

- ### Objectives
1. Develop a strategy for examining EVERY unilateral red eye
 2. Identify five dangerous red eyes
 3. Know why they are dangerous
 4. Review management and treatment

A Red Eye is a Cardinal Sign of Inflammation

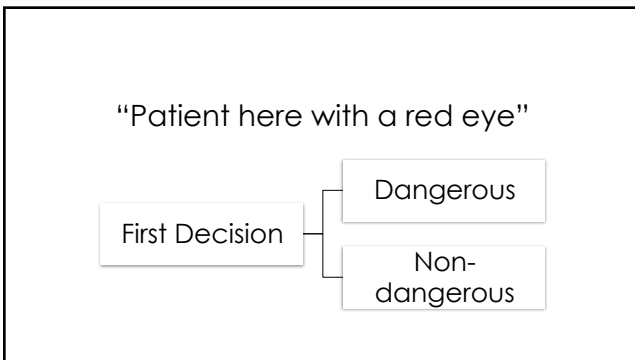
in·flam·ma·tion

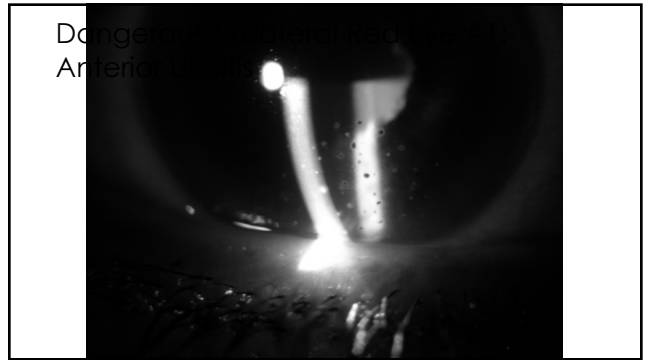
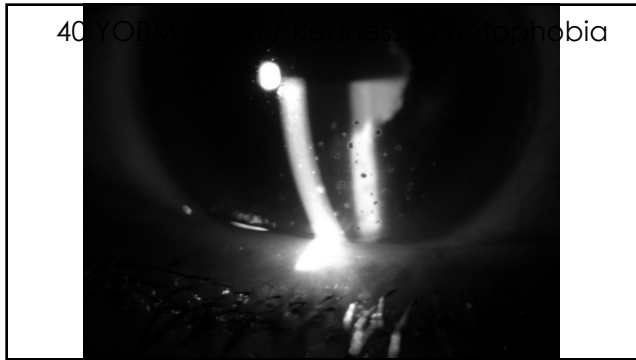
noun
noun: **inflammation**; plural noun: **inflammations**

A localized physical condition in which part of the body becomes reddened, swollen, hot, and often painful, especially as a reaction to injury or infection.

