Experience EXPO With Us!

- Main Stage - *Exhibit Hall – Booth F11084*
  Our Main Stage sessions feature free, promotional content for all attendees.
- Vision Series - *Thursday 9/18, Friday 9/19 and Saturday 9/20*
  Grab a bite to eat and continue learning over *Breakfast 8:30-9:30am or Lunch 12:00-1:00pm!**
  Listen to industry leaders as they address the latest clinical innovations in a relaxed and collaborative environment.

  **Open to Optometrists only. Not for Credit. Meals offered on first-come, first-serve basis to pre-registered attendees.*
- Exhibit Hall Hours
  Thursday, Sept 18 b 9:30am – 6:00pm
  Friday, Sept 19 9:30am – 6:00pm
  Saturday, Sept 20 9:30am – 3:00pm

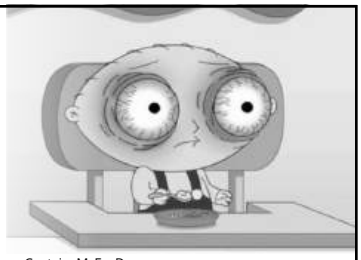
Conferee Cafe – Exhibit Hall – Booth P19087

Education Lounge – Level 1 - Conference Area
Conferee Happy Hour Thur, Sept 18 4:30 - 5:30pm

vision expo

1

What's Your Ocular Emergency?



Mark Schaeffer, OD,FAAO – Clinical Excellence Captain, MyEyeDr

Cecelia Koetting, OD, FAAO DipABO– Assistant Professor, University of Colorado School of Medicine

Andrew S. Morgenstern, OD, FAAO, FNAP – Optometrist, OcuSolve, LLC

2

CECELIA KOETTING FINANCIAL DISCLOSURES

"All relevant relationships have been mitigated."

- Ocular Therapeutix -C
- Horizon-C
- Quidel-C
- Ivantis-C
- Orasis-C
- Otto-C
- Trukera-C
- LENZ-C
- Tarsus-C,S,R
- + Glaukos-C
- + B +L- C,S
- + Iveric-C
- + Aldura-C
- + Claris Bio-C
- + Aldeyra-C
- + Twenty Twenty Therapeutics-C
- + Dompe-C,S,R
- Oyster Point/Viatris-C, S,R
- Allergan/Abbvie –C,S,R
- Alcon-C,S
- Visus-C,S
- Harrow-C,S
- Thea-C,R
- Bruder-C
- Blinkjoy-C
- SCOPE-C

Intrepid

KOETTING

3

Financial Disclosures – Mark Schaeffer, OD FAAO

All Relevant Relationships Have Been Mitigated

- Alcon – Consultant, Speaker
- Allergan – Consultant, Speaker
- Bausch + Lomb – Consultant, Speaker
- CooperVision – Consultant
- Dompe – Consultant, Speaker
- Harrow – Consultant, Speaker
- Johnson & Johnson Vision Care – Consultant
- LENZ Therapeutics - Consultant
- Optase – Consultant
- Orasis – Consultant, Speaker
- Science Based Health – Consultant
- Sight Sciences – Consultant
- Tarsus – Consultant, Speaker
- Thea - Consultant
- Tenpoint Therapeutics – Consultant
- Zeiss – Consultant, Speaker

- Founder, Dr. MES Consulting
- Founding Member, Industry Chair: Intrepid Eye Society

Intrepid

4

4

Andrew Morganstern, OD FAAO FNAP Financial Disclosures

- LENZ- Advisory Board
- Epion- Advisory Board
- Tarsus- Speaker
- Virtual Field- Consultant
- IKA- President and Co-Founder
- New England College of Optometry- Board of Trustees

- All relevant relationships have been mitigated

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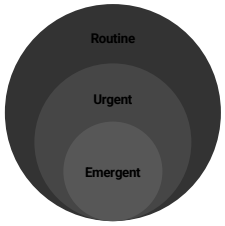
Levels

- Immediate/Emergency
  - Should come to office to be seen immediately, or to nearest emergency eye care facility
- Urgent
  - 24 hours
- Semi-Urgent
  - 1 week
- Routine
  - Next available
  - Does not pose immediate threat, may have been present for more than a week

6

Tackling the triage:



Written protocol

Staff training
- Including mock scenarios
- Calls and case review

When in doubt, see the patient!

7

- Who
- What
- When
- Where
- Why

- Assess and classify a patients signs and symptoms according to their severity and urgency

8

Anatomy

- Eyelid
- Orbit
- Globe
- Optic Nerve

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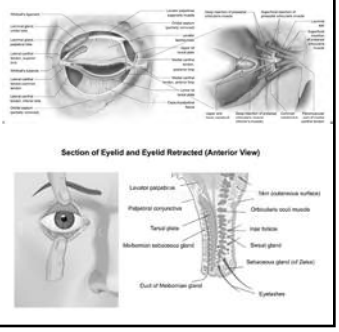
Eyelid Anatomy



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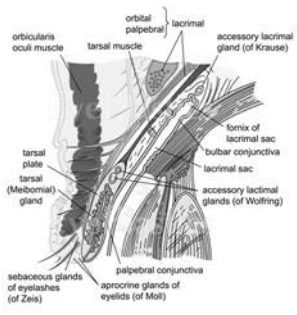
Eyelid Anatomy



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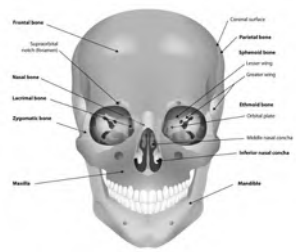
Orbit Anatomy



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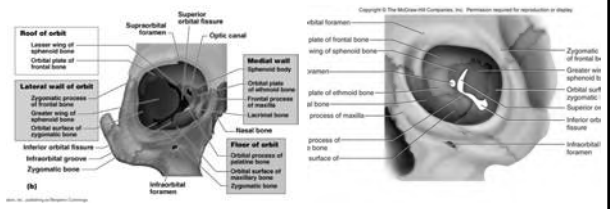
Orbit Anatomy



