On behalf of Vision Expo, we sincerely thank you for being with us this year.

Vision Expo Has Gone Green!

We have eliminated all paper session evaluation forms. Please be sure to complete your electronic session evaluations online when you login to request your CE Letter for each course you attended! Your feedback is important to us as our Conference Advisory Board considers content and speakers for future meetings to provide you with the best education possible.

VISION EXPO

1

Ocular Emergencies

MARK SCHAEFFER, OD
JESSILIN QUINT, OD, MS, MBA, FAAO

2

Financial Disclosures- Jessilin Quint, OD, FAAO

Alcon-Consultant, Speaker Bureau
Allergan-Consultant, Speaker Bureau
Dompe-Consultant
Tarsus-Consultant
Ocuphire-Consultant
Oyster Point Pharma-Consultant
Eyenovia-Consultant

Intrepid

3

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- Alcon- Consultant, Speaker Bureau
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- CooperVision- Consultant
- Horizon - Consultant
- Kala Pharmaceuticals - Consultant
- SightSciences - Consultant
- Science Based Health - Consultant
- Tarsus - Consultant

Intrepid

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What Classifies an Emergency?

Ocular complaints
Vision complaints
Systemic complaints

5

Optometrists & Emergencies

How many people visit urgent care/ER for ocular problems?

Optometrists are best suited to handle eye emergencies
- Urban/suburban setting
- Rural setting
- Going to urgent care vs optometrist
- Integrated health care model

6

Office Protocols of emergencies

- Triage training
  - Same day/asap appointments
  - Within 24 hours
  - At earliest convenience
  - At a future date
- Document, Document, Document
- Importance

7

Taking call as an optometrist

- Required by state?
- Value to the patient

8

Let's get to some cases!

9

Battle of the Friday 5pm Hyphemas

Case 1

23 year old Dental student

Hit in eye with bungee cord while moving

- Extremely light sensitive, seeing red in his vision
- Trouble keeping eye open

Case 2

- 25 year old packing up car to go on Memorial Day Weekend trip to the lake
- Fishing pole snapped in half and hit in the eye
- Very light sensitive, mild pain, vision slightly blurry
- Wants to make it to the lake by dinner

Which one do you want in your chair?

10

More details

Case 1

	OD	OS
VA	HM PH/NI	20/20
IOP	22	17
Anterior Seg	See following slides	clear
Posterior Seg	See following slides	clear

Case 2

	OD	OS
VA	20/25	20/25
IOP	13	13
Anterior Seg	See following slides	clear
Posterior Seg	See following slides	clear

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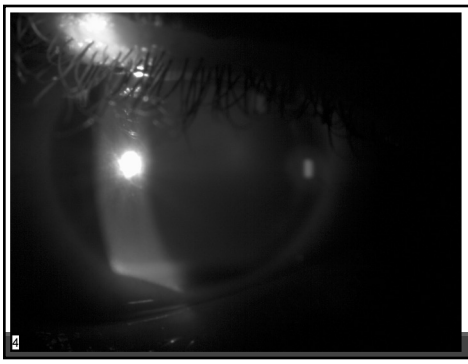

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Traumatic Hyphema

What to do next?

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Traumatic Hyphema

Accumulation of red blood cells in anterior chamber

Blunt trauma primary cause of hyphema

Injury to any anterior structure (iris, ciliary body, trabecular meshwork, and associated vasculature

Grade	Anterior chamber filling	Diagram	Best prognosis for 20/50 vision or better
Microhyphema	Circulating red blood cells by slit lamp exam only		90 percent
I	<33 percent		90 percent
II	33-50 percent		70 percent
III	>50 percent		50 percent
IV	100 percent		50 percent

15

More detailed information

Case 1

	OD	OS
Cornea	Clear	Clear
Chamber`	Hazy, 30% hyphema and growing, 2+ cells	Deep and quiet
Iris	Normal	normal
Pupil	Reactive	reactive

Case 2

	OD	OS
Cornea	Clear	Clear
Chamber`	5-10% hyphema, trace cells	Deep and quiet
Iris	Normal	normal
Pupil	Reactive	reactive

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How are you treating each of these?

Case 1?

Case 2?