Inflammation

1. Pain
2. Redness
3. Swelling
4. Heat

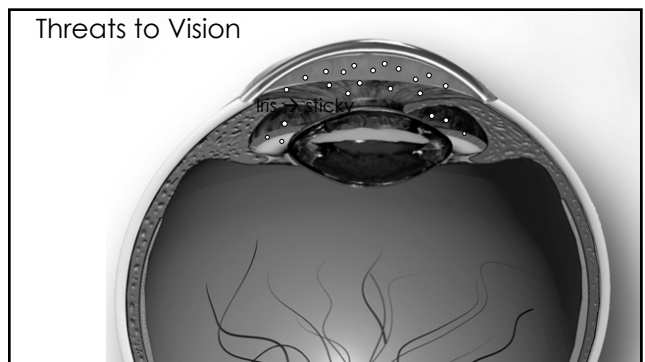
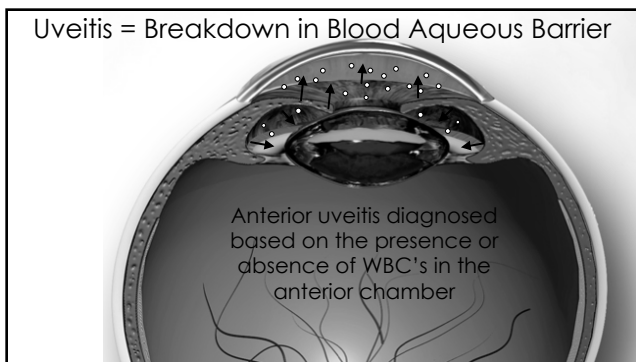
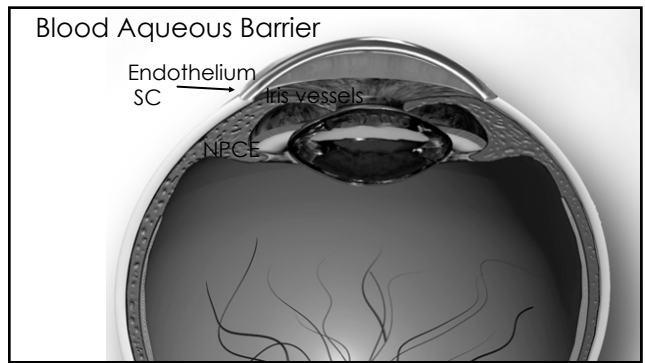


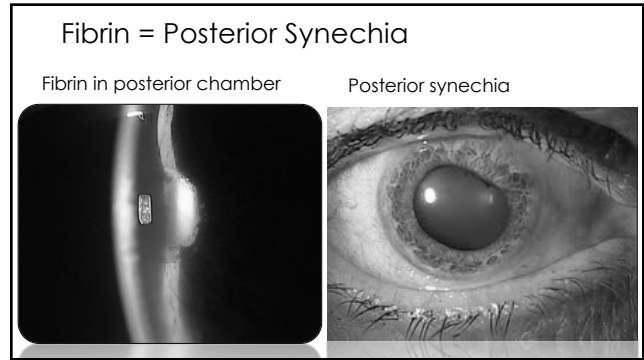
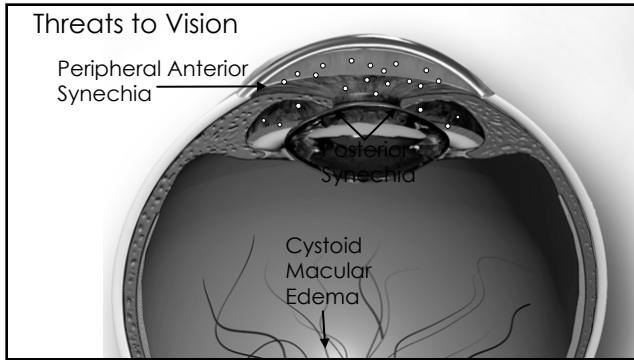


Anterior Uveitis

Frequently occurs in young adults

Peak incidence: 20's-40's





Causes? Categorization Can Help

Acute vs. Chronic	Type of Inflammation	Location	Laterality
<ul style="list-style-type: none"> • Acute < 3 months • Chronic > 3 months 	<ul style="list-style-type: none"> • Non-granulomatous • Granulomatous 	<ul style="list-style-type: none"> • Anterior (75%) • Intermediate (8%) • Posterior/panuveitis (17%) 	<ul style="list-style-type: none"> • Unilateral • Bilateral • Alternating

Most Common:
Acute, unilateral, non-granulomatous, anterior uveitis

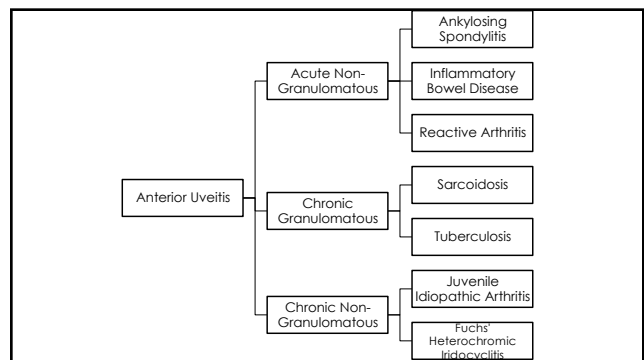
New Onset Acute Non-Granulomatous Anterior Uveitis

