total
- Progressive, severe ocular surface disease

+ Clinical findings

- Decreased vision
- Pain
- Contact lens intolerance
- Neovascularization
- Chronic inflammation
- Poor epithelial integrity
- Pannus

**IN SEVERE
CASES CAN
LEAD TO
BLINDNESS**

+ TREATMENT for pt at Initial Presentation

Rx:

- Restasis (cyclosporine-A) BID OU
- Alrex QID OU

OTC:

- Preservative-Free Artificial Tears q1h OU
- OTC Analgesics PRN

+ Two weeks later....

■ VA with specs:

- 20/40-2 OD (from 20/200)
- 20/40+1 OS (from 20/80)

■ IOP: 18/19mmHg w/ iCare @ 2pm

■ SLX: (+) NaFl staining still present

■ Management:

- Alrex tapered OD
- AMT inserted OD (ProKera Slim™)

+ Lens Inserted OD



+ Amniotic Membrane: What to expect...

- Mucoïd discharge / debris present from normal membrane degradation – can *mimic* bacterial infection (antibiotic not necessary!)
- Healing can be assessed with NaFl
- Follow-up ~ 1 week (dissolves 7-14 dys)
- IOP can be measured with a Tonopen

+ Amniotic Membrane: What to expect...

Different Types

- Cryopreserved = Cold, “wet” membrane in ring
 - Storage, cost
 - Comfort
- Freeze-dried/dehydrated memb “loose” tissue
 - Easier to store, less expensive
 - Needs rehydration
 - Bandage CL and considerations; does it lose anti-inf?
- Anti-inflammatory and anti-microbial properties

+ 3 days after AMT removal

- **VA:**
 - 20/40-2 OD
 - 20/30-2 OS
- **IOP:** 14/18 w/ iCare @ 12:50 pm
- **SLX:**
 - Limbal linear opacities, (+) NaFl

+ 8 weeks later

- **History:**
 - Pt still taking NPAT QID and Restasis BID
 - Pt notes vision is better, but still blurry
- **VA:**
 - 20/25+ OD
 - 20/20- OS
- **IOP:** 16/16 w/ iCare @ 3:30pm
- **Slit Lamp:**
 - **OD:** Mild sup linear limbal staining

+ 8 weeks later

- Pt notes significantly better vision with contact lenses trialed in office (20/15)
- Ultimately patient was fit in semi-scleral lenses with good result

+ Madame Professor



71 YO female

- Presents to urgent care service with a red, “itchy”, painful eye OS
 - Started 2 day(s) prior
 - Moderate pain but worsening; (+)*photophobia*
 - Concurrent periorbital redness & matted lashes
- Pt is using an unknown lubrication drop

+ History



- Upon further questioning
 - Denies using any new soaps or lotions
 - No Hx of contact with any sick individuals or other people with red eyes
- Additional notes:
 - **Headache** – about the same time as redness; using **Aleve**
- Social history:
 - Non-smoker, non-drinker, some caffeine use
- Retired professor
- Family history: High cholesterol

+ History



- Medical History:
 - “Arthritis”
 - H/O elbow, shoulder and knee pain
 - ...Self diagnosed
 - Hypercholesterolemia
- Medications:
 - Omega-3
 - Glucosamine Sulfate
 - Omeprazole (Prilosec, Zegerid) → proton pump inhib
 - Crestor

+ Exam Findings



- BVA: 20/25-1 OD, 20/25 OS
- Entrance testing:
 - CF: unremarkable
 - Motility: Full OD and OS but patient appears uncomfortable in upgaze
 - Pupils: *mild photophobia OS*, ERRL (-)APD
- (-) PAN
- Tonometry: 17mmHg OD and OS

+ Slit Lamp Exam Findings



- **Conjunctiva:**
 - OD: tr diffuse injection & OS: 1+ diffuse injection
- **Cornea:**
 - OD: pigment on endo, TBUT = 7 secs
 - OS: pigment on endo, (+)ropy discharge, TBUT= 7 secs
- **Anterior Chamber:**
 - OD: trace cells,
 - OS: 1+ cell, trace flare
- **Iris/Lens:**
 - No Synechiae, (+)“old” pigment ant. lens surface

+ Posterior Segment



- **Optic Nerve:**
 - OD: notching inf >> sup; flat, good color
 - OS: flat, sharp, good color
- **CD Ratio:**
 - Vertical: .75 Horizontal: .65
 - Vertical: .6 Horizontal: .6
- **Macula:**
 - OD & OS: mild mottling

+ Diagnosis & Management



1. Iritis, OS>>OD

→ Appears chronic due to pigment on lens/corneal endothelium/relatively mild symptoms

- Prescribed Pred Forte 1% q2h OU
 - Ed pt to shake bottle before instillation
 - Instilled 2gtts Cyclopentolate 1% OU in-office
 - Referred pt to PCP for bloodwork & clinical eval
 - **Why on "first time"?**
- RTC -2 days for f/u for iritis

+ Management



- Pt responded very well to Pred Forte
 - Initially q2h while awake and 2x/overnight – nearly resolved 2 days later and no cells noted
 - Started taper

Serology Surprise!

- ANA, RF and ESR
- CBC with differential → Absolute Lymphocytes (Lymphocytosis)

+ Lymphocytosis

Specific causes of lymphocytosis include:

- Acute lymphocytic leukemia
- Chronic lymphocytic leukemia
- Cytomegalovirus (CMV) infection
- HIV/AIDS
- Mononucleosis
- Multiple myeloma
- Infectious conditions including:
 - Tuberculosis, Vasculitis, Whooping cough

+ Additional Diagnosis & Mx



2. Dry Eye Syndrome OU

- Pt recommend PFATs for discomfort

3. Self-Dx "Arthritis" for years

- Referred pt to PCP for serology and evaluation
 - Consider referral to rheumatology

4. Glaucoma Susp OD>OS vs. Physiologic

- Discussed findings & silent, progressive nature of glaucoma
- RTC 2 days for FU and will begin to perform additional baseline testing (photos, gonio, pach, OCT, VF, etc.)

