Anterior Segment Dilemmas
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I. Introduction: Clinical Pearls for Handling Difficult Cases
   A) Be observant
   B) Think logically
   C) Don’t be afraid to question previous findings/diagnosis
   D) Be aware of your limitations/comfort levels
   E) Always do what is in the patient’s best interests
   F) Document EVERYTHING

II. Case One
   A) Demographics/History
      1) 47 year old female, Caucasian in for urgent red eye visit.
      2) Red, pain, photophobia, tearing, blurred vision for nearly 8 months continuous in OD
      3) Started after fingernail injury to her eye from her daughter approximately 11 months ago
      4) No relevant systemic history
      5) Seen two different docs (1 MD, 1 OD) for condition prior to her visit
   B) Prior Diagnosis/Treatment
      1) RCE diagnosed 8 months ago
      2) Prior treatment:
         a) Muro 128 5% gtts TID
         b) Muro 128 5% ointment qhs
         c) Tobramycin BID OD
         d) BCL
   C) Our Diagnosis
   D) Treatment Options
      1) Continue same treatment
      2) Switch medications
      3) Stromal puncture
      4) Refer for PTK
      5) Other?????
   E) Our Treatment
      1) Debride
      2) Buff
      3) Control inflammation
      4) Assist wound healing
   F) Inflammation and RCE
      1) Strong link to ABMD – genetic dysfunction of BM secretion by basal cells
         a) ABMD most common anterior corneal dystrophy
      2) Weakening of hemidesmesomal structure by upregulation of MMP and other proteolytic molecules
3) Increases likelihood of recurrence
G) Options for anti-inflammatory treatment
H) Use of amniotic membrane in RCE
   1) Cryogenically preserved, or chemically treated and dehydrated forms available
   2) Used for 2 decades in ophthalmology
   3) Potential benefits:
      a) Sequestration of neutrophils/macrophages
      b) Release of high-MW hyaluronic acid
      c) Composed of collagen IV
      d) High amounts of pentraxin-3
      e) Provides protection
      f) Relieves pain

III Case #2
A) Demographics/History
   1) 54 year old Caucasian male, 6 month follow up for dry eye
   2) Recurrent redness, irritation, itching, some discharge in mornings
   3) Currently taking Restasis BID OU, Systane Balance prn (average TID), Claritin PO QD, Omega-3 supplement 2000mg/day
   4) No other known relevant systemic history
B) Exam findings
   1) BCVA = 20/20 OD, OS
   2) Osmolarity = 308 OD, 314 OS
   3) LipiView ICU average = 75nmOD, 81nmOS, complete blink noted
   4) SLE:
      a) Lids: 2+ blepharitis
      b) Sclera/conj: 1+ diffuse hyperemia, 1-2+ papillae
      c) Cornea: clear
      d) AC: D/Q
      e) Lens: clear
C) Diagnosis: Demodex blepharitis
D) Clinical signs
   1) Cylindrical dandruff (pathognomonic)
   2) Itching, burning, FB sensation
   3) Misdirected lashes/trichiasis
   4) Madarosis
   5) MGD
   6) Conjunctival inflammation
   7) Corneal vascularization
   8) Superficial opacities
   9) Unresponsive/recalcitrant to conventional treatment
E) Identification: Rotation vs. Epilation
   1) Rotation
      a) How to perform
      b) Advantages/Disadvantages
2) Epilation
   a) How to perform
   b) Advantages/Disadvantages

F) Treatment Options
   1) At-home
   2) In-office

G) Treatment
   1) In-office application of Tea Tree Oil (Ocushot, Inc)
   2) Cliradex wipes BID OU x 2 weeks, then 4 weeks QD
   3) Lastacaft QD OU
   4) Follow up 4-6 weeks
   5) Continue current dry eye therapy

H) Goal of treatment:
   1) Lower mite overpopulation
   2) Difficult, if not completely impossible, to eradicate completely
   3) Reduce potential contributors to ocular surface disease:
      a) Harbor for Staph organisms
      b) Reactions to chitin
      c) Reactions to decaying mites
      d) Alteration of normal tissue structure

I) Epilogue: 6 week follow-up
   1) Decreased redness
   2) Resolution of papillae
   3) Lashes clear of CD
   4) Patient reports “a little better”
   5) Rotation reveals 1-2 mites per lid
   6) Maintenance??

