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.

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Red Eyes: It's Just Conjunctivitis...Or Is It?

Disclosures

- Allergan- Consultant, speaker, research
- Avellino- consultant
- Azura- consultant
- BioTissue- consultant, speaker
- Bruder- consultant
- Dompe- consultant
- Glaukos- consultant, speaker
- Horizon Therapeutics- consultant
- Kala- consultant, speaker
- LacriSciences- share holder, consultant
- Sight Sciences- consultant
- Sight Sciences- consultant
- Thea- consultant
- Novartis- consultant
- Sun- consultant, speaker
- Tarsus- consultant, researcher
- Visus- consultnat
- Quidel- consultant, speaker
- Zeiss- consultant
- SeaGen- consultant
- Orasis- consultant

Optometry: Primary Eye Care Providers

Who see's your patients?

- PCP's
- Urgent Care
- Pediatrician's
- PA's

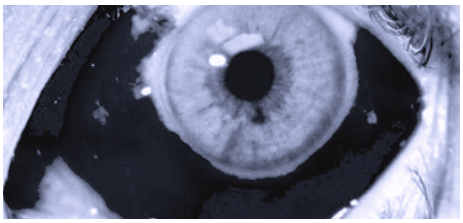
Practice Growth Opportunity

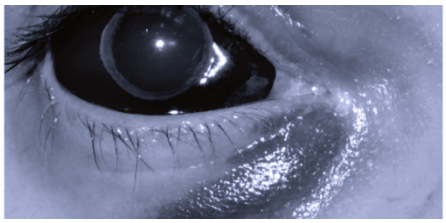
- Medical eye services help bring in patients
- Leads to increased spectacle sales
- Enhances contact lens care
- Patient retention = increased revenue
- Greater word of mouth (referrals)
- Greater overall growth in all areas (optical, medical, CL's)

Cases

We will review common and uncommon causes of "red eyes" commonly seen in practice
Etiology:

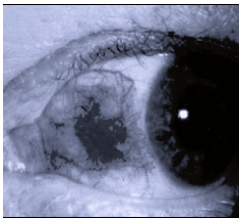
- Infectious
- Inflammatory
- Immune
- Idiopathic
- Allergic
- Environmental
- Hypoxic
- Other



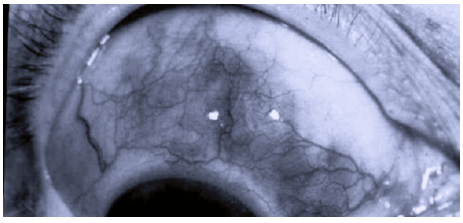


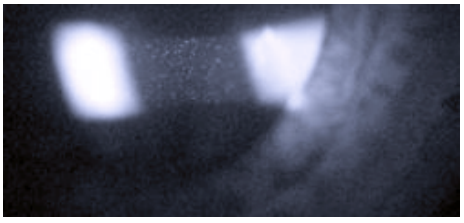
https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3702240/#