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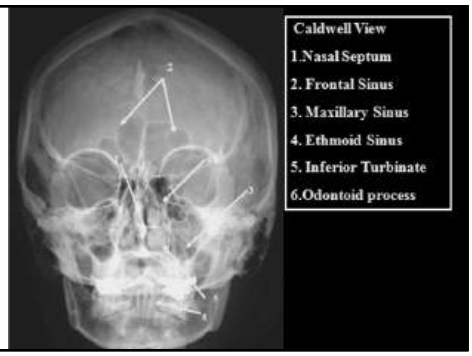
Orbit Anatomy



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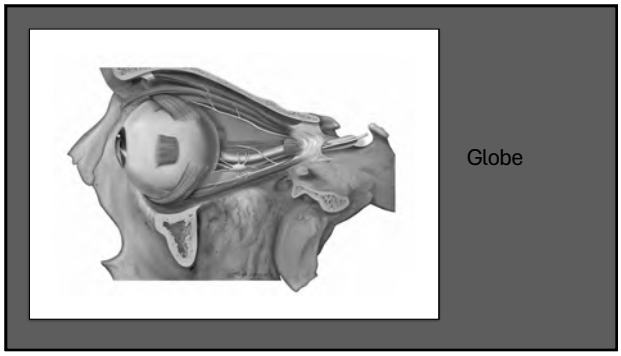

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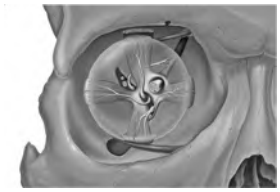
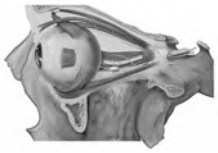
Globe





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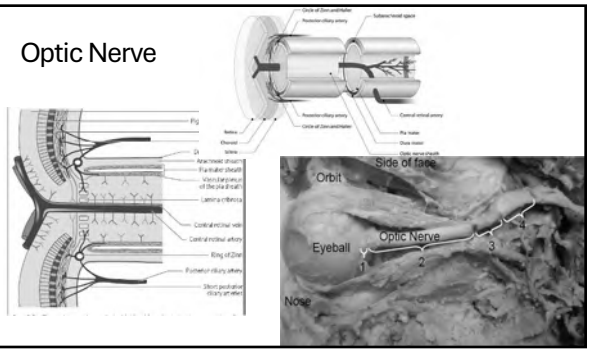
Optic Nerve



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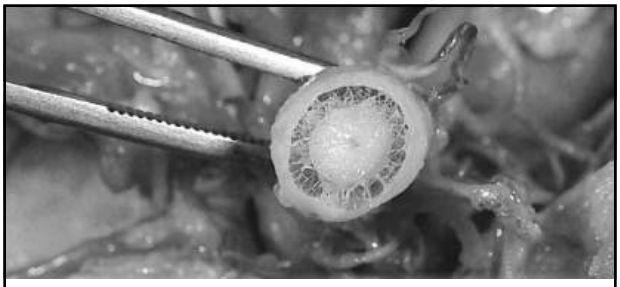

Cross Section of an Optic Nerve

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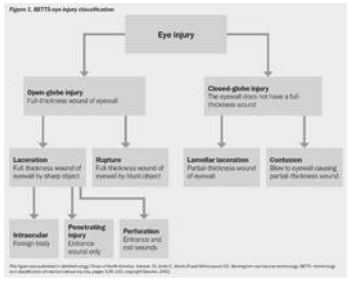
Birmingham Eye Trauma Terminology System (BETTS)



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Open Globe Injury Classification

- Type
  1. Rupture
  2. Penetrating
  3. Intraocular
  4. Perforating
  5. Mixed
- Grade- visual acuity
  1. ≥20/40
  2. 20/50 to 20/100
  3. 19/100 to 5/200
  4. 4/200 to light perception
  5. No light perception
- Pupil
  - Positive-RAPD+ in affected eye
  - Negative-No RAPD in affected eye
- Zone
  - I- Isolated to cornea (Including the corneoscleral limbus
  - II- Corneoscleral limbus to a point 5mm posterior into the sclera
  - III- Posterior to anterior 5mm of sclera

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Closed Globe Injury Classification

- Type
  1. Contusion
  2. Lamellar laceration
  3. Superficial foreign body
  4. Mixed
- Grade- visual acuity
  6. ≥20/40
  7. 20/50 to 20/100
  8. 19/100 to 5/200
  9. 4/200 to light perception
  10. No light perception
- Pupil
  - Positive-RAPD+ in affected eye
  - Negative-No RAPD in affected eye
- Zone
  - I. External (limited to bulbar cj, sclera, cornea)
  - II. Ant seg (structures internal to cornea including PC, pars plicata)
  - Post seg- all structures post to PC)

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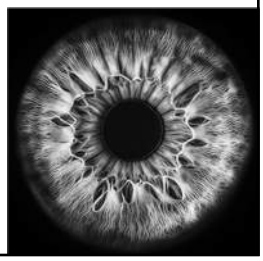
What is the Most Important Detail to Record Immediately After an Eye Injury?

A. Level of Pain
B. Open vs. Closed Globe
C. Visual Acuity
D. Pupils and Motility



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MILITARY MEDICINE, 183, 3/4:219, 2018

Simplified Method for Rapid Field Assessment of Visual Acuity by First Responders After Ocular Injury

CPT Nikhil J. Godbole, MC, USA; MAJ Erin S. Seefeldt, MC, USA*†; COL William R. Raymond, MC, USA, (Ret.)*; James W. Karesh, MD, FACS‡; Andrew Morgenstern, OD‡; Jo Ann Egan, BSN, MS‡; LTC Marcus H. Colyer, MC, USA§; COL Robert A. Mazzoli, MC, USA, (Ret.)*†‡*

ABSTRACT Objective: Initial visual acuity after ocular injury is an important measure, as it is an accurate predictor of final visual outcome and gives a rapid estimation of the overall severity of the injury, thereby aiding evacuation prioritization. We devised a simple method for rapidly assessing visual acuity in the field without having to rely on formal screening cards. Methods: Using common objects, icons, and text found in the injury zone – for example, common military name tapes, rank insignias, patches, emblems, and helmet camouflage bands, which will be known collectively as the Army Combat Optotypes (ACOs) – a Snellen-equivalent method of assessing visual acuity was devised and correlated to the ocular trauma score (OTS). Results: Ability to read the ACOs at 2, 3, and 5 ft correlates with acuities in the range from 20/20 to 20/400. Identification of ACOs with visual acuity of 20/50 and 20/200 approximates important inflection points of severity for the OTS. Conclusion: Accurately assessing visual acuity in the field after ocular injury provides essential information but does not require sophisticated screening equipment. Pertinent and accurate acuities can be rapidly estimated using commonly available text or graphical icons such as standard name tapes, patches, and rank insignias.

