70 year old male, h/o cataract surgery OD about 5 months prior

CC: blurry vision OD for about 1 month “vision was good after surgery, then started getting blurry”

POHx: Age-related macular degeneration

VA: OD 20/60 uncorrected
MRx: OD plano/sph, no improvement
Treatment?

A) Topical steroid/NSAID
B) Intravitreal Avastin
C) Intravitreal steroid
D) Vitrectomy
E) Observation

Rx: Ketorolac and Prednisolone qid

Baseline: 20/60

2 Months: 20/25
(Pseudophakic) Cystoid Macular Edema

Incidence: 4-11% CME on OCT
0.1-2.35% Clinical CME (vision loss)

Mechanisms: Surgical manipulation
Inflammation/cytokines
Increased vascular permeability
Compromise of blood-retina barrier
Vitreomacular traction

Course: Peak incidence: 4-6 weeks post-op
80% resolve in 3-12 months

(Pseudophakic) Cystoid Macular Edema

Risk Factors: Surgical complications
Vitreous loss
Vitreous traction (incisions)
Retained lens fragments
Iris trauma
Posterior capsule rupture

Predisposing baseline disease
Diabetic retinopathy
Uveitis
Retinal vein occlusions
Pseudophakic CME: Differential Diagnosis

Wet AMD

CSR
Pseudophakic CME: Differential Diagnosis

Macular Hole

ERM

Cystoid Macular Edema: Treatments

Topical NSAIDs (best evidence)
- Topical steroids
- Periocular steroid injection
- Intravitreal steroid injection
- Intravitreal anti-VEGF injection
- Systemic CAI
- Laser vitreolysis
- Vitrectomy

If underlying risk factors, tailor Rx accordingly

DME: anti-VEGF
Uveitis: steroid injection
VMT: surgery
ocriplasmin
Cystoid Macular Edema: Prophylaxis

Ophthalmic Technology Assessment

Topical Nonsteroidal Anti-inflammatory Drugs and Cataract Surgery
A Report by the American Academy of Ophthalmology

No strong evidence in support of routine NSAID prophylaxis
Does not affect long-term visual outcomes

CME: When to Seek 2nd Opinion

Underlying Disease:
- Diabetes
- AMD
- Uveitis

Improves after 1 Month on Topical Rx

Consider Referring

Follow
CME: Key Points

- Rare with modern surgical techniques but overall prevalence is still significant
- Best evidence still supports traditional topical NSAIDs for treatment; not clear if routine prophylaxis is beneficial
- Newer therapies may be better for chronic CME but larger studies needed

73 year old male, h/o cataract surgery OD 4 days ago.

CC: blurry vision OD with floaters and dull pain since last night
“vision was good after surgery, then started getting blurry; seeing snowflakes”

POHx: Well-controlled glaucoma OU

Gtt: Moxifloxacin tid OD
Lotemax tid OD
Bromfenac qday OD
Latanoprost qhs OU

VA: OD 20/100
(compared to 20/30 on POD #1)

IOP: OD = 21
OS = 14
Treatment?

A) Increase topical steroid/NSAID
B) Taper off topical steroid
C) Continue eyedrops and add timolol bid OD
D) Immediate referral to retina
E) Observation

Endophthalmitis

Severe inflammation of the intraocular cavities

- complication of intraocular surgery
- result of nonsurgical trauma
- systemic infection

Not necessarily an infectious process (sterile endophthalmitis)

- lens-induced inflammation
- severe noninfectious postoperative inflammation
CLASSIFICATION OF ENDOPTHALMITIS

I. Infectious
   A. Exogenous
      1. Surgical
         a. Acute onset
         b. Delayed onset
         c. Bleb associated
      2. Nonsurgical
         a. Posttraumatic
   B. Endogenous
      1. Hematogenous spread

II. Noninfectious
    A. Lens induced
    B. Sterile

Incidence (Acute, Post CE/IOL)

- About 0.1% (0.03%-0.2%)
- Pre-operative risk factors:
  - Blepharitis, DM, Older age
- Peri-operative risk factors:
  - Vitreous loss, PC tear, less surgeon experience
- Postoperative risk factors:
  - Wound leak on POD#1
Signs and Symptoms

- Decreasing vision (94%)  
- Conj. Injection (82%)  
- Pain (only in 75%)  
- Lid edema (35%)  
- Anterior chamber & vitreous cells  
  - In EVS, 14% had no hypopyon  
- Chemosis, Corneal edema

Critical findings on dilated examination include

- vitritis  
- scattered retinal hemorrhages  
- peri-phlebitis (if the retina is visible)  
- no view
Endophthalmitis Vitrectomy Study (EVS)
- Role of vitrectomy and systemic ABX
- Acute postoperative endophthalmitis
- Cataract surgery or secondary IOL
- Presenting VA: 20/50 to LP
- Treatment: All had intravitreal ABX
  (Vancomycin: 1.0 mg/0.1 ml, Amikacin: 0.4 mg/0.1 ml)
  - VIT vs. TAP
  - With and without intravenous ABX
    (Ceftazidime, Amikacin)
Prognostic Factors