IV. Case #3
   A) Demographics/History
      1) 48 year old African-American male, referred for red eye
      2) Eye pain OS x 2 weeks, photophobia, redness, some blurred vision
      3) Works in construction/”very dirty environment”
      4) Recurrent – one previous episode

   B) Referral findings:
      1) VA 20/30
      2) IOP: 14mmHg by applanation
      3) Cornea: 1.6mm infiltrate with some overlying staining
      4) “epitheliopathy” extending superior to infiltrate
      5) AC – DQ
      6) Culture = 1+ P. mirabilis

   C) Previous treatment
      1) Zymar q1h WA

   D) Exam Findings
      1) 1-2+ stromal edema with focal KP's on endothelium
      2) Associated uveitis
3) Stromal haze
4) Small area of epitheliopathy

E) Differential Diagnosis:
   1) Bacterial corneal ulcer
   2) Staph hypersensitivity
   3) Viral keratitis (HZO, HSV, etc)
   4) Fungal keratitis
   5) None of the above?

F) Diagnosis: HSV Immune stromal keratitis

G) Treatment:
   1) Valacyclovir 1000mg TID PO
   2) Pred Forte q1h WA – taper over a month or more
   3) Zirgan 5 x day
   4) D/C Zymar

H) Review of HSV
   1) Trigeminal ganglion
   2) Reactivation triggers
   3) Epidemiology
   4) Forms of HSV keratitis

I) Maintenance Therapy?

V. Case #4

A) Demographics/History
   1) 26 year old contact lens wearer
   2) Referred for corneal ulcer OD
   3) Pain, red, photophobic OD x 10 days
   4) Was on honeymoon cruise, developed pain on last day
   5) Tobradex gtts q2h OD x 5 days, then Vigamox q2h for 5 days
   6) Reports only moderate compliance with gtts
   7) Increased pain, worsening VA

B) Exam Findings
   1) VA (spectacles) = 20/150 NI to pinhole
   2) SLE:
      a) 3+ hyperemia, lid swelling
      b) 5.5mm irregular lesion, with 2.5mm dense infiltrate with overlying epi defect, 2-3+ edema to 7.5mm
      c) Some other smaller anterior infiltrates present
      d) Minimal excavation/tissue loss
      e) Intense irregular epithelium surrounding lesion
      f) AC – DQ

C) Differential Diagnosis
   1) Bacterial ulcer
      a) Pseudomonas
      b) Staph
      c) Strep
      d) Other?
2) Viral keratitis (HSV)
3) Fungal ulcer
4) Parasitic keratitis
5) Non-infectious keratitis

E) Diagnosis/Initial management
1) Fungal/parasitic keratitis
2) Corneal culture:
   a) Blood/Chocolate plates, Thio broth
   b) Sabourand’s agar
   c) M4 media
   d) Lowenstein-Jensen media
   e) Corneal scrape – send in wet prep
3) Culture CL case?
4) Treatment
   a) Continue Vigamox q1h 24hrs & urge compliance
   b) Add Clotrimazole q1h 24hrs
   c) Atropine 1% BID
   d) F/U 1 day
5) Initial Culture: 1+ Gram positive bacilli
6) At follow up, perineural infiltrate noted
7) Acanthamoeba

F) Treatment Options
1) Polyhexamethylene biguanide (PHMB) 0.02%
2) Chlorhexidine 0.02%
3) Neosporin
4) Pred Forte**
5) Vorconazole 400mg PO BID
6) Amniotic membrane
7) Corneal cross-linking

G) Acanthamoeba review
1) Common opportunistic organism
2) Pearls on identification
   a) Cultures
   b) Confocal microscopy
   c) Clinical signs
      i) Pain
      ii) Perineural infiltrates
      iii) Epitheliopathy
      iv) Uveitis/hypoenon
      v) Ring infiltrate

VI. Case 5
A) Demographics/History
1) 54 year old caucasian male
2) Atopic disease, smoker
3) Eye history: trauma to OS
a) Subsequent PK, cataract, trabeculectomy
b) Stable x 2 years (correctable to 20/20)
c) OD “normal”
d) Blepharitis, dry eye

B) Exam Findings
1) BCVA: 20/20 OD, OS
2) Ancillary testing: unremarkable
3) IOP: 13 OD, 10 OS
4) Biomicroscopy:
   a) Conjunctival lesion OD:
      i) 8.5 mm x 3.5mm x <0.5mm
      ii) Papillomatous texture
      iii) Encroached onto cornea <0.5mm with gelatinous nasal edge

C) Differential diagnosis:
1) CIN
2) Squamous metaplasia
3) Pinguecula/pterygia
4) Others?

