Case Presentation

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10-22-09

- HPI: S.P. is a 67 y.o. male with history of glaucoma who follows up for decreased vision and glare

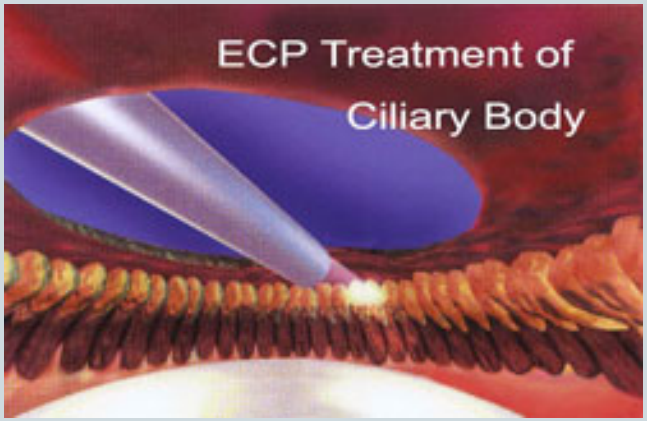
- POHx:
  - Refractive error (hyperopia)
  - Cataracts
  - Pseudoexfoliative glaucoma
    - s/p SLT OS 02/2009
    - s/p SLT OD 01/2008
- Ocular Meds:
  - Cosopt BID OU; Travatan qHS OU

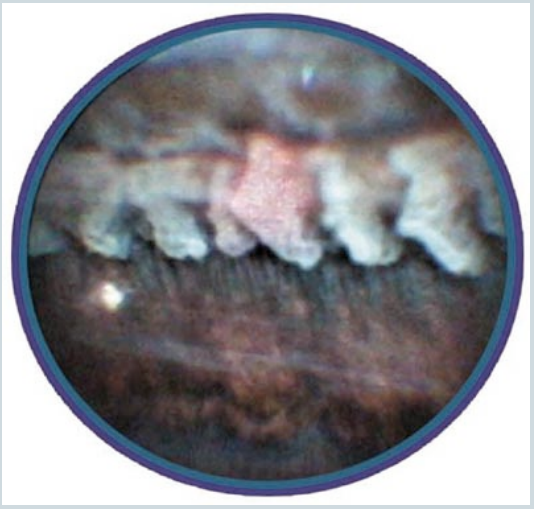
- PMHx:
  - Hypertension
- FHx:
  - Diabetes mellitus
  - Cancer
- SocHx:
  - No tobacco or IVDU; unremarkable

- Meds:
  - Atenolol
  - Zesteretic
- Allergies:
  - NKDA

- OD
  - VA: 20/25
  - IOP: 23
  - Extnl
    - Hypertrichosis
  - SLE
    - 2+ nuclear sclerosis
    - Fibrillary deposits
  - Fundus
    - C:D 0.65 x 0.65
- OS
  - VA: 20/25
  - IOP: 18
  - Extnl
    - Hypertrichosis
  - SLE
    - 2+ nuclear sclerosis
    - Fibrillary deposits
  - Fundus
    - C:D 0.5 x 0.5

- Assessment
  - Pseudoexfoliative glaucoma
  - Cataracts, visually significant
- Plan
  - Cataract extraction with endoscopic cyclophotocoagulation, (ECP) right eye





11/03/09 POD#1

- CC: no complaints
- VA: 20/30
- IOP: 31
- SLE:
  - Irregular pupil
  - AC w/ viscoelastic ; 1+ cells
  - IOL well positioned
  - Fundus WNL
- A/P:
  - s/p CE/IOL and ECP with post-op elevated pressure
    - Travatan, Combigan, and Azopt given → IOP 15
    - Continue hypotensives
    - Continue post-op regimen of Xibrom, Vigamox, Durezol

