Anterior Segment Disease Diagnosis and Treatment

- Dr. Paul Karpecki
- Corneal Services and Ocular Disease Research
- Koffler Vision Group

Case I

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

Epiphora

- __________________________
- __________________________
- __________________________
- __________________________
- __________________________

Additional testing:

- Weck cell sponge test (Merocil spear)
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:

- __________
- __________

Initial Treatments:

- Hyperosmotic agents
- Muro 128 ung & gtts
- Bandage contact lens
- Non-Ionic vs. silicone hydrogel

Treatment:

- Daytime meds?
- What about hyperosmotic drops?
- __________ gtts up to QID (Rx only)

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

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

Treatments:

- Steroids such as Lotemax
- Q.I.D. x 2 wks then BID x 6 wks
- P.O. Tetracycline
- Doxycycline 50 or 20 mg bid x 2 months

Cause of Sliding Epithelium?

- Metalloproteinases which cleave Bowman’s layer below the anchoring system (Hemidesmisones)
- 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 symptoms resolve

New Treatment for Recalcitrant RCE:

- _________ ung x 2 mo
- _________ drops tid x 2 mo
- _________ qid x 2 weeks then bid x 6 weeks
- _________ 20 mg PO BID x 2 mo

Other Options for Recalcitrant RCE:

- Bandage Contact Lens
- Stromal Puncture
- Phototherapeutic Keratectomy (PTK)
- Autologous serum

Other Options for RCE management:

- AzaSite qhs
- Especially in the presence of lid margin disease

46% of all patients in this study had EBMD

- The remainder had trauma induced causes
- Fingernail
- Paper cut etc.
Anterior Seg Case II History

- 43 y.o. Caucasian Male
- CC “here to have my chalazion removed – just moved to the area”
- Recurrence x 3 over 4 years
- Same location LUL

Chronic Chalazion

DDx

- _______________________
- _______________________
- _______________________
- _______________________
- _______________________

- Early presentation of MGD

Treatment of MGD/Meibomitis:

- Treatment of Anterior Blepharitis:
Melanosis: 1 in 400 chance of Malignant Melanoma

- Excessive melanotic pigment
- Congenital
- pigment flecks
- usually near limbus
- Primary Acquired
- if unilateral – significant malignancy potential

Three most common locations for a basal cell carcinoma?

- ______________________________
- ______________________________
- ______________________________

Rare entity
Usually originates from meibomian glands
Can be highly malignant, infiltrative and metastasize
Mortality may reach 30%
May masquerade as a _____________
Melanosis vs. Melanoma

- Melanosis typically on bulbar conjunctiva around limbal area
- Concern if pigment is located:
  - ___________________________________
  - ___________________________________

Malignant Melanoma

CASE: Patient 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

- 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

Signs

- 1,2,3 Rule:
  - 1 mm from __________ (or more)
  - 2 __________ (or more)
  - 3mm or greater in __________
- Nosocomial infections
- Immuno-compromised patient
- Post-surgical

When to culture?

Mini-tip Culturette


Sensitivity = 83.3%. - Specificity = 100%.

Therapeutic Treatment

- Fluoroquinolones
  - Zymaxid, Vigamox or Moxeza
  - Besivance - first chlorinated FQ

- Loading dose q 15 min x 2 hours
- Q1h while awake
- Q 2h while at night or
- Ung – bacitracin or tobramycin
What is the best form of pain management for a keratitis?

- A. Cycloplegia
- B. Steroids
- C. Topical NSAIDs
- D. Oral NSAIDs

Pain Management

- Cycloplegia
  - Homatropine 5% BID
  - Cyclopentolate 1% BID

Fortified Antibiotics

- Pseudomonas:
  - Tobramycin 13 mg/ml topical (40mg sci)

- Staphylococcus:
  - Cefazolin 133 mg/ml or Bacitracin 10,000 units/ml or Vancomycin 50 mg/ml

Therapeutic Treatment

When culture positive result is present:
- Decrease meds to only 1 antibiotic
- Use medication where sensitivity is shown

Other medications for severe keratitis:
- Systemic tetracycline
- Co-manage with a cornea specialist

Case MEB

- 5 year old patient
- Significant mucopurulent discharge and red eye
- Began 2 days ago not improving
Childhood Conjunctivitis Management?