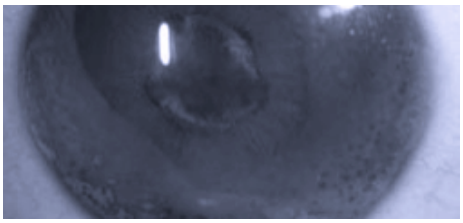
Episcleritis vs. Scleritis

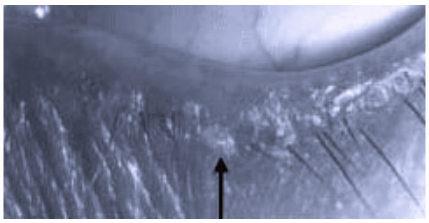


Scleritis

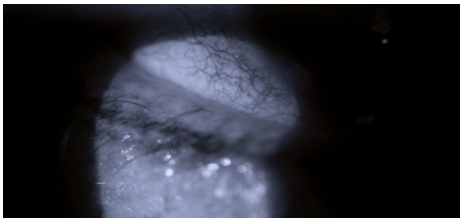




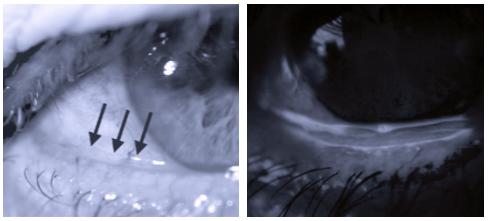




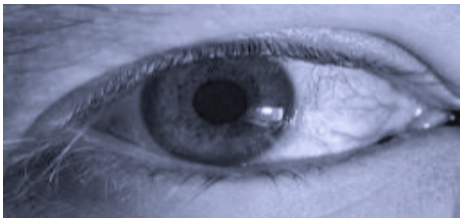
Ocular Rosacea



MGD & Ocular Rosacea Treatment Options :IPL



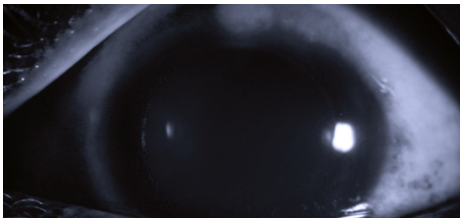
What about Infectious conjunctivitis?



Conjunctivitis

Allergic? Bacterial? Viral?

- OTC vs Rx?
- Palliative- ATs ,Cool compress, vasoconstrictors
- Topical steroids
- Topical ganciclovir

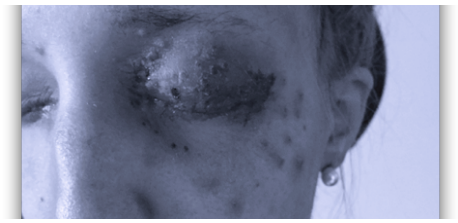


Challenging Cases

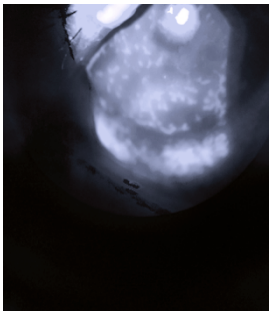
Case #1: The New Bride

* 23 year old Caucasian female
* Recently married
* Symptoms: severe ocular pain OS>OD, ocular hyperemia OS x 5 days and now OD, lid swelling, rash around lids, scalp, and face
* Sore throat, febrile, ear infection, nasal congestion
* (+) Hx of varicella-zoster as a child
* (+) Hx of ectodermal dysplasia
* Taking Bactrim PO and Augmentin PO

* Vesicles from forehead to chin
* Bilateral
* Eyelids swollen shut



* Get a good look at the cornea!
* This photo was the better eye!



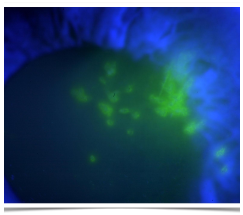
Testing

* Corneal cultures
  - Sensitivity/Specificity? Cost? Efficient?
* Corneal sensitivity- cotton wisp test
* Future point-of-care diagnostics?

Differential diagnosis?

Differential diagnosis:

* Pseudodentrites - HZV
* HSV – dendrites with terminal end bulbs
* Healing epi defect
* Recurrent erosions
* Acanthamoeba
* Neurotrophic cornea
* CL wearer



HSV Treatment

* Valacyclovir 500 MG TID PO
* Topical ganciclovir 5x/d OU
* D/C Bactrim, continue Augmentin
* Polytrim QID OU- prophylaxis
* Cyclogyl TID OU
* Tylenol #3 PO
* PCP- immune status?

