Differential Diagnosis in Anterior Segment Disease

Case I

58 y.o. Caucasian female
CC: F.B. sensation
Slight blur (20/20 -2)
Epiphora

Epiphora

• SLEx finding
  • e.g. conjunctivochalasis or trichiasis
• Nasolacrimal sac obstruction
• Lid Laxity conditions- ectropion
• Dry Eye
58 y.o. Caucasian female
CC: F.B. sensation
Slight blur (20/20 -2)
Epiphora

Epithelial Basement Membrane Dystrophy (EBMD)
87% of all recurrent erosion occurs in what region of the cornea?

A. Superior Cornea  B. Central Cornea  
C. Inferior Cornea  D. Exposure areas of 3:00 and 9:00

**Diagnosis:**

*Recurrent Corneal Erosion Syndrome*  
*EBMD*

**Initial Treatments:**

- Hyperosmotic agents  
  - Muro 128 ung & gtts  
- Bandage contact lens  
  - Silicone hydrogel

**Treatment:**

- Daytime meds?  
- What about hyperosmotic drops?  
  
FreshKote gtts up to QID (Behind the counter or in office)

Which of the following should be avoided in the treatment of RCE?

A. Steroid drops  B. Antibiotic drops  
C. Oral tetracycline  D. Lubricating ointments

**Treatment:**

What medications should be avoided?  

*Bland Artificial Tear Ointments*  
Eke T et al. Recurrent symptoms following traumatic corneal abrasion. *Eye* 1999 June
Treatment level 2:
- Steroids such as Lotemax
  Q.I.D. x 2 wks then BID x 6 wks
- P.O. Tetracycline
  Doxycycline 50 mg bid x 2 months


Why does this work?
- Metalloproteinases which cleave Bowman's layer below the anchoring system (Hemidesmisones)
- MMP's Develop through the production of Leukotrienes

For how long should RCE therapy be maintained to obtain a clinical cure?

A. 1 week
B. 6 weeks
C. 2-4 weeks
D. Until the first sign of resolution of symptoms

New Treatment for Recalcitrant RCE:
- Muro 128 ung x 2 mo
- FreshKote drops tid x 2 mo
- Lotemax qid x 2 weeks then bid x 6 weeks
- Doxy 50 mg PO BID x 2 mo

Other Options for Recalcitrant Cases:
- Bandage Contact Lens
- Stromal Puncture
- Phototherapeutic Keratectomy
- Autologous serum
- Amniotic membrane

PROKERA® Amniotic Membrane
- Class II medical device comprising of CRYOTEK™ amniotic membrane into a thermoplastic ring set
- Combines the functionality of a symblepharon ring with the biologic actions of CRYOTEK™ amniotic membrane to create a unique treatment option for corneal and limbal wound healing
Clinical Evidence for PROKERA®

- A safe and effective method to promote healing of the corneal surface with minimal side effects1
- Inhibits abnormal angiogenic processes and inflammation, thus promoting scarless healing1-7
- Stimulates healthy re-epithelialization of the corneal wound without sutures1,2,4-6
- Provides pain relief and reduces haze, resulting in improved visual acuity by a mean (SD) of 2.5 (2.6) Snellen lines2


PROKERA® Insertion

- Set patient expectations! Inform the patient they may experience some initial stinging and foreign body sensation
- Apply topical anesthesia
- Rinse the PROKERA® with a sterile solution (saline, BSS etc.)
- Hold the upper eyelid
- Ask the patient to look down
- Insert the PROKERA® into the superior fornix, preferably using your fingers to hold the ring
- Slide the PROKERA® under the lower eyelid

Patient RSJ

- 31 y.o. African American Male
- Presents after having seen 2 previous doctors with some improvement but no resolution of red eye
- Has been going on for 3-4 months


The remainder had trauma induced causes
- Fingernail
- Paper cut etc.