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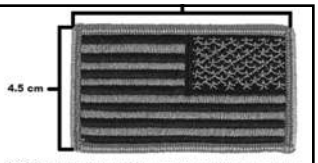

FIGURE 1. The subdued flag is worn on the soldier's right arm. It measures 4.5 cm in height by 8.0 cm in width. The field of stars measures 2 cm in height by 3.5 cm in width. Each individual star measures 2 mm at the widest portion. The stripes on the flag measure 3 mm in width.

FIGURE 2. The name tapes are worn on the right and left chest. They measure 2.54 cm in height and 12.7 cm in length. The letters measure 18 mm in height.

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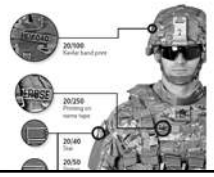
JOINT TRAUMA SYSTEM CLINICAL PRACTICE GUIDELINE (JTS CPG)

Eye Trauma: Initial Care (CPG ID:03)

This CPG provides a step-by-step approach for the non-ophthalmologist in the initial evaluation and treatment of eye trauma injuries sustained in the combat theater or in remote and austere environments.

Figure 30. Visual Acuity Testing.
Letters and patches on a U.S. Army uniform that can be used to determine visual acuity in the field. If using this method, test from a distance of 9 feet. *Photo credit: Vision Center of Excellence.*



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Which of the following are True Ocular Emergencies??

- Retinal Detachment
- Central Retinal Artery Occlusion
- Acid/Alkali Chemical Injury
- Acute Angle Glaucoma
- Partial Thickness Globe Injury
- Open Globe Injury
- Hollenhorst Plaque
- Orbital Floor Fracture
- Orbital Sinus Fracture

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True Ocular Emergencies

- Central retinal artery occlusion
- Alkali/Acid injury
- Orbital compartment syndrome
- Acute angle closure glaucoma

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Orbital Compartment Syndrome

- An acute increase in the compressive forces within the closed orbital cavity from either
  - A decrease in the orbital size without any compensating decrease in the orbital contents, OR
  - An increase in the orbital contents without and compensating increase in the size of the orbit
- Reduction in orbital perfusion caused by an increase in intraorbital compressive forces
- Irreversible ischemic injury to the optic nerve and retina resulting in loss of vision.

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Treatment
Orbital Compartment Syndrome

- Canthotomy/Cantholysis
- Cut Lateral Canthal Ligament

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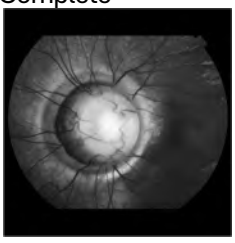
Optic Nerve Avulsion Complete



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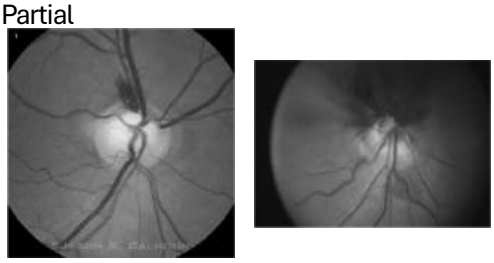
Optic Nerve Avulsion Partial



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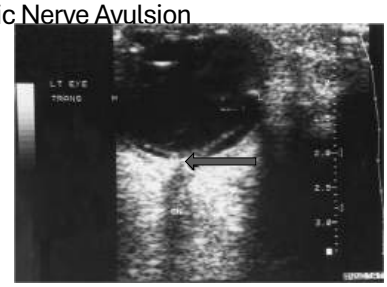
Optic Nerve Avulsion



Hypolucency posterior to the optic nerve head

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Emergent Ocular Injuries

- Central retinal artery occlusion
- Alkali/Acid injury
- Orbital compartment syndrome
- Acute angle closure glaucoma

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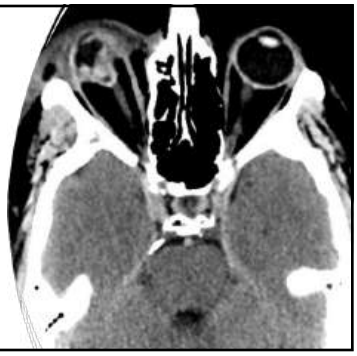
Urgent

- Hyphema (in certain situations such as sickle cell disease/trait)
- Severe periocular lacerations
- Orbital fracture with muscle entrapment
- Traumatic optic neuropathy
- Corneal foreign bodies



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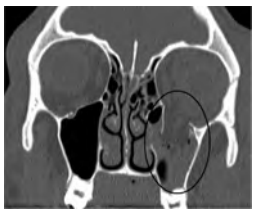
Non-Urgent

- Corneal abrasions
- Periocular lacerations
- Most hyphemas
- Most orbital fractures
- Most retinal detachments



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Intraocular Sequlae of Blunt Trauma
7 Rings of Anterior Segment tissue
LTC. Won I. Kim, MD USA (1 Eye Kim, really)

- Iris sphincter → sphincter tears (traumatic mydriasis)
- Iris base → iridodialysis
- Ciliary body face → angle recession
- Ciliary body attachment to scleral spur → cyclodialysis
- Trabecular meshwork → meshwork tears
- Zonules → lens subluxation/Traumatic cataract
- Ora serrata → retinal dialysis

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Emergency! Now What do I do??