D) Diagnosis: CIN
1) Conjunctival Intraepithelial Neoplasia
2) Most common tumor of the ocular surface
3) Typically found at limbus in older adults
4) Increased incidence with:
   a) Sun exposure
   b) HPV infection
   c) HIV seropositivity
5) Is precursor to squamous cell carcinoma

E) Treatment Options
1) Excisional biopsy
2) Cryotherapy
3) Intraleisional Mitomycin-C
4) Intraleisional 5-Fluorouracil
5) Topical Interferon α-2b
6) Topical/Intraleisional Anti-VEGF
7) Topical Retinoic acid

F) Treatment
1) Topical IFN α-2b (1,000,000 IU/ml) compounded by Phillips Eye Institute pharmacy
2) 1 gtt QID to OD
3) Follow-up: 2 weeks
4) Interferon – history and mechanism
5) Over 1 month, lesion gradually reduced in size and thickness

G) Epilogue
1) Lost to follow up and recurrence
2) Excisional biopsy and restart IFN
3) Results of biopsy

H) Ocular surface neoplasias
   1) Spectrum of invasion
   2) Associated risk factors

VII. Case #6
   A) Demographics/History
      1) 81 year old Caucasian male
      2) Over last 4 weeks, some mild pain, chronic redness, and irritation developing in OD
      3) Eye Hx:
         a) OAG OU, blepharitis
         b) Trabeculectomy with MM-C performed 4 mo ago OD
         c) Current treatment: WC, lid scrubs, and E-mycin ung qhs
      4) Systemic history: joint stiffness, no prior medical diagnosis
   B) Exam findings
      1) VA: 20/20 OD
      2) IOP: 6mmHg by applanation
      3) Slit lamp:
         a) Cornea: clear
         b) A/C: deep & quiet
         c) Lens: IOL centered
         d) Vitreous: clear & quiet
      4) Underneath upper lid:
         a) Large (8mm x 3mm) ulcerated-looking conjunctival anomaly supero-nasal to trabeculectomy site
         b) Does not absorb fluorescein stain
         c) No mucous discharge
         d) Adjacent hyperemia
         e) No seidel from adjacent trab
   C) Differential Diagnosis:
      1) Bacterial Ulcer
      2) Necrotizing Scleritis
      3) Wound Rupture
      4) Toxic Melt
      5) Surgical Complication
      6) Combination of some of the above
      7) None of the above
   D) Initial Diagnosis/Treatment
      1) Wound Rupture
      2) Pred Forte/Lid hygiene/AT
   E) Secondary Treatment
      1) 2 weeks of no improvement, repositioning of the conjunctiva was suggested to attempt to close the wound
      2) Exploratory surgery scheduled:
         a) Debridement of necrotic tissue
b) Biopsy
c) Conjunctival patch graft
d) Amniotic membrane graft sutured over site
3) Total area was 12mmx15mm under nasal conj

F) Rheumatology:
   1) CBC, Chem, C-ANCA, P-ANCA, ACE, CRP, ESR, ANA, Rh, Uric Acid, RPR, FTA-ABS
   2) Results:
      a) Elevated ESR
      b) Elevated CRP
      c) Inconclusive

G) Pathology:
   1) Elevated PMNs
   2) Destruction of conjunctival cells
   3) Polyclonal inflammation
   4) Consistent with necrotizing scleritis

H) Treatment
   1) 60mg Pred PO
   2) PF BID
   3) NSAIDS?
      a) Helpful in non-necrotizing cases
      b) IF methotrexate used, may increase risk of SE

I) Scleritis review
   1) Incidence/Demographics:
      a) 30-50 years old; 6:100,000
      b) 0.2-6.3% of RA, 7% Wegener’s
      c) Female:male = 1.6:1
   2) Clinical Signs:
      a) Pain (with eye movement), redness
         i) Diffuse (60%)
         ii) Nodular (20%)
         iii) Necrotizing
         iv) Posterior
      b) Uveitis
      c) Redness - resistance to blanching with 2.5% phenylephrine

J) Necrotizing Scleritis
   1) Necrotizing scleritis with and without inflammation
   2) Pathophysiology
   3) Systemic associations
   4) Mortality

VIII. Case #7
A) Demographics/History
   1) 75 year old female, referred by comanaging MD
   2) OcHx: HZO OS, resultant glaucoma
a) filtering surgery (trab)
b) Corneal scarring and ectasia
c) PK OS: 5/29
d) Two months post-PK, urgent referral for infection OS

B) Exam Findings
   1) VA = CF at 3’
   2) Meds: PF BID, EES ung BID
   3) SLE:
      a) 2-3+ corneal graft edema
      b) 1.7mm dense infiltrate at 11 o'clock
      c) 3-4+ cell, fibrin
      d) 7% layered hypopeon
      e) 3+ hyperemia, more intense around bleb
   4) IOP = 10mmHg

C) Differential
   1) Corneal Ulcer
   2) Blebitis
   3) Endophthalmitis
   4) Graft Rejection
   5) Combination?

D) Management
   1) Corneal culture
   2) Fortified antibiotics
   3) Atropine
   4) Referral for tap/inject

E) Follow-up visits
   1) Decreasing infiltrate, enlarging epithelial defect
   2) Effect of trab on risk of endophthalmitis
   3) Importance of corneal culture
   4) Suture track infection
   5) Increased risk for infection due to immunosuppression