ANTERIOR SEGMENT
GRAND ROUNDS

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DISCLOSURES

- Speaker / Consultant: Allergan
- Speaker: Bausch & Lomb
- Speaker: Shire
ITCHY EYES

- 14 y.o. w. m. c/o severe itching OU.
- Mom says, “Always messin’ with his eyes”.
- OTC “Naphcon A” 4-6 x/day w/o relief.
- Fluctuating Va
- Seasonal allergies Tx w/ Claritin D
Differential Dx

- Allergic Conjunctivitis
- Giant Papillary Conjunctivitis
- Vernal Kerato-conjunctivitis
- Viral Conjunctivitis
- Bacterial Conjunctivitis
- Phlyctenulosis
Differential Dx

- Allergic Conjunctivitis
- Giant Papillary Conjunctivitis
- Vernal Kerato-conjunctivitis
- Viral Conjunctivitis
- Bacterial Conjunctivitis
- Phlyctenulosis

Vernal Kerato-conjunctivitis

- < 1% Pop.
- Males >> Females
- 5-20 years of age
- Predominates in warm climates / Springtime
VKC

- **Pathology**
  - Type I IgE mediated hypersensitivity
  - Papillae
    - Lymphocytes, Plasma cells, Basophils, Eosinophils.
  - Horner Trantas Dots
    - Eosinophils and epithelial debris
  - 50% corneal involvement
  - 10% corneal shield ulcers (Togby’s)
VKC

- **Treatment**
  - Topical steroid in acute phase
    - Dosage dependent on clinical pic.
  - Antihistamine/Mast Cell Stabilizers
  - Cold compresses

- **Prognosis**
  - Very Good
  - Self limiting post puberty
43 y.o. w. f. CL DW SiHy wearer, EW 1-2 nights/wk, 30-60 D disp. c/o injection OS>OD, dec. wear time, FBS, tearring.

Allergic Conjunctivitis vs GPC OD
Tx: Remove CL x 2 wks.
Antihist./Mast Cell Stab. bid, DW CL.

Pseudo-membrane
Treatment

- Steroids
  - Dosage dependent
- Combo-agents
- Decrease or eliminate CL wear at least temporarily
- Daily Disposable CL

“Bacteviral Conjunctivitis”

- 66 y. o. b. m. c/o 3 d hx of “running, redness, soreness”, OS. AT no help.
- Bilat. Pseudophakia
- No meds., chronic sinusitis.
- 20/20 OD, 20/40 OS, IOP 16,22.
OS

DDX

- Bacterial Conjunctivitis
- Viral Conjunctivitis
“Bacteviral Conjunctivitis”

- Happily married and monogamous.
- Denies si or sx of urethritis.
- Denies any recent sexual encounters.

? Bacteria Conjunctivitis?

- Tx: Besivance OS qid
  Zithromax 1000 mg single dose.

- 2 d F/U: 20/50 Va, dec. mucopurulent discharge, 2+ chemosis / injection,
  (+) L PAN.
- Tx: Besivance qid, OS
?Viral?

- 5 d F/U: OS “still swollen but not as sore”. Pt. thinks OD is “catching the infection”.
- OD 20/25, OS 20/40
- Mild follicles OU, no discharge OU
- SEIs OU, epithelium intact OU
- d/c Besivance, Durezol OU qid

- 7d:  20/30 OD, OS
- Resolving SEIs
- IOP: 20, 21

- 14d:  20/20, 20/25
- Mild SEI OS, OD clear
- IOP 16,17
- D/C Durezol OU
Bacterial v. Viral Conjunctivitis

- **Bacterial**
  - Acute
  - Mild to mod. muc. discharge
  - Injection
  - Papillae
  - +/- Chemosis
  - (-) PAN (non-gonococcal)
  - +/- Culture
  - Tx
    - Polytrim or Fluoroquinolone
    - H. Influenza = Amox. / Clavulanate 20-40 mg/kg tid x 7d.