- Primary survey
  - ABCs: stabilization of life-threatening injuries
  - **Life, Limb, SIGHT and Safety**
- Secondary survey
  - Includes ocular exam

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Acute Ocular Trauma Exam

- Visual acuity
  - Snellen, CF, HM, LP, NLP
- Motility
- External
- Penlight exam
  - pupils, anterior segment

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Acute Ocular Trauma Exam – In Office

- Assessment of ocular injuries
- Irrigate if chemical exposure
- Protect eye with shield
- Avoid further injury
- Minimize increase in IOP
  - Positioning, splinting, pain control, antiemetics

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Primary Survey – In Office

- Mechanism of injury
  - Sharp, blunt, chemical exposure, dirt
  - Time of injury
- Subjective visual acuity (before and after)
- Visual/ocular symptoms
  - Pain, double vision, photophobia
- Last meal

40

Primary Survey – In Office

- Medications
- Allergies
- Medical conditions, including:
  - Cardiovascular/pulmonary disease
  - Sickle cell disease or trait
  - Bleeding disorders
- Immunization status (esp. tetanus)

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Primary Survey – In Office

- Visual acuity
- Corrective lenses (including contacts)
- Medications
- Known ocular pathology
- Previous ocular surgeries/injuries
  - Includes laser vision correction (LASIK/PRK)

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Ready for some cases?
Lets Dive in

43

Case

- 56 YOA white male, presents today for an urgent add-on visit for admitted to hospital June 6 for 1 month. Last eye exam last Friday. Issues started while in the Hospital, OS feels ok, OD throbs. Was wearing CL in OD when presented to hospital.
- Current Vigamox QID BE/Pred forte BID LE/Erythromycin QID RE/Vancomycin QID BE
- Not using his voraconazole

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How did we get here?

- Overdose on alcohol
- Hospitalized while contacts still in
- Moved/life lifted from his local hospital to UC because they are better able to care for the patient.
- Resident requested for ophth consult after arrived because eyes were noted to be VERY RED

Corneal infections and ulcers R=L

In the setting of contact use, regularly sleeps with contacts in. On Optho evaluation, 1 contact was found still in place. As of 6/18, left eye appears to be improving, right eye is being closely monitored for signs of perforation iso non-healing ulcer. Gtts liberalized to Q4 on 6/17, further timeline of gtts depends on improvement in right eye.

- Patient lives ~4.5hrs away, needs very close follow-up and corneal specialists are difficult to find near his home so stayed in the hospital an extra week for eye exams. Slow improvement in healing and Optho felt he could discharge and return to see them in clinic on Wednesday. They are working on finding a specialis near his home that can do exams that is closer. Continue treatments as outlined above

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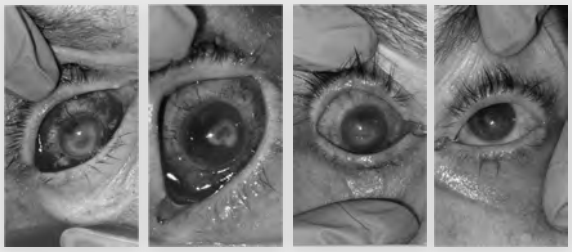

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Treatment?

- Discussed that OD may still have some active infection but also likely inflammation. OS has some scarring but no active infection at this time, scarring may improve but will likely continue to effect vision.
- Pt lives in Payonia, but doesn't have a local Dr. No close Cornea specialist. Grand Junction is the closest 1-1.5hrs. Denver is approximately 5 hrs.
- Ideally should be seen here till healed. Is not coming to Denver for any other treatments. Would want to see the patient next week to monitor. Patient is able to make it on Friday to see Dr. Wildes.

Treatment:

- Right eye
  - vancomycin four times a day till gone
  - moxifloxacin QID
  - erythromycin QID (ointment after drops)
- Left eye
  - vancomycin STOP
  - moxifloxacin QID
  - pred forte BID
- Continue doxycycline 100 mg BID PO (for corneal wound healing)
- Continue vitamin C 1000 mg QD PO (for corneal wound healing)

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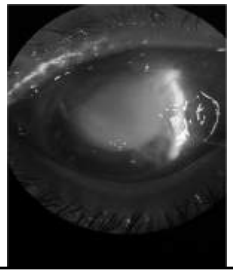
Bacterial Keratitis/Corneal Ulcer Risk Factors



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Work-up

- History
- Slit lamp examination
- Photodocumentation
- Culture - Rules of 1-2-3
  - Within 1 mm of visual axis
  - Ulcers with 2 or more infiltrates
  - 3 mm or more in diameter

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Indications for Cultures

- Hyperacute conjunctivitis
- Neonatal conjunctivitis
- Post-operative infections
- Chronic conjunctivitis
- Central corneal ulcers
- Membranous / Pseudoconjunctivitis
- Preseptal / Orbital cellulitis
- Post-traumatic infections
- Marginal infiltration / ulceration
- Atypical external disease
- Severe dry eye
- Bullous keratopathy
- Axial and severe keratitis

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Acanthamoeba

- Parasitic infection
  - *A. castellanii* and *A. polyphaga*
- Culture on dish of E. coli plated over non-nutrient agar
- Symptoms
  - Decreased vision
  - Typically pain is out of proportion to findings
  - Light sensitivity
  - Redness
  - Foreign body sensation
  - Lid edema
- Ocular findings
  - Epithelial irregularities
  - Epithelial or subepithelial infiltrates
  - Satellite lesions
  - Stromal infiltrates (ring-shaped, disciform)
  - Anterior uveitis
  - Scleritis
  - Chorioretinitis

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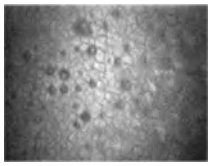
Confocal Microscopy

- Historically used for endothelial cell evaluation
  - Fuch's dystrophy
  - Post-surgical bullous keratopathies
- Studied for use in diagnosing infectious keratitis
  - Acanthamoeba
  - Fungal keratitis
  - Studies show
    - Sensitivities: 80-94%
    - Specificities: 78-93%
  - Procedure
    - Thick fluid-coupling agent on cornea
    - Scans all layers



