Grand rounds: A string of pearls

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Recurrent Corneal Erosions (RCE's)

- Tendency for minor trauma to cause significant corneal epithelial disturbances
- Pathophysiology
  - Abnormally weak attachment between the basal cells of the corneal epithelium and their basement membrane
- Most common causes of the weak attachment
  - Mechanical trauma
  - Corneal dystrophy
  - Corneal surgery

Recurrent Corneal Erosions

- Sx's:
  - Acute, severe pain
  - Photophobia
  - Redness
  - Blepharospasm
  - Tearing

***Usually sx's present first thing in the morning upon opening the eyes.***
And often this is recurrent

Recurrent Corneal Erosions

- Signs:
  - Epithelial defect may be present, usually in the inferior interpalpebral area

Recurrent Corneal Erosions

- Signs:
  - If no defect is present, look for loose, irregular epithelium (pooling of NaFl, rapid TBUT)
  - Signs of corneal dystrophies (will be bilateral)
Recurrent Corneal Erosions

• Tx:
  – Acutely:
    • Lubrication**
    • Topical Ab (Polytrim QID, erythro or bacitracin ung)
    • Pain control:
      – Cycloplegic (Homatropine BID)
      • Muro 128 drops or ung
    • Bandage lens???
      – Alleviates pain, does not improve healing

• Tx:
  – After the epithelium heals (recalcitrant RCE’s):
    • Fresh Kote TID (15ml bottle $25)
    • Muro 128 ung qhs (3.5g tube $10)
    • Lotemax QID X 2 weeks, BID X 6 weeks
    • Doxycycline 20-50mg BID
      – Azasite BID (2.5ml bottle $78)

**Avoid chronic long-term AT ung**

Recurrent Corneal Erosions

• Surgical Tx:
  – Anterior stromal micropuncture
  – Debridement of epithelium with polishing of Bowman’s membrane with a diamond burr or excimer laser (PTK)

Eyelid abscess vs. Preseptal Cellulitis vs. Orbital Cellulitis

• Preseptal Cellulitis
  – Usually upper eyelid swelling
  – Pain, tenderness, redness
  – Usually caused by adjacent infection (hordeolum, dacryocystitis)

• Orbital Cellulitis
  – All the same signs of preseptal with
  – Proptosis
  – EOM restrictions/pain with eye movements
  – Pupillary involvement
  – Usually an extension from an ethmoid sinusitis

Case #2
Oral Antibiotic Paradigm

Penicillins
Cephalosporins
Macrolides
Fluoroquinolones
Sulfa

Augmentin 875mg BID or 500mg TID
Keflex 500mg TID
Zithromax “Z-pak”
Levaquin or Ciprox
Bactrim DS 800/160 BID

Preventing Resistance

- Just one organism, methicillin-resistant Staphylococcus aureus (MRSA), kills more Americans every year (~ 19,000) than emphysema, HIV/AIDS, Parkinson’s disease, and homicide combined
- Most serious MRSA infections, an estimated 85%, are associated with a healthcare exposure, but nearly 14% of the infections are community-associated.
- Almost 1 million Americans per year develop hospital-acquired infections (HAIs), resulting in 99,000 deaths; the vast majority of which are due to antibiotic-resistant pathogens.
- CDC: Get Smart: Know When Antibiotics Work
  - Teaches both the provider and the patient when antibiotics should be used.
- The IDSA suggests five to seven days is long enough to treat a bacterial infection without encouraging resistance in adults, though children should still get the longer course.
  - This is different than previous guidelines of treating infections from 10-14 days.

Ocular TRUST 3: Ongoing Longitudinal Surveillance of Antimicrobial Susceptibility in Ocular Isolates

- Background:
  - Ocular TRUST is an ongoing annual survey of nationwide antimicrobial susceptibility patterns of common ocular pathogens.
  - To date, more than 1,000 isolates from ocular infections have been submitted to an independent, central laboratory for in vitro testing.
  - Ocular TRUST, now in its third year, remains the only longitudinal nationwide susceptibility surveillance program specific to ocular isolates.