- ▶ 50% HLA-B27 positive
 - ▶ Ulcerative colitis
 - ▶ Crohn's disease
 - ▶ Reactive arthritis
 - ▶ Anylosing spondylitis
 - ▶ Psoriatic arthritis
- ▶ 50% have an associated spondyloarthropathy (UCRAP)
 - ▶ 80% of these patients have ankylosing spondylitis
- ▶ 50% idiopathic

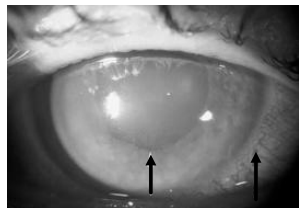
Granulomatous

Mutton-fat KPs Iris Stromal Nodules

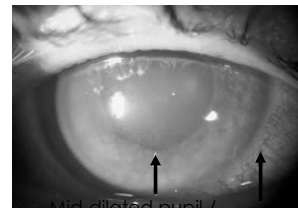
Granulomatous etiology more commonly infectious



30 YOWF / Pain / Redness / Nausea / Recently Started Topamax® (topiramate)



Dangerous Unilateral Red Eye #2: Acute Angle Closure



Mid dilated pupil / hazy cornea Ciliary flush

Acute Angle Closure: Testing

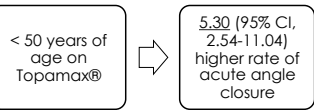
- ▶ IOP (50-100 mmHg)
- ▶ Van Herick angles
- ▶ Gonioscopy
- ▶ Anterior OCT

Acute Angle Closure: Risk Factors

- ▶ Age: average 60
- ▶ Gender: female 4:1
- ▶ Race: Asian decent
- ▶ Family history: ocular anatomical features are inherited
- ▶ Medications

Acute Angle Closure: Topamax® (topiramate)

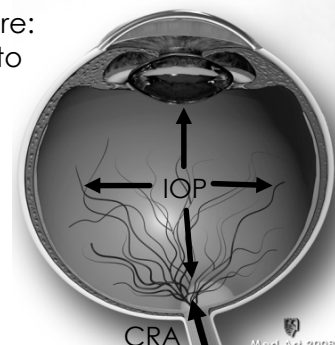
- ▶ Used to treat migraines, weight loss, epilepsy
- ▶ Causes supraciliary effusion moving the lens and iris forward
 - ▶ Angle closure
 - ▶ Myopic shift
- ▶ Typically occurs within first month of use or if dosage is increased

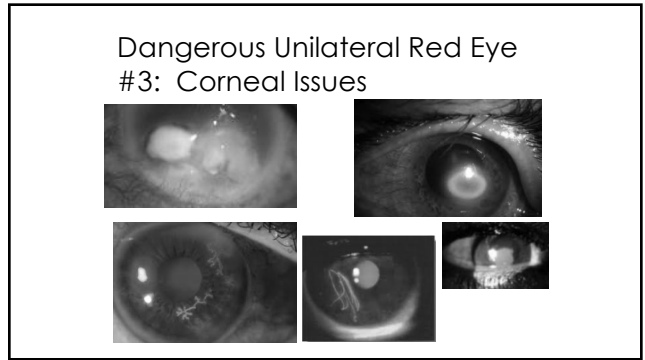


Symes RJ, et al. JAMA Ophthalmol. 2015 (Jul 9)