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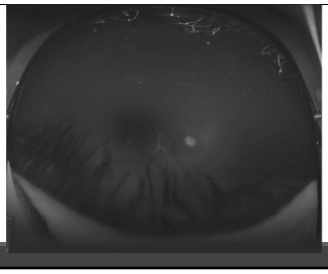
Case 1 Retina



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Treatment

Case 1

- Send to retina ASAP due to haze and active bleeding
- Started on Pred Forte q2h OD
- Cyclo?
- Treating IOP?
- No aspirin or blood thinners
- Head elevated

Case 2

- Pred Forte q2h OD
- Cyclo?
- No aspirin or blood thinners
- Head elevated
- Ok to go to the lake, but short leash

19

Following up…

Case 1

- At retina specialist, IOP spiked to 34mmHg
  - Nausea and vomiting
  - Headache
  - Pain
- Continued combigan, added Diamox 500mg bid
- 1 week later, VA improved to 20/30 PH
  - IOP 9mmHg
  - D/c Diamox
- 3 days later back at our office
  - IOP up to 30mmHg
  - VA 20/40+
  - Blood line and cells resolving
  - Testing?

Case 2

- Pred over the weekend reduced pain and light sensitivity within 24 hours
- Came back to office Tuesday,
  - minimal hyphema
  - (-) cells
  - Healing nicely
  - Started slow taper of pred
- RTC 1-2 weeks later for follow up
  - What testing done?

20

GONIOSCOPY

Check for iris structure abnormalities

Want to wait until bleeding starting to resolve to reduce re-bleeds

21

Case 1 Resolution

- Day 10
  - VA 20/40
  - IOP 13mmHg
  - Large fibrin in AC, trace cells
  - D/c Diamox
  - DFE
    - Retinal hole superior
  - Refer Back to Retinal specialist
- During surgery
  - Multiple holes found in periphery
  - Silicone oil used instead of gas

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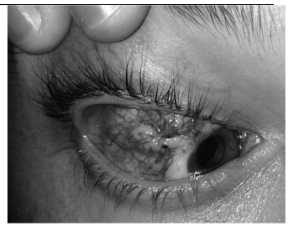
Continued

- Post-op RD:
  - Develops vicryl stitch allergy
  - Swapped for Durezol q2h OD
  - VA 20/50 with +2.50sph
    - Patient was -3.50-1.75x010 pre-RD
- Silicone oil eventually removed
  - BCVA 20/30+ with Contact lens
- Two years later, develops PSC central
  - Gets cataract surgery



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Sidebar: Cataract surgery on a 25 year old (Dental Student)

What's your target Rx?

What's your lens of choice?

Does the career choice make a difference for you?

24

When an emergency doesn't show up like one

25

"I just need glasses"

67 year old, Caucasian male

HPI: "can't see out of left eye", started 2 days ago

(-) pain

(+) headache-left side of head

(+) blurry vision-left eye only

(+) fatigue, pain around back of neck X 2 wks, scalp tenderness

(-) jaw pain/claudication

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History

Medical history: unknown, LME 10+ yrs ago

Medications: none

Allergies: NKDA

Ocular history: unremarkable
LEE 2017, cataracts

Social history: (-)EtOH, non-smoker

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Entrance Testing

BCVA: 20/30 OD; HM @ 4 ft OS

Pupils: PERRLA, (+)APD OS

Confrontational VF: grossly full OD, restricted OS

EOMs: Full & Smooth OU, (-)nystagmus

IOP: (NCT) 10 mmHG OU

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	OD	OS
Lids & Lashes	Normal	Normal
Conjunctiva/ Sclera	Trace injection	Trace Injection
Cornea	Clear	Clear
A/C	Deep & Quiet	Deep & Quiet
Iris	Brown, WNL	Brown, WNL
Lens	2+ NS	2+ NS

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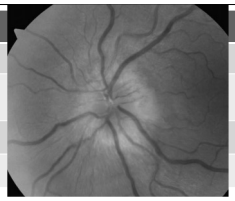
Posterior Pole Findings

	OD
Vitreous	Quiet-no cells
Optic nerve	Pink, healthy rim 0.3/0.3 C/D ratio
Macula	Flat & clear
Retina	No breaks/tears



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Diagnosis

Differential Diagnoses:
- Headache/migraine
- NAION, AAION, Optic Neuritis, papilledema or pseudotumor cerebri

What's your Diagnosis?