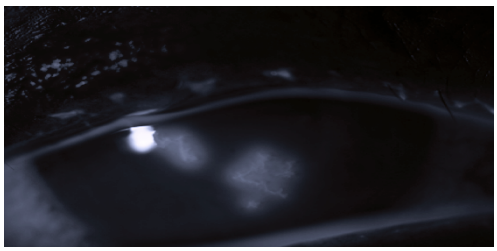
Testing Done:

* Slit lamp photos
* Corneal cultures/scraping

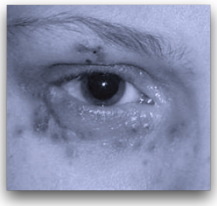
Ganciclovir

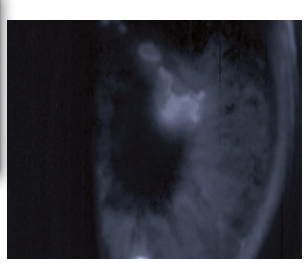
* Only works on cells infected with HSV
* Pro drug that gets phosphorylated to ganciclovir triphosphate by thymidine kinase inhibiting DNA polymerase
* Non toxic
* Less side effects

Chronic Disease (2 years later)



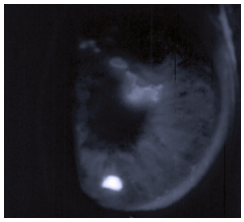
HSV Keratitis: Typical Presentation?

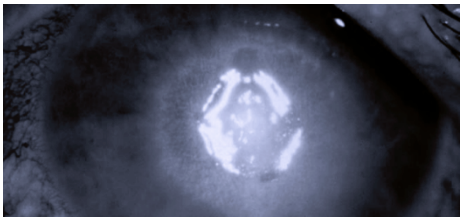




HSV

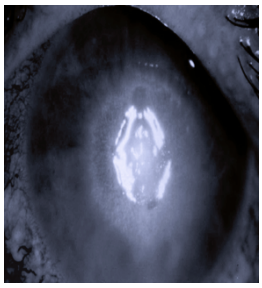
* Swollen epithelial borders
* Branched linear dendritic ulcers contain active virus
* Atypical appearance:
  - geographic ulcer
  - large dendritic ulcers
  - stromal keratitis
  - disciform endothelialitis





H S Endothelialitis

* KPs, Cells & Flare
* Stromal / Epi. edema
* No neovasc. or infiltr.
* Disciform, Linear, Diffuse
* ? CMV
* Tx: Top. Steroids, Top. Antivirals, and Oral Antivirals (1-2 gm/d)*



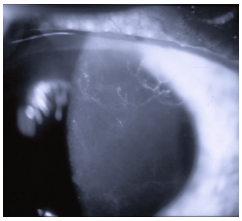
Koizumi N, et. al. Cytomegalovirus as an etiologic factor in corneal endothelialitis. Ophthalmology 2008; 115(2):292-297.

Case #2

72 y/o AAF- 1 wk hx "shingles" c/o dec. Va OS. Valtrex 1 gram TID PO

Va: 20/30 OD, 20/100 OS

HZO

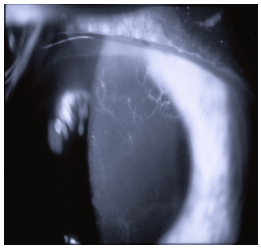


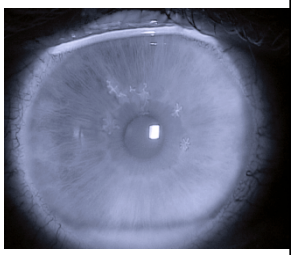
- Valacyclovir 1 Gram TID PO
- Tobramycin/dexamethasone oph ung bid
- Consider topical Ab peri orbital
- Difluprednate BID or

Prednisolone Acetate QID

- ganciclovir 5/Day

"Pseudo-dendrites" v. "Dendrites"

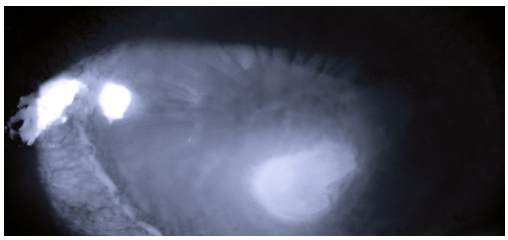


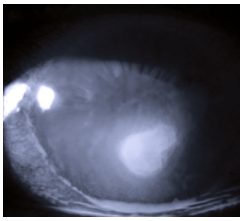


Pseudodendrites: Tree branches w/o terminal end bulbs.