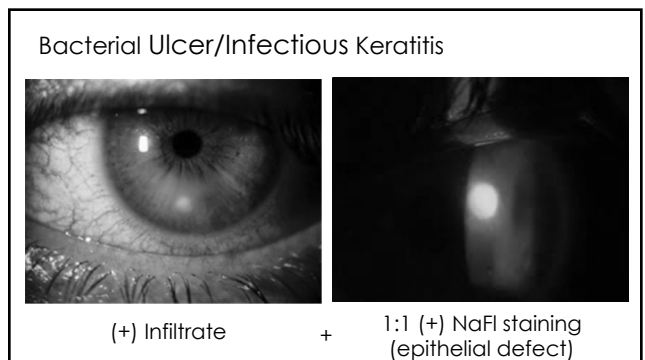
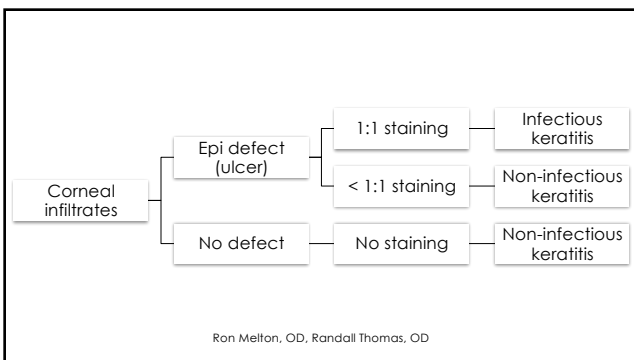
Acute Angle Closure: Immediate Threat to Vision?

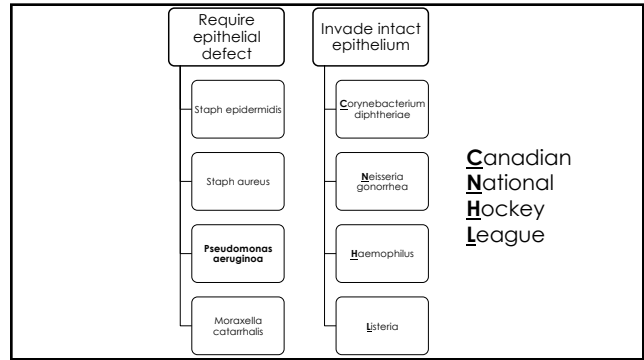
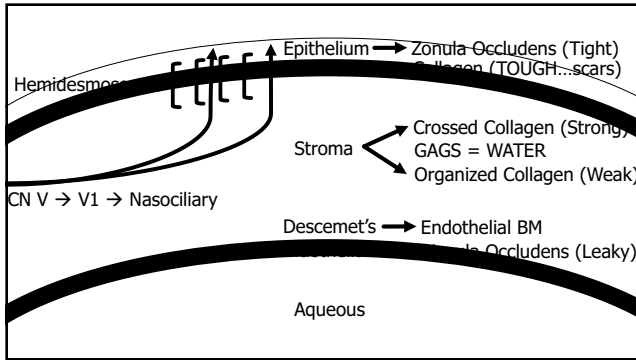
Critical Closing Pressure = CRAO





An infiltrate is a sign of your patient's immune system attacking an antigen via antibodies





CLINICAL TRIALS

SECTION EDITOR: ANNE S. LINDBLAD, PhD

ONLINE FIRST

Corticosteroids for Bacterial Keratitis

The Steroids for Corneal Ulcers Trial (SCUT)

Muthiah Srinivasan, MD, Jerna Mascarenhas, MD, Revathi Rajaraman, MD, Meeenakshi Ravindran, MD, Prajna Lalitha, MD, Dorail V. Ghilders, PhD, Karthooy J. Ray, MA, Kevin C. Hong, BA, Catherine F. Oldenburg, MPH, Salena M. Lee, OD, Michael E. Zegans, MD, Stephen D. McLeod, MD, Thomas M. Lietman, MD, Nisha R. Acharya, MD, MS; for the Steroids for Corneal Ulcers Trial Group

Objective: To determine whether there is a benefit in clinical outcomes with the use of topical corticosteroids as adjunctive therapy in the treatment of bacterial corneal ulcers.

Methods: Randomized, placebo-controlled, double-masked, multicenter clinical trial comparing prednisolone sodium phosphate, 1.0%, to placebo as adjunctive therapy for the treatment of bacterial corneal ulcers. Eligible patients had a culture-positive bacterial corneal ulcer.