Diagnosis: Arteritic ischemic optic neuropathy (AION)- Giant Cell arteritis (GCA)

3 Criteria for (American College of Rheumatology) Classification of GCA:

-Age of onset >50yrs or older
-Onset of new headache
-Temporal artery abnormality (tender or reduced pulsation)
-Elevated ESR (>50mm/hr Westergren)
-Abnormal artery biopsy showing necrotizing vasculitis with predominant monocular cell filtration or granulomatous inflammation

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Treatment

ER: CBC, ESR, CRP, FBS, FTA-ABS, ANA, temporal artery biopsy
- ESR >100mm/hr
- CRP 33mg/L
- Normal neuroimaging
- (+) Biopsy confirmed GCA

Rheumatology consult

Neuroimaging: rule out intracranial process

Steroids: IV - 1g methylprednisolone sodium succinate X 3 days then 80mg oral prednisone

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1 week follow-up

Resolution of headaches, pain, fatigue

No change in optic nerve edema

Vision decreased to LP

Rheumatology for GCA management

33

2 week follow-up

Resolved optic nerve edema

VA: 20/30 OD, NLP OS - no improvement to-date

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Giant Cell Arteritis

Most common vasculitis adults >50 years

Incidence 18 per 100,000; Women 4X more likely

Highest prevalence in Caucasians (Scandinavian or Northern European decent)

Granulomatous inflammatory vasculopathy affecting medium & large sized arteries

External carotid branches, ophthalmic, vertebral, distal subclavian & thoracic aorta

>50 yo, females > males

Goal: recognize & treat GCA before AION occurs

35

Symptoms

Headache/scalp tenderness

Temple artery tenderness

Neck pain

Weight loss

Jaw claudication

Weakness

Fatigue

Tongue/scalp necrosis

Unexplained fever

36

AAION (arteritic anterior ischemic optic neuropathy)

Most common cause of severe vision loss from GCA
Infarction of short posterior ciliary arteries that supply optic nerve
1 in 5 GCA patients will develop monocular vision loss related to AAION
1/3 patients amaurosis fugax present as sign of impending AION
Vision loss severe & responds poorly to treatment
If untreated, 50% lose vision in fellow eye within days to weeks of onset
TRUE OCULAR EMERGENCY

Acute phase → ON appear swollen & pale, flame hemes
Later → no edema, optic atrophy sets in

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ESR

Measures height of RBC's settling out of plasma per hour

Male Norm: age/2

Female Norm: age + 10 /2

38

GCA Ocular Manifestations

Cranial nerve involvement (CN VI)→diplopia

Cotton wool spots

Central Retinal artery occlusion (CRAO)

Visual Field defect (altitudinal, arcuate, cecocentral scotoma)

Choroidal infarction

Nystagmus/internuclear ophthalmoplegia

Rare=anterior segment neovascularization/ocular ischemic syndrome

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GCA

Actemra (tocilizumab) =2017 FDA expanded & approved use of subcutaneous Actemra (tocilizumab) to treat adults with GCA
- subcutaneous
- First FDA approved therapy specific to this type of vasculitis

Polymyalgia Rheumatica (PMR)
- Systemic autoimmune disease
- Shoulder & hip girdle pain
- 50% GCA patients also have PMR
- Controversy: GCA & PMR separate or different manifestations of same disease

40

GCA Clinical Pearls

Thorough case history

Prompt treatment=start tx before lab results are back
- If aggressive steroid tx initiated within first 24hrs of onset of visual symptoms, 50% chance of vision improvement
- Temporal biopsy should be done within 1 week of starting steroid tx
- Beware of normal labs
  - 15-30% patients with (+) temporal artery biopsies have normal ESR
  - Biopsy temporal artery 5-9% false negative rate due to skip lesions

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42

Routine Care that's anything but…

68 year old female reports to the clinic for routine eye exam

- Haven't had an eye exam since pandemic began
- Wants to update glasses

- Hx of hypertension, hyperlipidemia, anxiety

43

Patient findings

	OD	OS
BCVA	20/15	20/15
IOP	18mmHg	17mmHg
Cornea	Clear	Clear
Conjunctiva	White and quiet	White and quiet
Iris / Ant Chamber	Deep and quiet	Deep and quiet
Lens	Clear	Clear