Dendrites: Tree branches with terminal end bulbs.

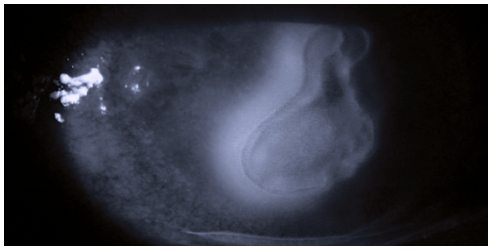
Case #3





* Diagnosis: HSV stromal keratitis
* Tx with ganciclovir 5/day, Valacyclovir 500 mg TID PO, Pred Forte TID
* CTL wearer

Infectious Keratitis

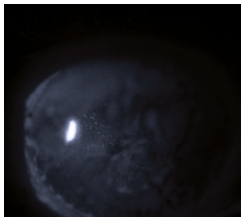


Infectious Keratitis

* Steroid induced bacterial keratitis
* *****CTL wearer*****
* Presented to us with bacterial ulcer
* Tx: Besifloxacin Q 1, Polytrim QID, Polysporin ung QHS
* After cultures came back, switched to fortified Vancomycin with Besifloxacin

Infectious Keratitis

* Cryopreserved amniotic membrane left in place until completely dissolved
* Completely healed epithelium
* Continued use of vanco & Besifloxacin with CPAM



Corneal Nerve Regeneration after Self-Retained Cryopreserved
Amniotic Membrane in Dry Eye Disease

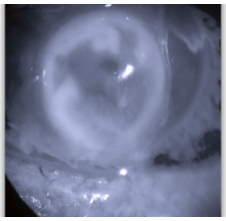
* Purpose: To evaluate the efficacy of self-retained cryopreserved amniotic membrane (CAM) in promoting corneal nerve regeneration and improving corneal sensitivity in dry eye disease (DED)
* Methods: In this prospective randomized clinical trial, subjects with DED were randomized to receive CAM (study group) or conventional maximum treatment (control). Changes in signs and symptoms, corneal sensitivity, topography, and in vivo confocal microscopy (IVCM) were evaluated at baseline, 1 month, and 3 months
* Results: Twenty subjects (age 66.9 ± 8.9) were enrolled and 17 completed all follow-up visits. Signs and symptoms were significantly improved in the study group yet remained constant in the control. IVCM showed a significant increase in corneal nerve density in the study group (12,241 ± 5083 μm/mm2 at baseline, 16,364 ± 3734 μm/mm2 at 1 month, and 18,827 ± 5455 μm/mm2 at 3 months, p = 0 015) but was unchanged in the control. This improvement was accompanied with a significant increase in corneal sensitivity (3.25 ± 0.6 cm at baseline, 5.2 ± 0.5 cm at 1 month, and 5.6 ± 0.4 cm at 3 months, p < 0 001) and corneal topography only in the study group.
* **Conclusions: Self-retained CAM is a promising therapy for corneal nerve regeneration and accelerated recovery of the ocular surface health in patients with DED.**

Thomas John,1,2 Sean Tighe,3,4 Hosam Sheha,3,4,5 Pedram Hamrah,6,7 Zeina M. Salem,6,7 Anny M. S. Cheng,3,4 Ming X. Wang,8 and Nathan D. Rock8