- Antibiotic drops qid x 5 – 7 days
- Are you done?

Most common cause of bacterial keratitis/conjunctivitis in children?

- A. Pseudomonas
- B. Staphylococcus
- C. Strep Pneumo
- D. Haemophilus influenza

Most common eye disorder in young children
- Adult conjunctivitis is typically caused by gram-positive organisms
- Staphylococcus aureus and Staphylococcus epidermidis
- Conjunctivitis in children is caused by:
  - nontypeable forms of Haemophilus influenzae, Streptococcus pneumoniae, Moraxella catarrhalis and adenovirus

Childhood Conjunctivitis

- Rule out __________
- It can alter the management plan
- i.e. involve a pediatrician
- Increased risk for gram-positive infection, such as MRSA or Streptococcal cellulitis

How to effectively manage childhood conjunctivitis:

What’s your diagnosis?

H. Flu Vaccine effects?

- Haemophilus flu bacteria that causes conjunctivitis is the nontypeable form, which is not accounted for by the vaccine.

- Conjunctivitis in children is caused by:
• One of the most common complications associated with acute bacterial conjunctivitis is ________
• Examine skin and adnexa around the orbit for a discrete reddish ________
• Patients with a preseptal cellulitis often have ethmoidal or maxillary sinus involvement, which results in orbital tenderness.9

How to effectively manage childhood conjunctivitis:

Anterior Seg Grand Rounds Case III

68 y.o. Caucasian female Complains of photophobia and blurred vision As well as a headache over right eye for 2 days

Slit lamp exam:

• Grade 2- injection:
• Irregular SPK and staining
• AC: grade 3 cell & flare

Diagnosis?

When to Refer to a Pediatrician/Pediatric Ophthalmologist:

• Fever or general malaise
• Purchase a tympanic or forehead thermometer
• Acute earache or ear infection
• Approximately one-third of all childhood cases are otitis-conjunctivitis syndrome
• A notable red sheen around the eyelids
• Preseptal cellulitis or cellulitis
• Significant purulent rhinorrhea or an upper respiratory infection associated with any fussiness or sleeplessness

Nearly 1 Million Americans develop ______ _______ each year
_______ accounts for up to 25% of presenting cases
Over ___% incur ocular damage
Lesion on the tip of the nose
Nasociliary branch of ophthalmic division of trigeminal nerve (V)
Nasal means possibly ciliary (ocular) involvement

Ocular findings:

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

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 ________!!

Treatment: Iridocyclitis

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

Six Rules of Iritis Management
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:

- _______ _____ mg 5x/day or new to generic: _______ ______mg __ x/day
- or Famvir 500 mg 3x/day or
- Advantages:
  - Easier to take 3x Vs. 5x
  - Decreased post-herpetic neuralgia, faster resolution of patient (Ormrod - Drugs June 2000)

Treatment:

- When should you begin therapy?
- Prior to ___ hours proven for Acyclovir (HE Kaufman)
- Not as critical for Valacyclovir or Famvir* (Ormrod)

Treatment:

- Duration?
- ___ days for most patients although newer studies (Zaal - Am J or Ophthalm. Jan 2001) suggest
- ___ days for patients over age 66 due to shedding

New Vaccine: __________

- Live attenuated zoster vaccine
- Indicated for patients above age 60 who had chicken box as a child but have not had shingles
- Doesn’t work in 100% of cases and decreased effect with age

New Vaccine: __________

- In the Shingles Prevention Study 38,000 patients 60 and older were enrolled
- 51.3% reduction of herpes zoster
- 61.1% reduction in the severity of herpes zoster
- 66.5% reduction in the incidence of post-herpetic neuralgia
Anterior Segment Grand Rounds case IV
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

Patient RSJ

- Previous doctors diagnosed bacterial keratitis and tried antibiotics with little response
- Lotemax showed improvement but the condition returned after discontinuation even with a slow taper
- Patient was referred to our clinic (referral centers have the advantage of previous attempts)

Small peripheral infiltrates noted

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
Anterior Seg case V

- 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

What test would you perform?