+ Lymphocytosis



- Lymphocytosis is a high lymphocyte count (increased white blood cells).
 - Role of Lymphocytes: help fight off diseases
 - **Normal to see a temporary rise after infection**
- A count significantly higher than 3,000 lymphocytes in a microliter of blood is generally considered to be lymphocytosis in adults

+ They said it was a migraine....

68 YO AF

- Presented to after hours clinic w/severe pain and headache with blurred vision
 - **Recently visited Emergency Department for headache complaints**
 - Was prescribed Rx analgesic without relief
 - Persistent headache, blur and today vomiting

+ They said it was a migraine....

Ocular History & Medications:

- Pt denied any ocular history prior to visit
- Not taking any ocular medications

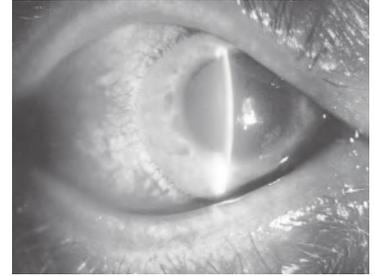
■ NKMA

Systemic History:

- Recent visit to ER & diagnosis of Migraine

+ They said it was a migraine....

- Uncorrected visual acuity:
 - OD: 20/30
 - OS: **20/50**
- Pupils, EOM, and Confrontation Fields:
 - Expected EOM and CF FTFC OD and OS
 - **Mid-dilated OS pupil**



+ They said it was a migraine....

■ Slit Lamp Examination:

- Corneal edema OS, poor view into A/C
- **Grade 3 redness 360 OS**

■ IOP:

- Goldmann = 24 mmHg OD/ **48mmHg OS**

■ Gonioscopy:

- **Closed angle**, minimal structures and peripheral anterior synechiae consistent with CHRONIC ANGLE CLOSURE and ACUTE ANGLE CLOSURE at present

+ They said it was a migraine....

In-office:

- 2 drops Iopidine (separated over time)
- 1 drop Beta Blocker
- *Waiting for IOP < 40 mmHg to instill Pilocarpine.....*

■ Oral Medications:

- Carbonic Anhydrase Inhibitor (CAI) → Diamox (Provided to lower IOP, 2 x 250mg tablets)

Ophthalmology consult

- Due to findings of chronic disease and peripheral block, required trabeculoplasty (vs. LPI)

+ I keep getting pinkeye!

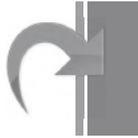
41 year old white female

- Presents with “stabbing pain” OD
 - Sudden onset previous evening
- At exam reported “bad migraine”, photophobia & mild nausea
- Ocular History:
 - High pressure in both eyes, poorly controlled with drops

+ I keep getting pinkeye!

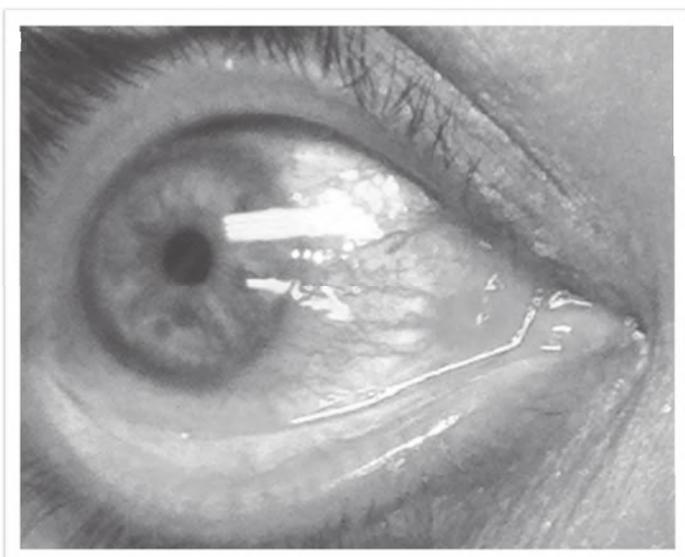
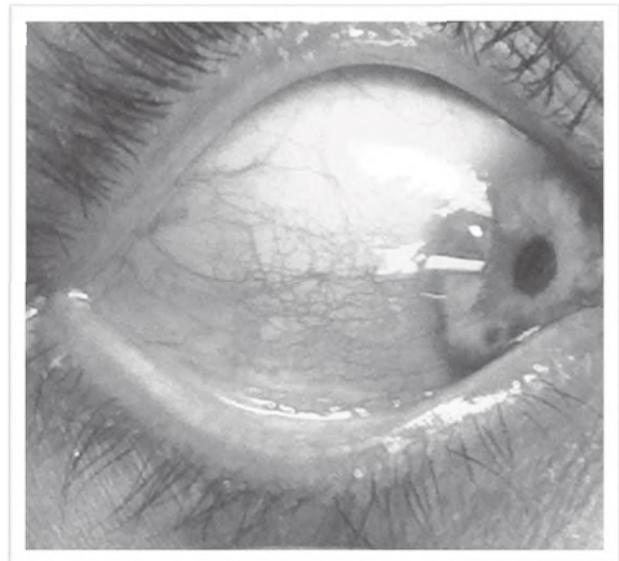
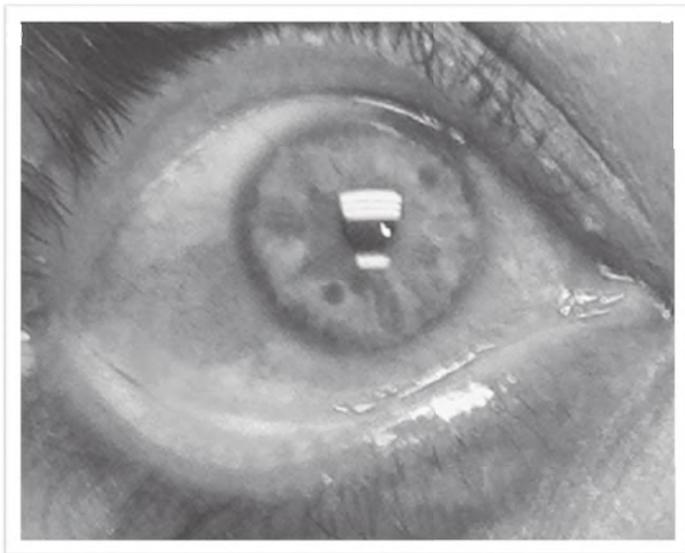
- Was seen at prominent tertiary eye care center where she received “shots in the eye”
- Medical history: (+) arthritis (rheumatoid?)
 - Not currently under the care of a physician
 - Not currently medicated
- BMI: 39
- <https://www.diabetes.ca/diabetes-and-you/healthy-living-resources/weight-management/body-mass-index-bmi-calculator>

