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Southern California Kaiser Permanente Optometry Symposium 2019

Posterior Segment Complications from Cataract Surgery

Hajir Dadgostar, MD, PhD

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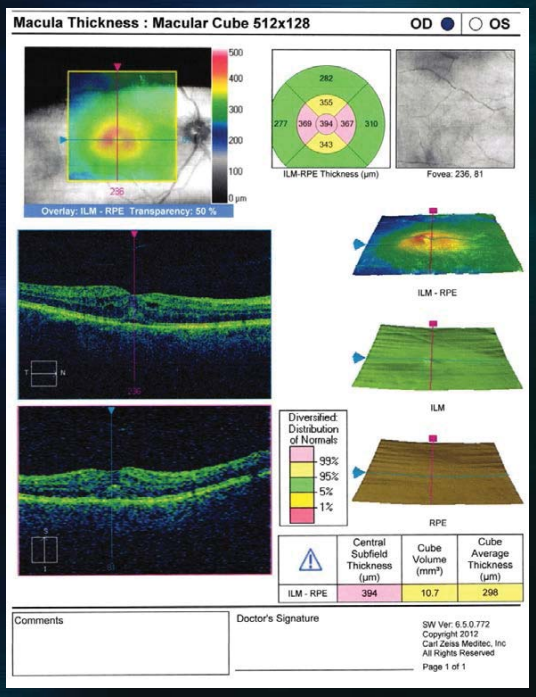
70 year old male, h/o cataract surgery OD about 5 months prior

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



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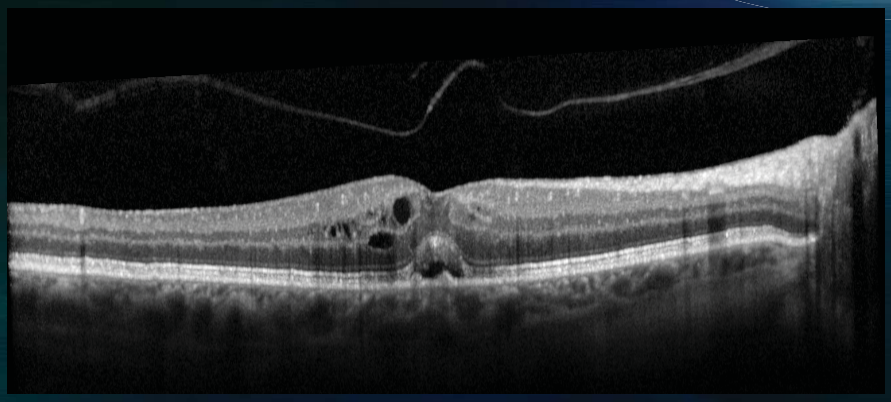