Case #4

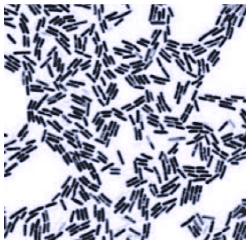
* 44 year old contact lens wearer presented from an outside clinic with blurred vision, red and painful OS
* Documented Assessment 3/29: corneal abrasion without evidence of infection
* Documented Plan 3/29:
* Prednisolone Acetate 1% QID only (no antibiotic)
* Return in 10 days

* 1 week later, presents to emergency department for a second opinion - "my eye seems worse…"
* ER doctor spoke with our corneal specialist
* ER doc: "It looks pretty bad"
* Steroids discontinued and besifloxacin q 1 hr initiated
* Follow up ASAP in clinic



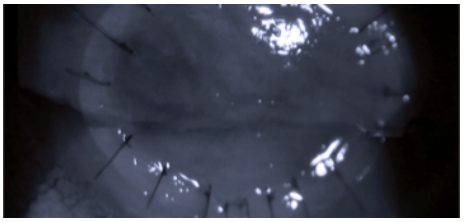
* BCVA: LP
* Extensive mucopurulent discharge
* 8.5 mm 'soupy' corneal ulcer extending nearly to inferior limbus
* Iris hemorrhage
* Flat anterior chamber
* Seidel (+)

- Gram stain : Gm - rods
  oxidase +
- Cx confirms: Pseudomonas Aeruginosa
- Perforated corneal ulcer- immediate PKP

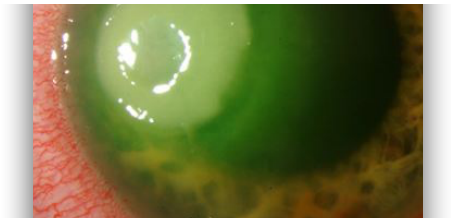


Treatment

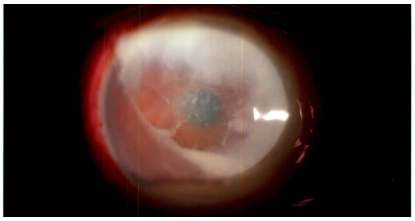
* Besifloxacin q 1 hr
* Polytrim QID
* Ciloxin ointment QHS
* Oral ciprofloxacin
* Pred Forte QID
* Prolensa q Day
* Cyclopentolate TID



Pseudomonas



Pseudomonas



Pseudomonas

* Rapid, extensive inflammation
* Eventual surgical intervention
* Common inhabitant of soil, water and vegetation
* Signs: Grayish-white infiltrate w/ an overlying epithelial defect, very inflamed eye, significant conjunctival and anterior chamber reaction
* Pseudomonas keratitis is the most common CTL related infection
* Symptoms: acute onset of significant pain, photophobia, decreased Va
* Tx: Broad spectrum fluoro Q 30, fortified Gram-negative antibiotics (e.g., tobramycin/ gentamycin)

Infectious Keratitis

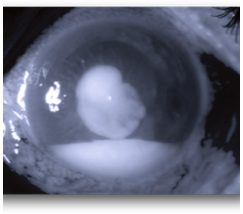
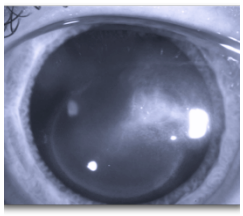
- Decreased vision
- Pain
- Photophobia
- Redness

Risk Factors:
- Extrinsic Factors
- Contact lens wear
  - Overnight wear?
  - Hygiene?
- Trauma - source
- Corneal Surgery
- Sick contacts?
- Fresh water?
- Travel history?
- Recent illness?
- Past herpetic disease?
- Pool
- Hot tub