+ I keep getting pinkeye!



- BMI: Healthy range = 18.5 to 24.0
 - Simple calculation using person's height and weight
 - Weight in kilograms/ Height in meters²
 - For use in "normal" adults 18-65 years
- Visual Acuity: 20/20 OD and OS

+ Anterior segment on initial presentation



+ I keep getting pinkeye!



- IOP:
 - 22/23mmHg with lid holding, high apprehension
- AC:
 - Trace flare, no cells
- DFE:
 - Deferred – time constraints
 - X 3 visits!!
- Undilated 90 (and eventual DFE) → showed no posterior segment abnormalities
 - Vascular tortuosity but no arteriolar attenuation

+ I keep getting pinkeye!



Tentative diagnosis:

- Mild scleritis vs. severe episcleritis with associated mild A/C reaction OU
- Treatment:
 - Durezol QID OU

+ “Pinkeye” – 2 day follow-up



- Signs and symptoms improved, But....
 - IOP 28/26 mmHg

Management

- Quick taper of steroid
- Request systemic consultation
- Request earlier records

+ “Pinkeye” – 4 days later



■ Signs & symptoms:

- More severe than at initial presentation
- IOP:
 - 33/30mmHg
- Records received from prior episode....

+ “Pinkeye” – Recovered Hx



- Sclerouveitis OD → diagnosed 2010
 - Initially treated w/ sub-tenon’s steroid injection
- IOP:
 - 38/22mmHg at 2 day follow-up in 2010
- C/D ratio:
 - 0.2/0.2
- Oral CAI:
 - given in-office & prescribed for short-term therapy

+ “Pinkeye” – continued Hx



- In 2010, pt was recommended for further evaluation and..... lost to follow-up

+ “Pinkeye”



After chart review,

- “Exchanged” steroid, from Durezol to Lotemax
- Recommended further assessments
- Systemic workup:
 - Confirmed RA (*recommend rheumatology consult*)
 - (+) morbid obesity (*recommend nutritional consult*)
 - (+) early COPD vs asthma (*recommend smoking cessation and pulmonology consult*)
- But Again..... Lost to follow up

WHAT TO DO WITH THE PAIN...

Treatment considerations:

- ✧ Jabs reported that **nearly 60% of scleritis patients require oral corticosteroids or immunosuppressive agents** to control the disease
 - Oral Steroids ~ 31.9%
 - Systemic Immunosuppressive agents ~ 26.1%

+

Oral Analgesics: Rx

- Tramadol/ Ultram (*Schedule IV*)
- Hydrocodone (Schedule II) → in combos, OPIOID
- Oxycodone (Schedule II) → OPIOID
- Tylenol 3 (Schedule III) = 30 + 300
- Tylenol 4 (Schedule II) = 60 + 300

+

Oral Analgesics: Tramadol

Schedule IV drug: For tx of mod. to severe pain

- Weak mu-opioid receptor agonist
 - Also induces serotonin release
- Inhibits the reuptake of norepinephrine
- Effectivity vs. potential side effects may not weigh in patient's favor
- *Other options available*

+

Oral Options for pain management: Tramadol – Schedule IV

Aka Ultram

- Available as 50mg capsule or 100, 150, 200, 300mg capsule
- Typical adult dose: 50-100mg q 4-6 h not to exceed 400 mg/day
- Recently moved from non-scheduled to Schedule IV

+

Oral Options for pain management: Hydrocodone – Schedule II

Available in combination with several other products

- **Combo With Acetaminophen – Vicodan, Lorcet, Lortab**
 - 2.5-10mg Hydrocodone
 - Available with 300+ mg acetaminophen
 - Dosed 2.5 – 10mg q4-6h PRN pain, not to exceed 60mg hydrocodone in 24 h
- **With Ibuprofen – Vicoprofen, Ibudone**
- *With Pseudoephedrine, Guaifenesin, Chlorfeniramine, Homatropine* – for cough suppression

+

Oral Options for pain management: Oxycodone– Schedule II

Aka Oxycontin

- 5, 10, 15, 20, 30mg tabs
- Other doses/formulations available as liquid, for XR, abuse-deterrent
- Dosed 5-30mg q4-6 h
- High potential for abuse