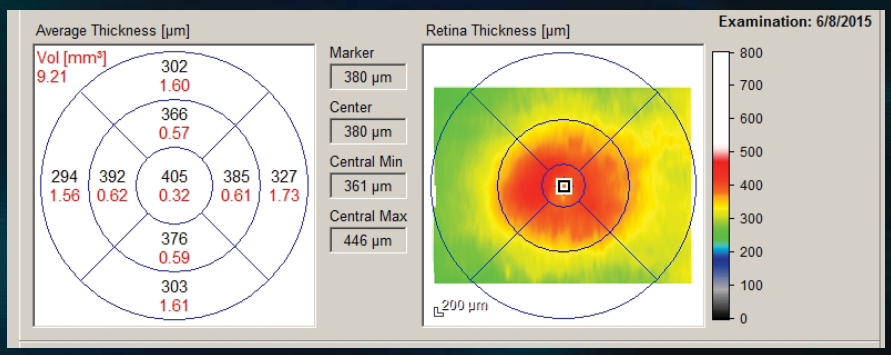

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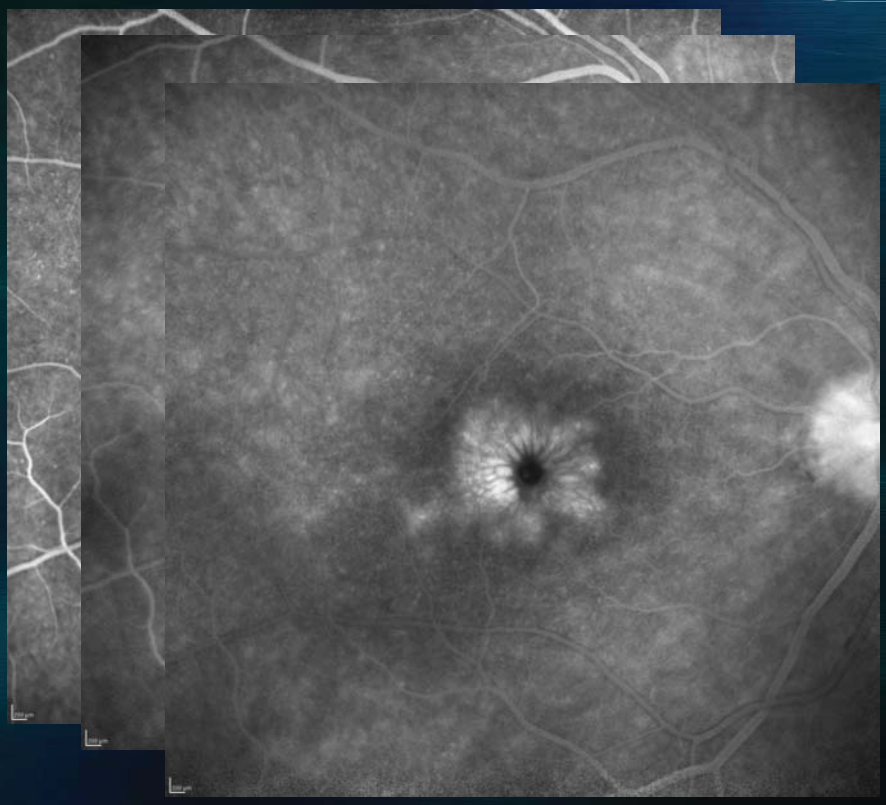

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Treatment?

A) Topical steroid/NSAID

B) Intravitreal Avastin

C) Intravitreal steroid

D) Vitrectomy

E) Observation

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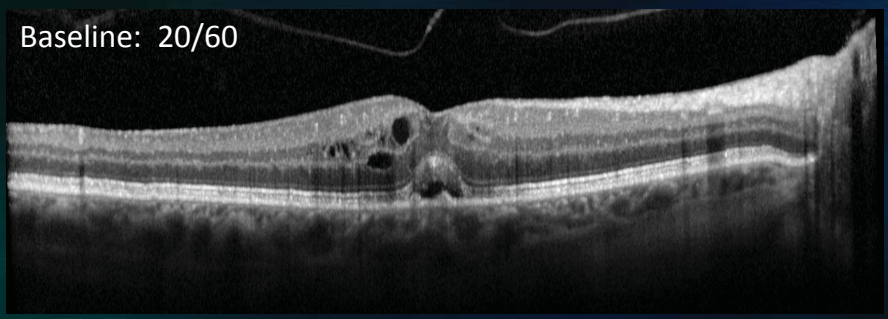
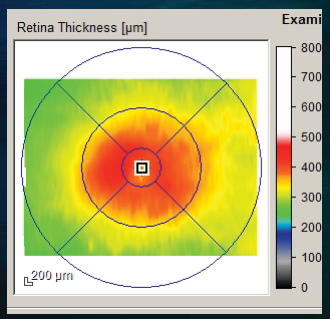
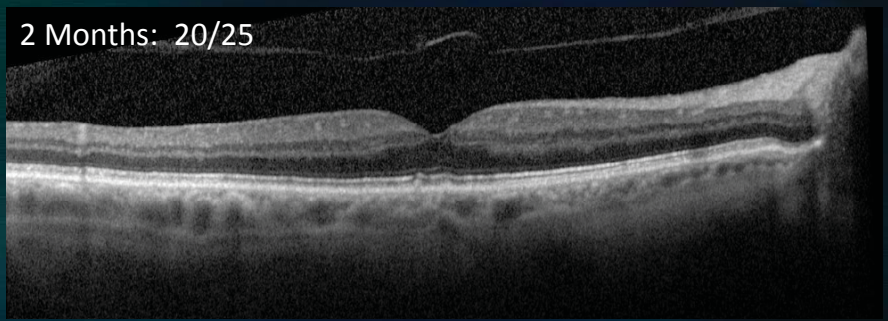
Rx: Ketorolac and Prednisolone qid