- **Viral**
  - Delayed onset
  - Watery discharge
  - Injection
  - Follicles
  - +/- Chemosis
  - (+) PAN
  - Tx
    - Cold compresses
    - Art. Tears / NSAIDs
    - Steroids if infiltrates develop
    - Betadine Tx

Conjunctivitis Flow Chart

- Follicles
  - (+) PAN
    - (+) Herpetic Si
      - HSV
    - (-) Herpetic Si
      - Adenovirus/Chlamydia
  - (-) PAN
    - Toxic conjunctivitis
      - Molluscum
      - Pediculosis

Chlamydia trachomatis:
Acute, sub-acute, follicles, + PAN,
**Conjunctivitis Flow Chart**

- **Papillae**
  - **SEVERE PURULENT DISCHARGE**
    - **GONOCOCCAL CONJUNCTIVITIS**
  - **SCANT PURULENT DISCHARGE**
    - **NON-GONOCOCCAL BACTERIA**
  - **WATERY DISCHARGE**
    - **ALLERGIC OR ATOPIC**

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Lee, JS et al. Gonococcal Conjunctivitis in Adults. Eye 2002 16:446-449

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**“Antibiotics Cure Everything”**

- 40 y. o. w. m. presents w/ 3d hx of “rash” on his hands and arms. Now having FBS, dec. Va, and injection OS.
- Presented to PCP 1d prior. No other findings or Sx. No hx of exposure.
- Tx w/ 5 d Z-Pack.
- Advised to see Dermatology.
C. B.

- LEE 2 years prior. Si Hy DW CL wearer. Obvious non-compliant SCL wear.
- Noticed dec. Va, FBS, injection OS 1 d prior. No discharge or pain. Removed CL OS immediately.
- BVa: 20/20 OD, 20/100 OS w/ MR
- P, EOM, MB, CF = Normal
- $T_A$: 16 mmHg, OU
DDX

- CL Overwear (Hypoxic) Keratitis
- CLAIK
- CLARE
- HSK
- Viral Keratitis
- Immune Associated Keratitis
DDX

- CL Overwear (Hypoxic) Keratitis
- CLAIK
- CLARE
- HSK
- Viral Keratitis
- Immune Associated Keratitis

C. B.

- Fundus = Normal
- Phone consult w/ derm. = prob. Erythema Multiforme
- Dx: Presumed HSK, OS
- Tx: Viroptic OS q2h, P. F. A. T. prn.
  Start Valtrex 500mg bid, finish Z-Pack as instructed.
- Derm. consult. following day.
C. B.

- **2 d f/u**
  - BVa OS: 20/30
  - IOP OS: 17 mmHg
  - EM confirmed by bx of skin lesion.

Add: Lotemax qid
Cont. Viroptic qid x 3d.
C. B.

- 8 d f/u
- BVa: 20/20
- IOP: 16 mmHg
- Tx: Lotemax qid x 1 more wk. then stop.

Herpes Simplex Keratitis

- Most common cause of corneal blindness in US, 50,000 new or recurrent cases/yr.¹

- Epithelial Disease
  - Vesicles, Dendrites, or Geographic ulcers.
  - Check K sensitivity
    - Viroptic q2h or 8x/d
    - Zirgan gel
    - Debridement?
    - Orals?
      - HEDS II
  - **Absolutely NO STEROIDS w epi. defects.

HS Stromal Keratitis

- Recurrent disease
- ISK
  - Retained Viral antigen in stroma.
- Nec. Strom. Keratitis
  - Dense infil., ulceration, and necrosis
- HEDS I
- HEDS II
  - Sig. benefit tx w/ orals.

H S Endothelialitis

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


Herpes Zoster Ophthalmicus

72 y. o. 1 wk hx “shingles” c/o dec. Va OS. Acyclovir 800 mg 5x/d.

Va: 20/30 OD, 20/100 OS
20/100 (-) K staining

Cont. Valtrex 800mg 5x/d
Tobradex oph ung bid / Lotemax qid

3wk: Cont. Lotemax bid

“Pseudo-dendrites” v. “Dendrites”

Pseudodendrites: Tree branches w/o terminal end bulbs.
Dendrites: Tree branches with terminal end bulbs.
“CL nightmare…w/ happy ending”

- 67 y. o. Biomedic toric CL wearer.
- Pt. wears CL 30d EW, 3 mo. Disp.
- LEE 20 mo. prior, Va 20/25 OD, OS.
- C/O 10 d hx of swollen upper eyelid. PCP found 2 CL in OD, Tx w/ ciprofloxacin qid.
- Now has Dec. Va, injection, pain, nausea

CL Nightmare

- Va cc HM 2ft OD, 20/40 OS
- 5-6 mm epi. Defect
- 2 mm infiltrate
- 20% hypopyon
C L Nightmare

- Tx: Zymaxid q 1 h, Homatropine 5% bid
- 1 d: 5mm x 4mm, Cont. Tx
- 2 d: Same size, IOP 32, Added Alphagan-P tid
- 4 d: 20/400 Epi. healed. Stromal infiltrate 4mm dense. Hypopyon < 5%, IOP 11.
  - D/C AlphaganP, Zymaxid, add Durezol qid
C L Nightmare

- Day 11: Va CF @ 10’, a/c clear, scar 4-5 mm, IOP 7, Continue Durezol qid.
- Day 18: Va 20/200, scar 3 mm. d/c Durezol. Pt. request PK 2nd opinion.
- Day 30: Surgeon declines surgery, suggests RGP.
Waking up!