- A. Jones Test
- B. RPS Adenodetector
- C. Culture
- D. Corneal sensitivity

Testing???

Diagnosis??

• ________________
  
• ________________
**Infectious Epithelial Keratitis: Cornea Vesicles**

- Cystic lesion of the epithelium
- Contains active virus
- No epithelial defect
  - Negative staining early
  - Late staining

---

**Infectious Epithelial Keratitis: Dendritic Ulcer**

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

---

**Dendritic Epitheliopathy**

---

**Infectious Epithelial Keratitis: Geographic Ulcer**

- Enlarged dendritic ulcer
- Scalloped borders
- Contains active virus

---

**Infectious Epithelial Keratitis: Marginal Ulcer**

- Begins as ulcer
- Stromal infiltrate rapidly develops
- Dilated limbal vessels
- Peripheral corneal NV

---

**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

Disciform Endotheliitis
- Most common form
- 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
- Follow-up (next day), day 3-4, day 7-10

Zirgan™ (Ganciclovir Ophthalmic Gel) 0.15%

Indication
Zirgan™ (ganciclovir ophthalmic gel) 0.15% Indication

Indication and Usage
- Zirgan is a topical ophthalmic antiviral that is indicated for the treatment of acute herpetic keratitis (dendritic ulcers).

Zirgan™ (ganciclovir ophthalmic gel) 0.15% Indication

Dosage and Administration
- The recommended dosing regimen for Zirgan is 1 drop in the affected eye 5 times per day (approximately every 3 hours while awake) until the corneal ulcer heals, and then 1 drop 3 times per day for 7 days.
Ganciclovir Mechanism of Action

- Penetrates cell infected with the virus
- Phosphorylated within the cell to ganciclovir monophosphate by a viral thymidine-kinase
  - Affinity for thymidine-kinase allows for specificity in its action
- Activation continues due to several cell kinases leading to formulation of ganciclovir triphosphate, which:
  - Inhibits viral DNA polymerase
  - Incorporates into viral DNA preventing replication

Properties of Zirgan™ Gel

- Polyfoil 5 gram tube with dropper fitting
- Gel formulation (due to carbomer-based vehicle)
- Allows for more prolonged contact time with the eye than oil-based formulations
- Aqueous gel allows for ganciclovir concentration of 0.15%
  - Sufficient to ensure good tolerability and efficacy in treatment of superficial acute herpetic keratitis
  - pH = 7.45
  - Osmolality = 300 mOsmol

Zirgan™ Clinical Efficacy Results

Results from a open-label, randomized, controlled, multicenter clinical trial evaluating ganciclovir ophthalmic gel 0.15% compared to acyclovir ophthalmic ointment 3% in patients with dendritic ulcers

<table>
<thead>
<tr>
<th></th>
<th>GCV 0.15%</th>
<th>ACV 3%</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>77</td>
<td>67</td>
</tr>
<tr>
<td>Clinical Resolution By Day 7</td>
<td>55 (77%)</td>
<td>48 (72%)</td>
</tr>
</tbody>
</table>

Zirgan™ Clinical Efficacy Results

Results from 3 randomized, single-masked, controlled multicenter clinical trial evaluating ganciclovir ophthalmic gel 0.15% compared to acyclovir ophthalmic ointment 3% in 213 patients with dendritic ulcers

<table>
<thead>
<tr>
<th></th>
<th>GCV 0.15%</th>
<th>ACV 3%</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>57</td>
<td>49</td>
</tr>
<tr>
<td>Clinical Resolution By Day 7</td>
<td>41 (72%)</td>
<td>34 (69%)</td>
</tr>
</tbody>
</table>

Treatment: Stromal keratitis or Endotheliitis

- Durezol QID
- Pred Forte QID
- 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