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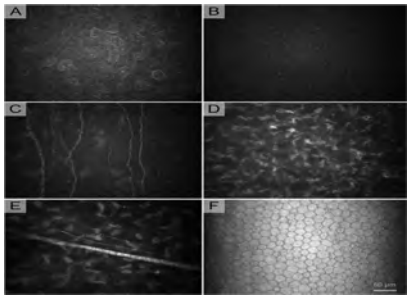
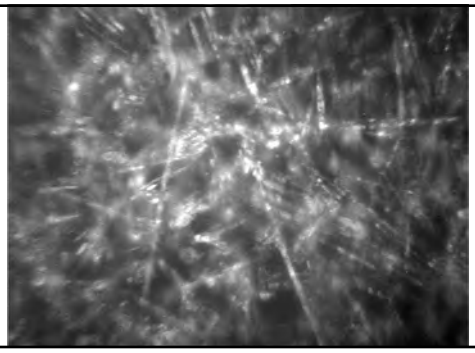


Hillenaar, T. (2012) In vivo confocal microscopy expanding horizons in corneal imaging

53



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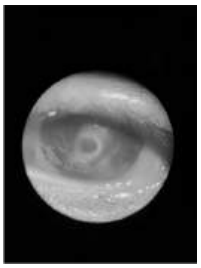
Treatment and Management of Acanthamoeba

- Culture! Refer to someone with a confocal if possible
- Early stages- topical antibiotics
  - Fortified compounded
  - Often and agressive
- Cationic antiseptics- polyhexamehtylene biguanide (PHMB) and Chlorhexidine
- Combination therapy with a diamidine
- Debridement of tissue
- Penetrating keratoplasty
- Steroids?
- What about CXL?

55

What if it doesn't heal?



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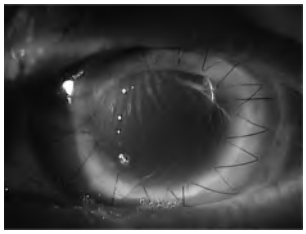
Penetrating Keratoplasty



57

Acanthomoeba May 2024- 15 YOA female

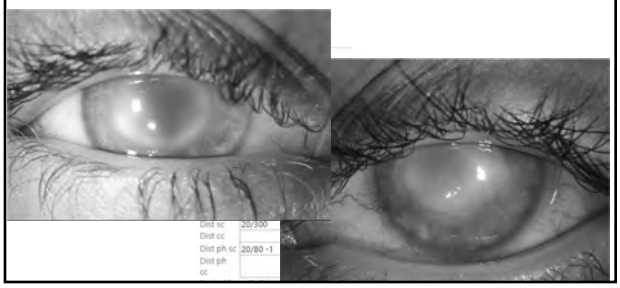
S/p 1. Corneal biopsy left eye and Placement of amniotic membrane on the surface of the left eve - 07/26/2024

s/p corneal biopsy with AMT left eye - 7/26/2024

S/p PKP left eye - 10/30/2024

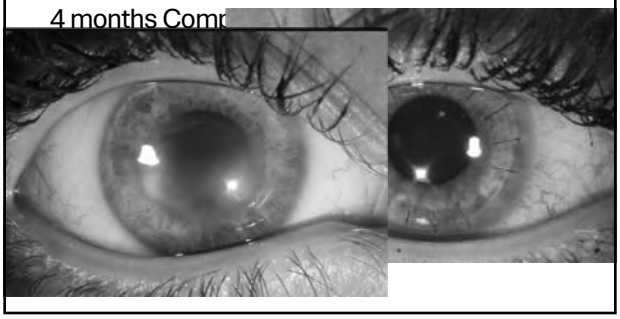
- Patient reports vision stable, using scleral CL in the right eye fit by Vicki
- Left eve with clear graft on exam no signs of infection or rejection - few loose sutures

58



59

4 months Comr



60

Let's get to some cases!

61

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

- 15 year old got hit in the face with soccer ball during practice
- Frame snapped at temple and hit in the left eye
- Very light sensitive, significant pain, having some trouble with vision

Which one do you want in your chair?

62

More details

Case 1

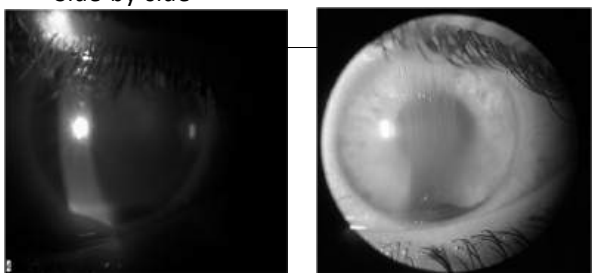
	OD	OS
VA	HM PH/NI	20/20
IOP	22	17
Anterior Seg	See following slides	clear
Posterior Seg	See following slides	clear

Case 2

	OD	OS
VA	CF@3ft PH: 20/30	NLP PH: NI
IOP	20	26
Anterior Seg	See following slides	clear
Posterior Seg	See following slides	clear

63

Side-by-side



64

Traumatic Hyphema

What to do next?

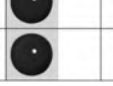
65

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

66

More detailed information

Case 1

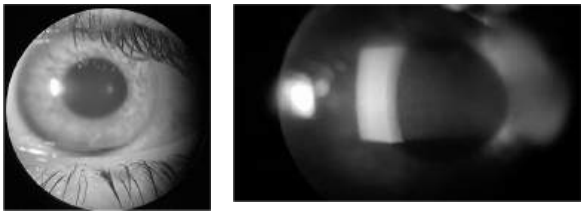
	OD	OS
Cornea	Clear	Clear
Chamber	Hazy, 30% hyphema and growing, 2+ cells	Deep and quiet
Iris	Normal	normal
Pupil	Sluggish	reactive

Case 2

	OD	OS
Rx	-5.00-2.00x012	-5.00-1.50x147
Cornea	Clear	Clear
Chamber	Deep and Quiet	Waterfall appearance Small settling of hyphema inferior, Difficult to see cells (maybe 1-2+)
Iris	Normal	normal
Pupil	Reactive	Sluggish

67

After phone call to on-call retina specialist…



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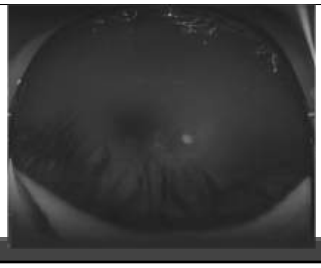
How are you treating each of these?