+ Opioid Considerations

- **CI:** In pts with depression, severe respiratory depression
- **Caution** in chronic alcohol use, Addison's disease, drug abuse history, impaired pulmonary function, psychosis, renal dysfunction, CV disease, hypotension

+ Oral Opioids: Tylenol 3

- 30mg codeine with 300mg acetaminophen
- **Category III scheduled drug**
- Usual dose is 1-2 tabs q4h
- **Uses:**
 - Severe trauma, abrasions, erosions
 - Post-surgical pain
 - Hydrops
- **Respiratory effect: Depresses Fxn**

+ Oral Opioids: Tylenol 3

- **T3 Side Effects**
 - Itching, rash, contact dermatitis
 - Delirium, seizures, cardiotoxicity
 - *Avoid all other CNS Depressants including alcohol when using opiates of any form*
- **T3 Contraindications**
 - Substance abuse risk or history
 - Hypersensitivity to narcotics
 - Asthma, COPD
 - Kidney or liver dysfunction

+ Oral Opioids: Tylenol 4

- 60mg codeine with 300mg acetaminophen
- **SCHEDULE II NARCOTIC**
- **Uses:**
 - Severe trauma, abrasions, erosions
 - Post-surgical pain
 - Hydrops

+ In the blink of an eye...



41 year old female

- Complains of sudden onset, acute, intense pain
 - Started abruptly upon awakening this morning
 - OS only

+ Blink - History



- **HPI:** Several episodes of acute ocular pain upon awakening over years but none as severe as present visit
- **Ocular Hx:**
 - Multiple corneal diagnoses including:
 - EBMD
 - Forme fruste keratoconus

+ Blink - History

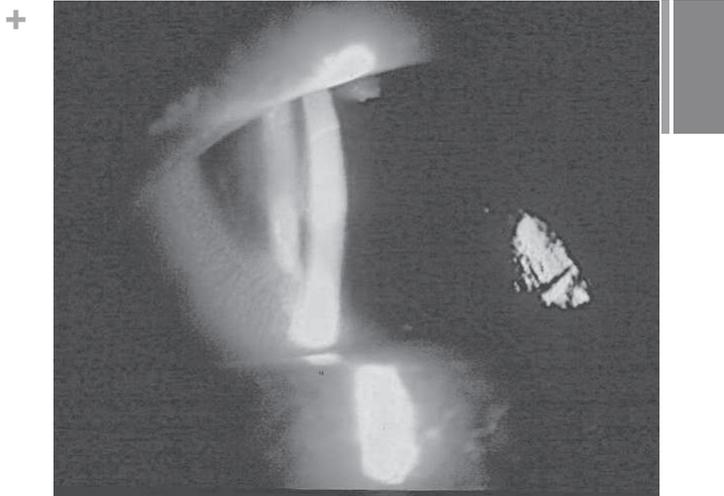


- Medical Hx:
 - Hypothyroidism; 125 mcg synthroid QD
- Family Hx:
 - (+) hypertension (M and F)
 - (+) hypercholesterolemia (M and F)
- Social history:
 - Non-smoker, occasional alcohol and caffeine use

+ Blink – Exam Findings



- Visual Acuity →
 - OD: 20/15 (plano)
 - OS: Reduced (unable to refract due to discomfort)
- Keratometry:
 - OD: 47.25/48.75, mires clear and round
 - OS: Unable to perform due to edema, irregularity
- Biomicroscopy:
 - OD: Fine, reticular/linear faint opacities in subepithelial layer, otherwise unremarkable
 - OS: (+)Edema, (+)Tr A/C cells and flare; See image



+ Blink - Management



- Pt intolerant to bandage soft contact lens
- Traditional pressure patch applied after instillation:
 - 1 drop 1% Atropine
 - ½" ribbon bacitracin ung
- Advil 600-800 mg PRN pain q 4-6 h
- RTC 24 h

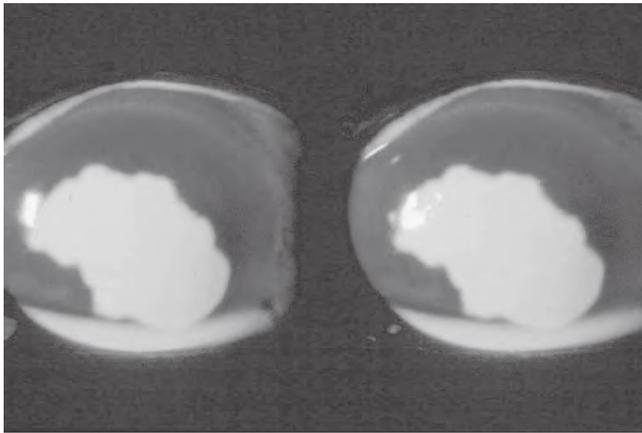
+ Blink - Management



- Medical management:
 - Continue bacitracin ung TID
 - Continue Advil PRN
- RTC 48 h to complete exam

Upon resolution of RCE – OS:

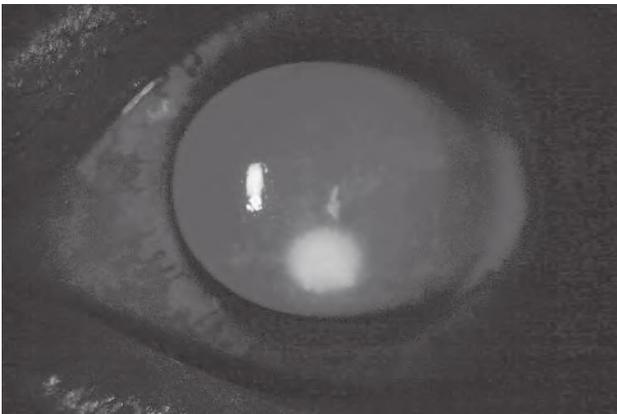
- Visual Acuity: 20/15
- Keratometry: 47.50/48.75