46% of all patients in this study had EBMD
Patient RSJ

- Previous doctors diagnosed corneal infiltrates related to contact lens wear and tried antibiotics combination agents with little response
- Showed improvement but the condition returned after discontinuation even with a slow taper

Small peripheral infiltrates noted

What is your diagnosis?

A. CL related sterile infiltrates
B. Adult Inclusion conjunctivitis (Chlamydia)
C. EKC or other viral keratitis
D. Toxic keratitis

What is your recommended treatment?

A. 1000mg Azithromycin once
B. 5 Day Z-Pack
C. 100 mg doxycycline x 3 weeks
D. Topical AzaSite
Treatment:

- 1000 mg Azithromycin (Zithromax)
- Four 250 mg tablets all at once
- What about a Z-pack?
- What about tetracycline?

Findings:

- Subepithelial infiltrates
- Neovascularization or micropannus
- Follicular conjunctivitis
- Preauricular lymph node on ipsilateral side
- Starts unilateral, if goes long enough could become bilateral

Psittacosis:

- Transmitted via the respiratory route from many avian species including Parakeets and Parrots, chickens etc.
- Follicular conjunctivitis
- Fever, dry cough
- Tx: Doxycycline 100mg BID x 3 weeks (pulmonologist/PCP)

Anterior Seg Case 3

- 38 y.o. African American Female
- Complaint of decreased vision for about 1 week
- Longstanding contact lens wearer
- Vision seems to be getting worse over last few days
- No significant pain
- No corneal staining
Testing??

Cotton Wisp or Dental floss to measure corneal sensitivity

Diagnosis??

**Herpes Simplex Virus (HSV) Endotheliitis**

**Infectious Epithelial Keratitis: Cornea Vesicles**

**Infectious Epithelial Keratitis: Dendritic Ulcer**

- Branching linear ulceration
- Swollen epithelial borders
- Contain active virus
- Most common presentation for HSK
Dendritic Epitheliopathy

- Enlarged dendritic ulcer
- Scalloped borders
- Contains active virus

HSV Neurotrophic Keratopathy

- Clinical Appearance
  - Punctate epithelial erosions
  - Ulcer
  - Dendritic epitheliopathy

Immune Stromal Keratitis (Interstitial Keratitis)

- Clinical Findings
  - Stromal haze or infiltrate
  - Neovascularization
  - Immune ring
  - Intact epithelium

Endotheliitis

- Central or paracentral disc-shaped area of edema
- KP corresponding to edema
- Iritis
- Elevated IOP

Treatment: Epithelial Involvement

In the past: trifluoridine - Viroptic q2h
New replacement: **Zirgan** 5 x per day until ulcer disappears then TID x 1 week
PO Valtrex 500mg TID
PF artificial tears
L-Lysine PO 1-3g per day?
Follow-up (next day), day 3-4, day 7-10
Treatment: Stromal keratitis or Endotheliitis

- Durezol QID
- Pred Forte Q2H
- Cover with PO Acyclovir (400 mg bid) or Valtrex (1000mg QD) or topical (Zirgan TID)

When to use Oral Therapy

- Toxicity of Viroptic requires lower dosing
- Patient with stromal keratitis
- Prevention of HSV stromal keratitis
- Children - primary HSV
- Prior to surgery

- In all cases?
  - Trigeminal ganglion suppression

CASE S.P. History

- 26 y.o. Caucasian male
- "Foreign body sensation" "light sensitivity" and "eye is red"
- Longstanding contact lens wearer
- Began this morning

Examination:

- 2+/3- conjunctival injection
- Slight lid edema
- Pupils normal
- Cornea ~small peripheral infiltrate, SPK over infiltrate
- AC grade 2 cell and flare

What appears to be a sterile infiltrate but has an AC reaction...

Begin treatment with __________________

Follow-up in one day
Symptoms

- Acute onset
- Pain
- Photophobia
- Discharge - mucopurulent
- Decreased vision
- Excessive tearing, lid edema, blepharospasm

Signs

- Conjunctival hyperemia and ciliary flush
- Lid edema
- Tear film debris - thick & cells present
- Epithelial defect
- Grayish-white stromal infiltrate
- AC reaction - from few cells to hypopyon

When to culture?