Case 1?

Case 2?

69

Case 1 Retina



70

Treatment

Case 1

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

Case 2

- Difluprednate qid OS
- Cyclo in office
- Brimonidine/Timolol bid OS
- No aspirin or blood thinners
- Head elevated
- Sent to Eye Foundation hospital for B-scan
- RTC 24-48 hours

71

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

- Taking Difluprednate and brimonidine/timolol
- Came back to office 2 days later,
  - (-) hyphema
  - (+) cells
  - Healing nicely
  - IOP OS 14mmHg
- Continued follow-up
  - 1 week resolved
  - Start slow taper of difluprednate, d/c brimonidine/timolol
  - IOP went up to 16mmHg

72

GONIOSCOPY

Check for iris structure abnormalities

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

73

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

74

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

75

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?

76

Case

- 58 year old African American female presents to clinic as a new patient due to "splotch of ink" present along the inferior visual field of the left eye. Patient reports this began about 2 weeks ago. Patient denies flashes of light or floaters in vision.

77

Medical History

- Type II Diabetes
  - 10+ years
  - A1c: 7.4
  - BG: 125
- Heart Disease
- Hypertension

- Medications:
  - Amlodipine
  - Atorvastatin
  - Losartan
  - Metformin
- Allergies:
  - Aspirin

78

Entrance Testing

- Vasc:
  - 20/40 OD PH: 20/25
  - 20/40 OS NIPH
- Mrx:
  - OD: -0.50 +0.25 x 005 20/25
  - OS: -0.25 +0.50 x 020 20/30-
- Pupils:
  - round, reactive no APD OU
- CVF:
  - FTFC OU
- EOM:
  - full range of motion
- IOP: 20/17

79

What's Your Next Step?

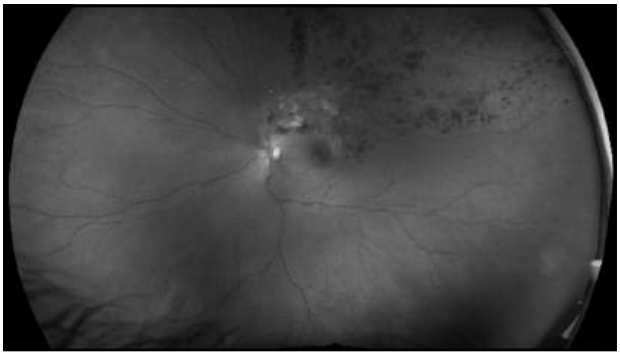
- Differentials?
- Testing?

80

Slit Lamp Exam

- OS:
  - Vitreous: no Shaffer's
  - C/D: 0.2 round healthy rim tissue
  - Macula:
    - dot blot hemes
    - CWS along the sup arcade
    - (-) plaque (-) neovascularization
  - A/V nicking and tortuosity

81



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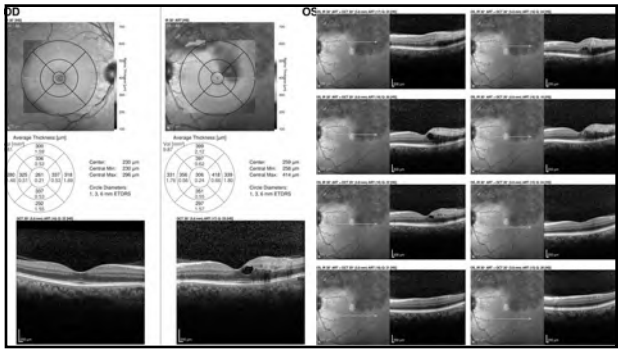


83

Plan

- Tributary branch retinal vein occlusion w/ macular edema
  - BP: 162/93 mmHg
  - Will refer to retina in 1 week for FA/OCTM/DFE

84

When an emergency doesn't show up like one

85

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

86

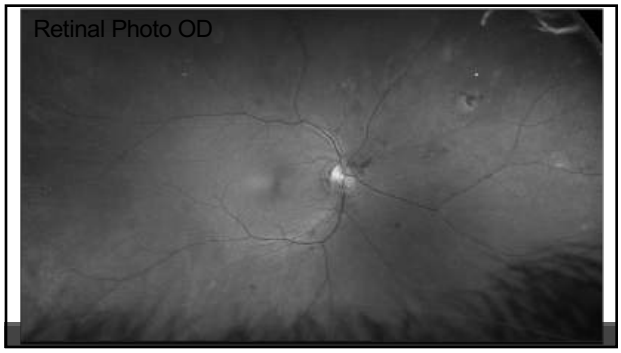
Patient findings

	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

87

	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

88



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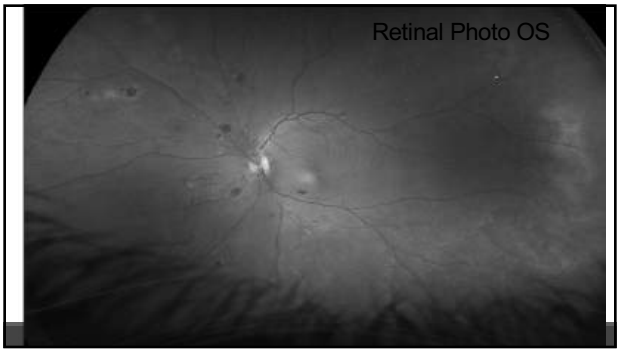


90

What's your plan?

91

Blood Pressure in office

216/128

92

Next questions

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

- Discontinued lisinopril 3-4 months ago

93

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 = arteriovenous

94

Grade 3 (Moderate) Hypertensive Retinopathy

95

Next steps

- Go directly to the ER!

96

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"

97

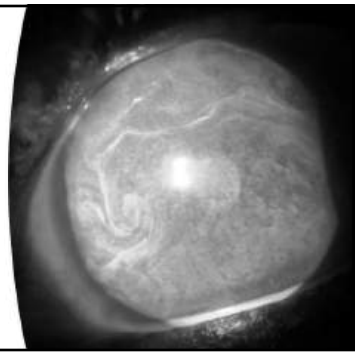
Case

- 18 year old African American male
- CC: Notes a gradual decrease in vision OU over the last few months. Contact lenses have become increasingly uncomfortable. Does not use any ocular medications. Denies sleeping in contact lenses and replaces his monthly CL on time.