11/5/09 POD#3 - Emergency

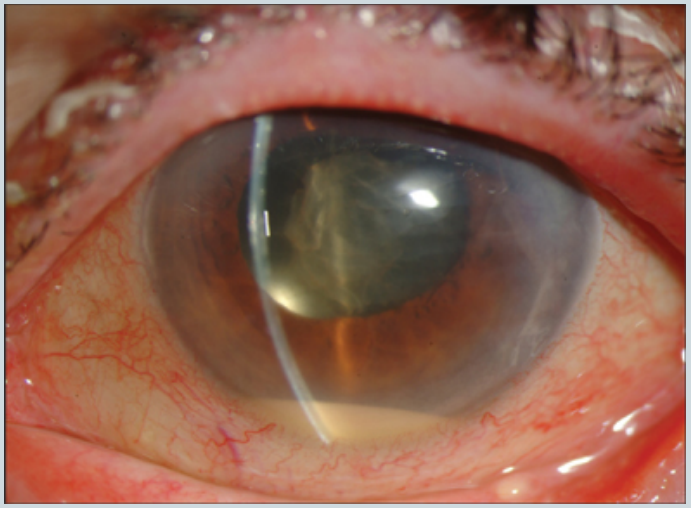
- CC: vision black out x30 min. after rubbing eye
- VA: 20/30
- IOP: 7
- SLE:
  - AC deep/quiet; no active leak
  - IOL in good position
  - Fundus WNL
- A/P:
  - s/p CE/IOL and ECP with post-op elevated pressure , now low IOP
    - May have “burped” his wound, causing lower IOP
      - Avoid eye rubbing, given self-sealing wound
    - Continue post-op regimen: Vigamox, Xibrom, Durezol
    - F/U 1 week

11/09/09 POD# 7

- CC: No complaints
- VA: 20/20
- IOP: 18
- SLE
  - AC deep/quiet
  - IOL in good position
  - Fundus WNL
- A/P
  - s/p CE/IOL and ECP
    - Excellent post-op course
    - D/C Vigamox; continue Xibrom, Durezol
    - F/U 3 wks for dilated examination

11/10/09 POD#8 - Emergency

- CC: eye pain o/n; blurry vision in AM
- VA: 20/25 (PH: 20/20)
- IOP: 15
- SLE:
  - No lid edema
  - AC deep; 4+ cells with hypopyon
  - IOL in good position
  - Fundus WNL



- Differential of severe post-op inflammation

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  - Infectious endophthalmitis
    - Progressive, often severe pain (NOT always)
    - Deteriorating vision
    - Inflammation – fibrin in AC, hypopyon, vitreous cell

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    - Mutton-fat KP
  - Aseptic endophthalmitis/sterile endophthalmitis
    - Sterile postoperative uveitis caused by excessive tissue manipulation or toxic substance
    - May present with hypopyon and mild vitreous reaction
    - Lacks profound pain and visual loss

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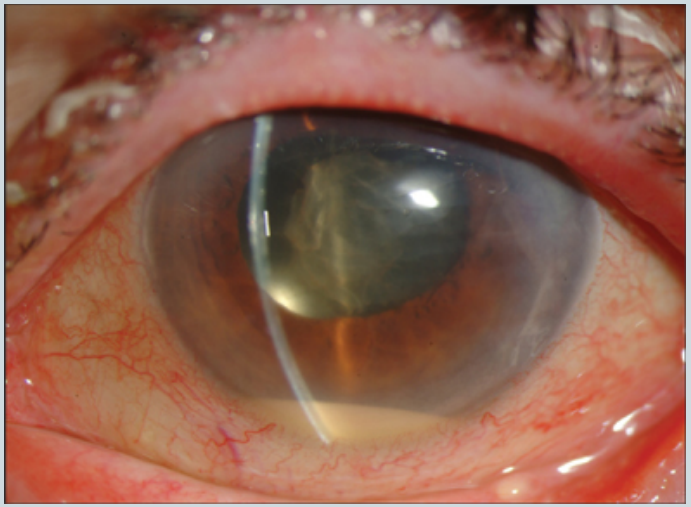
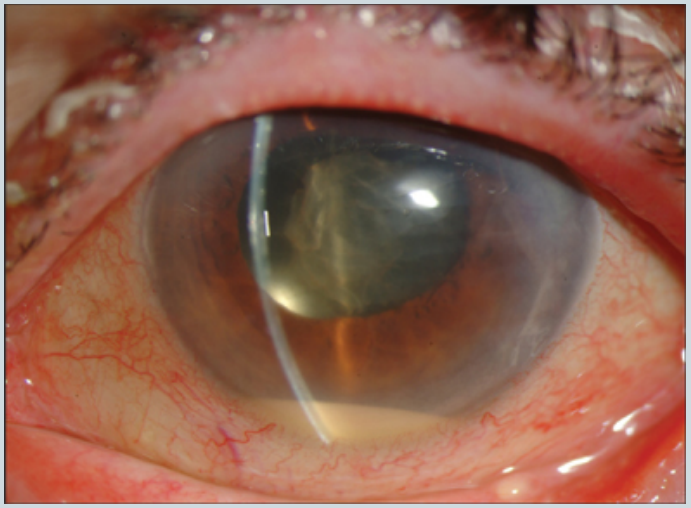