- 1,2,3 Rule:
  - 1 mm from visual axis
  - 2 infiltrates (or more)
  - 3 mm or greater in size
- Nosocomial infections
- Immuno-compromised patient
- Post-surgical
- Significant thinning
- Atypical

Mini-tip Culturette


Sensitivity = 83.3% - Specificity = 100%
2/20/2017

Therapeutic Treatment

- Fluoroquinolones
  - Zymar, Vigamox, Besivance
- Loading dose q 15 min x 1 hour
- Q1h while awake
- Q2h while at night or
- Ung – bacitracin or tobramycin

2009 ARMOR Surveillance
All S. aureus (n= 200)

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<tr>
<td>Azithromycin</td>
<td>≤0.25 – &gt;512</td>
<td>128</td>
<td>&gt;512</td>
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39% of ocular S. aureus isolates were MRSA
38% of ocular S. aureus isolates were FQ-resistant

Anti-bacterial Therapy

- Besifloxacin 0.05% (Besivance)
  - Fluoroquinolone FDA approved in July 09
  - MRSA and MRSE data is far superior to any other fluoroquinolone
  - Uses the DuraSite vehicle
  - No systemic form of the drug

What is the best form of pain management for a keratitis?

A. Cycloplegia
B. Steroids
C. Topical NSAIDs
D. Oral NSAID’s

Therapeutic Treatment

- Other medications for severe keratitis:
  - Systemic tetracycline
  - Fortified Antibiotics
  - Co-manage with a cornea specialist
Case History

66 y.o. Caucasian female
Complains of pain and headache over eye and scalp area began 4 days ago
Feels very nauseated and getting worse “unbearable”
Significant loss of vision OD this morning

Primary testing:

• VA (BCVA): 20/400 OD, 20/20- OS
• Pupil testing: difficult to ascertain
• CF: little to no vision and difficulty

Slit lamp exam:

Grade 2+ conjunctival injection:
Cornea: 3+ corneal edema
AC: grade 3+ cell & flare
Systemic Disease DDx:

*Herpes Zoster Ophthalmicus*
*Temporal Arteritis / Giant Cell Arteritis*

HZO v. GCA

HZO: No lesions noted in scalp area, forehead etc.
Key questions related to temporal arteritis:
- Jaw pain or stiffness?
- Weight loss?
- Polymyalgia rheumatica?
- TIA in last 2 months?

Palpated temporal artery and patient did not mention any increased pain or sensitivity

Lab Testing:

- SED RATE
- C-Reactive Protein
- CBC

Key Ocular Testing??
**Key Testing??**

**IOP**

56 mmHg OD  
17 mmHg OS

**Differential Dx for an elevated IOP??**

A. Inflammatory glaucoma  
B. Acute angle closure  
C. Glaucomatocyclitic crisis  
D. Neovascular glaucoma

**Inflammatory Glaucoma**

Best to Observe?

- Cell and flare in AC  
- Miotic pupil, PS  
- Ciliary flush and conj injection  
- Angles open

**FINAL DIAGNOSIS:**

UVEITIS  
Secondary to HZO
**Herpes Zoster**

- Nearly 1 Million Americans develop herpes zoster each year
- HZ ophthalmicus accounts for up to 25% of presenting cases
- Over 50% incur ocular damage

**Hutchinson’s Sign:**

- Lesion on the tip of the nose
- Nasociliary branch of ophthalmic division of trigeminal nerve (V)
- Nasal means possibly ciliary (ocular) involvement

According to a study by Thean what was the most common complication associated with HZO?