- Va: 20/400
- MK: 41.25/42.67 @ 095
  44.75/45.00 @ 095
- Rose K2 IC Bos XO
  - 8.04/11.2/+4.50 20/25
  - Rose K2 IC Bos XO/7.34/11.2/+1.00 D
  20/20
CL Keratitis

Australian MK Incidence Study

- Data collected Oct. 2003 thru Sept. 2004
- 286 cases from national prospective survey
- 1,373 case controls
- All cases & control subjects completed questionnaires

MK Incidence

- Schein et. al. Ophthalmology 2005
  - 5561 pts. 18/10,000 MK, 30DEW SiHy CL
  - Lower than EW < 3wks.
- Cheng et. al. Lancet 2000
  - 1/10,000 DWRGP
  - 4/10,000 DWSCL
  - 20/10,000 EWSCL
- Stapleton et. al. Ophthalmology 2008
  - 1-4/10,000 DWSCL
  - 12/10,000 DWSiHyCL
  - 20/10000 EWSCL
  - 25/10,000 EWSiHyCL
Microbial v. Hypoxic Ulcers

27 y.o. w. f. SCL, EW 2-3 wks, 30d disp. c/o 3 d hx red irritated OD. Removed CL yesterday. “Woke up with eye stuck together this am.”

Tx: Besivance qid.
Epi. healed x 3 d.
Started Lotemax qid x 7 d. Minimal scarring.

### Microbial v. Hypoxic Ulcers

- **Microbial**
  - More central location
  - Epi. Defect = infiltrate
  - A/C reaction
  - (+) CL wearer
  - Pain, photophobia
  - Severe injection
  - Tx
    - Culture
    - 4th gen. Fluoroquinolone alt w/ Tobramycin or Trimethoprim q30 min. until culture results or epithelium heals.

- **Hypoxic**
  - Usually peripheral
  - Epi. defect ≠ infiltrate
  - Absent A/C reaction
  - (+) CL wear
  - Photophobia
  - Injection
  - Tx
    - 4th gen. Fluoroquinolone until epi. heals then steroids.
Medicolegal

- Thorough history and CL wear documentation is a must!
- Photo-document!!!!!!!
- Visually threatening ulcers must be cultured and referred to K specialist.
- If treating, use 4th gen. fluoroquinolones and alternate with Tobramycin or Trimethoprim q 30 min. until healed.
- If site threatening or if sensitivities suggest: use fortified Vancomycin 35-50 mg/mL alt. w/ fortified Tobramycin 13 mg/mL.

“Hot Potato”

- 30 y. o. m. referred by local O.D. to local M.D. after 1 week of corneal ulcer tx w/ no improvement. SCL EW x 30, 3 mo. disp. using saline for storage overnight q 30 days.
- Presented to O.D. for deco. Va, redness, discharge x 3 d. Presented w/ CL still in eye.
- Txd x 3 d with Zymaxid q 30 min. then switched to Vigamox q30 min. Referred to local M.D. at 1 wk.
- Va= CF @ 3ft.
- Cultures on Blood and Saboraud dextrose agar
- Tx:
  - Natamycin q2h around clock and oral Voriconazole 200mg bid.
- Cult. + Fusarium sp.
- Referral to K specialist
  - PK 2 months later

Fungus

- S / SW US
- Usually follows veg. Trauma
- Feathery infiltrate
- Elevated
- Multifocal
- Deep penetration
- Hypopyon
Fungus

- Most Common Org.
  - Fusarium
  - Aspergillus
  - Tx
    - Natamycin (Fus.)
    - Amphotericin B (Asp)
  - Imidazoles
    - Miconazole
    - Ketoconazole
    - Itraconazole
    - Voriconazole
    - Diflucan

Fungal Keratitis ranges 2% - 35% N to S

- Fusarium more common in So. U. S.
- Candida and Aspergillus more common in No. U. S.
- Trauma, CL wear
App. 8 mo. s/p PK c/o injection, fbs, photophobia x 2 wks. Tx: Pred. Forte bid.
Va: 20/50