11/10/09 POD#8 - Emergency

- CC: eye pain o/n; blurry vision in AM
- VA: 20/25 (PH: 20/20)
- IOP: 15
- SLE:
  - No lid edema
  - AC deep; 4+ cells with hypopyon
  - IOL in good position
  - Fundus WNL
- A/P:
  - Severe intraocular inflammation in early post-op course
    - Change Durezol and Zymar to q1hr
    - Add Atropine
    - F/U 1 day



11/11/09 – POD# 9

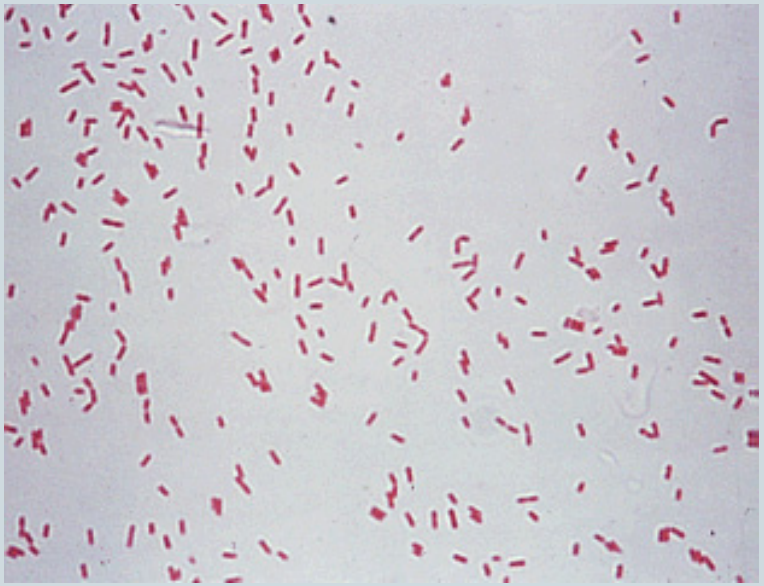
- CC: blurry vision; mild discomfort – no pain
- VA: 20/50
- IOP: 21
- SLE:
  - Conjunctival injection 1+
  - AC w/ 4+ cell, fibrin at lens; hypopyon
  - Fundus WNL
- A/P
  - Severe post-op inflammation, possible endophthalmitis
    - AC tap and culture
    - AC antibiotic injection – Vancomycin and Amikacin

11/12/09 – POD#10

- CC: pain and blurred vision
- VA: CF, close
- IOP: 38
- SLE:
  - AC w/ 4+ cell, fibrin
  - Limited view; red reflex only
- A/P
  - Diamox 500mg PO given