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	OD	OS
Discs	.2/.2, large area of PPA	.2/.2, large area of PPA
Vitreous	Clear	Clear
Macula	Normal	Normal
Retina	See photo	See photo

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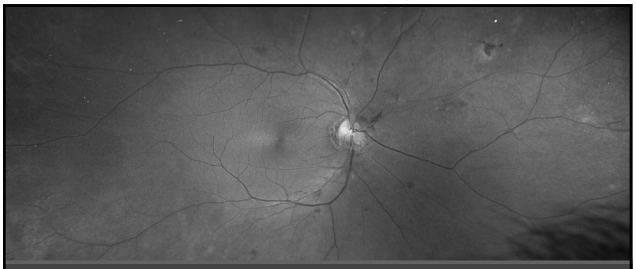

Retinal Photo OD

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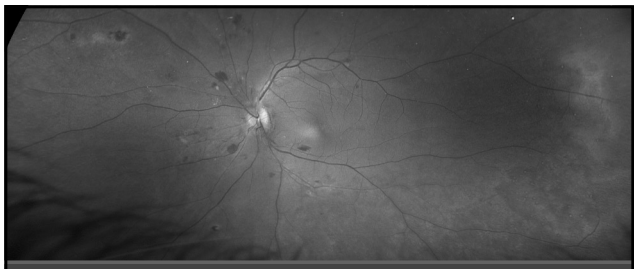

Retinal Photo OS

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What's your plan?

48

Blood Pressure in office

216/128

49

Next questions

- No nausea, headaches, dizziness, systemic symptoms
- Feeling good today
- Hasn't noticed any changes in vision or otherwise

- Discontinued meds 3-4 months ago

50

Hypertensive retinopathy

Are you a numbers person or a qualitative staging person?

Grade	Classification
Grade I	Mild generalized retinal arteriolar narrowing or sclerosis
Grade II	Definite focal narrowing and arteriovenous crossings Moderate to marked sclerosis of the retinal arterioles Exaggerated arterial light reflex
Grade III	Retinal hemorrhages, exudates and cotton wool spots Sclerosis and spastic lesions of retinal arterioles
Grade IV	Severe grade III and papilledema

TABLE 1
Classification of Hypertensive Retinopathy

Grade of retinopathy	Retinal findings	Diastolic BP (mmHg)	Systemic associations
Mild	generalized and focal arteriolar narrowing, A/V crossing changes	> 90 and < 110	modest association with risk of stroke, heart disease
Moderate	hemorrhages, retinal aneurysms, cotton wool spots, hard exudates	≥ 110 to 120	strong association with stroke, death, cardiovascular disease
Severe	moderate retinal findings plus optic nerve swelling	≥ 120	strong association with death

From Wong et al[1]
A/V = arterio/venous

51

Grade 3 (Moderate) Hypertensive Retinopathy

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Next steps

- Go directly to the ER!

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9 months later…

- 28 year old new patient reports to the office
- "Doc, you don't know me but I want to say thank you"
- Grandmother went to ICU for 7 days

- "Because of you, my grandmother got to hold her great granddaughter who was born 4 months ago"

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Patient

- 73 year old male reports to the clinic for an walk-in urgent care visit
- Woke up this morning with some mild tenderness, but mainly wanted to get a brown spot checked out on his eye
- Has a tee time in an hour but wife wanted him to get this looked at before he went to the course
- History of Diabetes and Hypertension
- Medications: Carvedilol, Metformin, Eliquis

Presentation title 20XX 56

56

Exam findings

Visual Acuity
- OD 20/25
- OS 20/40 PH: 20/30

IOP (iCare)
- OD 14 mmHg
- OS 19 mmHg

Slit lamp findings
- OD unremarkable
- OS see photo

Presentation title 20XX 57

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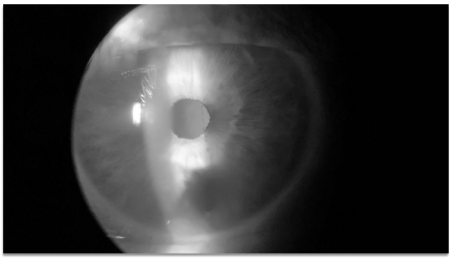
Brown, huh?