Bacterial Keratitis

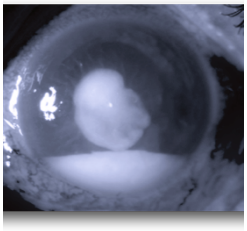
- Most common cause of infectious keratitis
- Red, painful eye
- Typically single area of ulceration
- May have lid swelling, mucopurulent discharge
- Most have rapid (24 to 48 hours) onset

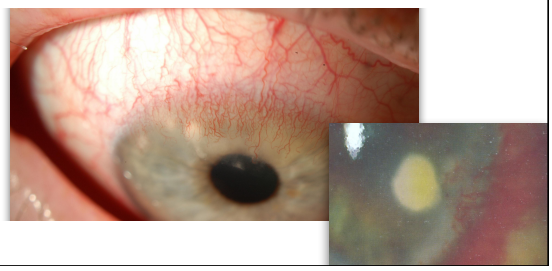
Bacterial Keratitis

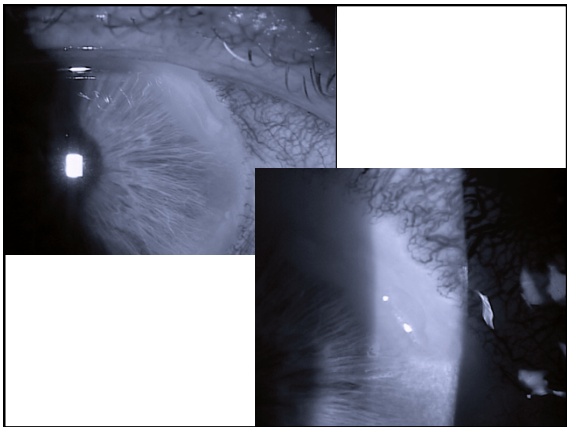



Staph Aureus

- Resistance a serious concern - think MRSA with nursing home / hospital / healthcare exposure, immunosuppression, or non- responsive to treatment.
- Tx: Besifloxacin Q 30
- Consider polytrim or vancomycin.

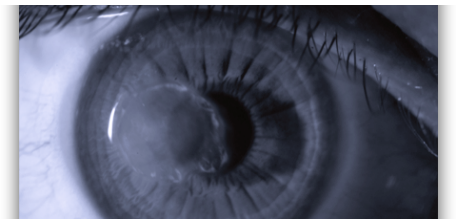


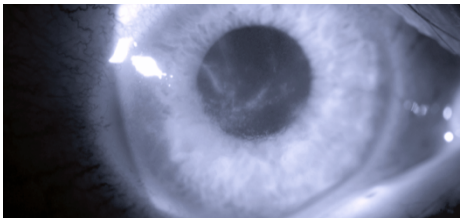




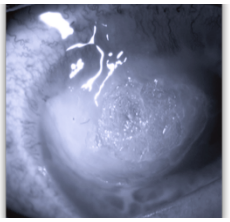
Staph Marginal Keratitis

* Immune mediated process from staph found on lids
* May have ulceration over sterile infiltrates
* May have secondary infection of the ulceration
* Treatment: antibiotic ointment with gram positive coverage + steroid to lid margins + lid hygiene w/ **hypochlorous acid**
* Tobramycin + **dexamethasone**
* Consider MRSA risk factors





Acanthamoeba



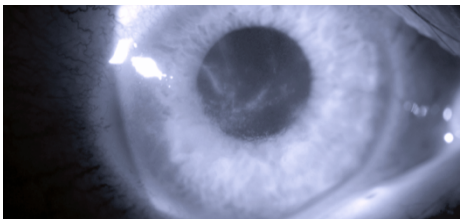
* Free-living protozoa
  Active: trophozoites
  Dormant: double-walled cysts — very resistant
* Risk factors: contact lens wear (80%), ocular exposure to uncholorinated/unsalinated water especially w/ contact wear, trauma
* Extreme pain, exquisite photophobia, decreased vision, injection
* Easily mistaken for bacterial or viral (first sign often dendritic), but won't respond