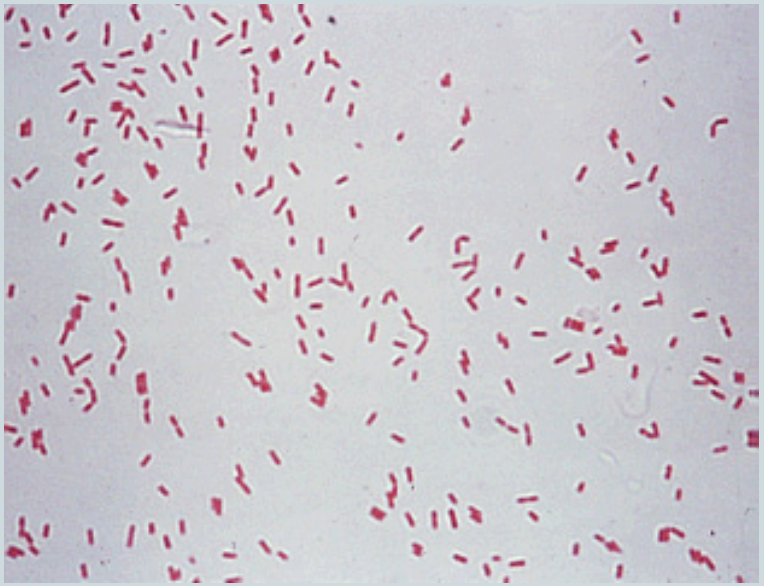
11/12/09 – POD#10

- CC: pain and blurred vision
- VA: CF, close
- IOP: 38
- SLE:
  - AC w/ 4+ cell, fibrin
  - Limited view; red reflex only
- A/P
  - Diamox 500mg PO given
  - MEEI microbiology: gram negative rods seen, sensitivity pending



11/12/09 – POD#10

- CC: pain and blurred vision
- VA: CF, close
- IOP: 38
- SLE:
  - AC w/ 4+ cell, fibrin
  - Limited view; red reflex only
- A/P
  - Diamox 500mg PO given
  - MEEI microbiology: gram negative rods seen, sensitivity pending
  - Hospitalize for bacterial endophthalmitis
    - IV Abx; intravitreal injections today



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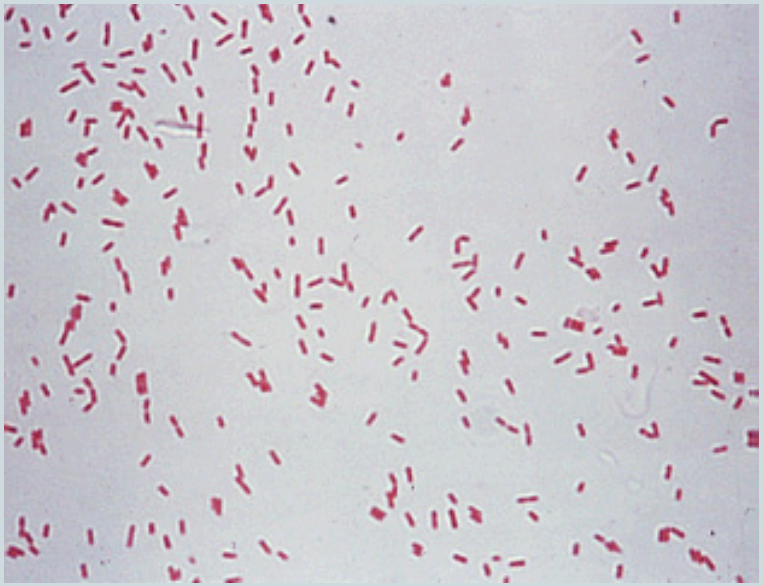

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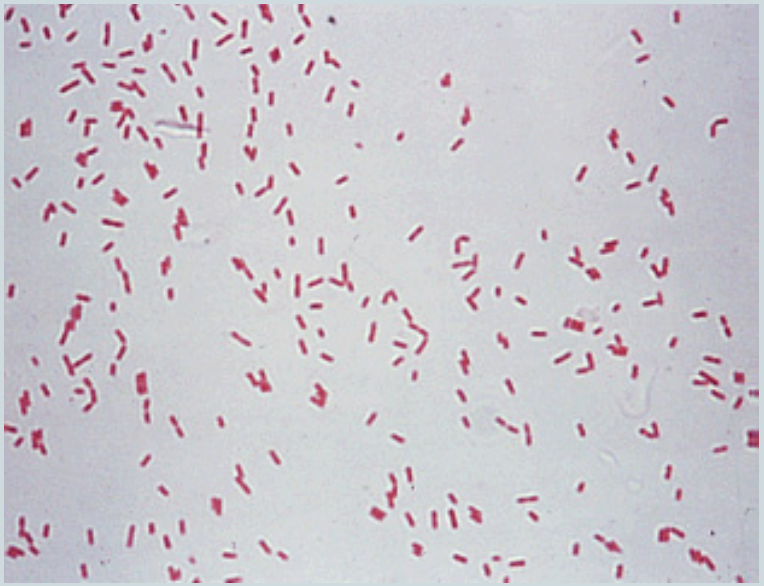