Presentation title 20XX 58

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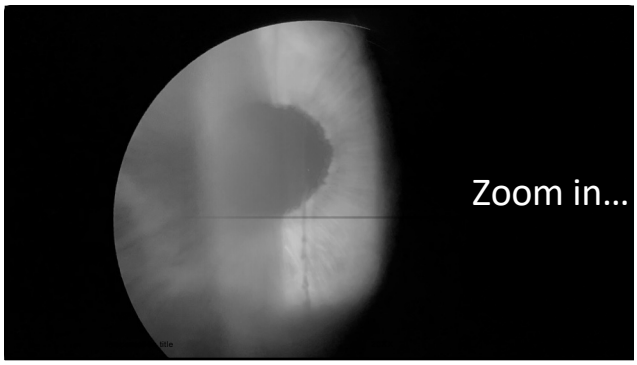

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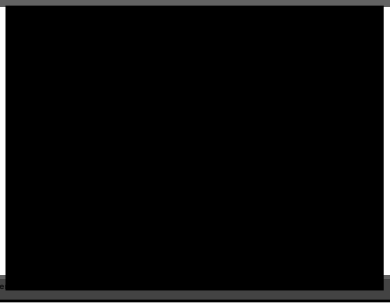
…and some video



Presentation title 60

60

Diagnosis

Hyphema
- No history of trauma
- No history of trauma
- No history of trauma
- Blood pressure checked in office
  - 218/120
  - 200/120
- Denies headache, fatigue, chest pain, dizziness, difficulty speaking, etc.

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Hyphema

Active bleeding that pools in anterior chamber

Usually from trauma or history of ocular surgery

Secondary to iris neovascularization in proliferative diabetic retinopathy

When recurrent, can be associated as UGH
- Uveitis-Glaucoma-Hyphema triad

Considerations:
- IOP
- History of Sickle cell or sickle cell trait
- Rebleeds
- Gonioscopy- when to perform?

62

Plan

Gave patient choice to call PCP or go to ER, pt elected to call PCP

Ended up going to ER into ICU due to elevated blood pressure

Stayed in ICU for 6 days

PCP added Losartan, HCTZ, Spironolactone

Was set up for retina consult after discharged from hospital

Hyphema resolved, BP still elevated, but much lower

64

My eye has been bothering me…BUT

65

"This isn't pink eye"

42 year old female reports to clinic for worsening red eye OS>OD
- Started 5 days ago in left eye, moved to right eye within 24 hours
- Complains of itchy, scratchy, foreign body sensation
- Started getting sore throat, swollen lids
- Patient states "this isn't pink eye, it's allergies, but I need help…now"

66

Went to urgent care instead of optometry clinic

67

At urgent care

- Diagnosed with allergic conjunctivitis
- Was prescribed Zerviate
- Had issues with pharmacy, after 48 hours of not having medication, was frustrated and asked pharmacist what to do
- Patient bought Pataday
- Came into clinic with sealed package

68

How many times has this happened to you?

What do you expect the eyes to look like?

69

Pertinent history

- Contact lens wearer (-10.00D sphere OU)
- Wearing monthly SiHy lenses
- Generally compliant
  - Discards about every month
  - Doesn't sleep in them
  - Uses appropriate solution and care
- Wore CLs first two days, but unable to wear since

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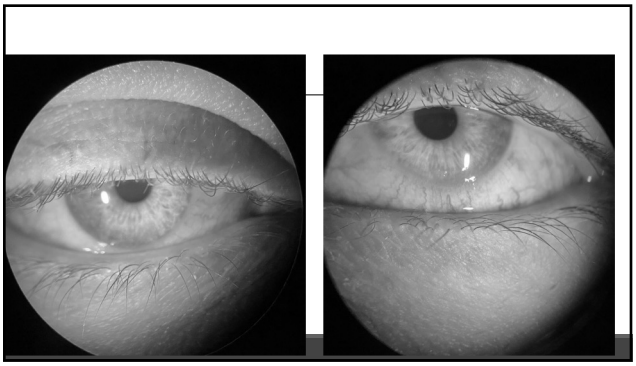

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So…This isn't pink eye???

