

Strategies for Anterior Segment Disease Management

Mile Brujic, OD, FAAO

1409 Kensington Blvd

Bowling Green, OH

43402

brujic@prodigy.net

419-261-9161

Summary

As optometry's scope of practice continues to increase, it is incumbent upon the practitioner to stay current with contemporary protocols. This course will discuss various anterior segment diseases and strategies to optimize successful treatment.

Learning Objectives

- 1) Discuss the differential diagnosis of the "red eye"
- 2) Understand point of care tests available and their role in helping diagnose the underlying cause of the red eye
- 3) Discuss the differential diagnosis of corneal opacities and contemporary treatment options
- 4) Understand pathophysiology and current treatments for epithelial basement membrane dystrophy
- 5) Discuss contemporary treatment options for Fuch's endothelial dystrophy
- 6) Understand Herpes simplex keratitis with discussions on treatment and management of the disease

Outline

- 1) The Red Eye
 - a. Differential diagnosis
 - i. Dry eye
 1. Decreased homeostasis of the ocular surface
 2. Usually not acute signs and symptoms although can be periodic exacerbations
 - ii. Blepharitis
 1. Inflammation of the lid margin that can cause ocular surface inflammation including the conjunctiva
 2. Often associated with collarettes at the base of the lashes
 3. Important to differentiate seborrheic vs. bacterial vs. demodex
 - iii. Viral
 1. A number of viral pathogens that can be implicated as causative agent
 - a. Adenovirus
 - b. Herpes simplex virus

- c. Herpes zoster virus
 - d. poxvirus
 - 2. Most common causative virus is adenovirus
 - iv. Contact dermatitis
 - 1. Exposure to allergens
 - 2. Watch for make up in females
 - a. Question about creams that may be used
 - b. If are contact lens wearers, may be transferring creams to ocular surface through contact lenses
 - v. Bacterial
 - 1. Most common causes are:
 - a. Staphylococcus aureus
 - b. Streptococcus pneumoniae
 - c. Haemophilus influenzae
 - vi. Adult inclusion conjunctivitis
 - 1. Caused by sexually transmitted chlamydia trachomatis
 - 2. Chronic red eye that recurs after treatment with antibiotic
 - vii. Contact lens related
 - 1. History of contact lens abuse
 - 2. Questionable contact lens solution sensitivity
 - viii. Ocular rosacea
 - 1. Often times accompanied with rosacea
 - 2. Ocular signs/symptoms may be present prior to more diffuse facial rosacea
 - ix. Medicamentosa
 - 1. Carefully question about topical drops that are being used
 - x. Floppy eyelid syndrome
 - 1. Extensive lid laxity secondary to decreased elastin content in tarsal plate secondary to low elastin levels
 - 2. Spontaneous eversion of the lid can occur while sleeping
 - 3. Can lead to chronic irritation of the lid and ocular discomfort
 - 4. It is critical to perform lid eversion on eye examination
 - 5. Has strong association with floppy eyelid syndrome
- b. Point of care test
- i. Adenoplus
 - 1. The test measures the presence of adenovirus through an antigen/antibody response
 - 2. Common clinical conditions caused by adenovirus
 - a. Nonspecific follicular conjunctivitis
 - b. Pharyngeal conjunctival fever
 - c. Acute hemorrhagic conjunctivitis
 - d. Epidemic keratoconjunctivitis
 - 3. How is test performed
 - a. Tear sample is collected
 - b. Sample collector is snapped into the test cassette

- c. Test cassette is dipped into the buffered vial for 20 seconds
 - 4. How is test interpreted
 - a. No line indicates that insufficient sample has been collected
 - b. Blue line demonstrates that an appropriate sample has been collected
 - c. A blue and a red line indicate that there is the presence of adenovirus in the sample
 - c. Treatment options
 - i. Discuss contemporary treatment protocols based on diagnosis
- 2) Infiltrates
 - a. Immune complexes that accumulate in the cornea
 - b. Can be infectious or inflammatory in nature
 - i. Infectious
 - 1. An infectious organism invades the cornea
 - 2. Will cause a compromise in the superficial layers of the cornea
 - 3. Often accompanied with discomfort and potentially pain
 - 4. Will often cause corneal staining
 - 5. May be accompanied with an anterior chamber reaction
 - ii. Inflammatory
 - 1. No active infection is present
 - 2. Usually sub-epithelial in nature
 - 3. Rarely has an anterior chamber reaction
 - 4. Rarely has epithelial compromise
 - 5. May have mild discomfort but usually has minimal symptoms depending on cause of infiltrates
 - c. Understand the main clinical conditions that can cause infiltrates
 - i. Contact lens related
 - ii. Both are associated with contact lens abuse
 - 1. Sterile
 - 2. infectious
 - iii. Adenovirus – EKC
 - iv. Thygeson’s SPK
 - v. Adult inclusion conjunctivitis
 - d. Understand the treatment options
 - i. Antibiotics
 - ii. Anti-infectives
 - iii. Combination agents
 - e. Understand the follow up schedule subsequent contact lens management
- 3) Epithelial Basement Membrane Dystrophy
 - a. Also referred to as map-dot-fingerprint dystrophy, Cogan’s dystrophy, Cogan microcystic epithelial dystrophy, anterior basement membrane dystrophy
 - b. Understanding the underlying mechanism