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- VA: CF, close
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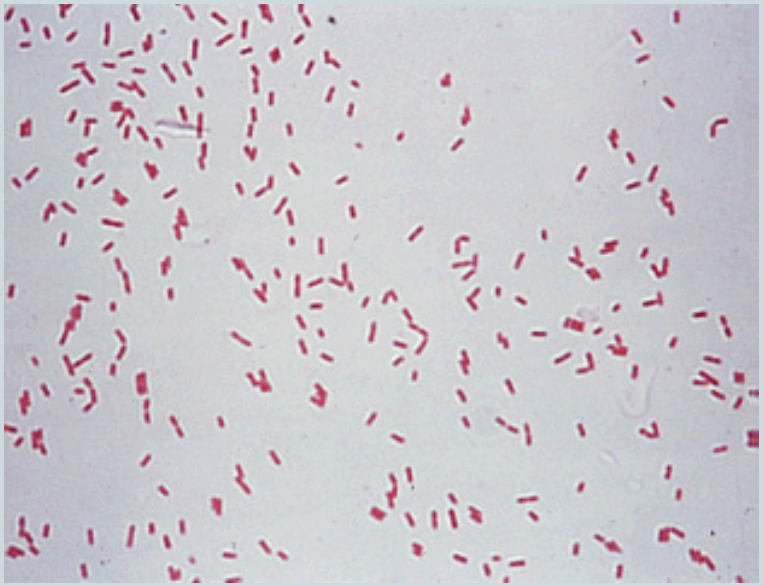
  - Limited view; red reflex only
- A/P
  - Diamox 500mg PO given
  - MEEI microbiology: gram negative rods seen, sensitivity pending
  - Hospitalize for bacterial endophthalmitis
    - IV Abx; intravitreal injections today
    - ID consult as patient now reveals → he is HIV positive
      - IV Levaquin and Ceftriaxone



Bacterial Endophthalmitis

- Definition
  - Inflammatory reaction of intraocular fluids caused by microbial organisms
- Pathophysiology
  - Bacterial entry via breakdown of ocular barriers (penetration via cornea or sclera); may be endogenous infection seeded hematogenously
- Epidemiology
  - U.S. Seen in <0.1% after intraocular surgery
    - Cataract surgery: 0.1%
    - Pars plana vitrectomy: 0.05%
    - Bleb-related: 0.2 - 9.6%
    - Post-trauma: 2.4 – 8.0%
    - Intraocular foreign body: 30%
- Morbidity
  - Vision loss, persistent pain
  - Rare extension beyond the globe

- Clinical presentation
  - Blurry vision
  - Red eye
  - Increasing, deep ocular pain
- Physical findings
  - Decreased acuity
  - Lid edema
  - Conjunctival hyperemia
  - AC cells/flare, ± hypopyon, ± fibrin
  - Vitritis; loss of red reflex
  - Specific findings
    - Delayed onset: white plaque at lens capsule equator
    - Bleb-related: purulent bleb
    - Endogenous: systemic illness

- Classification
  - Exogenous
    - Acute post-operative (<6 wks)
    - Delayed onset post-operative (>6 wks)
    - Filtering bleb-associated
    - Post-traumatic
  - Endogenous
    - Septicemia
    - Debilitated state
    - Indwelling catheter
    - IVDU

- Pathogenesis
  - Acute
    - Coagulase-negative Staph
      - S. epidermidis (most)
    - S. aureus
    - Enterococcus
    - Gram-negative (30%)
  - Delayed
    - Propionibacterium acnes
    - Coagulase-negative Staph
    - Corynebacterium
  - Bleb-related
    - Streptococcus
    - Haemophilus influenzae
  - Post-traumatic
    - Bacillus
    - S. aureus
  - Endogenous
    - S. aureus
    - E. coli
    - Streptococcus

- Origin
  - Eyelids/conjunctiva
  - Secondary lacrimal system infection
  - Contaminated eyedrops
  - Contaminated surgical instruments, IOLs, or irrigation fluid
  - Breached sterile technique
- Prophylaxis
  - 10% povidone-iodine for skin
  - 5% povidone-iodine for ocular surface
  - Pre-operative topical broad-spectrum antibiotics to decrease bacterial load
  - Subconjunctival antibiotics at end of intraocular surgery