Antimicrobials tested represent six classes of drugs:
- Fluoroquinolones (ciprofloxacin, gatifloxacin, levofloxacin, moxifloxacin)
- Dihydrofolate reductase inhibitors (trimethoprim)
- Macrolides (azithromycin)
- Aminoglycosides (tobramycin)
- Polypeptides (polymyxin B)
- β-lactams (penicillin)

Staphylococci were classified as methicillin-resistant (MRSA) or methicillin-susceptible (MSSA) based on susceptibility to oxacillin.

Ocular Trust 3: Results

- Most antimicrobials, except penicillin and polymyxin B, continue to be highly active against MSSA (azithromycin shows only moderate activity)
- With the exception of trimethoprim and tobramycin, less than one-third of MRSA strains are susceptible to ophthalmic antimicrobials
- Susceptibility profiles remain virtually identical for the fluoroquinolones, regardless of methicillin phenotype
- S. aureus is more susceptible to the fluoroquinolones than to macrolides, as represented by azithromycin

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Case #3

Acanthamoeba Keratitis

- History of CL wear w/ poor lens hygiene
- Often a history of hot tub/swimming pool/swimming in the river
- Symptoms:
  - Severe pain out of proportion to clinical picture
  - Redness & photophobia
  - All over the course of several weeks
- Signs:
  - Early -> Pseudodendrites
  - Late -> Ring-shaped stromal infiltrate

Acanthamoeba Keratitis

- Sx's:
  - Severe pain**
  - Redness
  - Tearing
  - Decreased vision
  - Photophobia
  - Minimal discharge

These sx's tend to develop over a period of weeks.**
H/O CL hygiene problems and swimming in lenses**

Acanthamoeba Keratitis

- Signs:
  - Epithelial or subepithelial infiltrates appearing as pseudodendrites early
  - Patchy anterior stromal infiltrates can also appear early

Acanthamoeba Keratitis

- Signs:
  - Radial keratoneuritis**
    - Perineural infiltrates seen during the first 1-4 weeks
  - Gradual enlargement and coalescence of the infiltrates to form a ring infiltrate**
    - Inflammation in the cornea doesn’t look that bad**

Acanthamoeba Keratitis

- Tx:
  - Topicals:
    - PHMB 0.02% drops q1h
    - Chlorhexidine 0.02% q1h
    - Fine line agents can be given separately or together
    - Propamidine 1% (Brolene) q1h
  - Orals:
    - Voriconazole 200 mg BID
    - Itraconazole 200-400 mg QD
  - Cycloplegics (homatropine BID)
  - Topical steroids??
  - Pain control
  - Surgery
Fungal keratitis

- Often a history of vegetative trauma, CL wear
- H/O poor response to topical Ab’s
- Symptoms:
  - Pain, photophobia, tearing, FB sensation
    - Pain often less than what the clinical picture would indicate
- Signs:
  - Stromal infiltrate w/ a feathery border
  - Satellite lesions surrounding the primary infiltrate

Symptoms:
- Pain, photophobia, tearing, FB sensation
- H/O cornea infection diagnosed as bacterial**
- H/O vegetative trauma, CL abuse, chronic steroid use

Fungal Keratitis

- Signs:
  - Gray-white stromal infiltrate with indistinct “fluffy” or “feathery” borders/margins
  - Often surrounded by fingerlike satellite lesions in the adjacent stroma

Fungal Keratitis

- Tx:
  - Pts may require hospitalization
  - Topical meds:
    - Natamycin 5% (for filamentous fungi)*
    - Amphotericin B 0.15% (for Candida)*
    - Both q1h around the clock initially and then tapered over 6-12 weeks
  - Orals meds:
    - Voriconazole 200 mg BID
    - Itraconazole
    - Fluconazole
  - Cycloplegics (homatropine BID)
  - Surgical (PKP or DALK)

Fungal Keratitis

- Sx’s:
  - Gradual onset of pain
  - Irritation/grittiness
  - Photophobia
  - Blurred vision
  - Watery or mucopurulent discharge

H/O cornea infection diagnosed as bacterial**
H/O vegetative trauma, CL abuse, chronic steroid use

Which topical antibiotic is your “go-to” choice for a suspected MRSA infectious bacterial ulcer?