- Virulence of organism
  - negative culture: best
  - Staph epidermidis: good
  - Staph aureus: poor
  - Streptococcus: very poor
  - Pseudomonas: very poor

EVS:
- Culture positive: 81%
  - 70% Coag.Neg. Staph (S. epidermidis)
  - 24% other Gram positive (10% Staph Aureus, 9% Strep sp.)
  - 6% Gram negative
  - Culture negative: 19%

EVS: VIT vs. TAP

- Final VA: Presenting VA ≥ HM
  - No difference between VIT and TAP
  - 53% 20/40 or better at 9 months

- Final VA: Presenting VA = LP
  - VIT better than TAP
  - 3 x chance VA ≥ 20/40 (33% vs. 11%)
  - 50% reduced risk severe Va loss (VA < 5/200)
    (20% vs 47%)

- Final media clarity same
- Best predictor final Va ➔ Initial Va
**Current Management**

- Primarily outpatient treatment
- AC +/- vitreous tap with 25 g. needle
- Intravitreal Vancomycin and:
  - Ceftazidime or
  - Amikacin
- Vitrectomy for LP vision at presentation
- Topical antibiotics & steroids, Atropine
  +/- oral antibiotics (moxifloxacin)
- See patient daily

**Don’t Forget Late Complications (EVS)**

- Retinal detachment ~5%
  - > 1.5% of VIT group
  - > 3.0% of TAP group
- Glaucoma ~ 3%
- Phthisis ~6%
DELAYED-ONSET INFECTIOUS ENDOPHTHALMITIS

• occurs more than 6 weeks following surgery
• less common (7% of cases)
• typically organisms of lower virulence
  • Propionibacterium acnes (60%)
  • Staph. Epidermidis
  • Fungi (20%)
• the clinical picture is frequently indistinguishable from that of uveitis
• Patients complaints include
  • photophobia
  • blurred vision
  • mild pain

• Signs include
  • keratic precipitates
  • anterior chamber and vitreous cells and flare
  • Hypopyon LESS frequent
  • a capsular plaque is very typical in P. acnes endophthalmitis
Current Management

- **Controversial**

- **Vitrectomy/Partial capsulectomy**
  - If recurs: Vitrectomy/total capsulectomy/IOL removal

- **Intravitreal Vancomycin and Ceftazidime**
  - +/- Voriconazole

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**BLEB-ASSOCIATED INFECTIOUS ENDOPHTHALMITIS**

- follows glaucoma filtering procedure (Mean 1.5-7 years, up to 44 years!)
- may range from blebitis to frank purulent endophthalmitis and may occur during the early or late postoperative periods.
- Incidence varies greatly (0.17% - 13.2%)
- Risk Factors: thin/avascular bleb, use of antimetabolites, inferior bleb, bleb leak
• Signs and Symptoms:
  • similar to acute endophthalmitis

• Acute-onset
  • most commonly Staph. species

• Delayed-onset
  • most commonly *Strep species* and *Moraxella catarrhalis*

Management:
• Controversial
• Guarded prognosis
• Prompt PPV/antibiotics

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**Toxic Anterior Segment Syndrome (TASS)**

• Non-infectious acute postoperative inflammatory reaction
• Usually following uncomplicated CE/IOL
  • Phakic IOL
• Felt secondary to toxic inoculation intraoperatively
  • Detergents, incompletely cleaned instruments, sink water used to clean (endotoxin)
• Endothelium preferentially damaged
• Not great data on incidence or prevalence
Table 1. Differentiating Toxic Anterior Segment Syndrome and Infectious Endophthalmitis

<table>
<thead>
<tr>
<th>Signs and Symptoms</th>
<th>TASS</th>
<th>Infectious Endophthalmitis</th>
</tr>
</thead>
<tbody>
<tr>
<td>Onset</td>
<td>12-24 hours usually</td>
<td>2-7 days usually</td>
</tr>
<tr>
<td>Pain</td>
<td>Usually none but can be mild to moderate</td>
<td>Usually severe</td>
</tr>
<tr>
<td>Corneal edema</td>
<td>Limbus to limbus</td>
<td>Specific to area of trauma</td>
</tr>
<tr>
<td>Intrascleral pressure</td>
<td>May increase suddenly</td>
<td>Usually not elevated</td>
</tr>
<tr>
<td>Anterior chamber inflammation</td>
<td>Moderate-to-severe anterior chamber reaction with increased white blood cells and fibrin. Hypopyon may be noted.</td>
<td>Moderate-to-severe anterior chamber reaction. Fibrin is variable. Hypopyon often present (75% of the time).</td>
</tr>
<tr>
<td>Vitritis</td>
<td>Very rare</td>
<td>Always present</td>
</tr>
<tr>
<td>Pupil</td>
<td>Fixed and dilated</td>
<td>Reactive</td>
</tr>
<tr>
<td>Lid swelling</td>
<td>Usually not evident</td>
<td>Often present</td>
</tr>
<tr>
<td>Visual acuity</td>
<td>Decreased</td>
<td>Decreased</td>
</tr>
<tr>
<td>Response to steroids</td>
<td>Dramatic improvement</td>
<td>Equivocal</td>
</tr>
</tbody>
</table>