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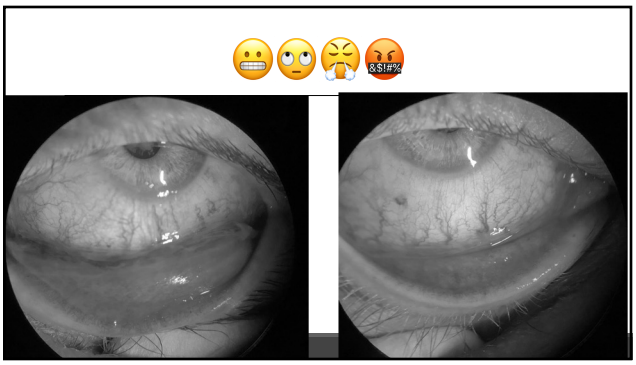

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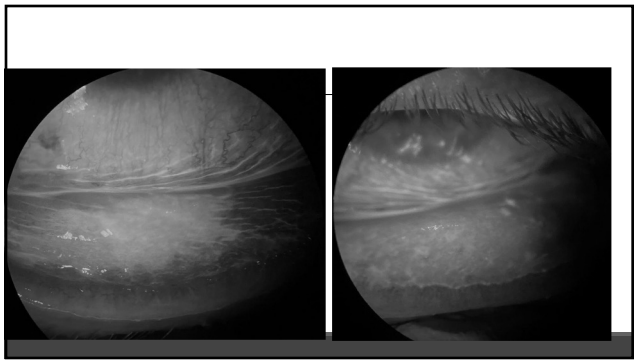

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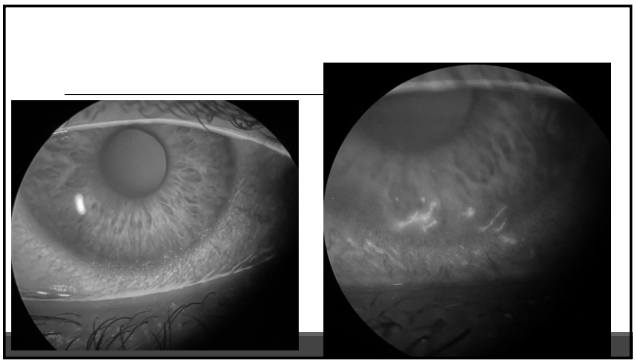

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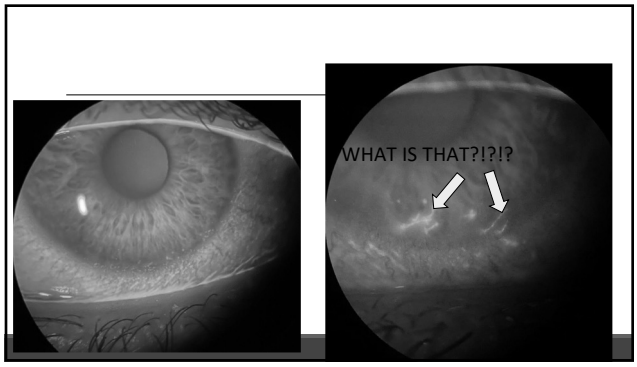

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What are we thinking?

- Hemorrhagic epidemic keratoconjunctivitis with pseudomembranes OU
- Herpes simplex keratitis OS?

- Patients reserve the right to have multiple diagnoses at the same time***

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Linear staining moves on blink…

Filiaments from mechanic rubbing from pseudomembranes

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Epidemic Keratoconjunctivitis / Pseudomembranes

- Viral infection typically associated with systemic viral infection
- Peripheral lymph adenopathy
  - Patient has swollen submandibular and preauricular lymph nodes upon palpation
- Infection spreads from one eye to the other within 24 hours
- Highly contagious
  - Need to change towels, sheets, etc.
  - Keep head in a proverbial bubble
  - Copious handwashing
- Most significant ocular manifestation is sub-epithelial infiltrates that can cause corneal scarring leading to decreased vision
- GLOVE UP! and other considerations

79

Management

- Educate the patient that this in fact is pink eye
  - "Are you sure?!"
- Stay out of contact lenses while this is healing
  - "Are you sure?!"
- Started on Zylet q1h OU overnight
- Rx'd Zirgan 5x/day OU
- RTC 24 hours

- Betadine?