98

Ocular Findings

- BCVA 20/40 OD; 20/40 OS
- SLE: 3+ Diffuse SPK, whorl like pattern OU
- DFE: all WNL OU



99

Is it LSCD or DED?

- Chronic DED can lead to or exacerbate LSCD
- Not mutually exclusive

- BUT what about Neurotrophic keratitis?

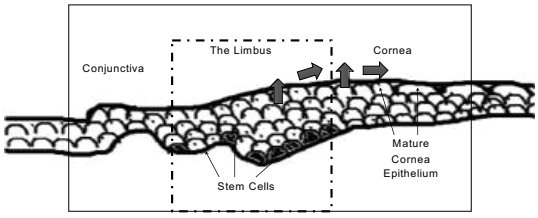
100

Role of Limbal Stem cells

- Regenerate the entire corneal epithelium
  - Produces the basal cell layer of the epithelium
  - Then basal cells migrate toward the center of the cornea
  - As move toward center also move up to become wing cells and eventually upwards to become surface cells
  - Then shed into the tear film
- Turnover of the epithelium cells is approximately 7 days
- The limbal stem cells also helps to prevent the conjunctival epithelial cells from migrating onto the corneal surface

101

Limbus



102

Limbal Stem Cell Deficiency

- When limbal stem cells begin to struggle and poorly function, the epithelial cell layer and its reproduction becomes compromised
- Loss or deficiency of stem cells in the limbus which are vital for re-population of the corneal epithelium and to the barrier function of the limbus
- Once limbal stem cells are damaged the epithelium will be replaced by conjunctival goblet cells

103

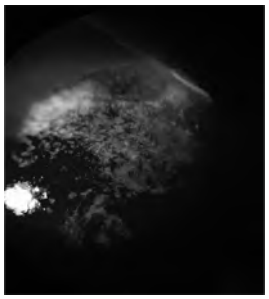
LSCD Causes

- Acquired
  - Trauma
    - Ocular surgeries
    - Chemical injury
    - Radiation
  - Contact lens
  - Mitomycin C, glaucoma drops, preservative sensitivity
  - Thermal injury
  - Inflammatory
  - Autoimmune
- Inflammatory
  - DED
    - Sjogrens Syndrome
    - Rosacea/MGD
  - Allergic Eye Disease
    - Vernal keratoconjunctivitis
    - Atopic Disease
  - Chronic limbitis
  - Bullous Keratopathy
  - Neurotrophic keratopathy from trigeminal neuralgia
  - Diabetes mellitus
  - Herpes simplex/Herpes Zoster
- Autoimmune
  - Sjogrens Syndrome
  - Stevens Johnson syndrome
  - Mucous membrane pemphigoid
- Congenital
  - Aniridia
  - Autoimmune Polyglandular Syndrome
  - Keratitis, Icthyosis, and Deafness Syndrome

104

Signs and Symptoms

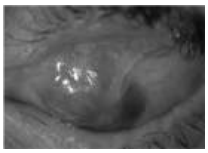
- Varying degree of ocular signs depending on severity and level of corneal conjunctivalization
- Symptoms
  - Decreased vision
  - Photophobia
  - Tearing
  - Blepharospasm
  - Recurrent pain



105

Severe LSCD

- Conjunctivalization
  - Corneal surface stains abnormally because the conjunctival epithelium is more permeable to the stain than true corneal epithelium
- More prone to recurrent or non-healing epithelial defects
- Stromal scarring or melting
  - Expect more pain and vision loss



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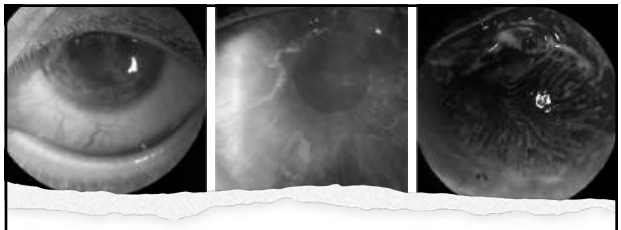


Conjunctivalization

107

Non-Surgical Treatment

- Treating underlying systemic causes
  - Autoimmune control
- Improve tear film and control inflammation
  - Vitamin A ointment QHS
  - Topical steroids
    - Compounded Preservative Free option
  - Topical cyclosporine
  - Preservative free AT
  - Punctal Plugs
- Remove traumatic or toxic insults that may be the cause
  - Discontinue contact lens wear
    - Possible refit in scleral
    - Bandage CL?
  - Discontinue or switch topical medications
    - Glaucoma medications
    - Preservative sensitivity
      - BAK

108

109

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

110

110

Exam findings

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

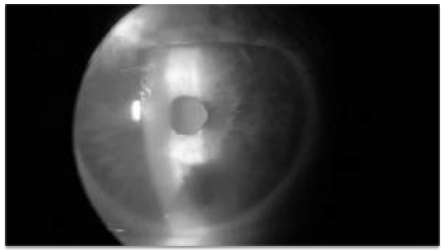
IOP (iCare)
- OD 14 mmHg
- OS 19 mmHg

Slit lamp findings
- OD unremarkable
- OS see photo

111

111

Brown, huh?



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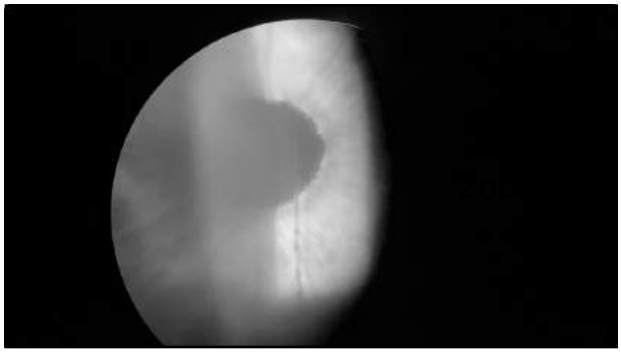
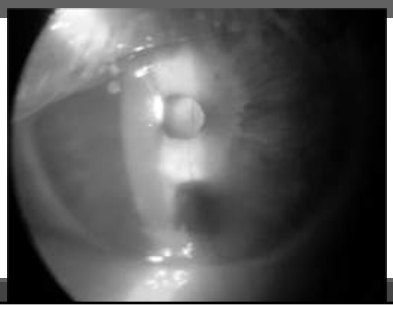


113

…and some video



114

114

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.