TASS: Management

- If diagnosis unclear → tap and inject

- If TASS → Intensive topical steroids (PF q 1hour)
  - Close follow up
  - Manage IOP
  - If does not improve rapidly consider tap and inject / Vitrectomy
  - No clear benefit to AC washout
  - If corneal edema does not resolve in 6 weeks may need PK
Endophthalmitis: Key Points

• Endophthalmitis is an uncommon but serious risk of all intraocular surgery

• Untreated, endophthalmitis can result in total loss of vision

• Referral: Same day

• All eye care professionals and our staffs must be vigilant to prevent, or to help diagnose and treat endophthalmitis at its earliest stages to preserve the visual potential of affected patients
Retinal Detachment after CE

Incidence: About 1% per year
75% occur in first year
5.5X greater risk than phakic pts

Risk Factors: High myopia
Lattice degeneration
History of RD in fellow eye
Older techniques (ICCE)
Complicated surgery (vitreous loss)

Symptoms: Shadow, curtain, field loss
New floaters
Photopsias
Asymptomatic

Rhegmatogenous
Non-rhegmatogenous
Tractional - exudative
Treatment Options

• Laser demarcation
• Pneumatic retinopexy
• Scleral buckle
• Vitrectomy

Laser Demarcation

• Flat
• Non-tractional
• Anterior to equator
Pneumatic Retinopexy

- Superior
- Single break or <3 hours apart
- Cooperative patient
- Clear media
- 65-75% Single operation success
Pocket of submacular fluid

Scleral Buckle

- Younger patients
- Phakic patients
- Inferior breaks
- Anterior breaks
Vitrectomy

- Opaque media
- Pseudophakia
- Superior breaks
- Posterior breaks
- PVR
Timing of Retinal Detachment Repair

- Macula on – 1/199 progressed to fovea within four days (Miami AJO 2010)
- Macula off – <5 days <10 days
- “Urgency inversely proportional to duration of symptoms”
Comparison of 1-Year Outcomes

- Primary success rate
  - Scleral buckle: 86%
  - Vitrectomy: 90%
  - Scleral buckle/Vitrectomy: 94%
  - Pneumatic retinopexy: 63%

- No difference in final VA at 1 year


Retinal Detachment: Key Points

- Increased risk following intraocular surgery
- Sight threatening but largely treatable; multiple surgical options
- Urgency inversely proportional to duration of symptoms
Retained Lens Fragments

Incidence:  About 1%

Risk Factors:  Poor dilation
Movement during surgery
Type of cataract (traumatic, post. polar)
Zonular weakness (PXF, Marfan)
Otherwise difficult surgery

Complications:  Poor vision
IOP elevation
Inflammation (pseudo-endophthalmitis)
Intraocular hemorrhage (hyphema, VH)
Retinal detachment
Cystoid macular edema
IOP Elevation
- Proportionate to amount of lens material
- Increased risk if prior glaucoma
- May aggravate corneal edema

Intraocular Inflammation
- Proportionate to amount of lens material
- Nuclear material more pro-inflammatory
- May aggravate IOP elevation

Management
Vitrectomy vs. observation
- Minor cortical fragments
  - Usually can observe closely
  - Aggressive IOP lowering and anti-inflammatory Rx
  - Vitrectomy if IOP, inflammation unstable
  - Lower threshold for surgery if diabetic

- Extensive cortex, any nucleus
  - Vitrectomy, lensectomy
Timing of surgery

“Early” (3-7 days) > “Immediate” > “Late”

- Corneal edema
- “Hot” eye
  - Poor view
  - Higher risk
- Group bias
  - Worse baseline

Colyer, Berinstein, Khan et al. Retina. 2011; 31: 1534-40
Outcomes

Variable: dependent on comorbidities and underlying pathology

Review of 223 cases
Final VA ≥ 20/40 in 71%
IOP > 25 in 45% at presentation, 5% after PPV
25% with CME, 9% with RD


Retained Lens Fragments: Key Points

• Non-surgical management possible in select cases
• Important to closely monitor IOP and inflammation early
• Best surgical timing varies: overall, early but not immediate surgery may be optimal
• At greater risk for other late complications: CME, RD
Thank you