Results: At 3 months, patients with vision of counting fingers or worse at baseline had 0.17 logMAR better visual acuity with corticosteroids (95% CI, -0.31 to -0.02; P = .03) compared with placebo, and patients with ulcers that were completely central at baseline had 0.20 logMAR better visual acuity with corticosteroids (-0.37 to -0.04; P = .02).

Conclusions: The addition of topical corticosteroids to antibiotic therapy for bacterial keratitis did not improve visual acuity (P = .44), or corneal perforation (P > .99). A significant effect of corticosteroids was observed in subgroups of baseline BCVA (P = .03) and ulcer location (P = .04).

Srinivasan, et al. SCUT—The Steroids for Corneal Ulcers Trial. Arch Ophthalmol. 130:2, Feb. 2012.

Steroids?

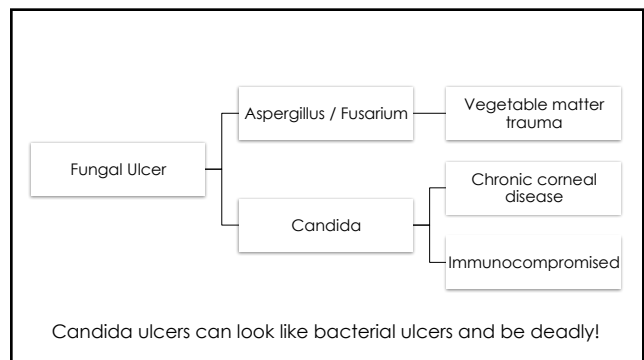
For bacterial ulcers the addition of steroids to Vigamox

- ▶ did not reduce scar formation
- ▶ did not increase re-infection rate
- ▶ did not improve VA in the over all group
- ▶ no increase in adverse events were found

Srinivasan, et al. SCUT—The Steroids for Corneal Ulcers Trial. Arch Ophthalmol. 130:2, Feb. 2012.

Fungal Ulcer/Infectious Keratitis

Gray-white infiltrate with feathery edges: classic for Aspergillus / Fusarium



Acanthamoeba Keratitis

- ▶ Most common protozoa found in soil and frequently in water
- ▶ Associated with inadequate contact lens hygiene
- ▶ Early: **pain is severe and out of proportion of signs**
- ▶ Late: Patchy anterior stromal infiltrates that can present with overlying pseudodendritic epithelial defects
 - ▶ Later progress to ring ulcer

Ring Ulcer



Hangover

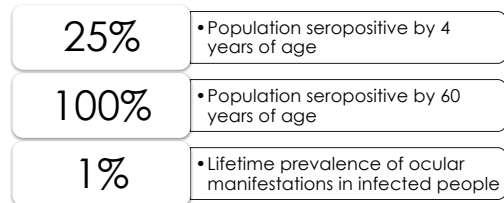


Herpes Simplex Virus (HSV)

- ▶ Recurrent infections most common in young adults
 - ▶ Ask about previous episodes and/or cold sores