Peri-limbal injection, neovasc. suture lines, epithelial rejection line.
Pred. Forte q2h → second PK

Khodadoust Line
Gauger, MD, Elizabeth, Khodadoust Line (Corneal endothelial rejection line). University of Iowa Department of Ophthalmology. Eyervounds.org
Graft Rejection

- Must be at least 10 d p. o.
- Early Sx
  - Dec. Va, injection
- Later Sx
  - FBS, photophobia,
- Clinical Si
  - Peri-limbal injection, neovasc., epi. or stromal infiltrates and/or edema, endothelial kp (Khodadoust line), cell/flare


Graft Rejection

- Treatment
  - Aggressive topical steroid
  - Topical cyclosporine???

19 Year Old With Severe Dry Eyes?

- 19 y. o. b. m. presents w mother c/o OU red and “infected” x 2 weeks, also very dry. Mother states last occurrence “tubes had to be put in”.
- PMHx: Mild “Behavioral” Cerebral Palsy, Epilepsy, Asthma, Deafness.
- POHx: L DCR w/ Crawford Tubes 2001 secondary to Dacryocystitis.

D. B.

- FMHx: Unremarkable
- FOHx: Unremarkable
- Allergies: Bactrim = Rash  
  Fish, Eggs, Milk = Rash / Asthma
- Meds: Depakote qd, Risperdal qd, Tylenol prn, Sudafed prn.
- Normal Pregnancy and birthweight.
- Dev. Milestones were delayed.
D. B.

- BVa: 20/40 OD, 20/50 OS
- P, MB, EOM, CF: Normal
- IOP: 16mmHg OD, OS

OD
Work Up

- Hx cont.: Mom says, “He has horrible eating habits. He won’t eat anything but burgers and fries!”
  - CBC w/ Diff.
  - LFTs
  - Vitamin Panel

Treatment

- Pres. Free Tears q1-2h OU
- AT ung bid OU
- OTC Multi-vitamin qd
- Vitamin A 3000 mcg/d (10,000 IU)
Lab Results

- Vitamin A 22 (26-72 mcg/dL)
- Vitamin B₁₂ 159 (200-1100 pg/mL)
- Vitamin D 12 (20-100 ng/mL)

PCP Treatment

- Vit. B₁₂ injections
- Vit. D 400 IU qd OTC
- Continue Vit. A 10,000 IU qd
Childhood Xerophthalmia

- **Congenital**
  - Alacrima
  - Ectodermal Dysplasia
  - Allgrove Syndrome (Triple A)
  - Cystic Fibrosis

- **Endocrine**
  - D. M.
  - Thyroid Dz

- **Immunological**
  - Sjogren Syndrome
  - GvHD
  - Juvenile Idiopathic Arthritis

- **Dermatologic**
  - Epidermolysis bullosa
  - Acne Rosacea
  - TEN (Toxic Epidermal Necrosis)
Childhood Xerophthalmia

- Post Infectious
  - HTLV-1, EBV, HIV

- Medications
  - B blockers, Retinoids, Valproic acid**

- Nutritional
  - Malabsorption, Poor dietary habits**

Vitamin A Deficiency

- Nyctalopia
- Xerophthalmia
  - Bitot’s Spots
- Xerostomia
- Pruritis
- Anemia
- Humoral and Cell Med. Immune Dysfunction
- Excessive Bone Dep
- Mortality
W. H. O.

- Most common cause of preventable blindness in the world.\(^1\)
- Est. 52,000 children go blind every year in India.\(^2\)

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1. Severe malnutrition: report of a consultation to review current literature
   Geneva, World Health Organization, 6-7 September 2004


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- 12 y. o. w. f. c/o progressive dec. Va, pain, photophobia OD x “weeks”.
- OHx: Chronic allergic conjunctivitis tx. w/ top. antihist./mcs, steroids, and tears.
- MHx: Chronic allergies tx. w/ otc Claritin D and Zyrtec.
- Currently no tx.**
Differential Diagnosis

- Staphylococcal keratitis with phlyctenule
- Microbial keratitis (*Mycobacterium tuberculosis*)
- Inflamed pterygium
- CIN
- Chronic FB

PKC

- Tx: Pred Forte OD q2h x 2 d then qid, Gatifloxacin OD qid x 1 wk., warm compresses, lid hygiene.
- D/C topical allergy meds.
- Doxycycline 50mg bid x 2 mo.
- PPD (-)
3 wks post tx
PF tapered over 3 weeks, Doxy 50 mg continued x 5 wks, lid hygiene daily.