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24 hours later

- Feeling much better
- Using Zylet q1h OU
- Did not get Zirgan, will pickup later today
- Pseudomembranes present but breaking up minimally
- Corneal staining inferior improving
- Decrease to q2h OU on Zirgan over the weekend, RTC Monday
- On the way out the door…
  - "Ummmm doc, how long will I be out of my contact lenses?"

81

Follow-ups

- Day 4
  - Patient reporting more FBS at corners, lateral OD, medial OS
  - Still very injected, red, but feeling better
  - "Can I wear my CLs?"
    - NO!
    - "But doc…"
  - OS membrane breaks into two separate membranes down the middle
    - Elevation causing FBS
  - Corneal staining OS>OD, resolving
  - Stay the course
  - RTC end of the week
- Day 8
  - Membrane OD resolved, corneal staining healed
  - Membrane OS, small patchy area nasal, mild staining
  - Continue Zylet qid OS, Change schedule for trip

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On Day 7…

- Other doctor in practice has patient on the schedule with same last name with complaints of red, irritated, itchy eyes off and on that have been going on for about 2 weeks…with visits to our office
- It's the Daughter!
- Who gave what to whom?!?

83

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"This isn't pink eye" Case #2

56 year old male

HPI: "right eye is red, I think I have pink eye" began 1-2 week ago

(+) pain 2/10 severity

(+) photophobia

(+) blurry vision

(+) watering

85

History

Medical history: Anxiety, Depression, HTN, neuropathy (feet)

Medications: lisinopril, Effexor, Xanax

Allergies: NKDA

Ocular history: unremarkable
LEE 2014, Air Optix Aqua MF contact lenses

Social history: 1-2 drinks/week, non-smoker

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Entrance Testing

BCVA: HM @ 4ft OD NIPH; 20/30 OS

Pupils: PERRLA, (-)APD

Confrontational VF: grossly full OU

EOMs: Full & Smooth OU, (-)nystagmus

IOP: (iCare) 17 mmHG OD, 16 mmHG OS

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Sl

	OD	OS
Lids & Lashes	Normal	Normal
Conjunctiva /Sclera	3+ injection	Trace Injection
Cornea	Contact Lens Diffuse edema Central epi defect Neovascularization (0.5mm I & N)	Contact Lens
A/C	Hazy View	Deep & Quiet
Iris	Brown, Grossly normal	Brown, WNL
Lens	Trace NS	Trace NS

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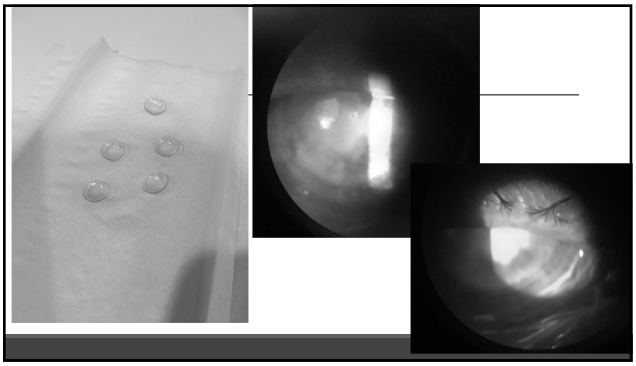

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Posterior Pole Findings

	OD (Hazy View)	OS
Vitreous	Quiet-no cells	Quiet-no cells
Optic nerve	Pink, healthy rim 0.3/0.3 C/D ratio	Pink, healthy rim 0.3/0.3 C/D ratio
Macula	Flat & clear	Flat & clear
Retina	No breaks/tears	No breaks/tears

90

Diagnosis

Differential: corneal abrasion, corneal infiltrate

Diagnosis: corneal ulcer secondary to contact lens overwear

What do you do now?