+ RCE - Considerations

- Pts w/ recurrent corneal erosions:
 - Chronically increased level of metallo-proteinase enzymes (specifically MMP 2 & 9)
 - These enzymes dissolve basement membrane and fibrils of the hemi-desmosomes

+ Note loose tissue above RCE



+ Long-Term Management

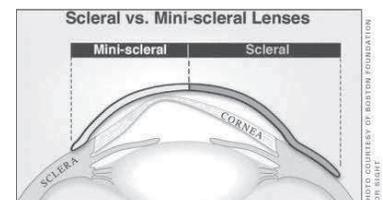
- Oral Doxycycline
 - 50 mg BID a day for 2 months
 - Concurrent topical corticosteroid TID, 2 to 3 weeks
 - Why?
 - Effects on metalloproteinase-9 activity by 70%
- Consider NaCl drops/ung long-term
- Bland ointment/gel qhs
- Nutritional support for associated dry eye

+ More Long-Term Management

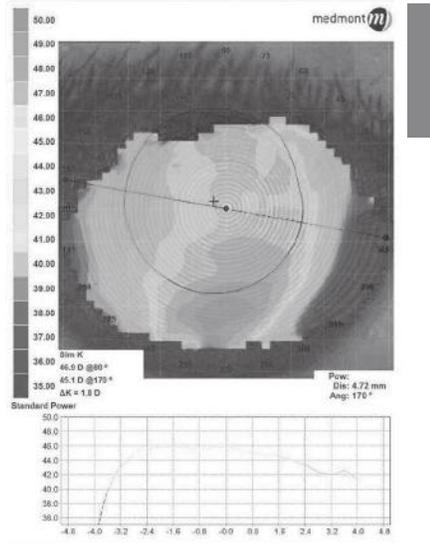
- **“Surgical Intervention” considerations**
 - Anterior Stromal puncture
 - PTK
 - Poor choice for this patient due to q/o forme fruste keratoconus & plano refraction

+ Blink -- 9-year data

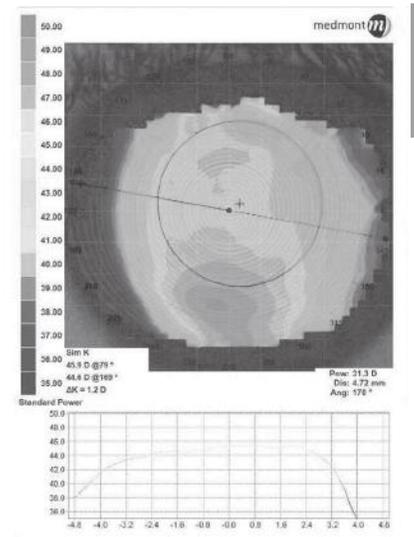
- BSCVA
 - OD 20/30-
 - OS 20/15
- With Semi-Sclerals:
 - OD 20/15+
 - OS 20/15+
- Topography:



+ Right Eye



+ Left Eye



+ Options for pain management - Topical

- NSAIDS – Acular LS QID, Voltaren TID
 - 'Newer' generation: Prolensa QD/ Bromday
- Steroids – Pred Forte, Loteprednol (*Alrex, Lotemax*)
 - 'Newer' generation: Durezol
- Immunomodulators – Cyclosporin-A
 - Pending role of Lifetegrast
- Cycloplegia → often forgotten, over-looked but can be very beneficial for patients with photophobia and pain

+ Options for pain management - Topical

Topical Consideration

- NSAIDS – block cyclooxygenase pathways leading to prostaglandin formation (also in Orals)
 - Old generations: less penetration to posterior chamber
 - Acular LS QID
 - Voltaren TID
 - 'Idiosyncratic' risk of corneal melt might be the result of uncommon genetic collagen disorder adversely affected by cox enzyme inhibition
 - Newer generation: Prolensa QD

+ Options for pain management: topical

TOPICAL

- Steroids - block most pain-mediating prostaglandin pathways (also in Orals)
- Pred sodium phosphate (e.g. *Inflamase Forte*) penetrates poorly to AC as compared to Pred acetate (e.g. *Pred Forte*) but with similar side effects profile

+ Options for pain management: topical

- Site specific steroid: Loteprednol
 - Reduces but does not eliminate risk of IOP increases & offers good surface anti-inflammation
 - Approved originally for allergy

Steroids reduce ability of cornea to regenerate – not a great choice for patients with increased collagenase activity

+ Options for pain management

- **Immunomodulatory:** Cyclosporine-A as adjuvant*
 - *modifies the affects of other agents*
- Blocks several other cytokines involved in inflammatory process but does not block prostaglandins as effectively as NSAIDs or Steroids

+ It burns....



73 YO male

- Painful, burning left eye x 3 weeks, *especially superiorly*
- Med Hx (& medications):
 - High cholesterol (Simvastatin)
 - HTN (Atenolol)
 - (+) Skin cancer, removed 2007
 - (+) Triple bypass in 1993 (ASA daily)

+ It burns – Ocular history



- Retinal detachment OS, 2001
- Corneal ulcer OD, 2004
- Cataract extraction with AC IOL, 2001
- Allergic conjunctivitis (possible cat?), 2009
 - Chemosis OS>OD
 - Treated with FML QID
 - Did not return for follow up

+ It burns - Exam Findings



- **Uncorrected (distance) VA:**
 - 20/20 OD & OS
- **Pupils, EOM's, CF:**
 - Within Normal Limits (WNL) OD & OS
- **Biomicroscopy**
 - OD: WNL with AC IOL
 - OS: See Image/Video

+ Image/Video



+ What's going on?