A. Zymaxid/Zymar
B. Polytrim
C. Besivance
D. Moxzea/Vigamo
E. Ciloxan
F. Tobramycin
G. Vancomycin
**Bacterial Keratitis**

- Tx:
  - Hospitalization???
  - No CL's***
  - Pain relief
  - Topical Ab's: (amount & strength depends on the ulcer)
    - Besivance, Moxeza, or Zymaxid q1h around the clock for 24-48 hours & tapering according to clinical progress
    - Besivance (or Moxeza or Zymaxid) & Tobramycin (or Gentamicin) q1h alternating around the clock
    - Fortified Ab's?? (large ulcers, visual axis, hypopyon)
      - Fortified Vancomycin, cephalexin and/or gentamicin

**Ocular Trust 3: Results**

- most antimicrobials, except penicillin and polymyxin B, continue to be highly active against MSSA (azithromycin shows only moderate activity)
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**Bacterial Keratitis**

- Tx:
  - Steroids???
    - Reduce inflammation, improve comfort, and minimize corneal scarring...but evidence that they improve final visual outcome is limited
    - Will make herpes, fungal, acanth much worse
    - Epithelialization may be slowed by steroids
    - Can cause corneal thinning (but not usually)
    - DO NOT USE until clinical improvement is seen with Ab's alone
    - Pred Forte QID
    - Doxycycline or Azasite??
      - Inhibit MMP-9

**Case #4**

**Scleritis**

- Rare disorder of inflammation & necrosis centered on the sclera
- 30-60 year olds, female > male
- Bilateral 40-80% of time
- Pathophysiology is poorly understood
- Etiology
  - 50% of cases are idiopathic
  - 50% of cases are associated with systemic disease
    - Connective tissue diseases
      - RA most common
    - Infections
      - HZO, HSK, syphilis

**Scleritis**

- Types of Scleritis
  1. Diffuse anterior scleritis
  2. Nodular anterior scleritis
  3. Necrotizing anterior scleritis w/ inflammation
  4. Necrotizing anterior scleritis w/o inflammation (scleromalacia perforans)
  5. Posterior scleritis
**Scleritis**

- **Symptoms**
  - Severe, boring, deep eye pain*** (80%)
    - Can radiate to the forehead, brow, jaw
    - May awaken pt from sleep
  - Diffuse red eye
  - Photophobia
  - Tearing

- **Signs**
  - Sectoral or diffuse inflammation of conj, episcleral, and scleral vessels
  - Scleral vessels do not move at all and do not blanch w/ phenyl
  - Bluish hue to sclera***
  - Scleral nodules
  - Corneal changes (peripheral infiltrates/keratitis)

- **Differential Diagnosis**
  - Episcleritis
  - Uveitis

- **Diagnosis**
  - Clinical picture
    - If underlying systemic disease is not known, systemic workup is indicated (refer to PCP or internist)***
    - CBC
    - ANA/RF/HLA-B27
    - ESR
    - RPR/FTA-ABS
    - Fasting blood sugar
    - ACE
    - C-ANCA, P-ANCA

- **Treatment** – depends on severity and type
  - Oral NSAIDs
    - Indomethacin 25-50 mg TID
    - Ibuprofen 400-600 mg QID
    - Naproxen 250-500 mg BID
  - Oral Steroids
    - Prednisone 60-100 mg QD X 1 week with taper down to 20 mg QD over next 2-3 weeks, slow taper after that as well
  - Immunosuppressive therapy
    - Cyclophosphamide, methotrexate, cyclosporin

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**Case #5**
Central Serous Chorioretinopathy (CSR)

• Demographics
  – 25-50 year old men, stressed/Type A personalities

• Symptoms
  – Unilateral, blurred vision
    • VA -> usually 20/20 - 20/80
  – Metamorphopsia