- Work-up
  - B-scan: if limited view of fundus
    - R/O detachment, retained lens material
    - May note choroidal thickening
  - Systemic work-up if endogenous:
    - Pan-culture (blood, sputum, urine)
    - CXR
    - 2D ECHO
  - Culture and sensitivity of aqueous & vitreous

- Endophthalmitis Vitrectomy Study (EVS)
  - 420 eyes post-cataract extraction w/ suspicion for bacterial endophthalmitis and VA 20/50 or worse
    - Randomized to intravenous antibiotics or not
    - Randomized to initial PPV w/ intravitreal Abx vs. initial AC/ vitreous tap with intravitreal Abx (re-treatment w/in 36-60 hours if eyes doing poorly)
  - Conclusions
    - Intravenous antibiotics not beneficial
    - VA HM+ → medical treatment as effective as surgical
    - VA LP- → PPV with intravitreal Abx injections

- Treatment
  - Intravitreal antibiotics
    - Vancomycin 1mg/0.1mL
    - Ceftazidime 2.25mg/0.1mL or Amikacin 0.4mg/0.1mL
  - Intravitreal steroid
    - Dexamethasone 0.4 mg/0.1 mL
  - Cycloplegic
  - Fortified topical medications
    - Vancomycin 50mg/mL
    - Ceftazidime 50mg/mL
    - Pred forte 1%
  - Topical corticosteroid

- Treatment concerns
  - Ceftazidime vs amikacin for gram negatives?
    - Concern regarding ceftazidime-resistent bacteria
    - Aminoglycosides associated with macular toxicity
      - Macular ischemia with capillary closure and telangiectasias following amikacin and vancomycin
      - Macular infarction after intravitreal injections of amikacin, vancomycin, and dexamethasone
  - Toxicity from repetitive intravitreal injections?
    - Preretinal hemorrhages seen after two intravitreal injections of cephazolin and amikacin, 48 hrs apart
    - Rabbit study evaluating combined amikacin and vancomycin repetitive intravitreal injections, 48 hrs apart
      - No toxicity after single injection
      - 50% focal retinal toxicity on histologic study
      - 100% eyes with histologic evidence of advanced retinal toxicity, primarily at photoreceptor outer segments and RPE

- Inpatient care
  - May be needed depending on
    - Severity
    - Patient reliability/compliance
    - If underlying systemic disease
- Outpatient care
  - Factors denoting improvement
    - Decreased pain
    - Decreased inflammation/fibrin retraction
    - Improved vision

- Complications
  - Retinal necrosis
  - Retinal detachment
  - IOP elevation
  - Vascular occlusion
  - Panophthalmitis

- Prognosis
  - Factors influencing prognosis
    - Duration
    - Time to treatment
    - Virulence of bacteria
    - Etiology of entry
    - Existing ocular disease
  - Final VA 20/100+ in the EVS:
    - Percentage of patients achieving VA of 20/100+:
      - *S aureus* - 50%
      - Streptococci - 30%
      - Enterococci - 14%
      - Gram-negative organisms - 56%

11/19/09 – POD#17

- CC: S.P. reports improved vision

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- VA: 20/50

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- CC: S.P. reports improved vision
- VA: 20/50
- IOP: 16

11/19/09 – POD#17

- CC: S.P. reports improved vision
- VA: 20/50
- IOP: 16
- SLE:
  - Cornea w/ fine KP
  - AC w/ trace cell
  - PCIOL; 2+ PCO
  - 2.5+ vitreous cell; limited view of retina

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- CC: S.P. reports improved vision
- VA: 20/50
- IOP: 16
- SLE:
  - Cornea w/ fine KP
  - AC w/ trace cell
  - PCIOL; 2+ PCO
  - 2.5+ vitreous cell; limited view of retina
- A/P
  - Post-operative Pseudomonas endophthalmitis, improving
    - Zymar QID and Pred Forte on slow taper
    - Future plan for YAG +/- PPV
    - Levaquin 500mg daily (10 day course)

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- Thank you