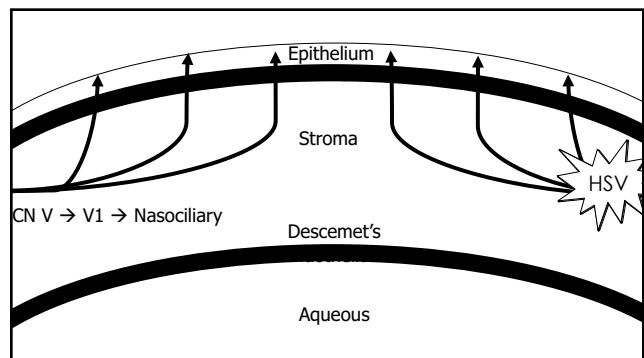


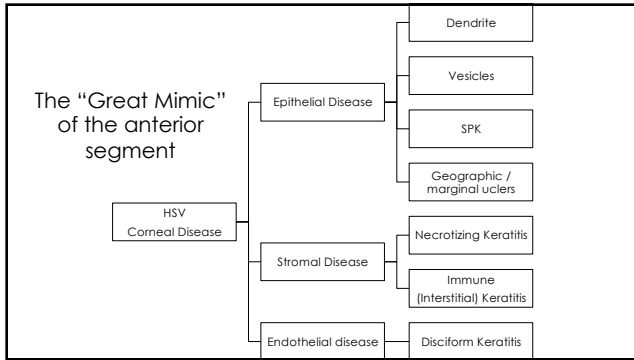
Herpes Simplex Virus (HSV) in United States



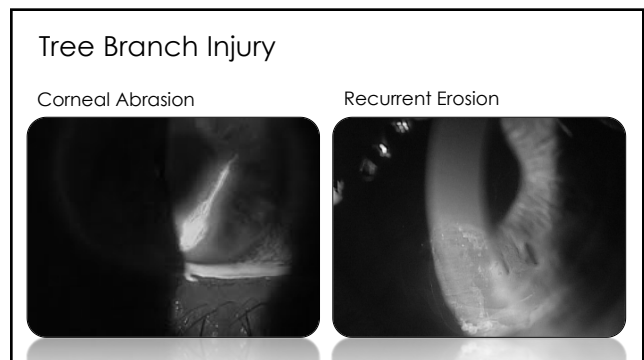
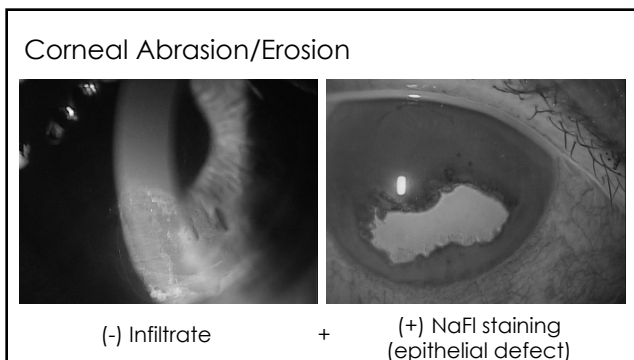
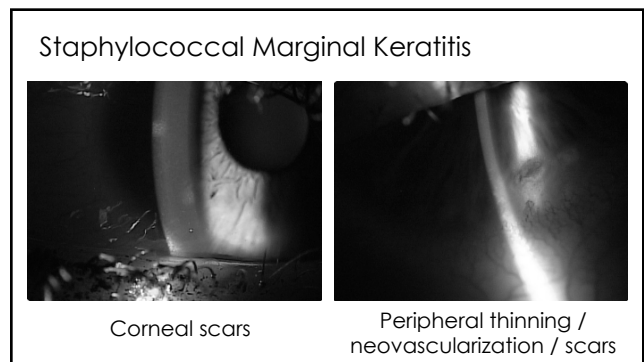
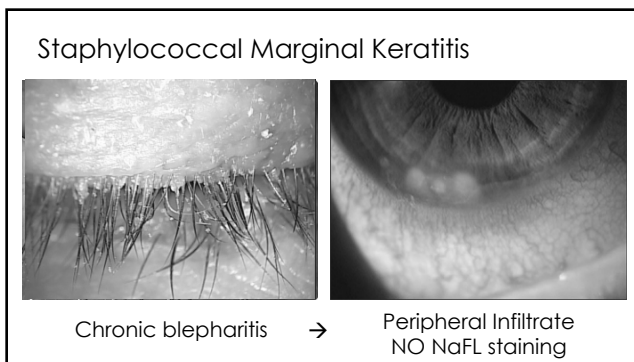
Colin J. Clin Ophthalmol 2007;1:441-53

HSV Dendrite



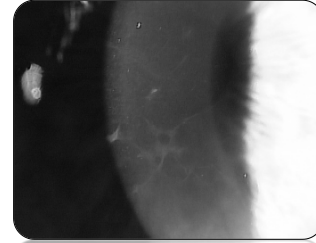


HSV is the 2nd most common cause of corneal blindness in the United States

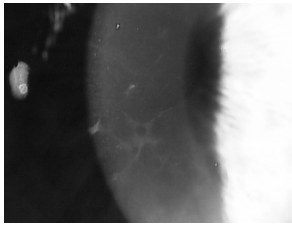


What about if no history of previous trauma?