• Signs
  – Localized serous detachment of the neurosensory retina in the macula

Central Serous Chorioretinopathy

• DDx:
  – Optic disc pit
  – CNVM

Central Serous Chorioretinopathy

• Med associations:
  – Steroids
    • Nasal sprays, steroid creams, oral, injectable
  – Ephedra
    • Ephedrine & pseudoephedrine

• Treatment:
  – Observation/lifestyle change
  – D/C steroid if possible
  – Possible laser therapy

Case #6
Plaquenil Toxicity

- Antimalerials:
  - Chloroquine
  - Hydroxychloroquine (Plaquenil)
- Now used for RA, SLE, Sjogren’s, etc.
- Toxicity risk is low, but....
- Lots of different screening recommendations have been proposed

Plaquenil Toxicity

- Risk Factors:
  - Cumulative dose**
    - 1000 gram cumulative dose for Plaquenil
    - 6.85 years to reach that
  - Daily dose
  - Age
  - Liver or kidney dysfunction
  - Pre-existing retinal disease or maculopathy

Plaquenil Toxicity

- Symptoms:
  - Asymptomatic early
  - Paracentral visual field defects affecting reading
  - Color vision changes
- Signs:

Progression of Plaquenil maculopathy - early

Progression of Plaquenil maculopathy - moderate

Progression of Plaquenil maculopathy - advanced
Plaquenil Toxicity

• Recommended Screening Guidelines:
  1. Baseline exam within the first year of starting Plaquenil
     • Biomicroscopy exam, 10-2 VF, Fundus photos

     – After 5 years, annual screening exams
       • SD-OCT or
       • mfERG or
       • Fundus autofluorescence

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  – After 5 years, annual screening exams
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       • SD-OCT or
       • mfERG or
       • Fundus autofluorescence

Plaquenil Toxicity

• Tests not recommended for screening
  – Fundus photography
  – Time-domain OCT
  – FA
  – Full-field ERG
  – EOG
  – Color vision testing
  – Amsler grid

Plaquenil Toxicity

• Treatment:
  – No medical therapy is available to treat/cure the toxicity
  – D/C the med if possible
    • Work with the PCP
Case #7

Pseudotumor Cerebri

• AKA
  – Idiopathic intracranial hypertension
• Elevated intracranial pressure
  – Not caused by tumor, infection, or obstruction of the ventricular system
  – Increased production vs. decreased absorption
• Etiology:
  – Idiopathic (young, obese females)
  – Medications
    • Oral contraceptives, Tetracyclines, too much vitamin A
  – Trauma

Pseudotumor Cerebri

• Symptoms:
  – HA’s (90%)
  – Visual disturbances (72%)
    • Transient visual obscurations (TVO’s)
  – Tinnitus (60%)
  – Diplopia (20%)
  – Blurred vision
  – Abnormal color vision
  – N&V

Pseudotumor Cerebri

• Signs
  – Papilledema – hallmark sign of PTC
    • Increased intracranial pressure -> slowing axonal transport -> accumulation of axonal contents in the NFL -> elevated ONH’s
    • Bilateral disc edema
    • Blurred disc margins
    • Obscuration of blood vessels
    • Hyperemia of the disc
    • Venous dilation
    • Peripapillary hemorrhages & CWS

Pseudotumor Cerebri

• Other signs
  – Enlarged blind spot
  – 6th nerve palsy
    • Tends to subside as treatment is effective

Pseudotumor Cerebri

• Diagnosis:
  – Clean MRI/MRV
  – Lumbar puncture
    • Elevated ICP > 250mmHg in an obese pt
    • > 200mmHg in a non-obese pt
    • Normal CSF composition
  – No other neurological findings
    • Exception -> 6th nerve palsy
    • SVP
    • Yes -> not Pseudotumor
    • No -> ????
Pseudotumor Cerebri

- Treatment:
  - Weight Loss*
    - Papilledema resolution with weight loss of 6% of total body weight
  - Diamox (acetazolamide)
    - 500 mg Sequels BID-QID
    - Taper as the sx’s stabilize
  - Lumbar-peritoneal shunt
  - Optic nerve sheath decompression

Thank you for your attention!