91

Sterile vs Infectious Infiltrate

Sterile	Infectious
Smaller lesion (<1mm)	Larger lesion (>1mm)
Peripheral location	Central location
Minimal epithelial damage	Significant epithelial defect
No mucous discharge	Mucopurulent discharge
Less pain or photophobia	Pain & photophobia
No or minimal A/C reaction	Anterior chamber reaction
No lid involvement	Lid edema, hypoyon

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Infectious Infiltrates

Viral=adenovirus, EKC, HSV, HZO

Bacterial=Staphylococcus, Strephtococcus, Pseudomonas
-Contact lenses: *Pseudomonas aeruginosa*
- *Staphylococcus aureus*

Fungal

Protozoan=*Acanthamoeba*

Contact Lens patient=treat as infectious until proven otherwise

93

Culturing

When to Culture:
-Large, central ulcer
-unresponsive to treatment
-post-surgical, monocular, or immunocompromised
-3-2-1 Guideline

-Best to perform culture before initiating treatment

-"**Quick culture**": sterile swab placed in prepared (thioglycolate) broth and sent to lab to be placed on nutrient plates

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Treatment

Antibiotic
- Fluoroquinolones
- Aminoglycosides
- Polymixin-B combos
- Other: erythromycin, bacitractin, azithromycin

Steroid

Amniotic Membranes

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Case: 56 yo male Corneal Ulcer

Treatment
- 0.3% ciprofloxacin q30min
- 1% cycloplegic in office
- Prokera Slim Amniotic Membrane
- RTC 1 day

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Follow-up

1-Day: Prokera Slim 80% dissolved
-replaced with new Prokera
-Continue topical antibiotic q30min
-RTC 1 day

4-day: 2nd Prokera dissolved
-resolved infiltrate
-2+ SPK cornea
-Taper topical antibiotic to qid
-Start 1% pred acetate q2hr
-copious PF ATs
-RTC 2 days

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Follow-up

6-Day:
-1+ SPK
-D/C topical antibiotic
-Decrease 1% pred acetate qid & increase PF ATs
-RTC 3 day

10-day:
-trace SPK
-BCVA 20/25-
-IOP stable
-small central epithelial scar

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Corneal Ulcer Clinical Pearls

Infectious vs Non-infectious

Be aggressive

Don't forget about amniotic membranes

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Beauty is pain…

47 year old female reports to clinic with severe eye pain
- Started this afternoon (Wednesday) suddenly after leaving appointment with aesthetician for eyebrow tinting
- Has had several of these before in the past with no issues
- Extreme photophobia, trouble seeing out of the eye
  - Unable to keep eye open enough to get vision in OD
- Unable to sit upright

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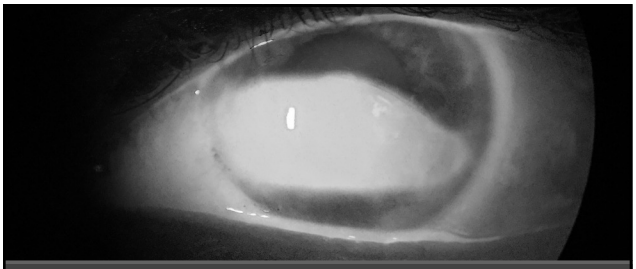

Corneal staining with NaFL, after anesthesia

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Conjunctival image with NaFL staining

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Anything different about today's visit for cosmetic procedure?

New assistant with the aesthetician, put drops in eye today

**Later get photo of drops that say, "DO NOT PUT DIRECTLY IN EYE"

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Diagnosis

- Iatrogenic Corneal abrasion / erosion secondary to drops
- Chemical injury
  - Was not aware at time of diagnosis
  - Keep this in mind: would this have changed your management / treatment

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Doc, I'm heading to Yellowstone Friday AM

Am I the only one who has emergency patients who leave 2 days after a red eye?

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Management

- ProKera applied in office
- Cycloplegia done prior to insertion
- Partial tarsorrhaphy with transpore surgical tape
- Given sample of NSAID use prn
- RTC 15 minutes before office closes tomorrow (getting 28 hours of amniotic membrane healing)

- Would you have done anything different if suspecting a corneal chemical injury?

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RTC 28 hours later

- Patient feeling better
  - Eye feels irritated due to wearing ProKera
  - Declines photophobia, pain, vision still blurry

- ProKera removed
  - Cornea, 100% closed, mild SPK at limbus
  - Conjunctiva, mild staining at area of erosion
- Management
  - Rx'd Lotemax tid OU x 3 days to help with inflammation
  - Have a great trip!

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Take Home Points

Emergent vs Urgent

Vision vs Life Threatening

Acute vs Chronic

Progressive vs Stable

Proper Documentation

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Thank you

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Thank you!

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