+ It burns - Assessment & Plan

- **Multiple “FB” = eyelashes embedded in conjunctiva OS**
 - → Removed in office without incident
 - Rx Zylet QID for one week
- **Possible Papilloma OS with symblepharon OS**
 - Referred to ophthalmology for further evaluation / second opinion

+ Ocular and Medical History

- **Ocular History and Ocular Medications**
 - Unremarkable
- **Medical History:**
 - (+) Type II NIDDM, unknown BS and A1C levels
 - (+) Hypertension
- **Systemic Medications**
 - Metformin 500 mg BID & Lisinopril 20 mg QD
- **Soc.Hx:** (+) smoking, 1 pack per dy x 20 yrs, caffeine 1 cup a day

+ Exam Results: Ocular Health Evaluation

- **Slit Lamp Evaluation:**
 - Lids: crusting, debris, 1+ MGD, OU
 - Cornea: **(+) vertical striae OU**, debris in tear film OU, mild PEK inferior OS
 - Iris: (-) NVI OU
 - Lens: trace NS OD, 1+ NS OS with isolated vacuoles
- **Intraocular Pressure (IOP):**
 - 20 mm Hg OD and 21 mm Hg OS

+ Case History

57 year old white male

- **Chief Complaint: Decreased vision for two days**
 - “Sudden”, constant, *distance more than near vision*, worse when driving
 - Both eyes
 - **Chronic low-grade ocular pain**
- **Secondary Complaint: Tinnitus**
 - On and off for two years
 - (-) tingling, loss of consciousness, memory loss

+ Exam Results: Preliminary findings

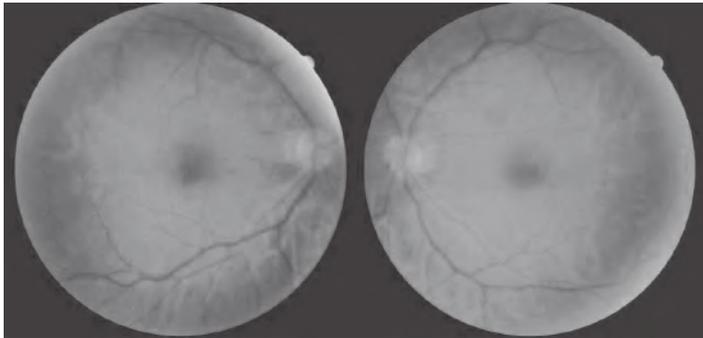
- **Best Corrected Visual Acuity:**
 - **OD: 20/60**
 - **OS: 20/80**
- **Pupils:** Equal, Round, Reactive (direct & consensual)
 - (-) RAPD
- **Motility:** Normal
- **Confrontation Fields:** FTFC OD and OS
- **Color Vision: Fail OD and OS, unclassified pattern**
- **Blood Pressure:** 124/82 RAS

+ Exam Results: Ocular Health Evaluation

- **Dilated Fundus Examination:**
 - **Optic Nerve:** (-) NVD OU
 - OD: 0.05/0.05
 - OS: Minimal cupping
 - **Macula:** Flat, even and without pigmentary changes; (-)CSME
 - **Posterior Pole OU:** A/V nicking superior, A/V ratio = 1/2, (-) NVE

*See following images

+ Posterior Pole Images



(+) Arteriole attenuation, (-) CWS, (-) Hemorrhages, (-) Exudates

+ Exam Results: Posterior segment

Dilated Fundus Examination:

- **Peripheral Retina OU** – Flat and Intact 360 degrees, **(+) Retinal hemorrhages – scattered, diffuse**
- **Peripheral Retina OD** -- Blot hemorrhage temporal and isolated RPE hyperplasia sup-nasal

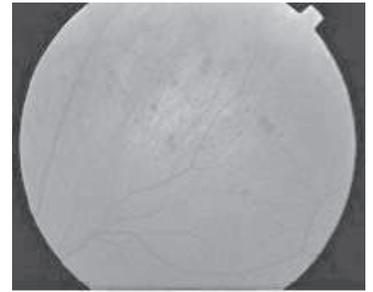


Image consistent with patient's findings

+ Impression

- **Assessment:**
 - 1) Mild/ Moderate peripheral retinal hemorrhages OU/ decreased VA unexplained by anterior segment findings → **suspected ocular ischemia**
 - 2) Diabetes w/ retinal hemorrhages → atypical presentation for "traditional" NPDR
 - peripheral without posterior pole
 - 3) Progressive tinnitus
 - 4) Moderate posterior blepharitis OU
 - 5) Mild Cataracts OU → not responsible for VA

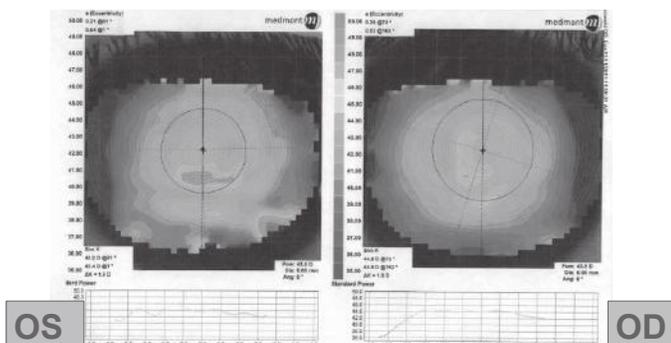
+ Initial Plan

Plan:

- Additional in-office testing to rule-out other subtle etiologies of decreased vision
 - *Corneal topography*
 - *OCT*
 - *Visual Field*

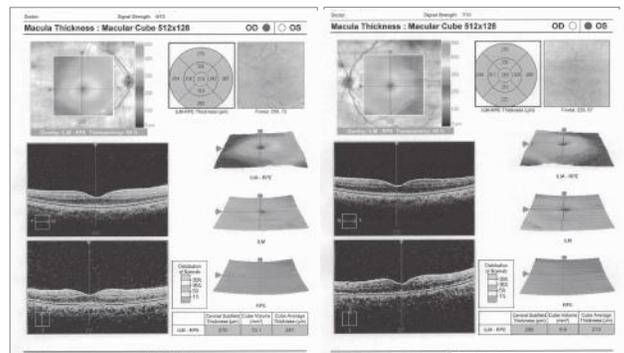
+ Additional Testing In-Office: Corneal topography- R/O irregular astigmatism

- **Medmont results – mild insignificant irregularity**

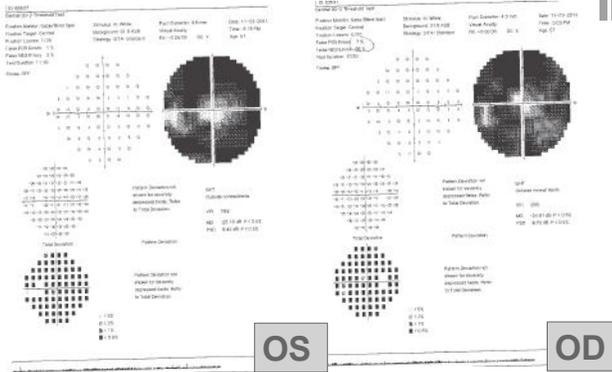


+ Additional Testing In-Office: Posterior segment OCT of macula

- **R/O maculopathy, VMT**



Additional Testing In-Office: Humphrey Visual Fields



30-2 Sita Standard Examinations – Good Reliability, Severe Generalized Depression

Additional Plan

- Pt educated on the retinal findings and possible underlying systemic etiologies.
- Due to significant nature of presentation and concurrent neurologic complaints → Patient referred immediately for:
 - Carotid Doppler imaging
 - Serology
 - CT scan
- Letter provided for PCP to assess FBS & hemoglobin A1C w/ additional serology

Referral and Results

- **Carotid Doppler Imaging:**
 - Right: Reduced flow with minimal plaque disease
 - **Left: 100% blockage of left internal carotid** with severe heterogeneous calcified plaque, no distal flow
- **CT Scan of Brain:**
 - Concurrent frontal lobe damage with left frontal encephalomalacia
 - Small focus of lacunar change left periventricular white matter

Follow-up Information

RTC as scheduled for :

- Additional testing to evaluate level of ocular function damage and R/O further complication →
- **Gonioscopy**
- **VF testing**

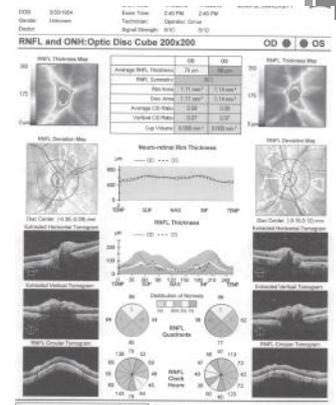
Follow-up Information

- **UPDATED/Additional Medical History & Medications**
 - Hypercholesterolemia – Lovastatin 10 mg QD
 - Thyroid Disease – Levothyroxin 50 Mcg QD
 - Baby Aspirin QD and Chantix (smoking cessation)
- **Visual Acuity at Follow-up:**
 - OD: 20/70
 - OS: 20/70
- **Gonioscopy: (-) NVA, open in all quadrants OU**

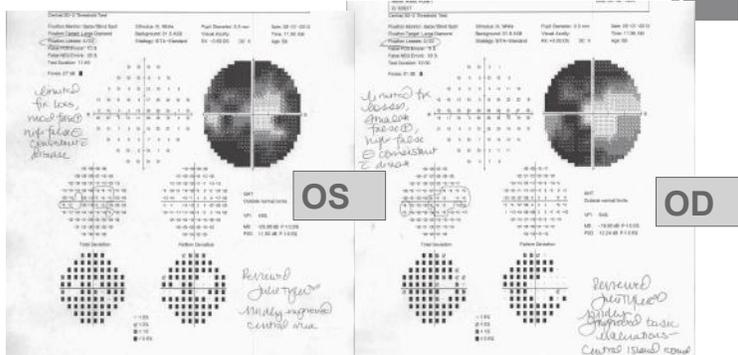
Additional Testing In-Office: OCT of ONH after confirmed OIS

Findings:

- ONH overall small diameter
 - No additional findings consistent with VA or VF
- Confirmed areas of NFL loss & decreased avg NFL thickness
- “Sparring” of papillomacular bundles OD & OS may explain central “clear” zone on VF



+ Repeat visual field: Follow up at six month mark



30-2 Sita Std Examinations – Overall good reliability, Severe Generalized depression with improved central island c/w OIS

+ Management and Follow-Up

Patient received Tx/Mx for systemic findings including increased systemic medical therapy & continue monitoring.

Additional Referrals:

- Low Vision Services
- Vascular Surgeon

Patient continued to be managed by primary care physician, endocrinology and frequent ocular examinations to monitor for additional complications (e.g. NVA).