A. Iritis  
B. Optic neuritis  
C. Neurotrophic keratitis  
D. Scleritis

**Ocular findings:**

- Conjunctivitis/Scleritis
- Pseudodendrites
- Neurotrophic keratitis
- Iritis
- Glaucoma
- ION, vein or artery occlusion
- Nerve Palsy

**Herpes Zoster Ophthalmicus**

- Pseudodendrites
Iridocyclitis and HZO

- Most common and most often overlooked ocular complication (43%)
- Highly elevated IOP
- Study by Thean, Hall & Stawall -*clinical Ophthalmology Dec 2001*
- 56% of patients developed glaucoma!!

Seven Rules of Iritis Management

- Rule out keratouveitis
- Check IOP
- Rule out previous ocular surgery
- Gauge severity – need for systemic work-up
- Treat AGGRESSIVELY
- Go beyond AC cell and flare (Restore the Blood-Aqueous Barrier)
- Dilate and check posterior segment

Treatment: Iridocyclitis

- Pred Acetate 1% q1 or q2h
- Durezol (Difluprednate) 0.05% QID
- Lotemax Long term
- Cycloplegia
  - Homatropine 5% bid
  - Cyclopentolate 1% bid

Also added medication to lower the IOP

- Diamox 500 mg (non-sequels) after asking about sulfa allergies and kidney problems
- Beta-blocker gtts (after asking about heart rate and breathing problems)
- Iopidine/Alphagan

Treatment for HZO:

- Acyclovir 800 mg 5x/day
- Famvir 500 mg 3x/day or Valacyclovir 1000 mg 3x/day

Advantages:
- Easier to take 3x Vs. 5x
- Decreased post-herpetic neuralgia, faster resolution of patient (Ormrod - Drugs June 2000)

When should you begin therapy?

Prior to 72 hours proven for Acyclovir (HE Kaufman)
Not as critical for Valacyclovir or Famvir* (Ormrod)
Treatment for HZO:

Duration?

7 days for most patients although newer studies (Zaal - Am J Ophthal. Jan 2001) suggest 10 days for patients over age 66 due to shedding.

Back to our patient: Full Blown Zoster

Significant Shingles in area of scalp and forehead

Back to our patient: Full Blown Zoster

• Therapy helped significantly
  • IOP after glaucoma meds and Durezol were 28 in office, then 23
  • Next day 14 and AC Reaction down to 2+ cell and 1+ flare
  • No PAS

VA: 20/400 @ 1 week visit

What is the greatest concern with a highly elevated pressure?

A. Glaucoma       B. A hazy cornea
C. Patient comfort D. Vascular Occlusion
Management of NAION

Previously no treatment, referral to PCP for Doppler, EKG and work-up

Now: www.EyeActNow.com

Quark NAION study QRK207

A Phase 2/3, Randomized, Double-Masked, Sham-Controlled Trial of QPI-1007 Delivered By Single or Multi-Dose Intravitreal Injection(s) to Subjects With Acute Nonarteritic Anterior Ischemic Optic Neuropathy (NAION)

Purpose of the study

• Determine the effect of QPI-1007 on visual function in subjects with recent-onset NAION.
• Assess the safety and tolerability of intravitreal injections of QPI-1007 in this population.
• Evaluate the structural changes in the retina following administration of QPI-1007.

Study Design

• This is a double masked, randomized, sham-controlled efficacy and safety study that will enroll approximately 530 subjects with recent-onset NAION.
• Subjects will be randomized into one of 5 groups in a 1:1:1:1:1 ratio, and assigned to receive QPI-1007 and/or a sham procedure. Subjects will have a one in five (20%) chance of receiving sham procedure (no active treatment).
• 5 cohorts: single low dose injection, single high dose injection, multiple low dose injections, multiple high dose injections, and sham injection procedure.
• Total study time involvement is approximately 12 months.

Key Inclusion Criteria

• Males and females 50-80 years old
• Positive diagnosis of first episode of NAION in the study eye with symptom onset within 14 days prior to planned study drug administration/sham procedure
• Clear ocular media and able to undergo adequate pupil dilation to allow a good fundus examination

Go to www.EyeActNow.com for current sites
THANK YOU

paul@karpecki.com