115

115

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?

116

116

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

Presentation title 20XX 117

117

My eye has been bothering me…BUT

118

"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"

119

Went to urgent care instead of optometry clinic

120

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

121

How many times has this happened to you?

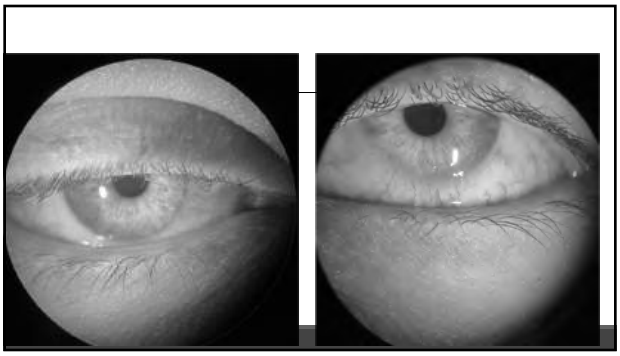
What do you expect the eyes to look like?

122

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

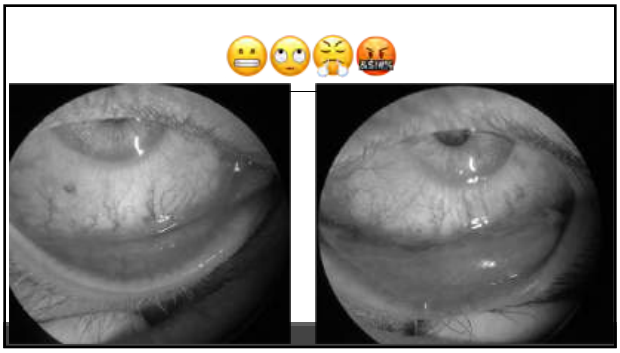
123



124

So…This isn't pink eye???

125



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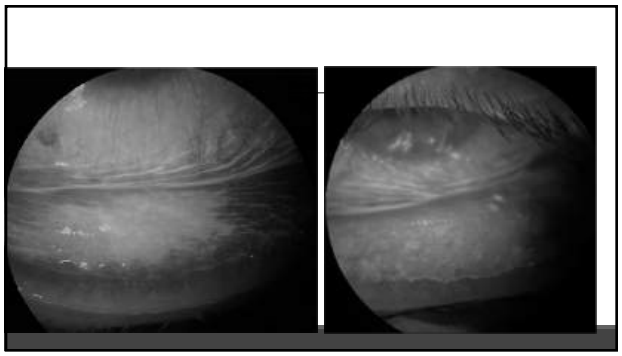

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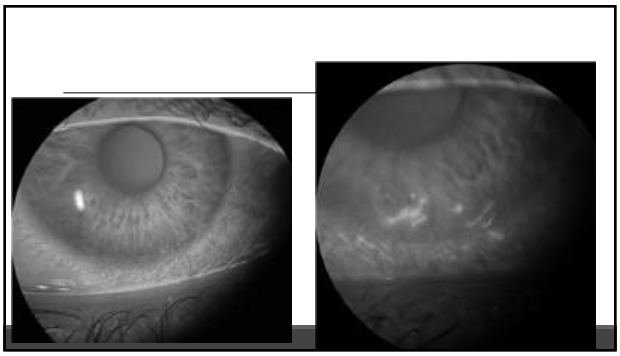

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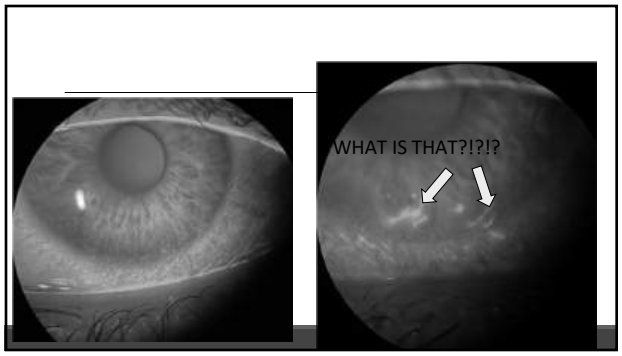

129

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***

130

Linear staining moves on blink…

Filiaments from mechanic rubbing from pseudomembranes

131

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

132

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?

133

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?"

134

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 pseudomembrane breaks into two separate areas down the middle
    - Elevation causing FBS
  - Corneal staining OS>OD, resolving
  - Stay the course
  - RTC end of the week

- Day 8
  - Pseudo-membrane OD resolved, corneal staining healed
  - Pseudo-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?!?

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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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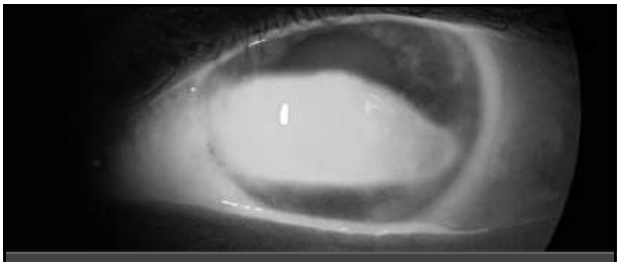

Corneal staining with NaFL, after anesthesia

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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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Considerations in Delivering Difficult News

1. Empathy and Reading the Room
2. Honesty
3. Clear Communication - What Did the Doctor Say??
4. Keep the Doors Open for Communication
5. Sometimes it happens; misunderstanding, poor delivery, conflict of personalities, or just lack of trust built
   - Never hesitate to give patients the option for a second opinion

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Key Takeaways:

- Staff education is vital for triaging urgency systematically.
- Have a systematic approach for in-office urgent care needs.
- Keep emergent/urgent care supply kit stocked and up-to-date.
- **Take a deep breath, you've got this Doc!**

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