+ Additional differential diagnoses for anterior segment-related pain

- Iatrogenic/medicamentosa-induced corneal damage
- Secondary angle closure
 - Eg, NVA associated with ischemia
- Shield Ulcer secondary to Vernal/Atopic conditions
- Infectious disease/MK
- Significant corneal hypoxia, CLARE, etc
- Post-surgical irregularities

+ Posterior Segment/Neurological Conditions

- Ocular Ischemic Syndrome (OIS)
- Multiple Sclerosis (MS)
- Anterior Ischemic Optic Neuropathy (AION)
 - Arteritic (GCA) or Non-Arteritic (vascular)
- Posterior scleritis

“Just in case”

90 year old female

- Presents with decreased vision
- c/o “reduced vision” OD, distance & near
- Denies photophobia
- **(+) Pain**
- (+) Headache – in scalp region
 - Persistent, not new ...but.....

“Just in case” - History

- Ocular History
 - S/P cataract extraction OU
- Medical history
 - (+)HTN
 - (+) gallstones (HCTZ and Advil)
- NKMA

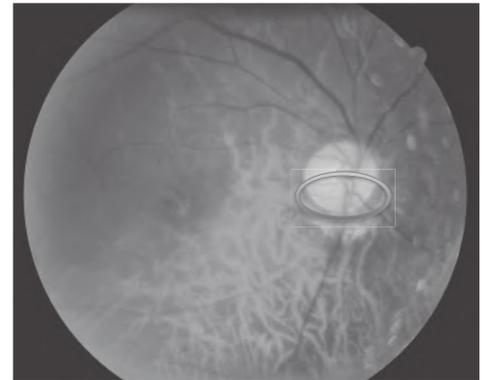
Denies use of recreational drugs and alcohol

“Just in case” - Prelims

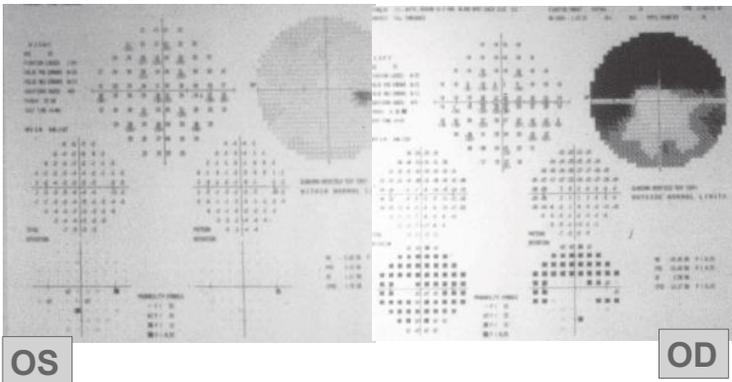
- BCVA: OD 20/25, OS 20/25
- Color vision: Intact and equal
- EOM: Full range of motion OU
- Pupils: Round/reactive OD and OS
- Confrontation Fields: FTFC OD and OS

“Just in case” - Exam

- Slit lamp:
No pathology
OD or OS
- GAT:
15mmHg OD
and OS
- DFE OD:
See image



“Just in case” – Visual Fields



+ “Just in case” – Arteritic anterior ischemic optic neuropathy

- **Typical Symptoms -- Several:**
 - Sudden, painless vision loss
 - Non-progressive, initially unilateral but high risk of bilateral
 - Simultaneous HA, jaw claudication, scalp tenderness, malaise, weight loss, fever, memory loss
- **Typical Signs – Generally absent although...:**
 - APD
 - Severe vision loss
 - PALE and SWOLLEN ONH
 - Often associated w/flame-shape heme

+ “Just in case” – Arteritic anterior ischemic optic neuropathy



Risk Factors:

- Expect pt >50 yrs
- F>M

- **Differential diagnosis:**
 - Non-arteritic ION
 - Inflammatory papillitis
 - Compressive optic nerve tumor,
 - Vascular occlusion: CRVO, CRAO
- **Serology:**
 - IMMEDIATE ESR & C-reactive protein
 - MEN = 0.5 x age for norm
 - WOMEN = 0.5 x (age + 10) for norm
 - Temporal artery biopsy even if blood work is normal if hx consistent with GCA

+ “Just in case” – Arteritic anterior ischemic optic neuropathy

Treatment

- **Start Prednisone STAT**
- **Temporal Artery Biopsy (TAB) =** should be performed within 1 wk after start of systemic steroid
 - Example: Methylprednisolone 250mg IV q6h for 12 doses in hospital then switch to oral pred 80-100mg po QD
- **Treatment minimum time = 3-6 months**

“Just in case” – What we did?

- **Our plan:** Referral to rule-out GCA... just in case
 - Age
 - Pain complaint
 - Visual “changes”
 - q/o altitudinal defect and ONH pallor

- Pt living temporarily in the country and so chose to delay management until travel back home...

+ Arteritic vs Non-arteritic AION

	Arteritic AION	Non-Arteritic AION
Mean Age	70	60
Sex	Female > Male	Female = Male
Symptoms	Headache, scalp tenderness, jaw claudication, PMR, fever, malaise, weight loss	Pain rare
Visual Acuity	Up to 76% < 20/200	Up to 61% > 20/200
Disc	Pale > Hyperemic edema, normal cup	Hyperemic > Pale edema, small cup
Mean ESR	70	20-40
IVFA	Delayed choroidal & optic nerve filling	Delayed optic nerve filling only
Natural History	Improvement rare, Fellow eye up to 95% without treatment	Improvement in up to 43%, Fellow eye < 30%
Treatment	Corticosteroids	None proven

Adapted from Yanoff 2004