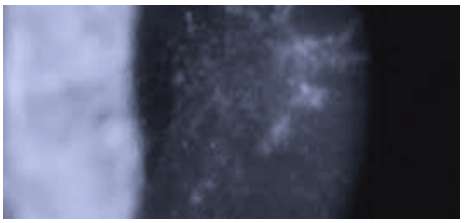
Acanthamoeba

* Patient presents early with irregular, disrupted epithelium
  * Punctate erosions
  * Pseudodendrite formation
  * Small infiltrates
  * Often mistaken for herpes simplex
  * Delayed diagnosis is typical, avg. 6 weeks

Acanthamoeba: Early Stages

* Pain is disproportionate to clinical presentation
  * Radial peri-neuritis
  * Sub-epithelial infiltrates along radial corneal nerves



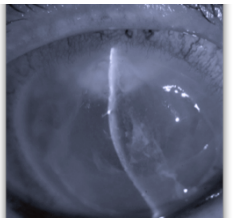


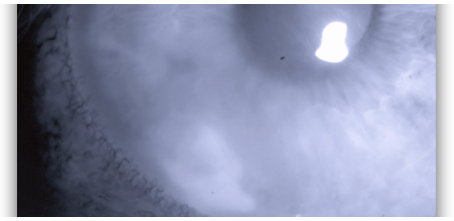
Acanthamoeba: Late Stages

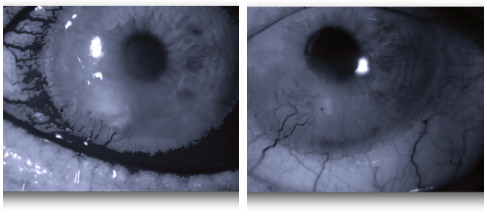
* Ring infiltrate
  * Seen in only 6% of early cases
  * Seen in only 16% of late cases
* Hypopyon
* Progressive corneal thinning
* Risk of perforation

Acanthamoeba

* Late finding: dense or ring infiltrate
* Treatment
  * Biguanide: PHMB 0.02% every hour
  * Diamide: Brolene 0.1% (not commonly available)
  * Neomycin has some benefit (not monotherapy)
  * Consider adjunctive oral ketoconazole
* May require PKP







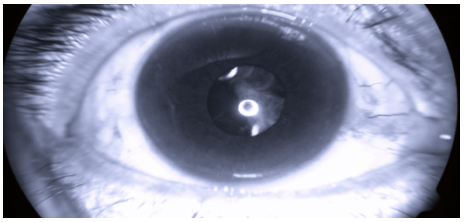
Fungal Keratitis

- May have feathery borders or satellite lesions… …or may resemble bacterial
- Consider with organic-trauma risk factors, intact epithelium over ulcer, or minimal discharge compared to lesion
- Time course, gram stain, and culture are key to differentiate
- Deep or scleral involvement is serious!
- Treatment: natamycin (*Fusarium*) or voriconazole (*Candida*)
- Long duration of treatment

Keratitis General Recommendations

- Broad spectrum initial coverage: Moxifloxacin, Besifloxacin, or Gatifloxacin q 1-2 hrs while awake
- Broad spectrum initial/advanced coverage: Fortified vancomycin (25 mg/mL) + fortified tobramycin (14 mg/mL), potentially plus a fluoroquinolone
- Culture when appropriate, agents customized to the organism and it's sensitivities
- Fungal will require antifungal agent; typically slow-growing so initial antibacterial treatment in an unclear case is reasonable
- Acanthamoeba requires specialized agents and early differentiation makes a big difference in outcomes

Rare..Unless It's In Your Chair



Other causes:

- Retinal Detachments- Why?
- Dry Eye
- C-Pap use
- Lagophthalmos/Microlagophthalmos
- Pinguecula/pterygium
- Systemic

- Thank You!
- Email : drj@gaeyepartners.com