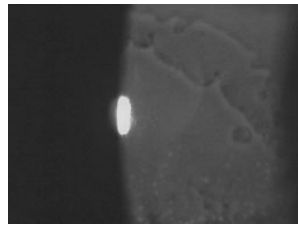
Epithelial Basement Membrane Dystrophy (EBMD)



Epithelial Basement Membrane Dystrophy (EBMD)



Map-lines, dots, and/or fingerprints

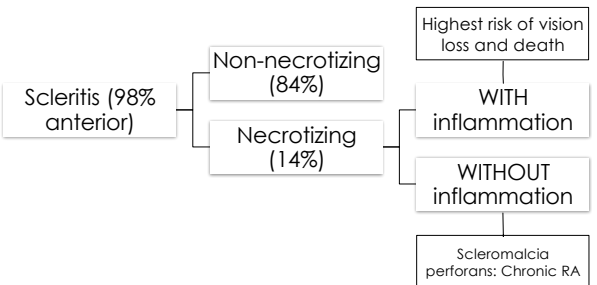
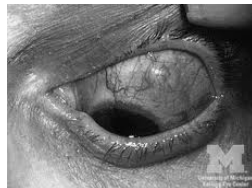
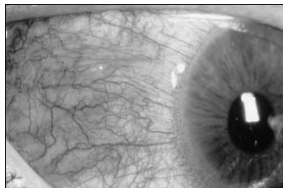


(-) NaFl staining (elevated cornea)

10% of EBMD patients develop corneal erosions

50% of patients with corneal erosions will have EBMD

Dangerous Unilateral Red Eye #4: Scleritis



Scleritis vs. Episcleritis

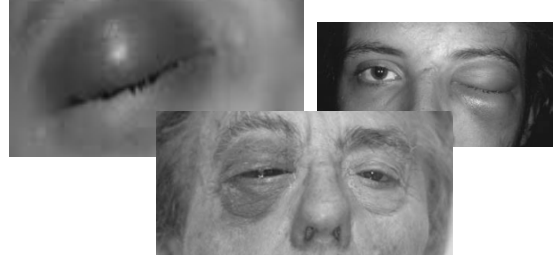
Scleritis

- ▶ Severe pain
- ▶ Diffuse deep inflamed vessels
- ▶ If nodule: immobile
- ▶ 50% associated with systemic disease

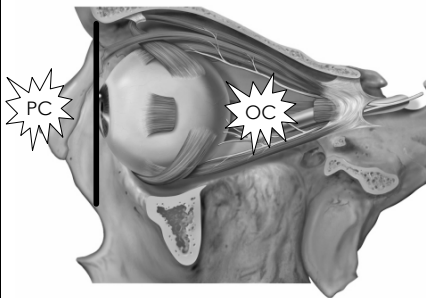
Episcleritis

- ▶ Mild/moderate pain
- ▶ Sectoral superficial inflamed vessels
- ▶ If nodule: moveable
- ▶ 25% associated with systemic disease

Dangerous Unilateral Red Eye #5: Orbital Cellulitis








Preseptal Vs. Orbital Cellulitis



- ▶ Headache, fever, general malaise
- ▶ Optic nerve involvement
- ▶ EOM involvement
- ▶ Proptosis

Orbital cellulitis is a serious infection that can result in a cavernous sinus thrombosis, brain abscess, and/or meningitis if not caught early and managed appropriately

Dangerous Unilateral Red Eyes

-  Anterior Uveitis → AC
-  Acute Angle Closure → IOP
-  Corneal Issues → NaFl
-  Scleritis
-  Orbital Cellulitis