- i. Aberrant basement membrane attachments
 - ii. Is it a dystrophy or a degeneration?
 - iii. How prevalent is the condition?
 - iv. What are the clinical consequences?
 - 1. Refractive error fluctuations
 - 2. Recurrent corneal erosions
 - 3. Dry eye symptoms
 - 4. Decreased best corrected visual acuity
 - a. Secondary to irregular corneal surface
 - c. Understanding the presentation
 - i. Subtle differences in the corneal surface architecture
 - 1. Often times the irregular epithelial patterns are difficult to detect with standard slit lamp evaluation
 - 2. Irregularities are more easily identified with fluorescein dye when viewed with a cobalt blue light and written filter
 - d. Treatment options
 - i. Lubrication
 - 1. Artificial tears, gel, ointment, lacriserts
 - ii. Bandage contact lenses
 - 1. Soft contact lenses
 - a. Higher modulus lenses will have a greater chance of masking irregularities
 - 2. Rigid gas permeable lenses
 - a. Small diameter lenses
 - b. Scleral lenses
 - i. Assure appropriate:
 - 1. Central corneal clearance
 - 2. Limbal clearance
 - 3. Scleral landing zone
 - iii. Phototherapeutic keratectomy
- 4) Fuch's endothelial dystrophy
- a. Signs
 - i. Guttata visible on slit lamp examination
 - ii. Reduced best corrected visual acuity
 - iii. Increased corneal thickness
 - 1. Altered corneal thickness maps with OCT
 - iv. Decreased endothelial cell count
 - v. Can cause water in the stroma of the cornea through inadequate removal because of a poorly functioning endothelium
 - vi. Can cause epithelial swelling
 - vii. Endothelium is highlighted on OCT examination
 - b. Symptoms
 - i. Blurred vision
 - 1. May get better throughout the day
 - c. Treatment options
 - i. Hyperosmotic agents/ hyperoncotic agents

- ii. Descemet's stripping with endothelial keratoplasty (DSEK)
 - iii. Corneal transplant
- 5) Salzmann's nodular degeneration
 - a. Signs
 - i. Midperipheral nodules – can vary in size
 - ii. Fluorescein stain consistent with recurrent corneal erosion
 - b. Symptoms
 - i. Decreased visual acuity
 - ii. Symptoms similar to dry eye
 - iii. Symptoms consistent with abrasion if RCE occurs
 - c. Treatment
 - i. Lubricants
 - ii. Bandage contact lens
 - iii. Superficial Keratectomy
 - iv. Phototherapeutic keratectomy (PTK)
- 6) Blurred vision
 - a. Can occur with patients who have best corrected visual acuity but still feels like vision isn't clear
 - b. Often times occurs as a result of pupil dilation in dim illumination exposing higher order aberrations
 - c. Conditions causing higher order aberrations with pupil dilation
 - i. Post radial keratectomy (RK)
 - ii. Post LASIK
 - iii. Orthokeratology patients
 - iv. RGP multifocal contact lens wearer
 - d. Treatment options
 - i. If is secondary to corneal issues consider specialty lenses
 - ii. Brimonidine
 - 1. Available in 0.1%, 0.15% and 0.2%
 - 2. Is an alpha-2 adrenergic agonist
 - 3. Alpha-2 receptors are located on the pre-synaptic nerve terminal that innervates the dilator muscle of the pupil
 - 4. It controls the negative feedback loop
 - 5. By stimulating the receptor, it decreases the release of nor-epinephrine, minimizing pupil dilation
- 7) Herpes Simplex Keratitis
 - a. Discuss the etiology
 - i. Discussion of viral infection of the corneal epithelium
 - 1. Virus is intracellular pathogen
 - 2. Replicates with the host DNA
 - ii. Discussion of ocular complications
 - b. Differentiate from Herpes Zoster
 - i. Understanding the role of fluorescein and rose Bengal
 - ii. Differentiating dendrites from pseudodendrites
 - c. Discussion of treatment options
 - i. Differentiating the treatment options

ii. Understanding current treatment protocols