3/15/12 c/o redness, pain, tearing, OD x few days.
Urgent Care Rx: Tobramycin OD q2h

80 y. o. w. m. retired firefighter.
Similar occurrence 2 yrs prior with Dx of allergic conj. Tx w/ Alrex qid w/ no improvement x 2d then LTF/U.

3/15/12 c/o redness, pain, tearing, OD x few days.
Va: 20/40 ph 20/30
A/C: DQ
IOP: 16

DDX:
1. Microbial Keratitis
3. Auto-immune corneal melt
Dx: 1) Severe Mixed Blepharitis
   2) Staph. Hypersensitivity
   3) Cornea Ulcers
Tx: Zylet OD q2h
   Lid Hygiene
   Doxycycline 50 mg po bid

4d f/u: Feeling “much better”
   20/30
   IOP: 13
Zylet OD qid x 1wk.  
Doxy 50 mg bid
Staph. Hypersensitivity

- **Si/Sx**
  - Recurring episodes
  - Injection, sensitivity, fbs/pain, photophobia
  - Secondary to patient antibodies to Staph. Antigens

- **Clinical**
  - Blepharitis
  - SEIs or ulcers in peripheral cornea
  - +/- Staining
  - +/- Phlyctenule

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**Staph. Hypersensitivity**

- **Treatment**
  - Warm compresses
  - Lid hygiene with commercial lid cleanser
  - Broad spectrum topical antibiotic
  - Antibiotic ointment
  - Topical steroid*
  - Oral tetracycline antibiotics if >10 y. o.

PKC / Staph. Hypersensitivity

- Non-infectious hypersensitivity
- Phlyctenules (phlyctena)
  - histiocytes, lymphocytes, plasma cells, neutrophils
- Microbial association
  - Staph. Aureus
  - Myco. Tuberculosis
  - Chlamydia trachomatis
  - Neisseria gonorrhea
  - Coccidiodes immitis
  - Bacillus spp.
  - Herpes simplex virus
  - Leishmaniasis Ascaris lubricoides
  - Hymenlepsis nana
  - Candida spp.

Staph. Hypersensitivity

- Si/Sx
  - Recurring episodes
  - Injection, sensitivity, fbs/pain, photophobia
  - Sec. to patient antibodies to Staph. Antigens

- Clinical
  - Blepharitis
  - SEIs or ulcers in periph cornea
  - +/- Staining
  - +/- Phlyctenule
Staph. Hypersensitivity

- **Treatment**
  - Warm compresses
  - Lid hygiene with commercial lid cleanser
  - Broad spectrum topical antibiotic
  - Antibiotic ointment
  - Topical steroid*
  - Oral tetracycline antibiotics if >10 y. o.


- 47 year-old male
- Presentation: “progressively enlarging red spot next to the left pupil; first noticed 3 weeks ago”
- Associated symptoms
  - Mild blurred vision
  - Photophobia
  - No pain or conjunctival injection
- **Best-Corrected Visual Acuity**
  - 20/20 OD; 20/30 OS
- **Tonometry** - 16 OD; 15 OS
- **Gonioscopy** - Normal OU (D30R)
  - No invasion of lesion into angle
- **Slit lamp examination**
  - Normal right eye
  - Left eye ….

- **Left eye**
  - Clear Cornea
  - Microhyphema
  - Large elevated iris stromal neoplasm with diffuse papilloma-like vascularization and broad base with sparing of the angle
  - Exudative heme/debris extending from lesion into anterior chamber
  - Clear lens
DDX

- Hemangioma
- Leiomyoma
- Melanoma
- Metastatic tumor / adenocarcinoma
- Intraocular papilloma
- **Biopsy**
  - Concerns
    - Intraocular bleeding with resection
    - Cataract formation
    - Iris damage
    - IOP elevation / corneal blood staining

- **Systemic evaluation**

  - Complete blood count
  - Electrolyte panel
  - Liver panel
  - Renal function
  - CT of head, chest and abdomen - **Negative**

  - Serum Carcinoembryonic antigen - **Elevated**
Multiple Areas of Glandular Epithelium

Staining for Cytokeratins AE-1 and AE-3
- Stage IV B Esophageal Adenocarcinoma

- Inoperable
- Topical corticosteroids
- Intracameral Avastin injections (3 injections)
- Systemic chemotherapy started
QUESTIONS?

THANK YOU!!!!

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