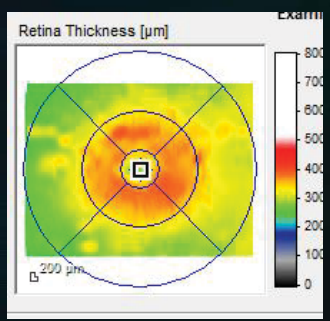
Baseline: 20/60





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

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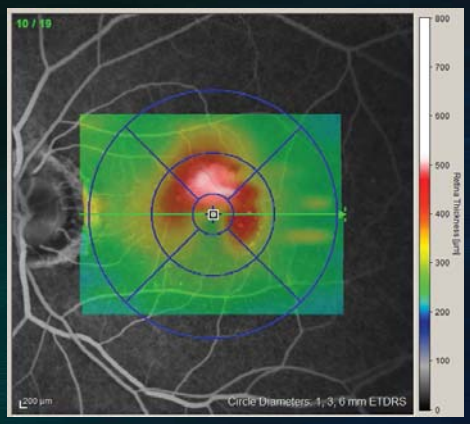
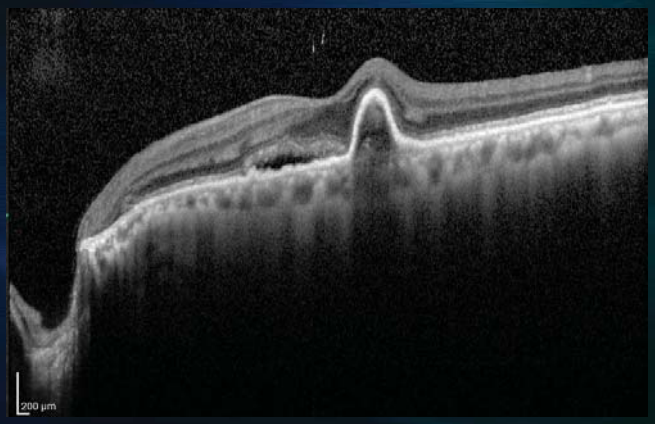
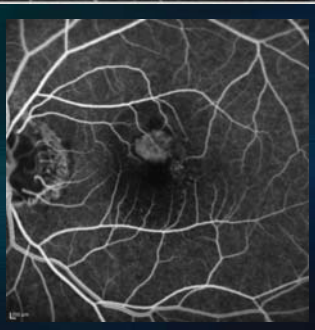
Pseudophakic CME: Differential Diagnosis

Wet AMD







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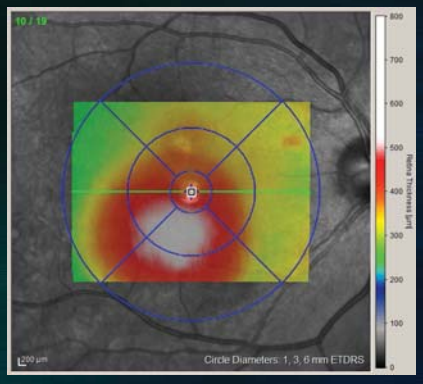
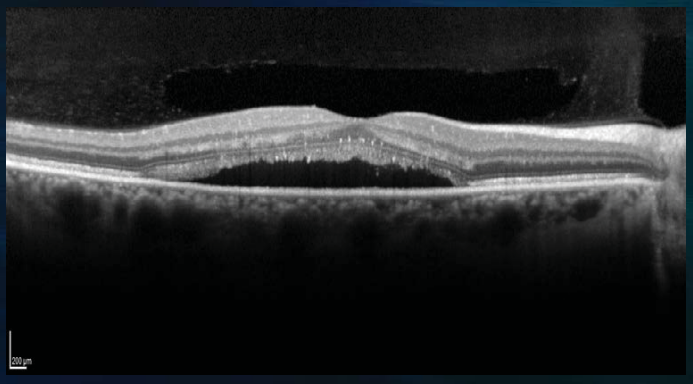
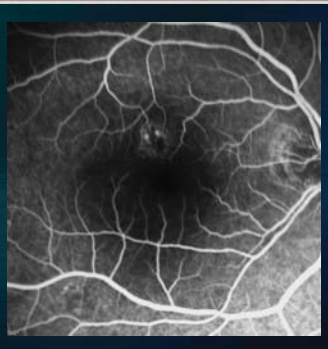
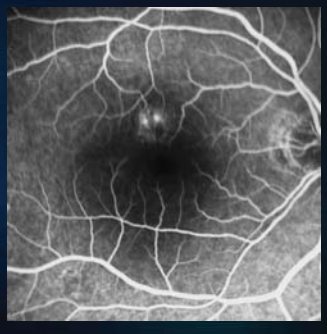
Pseudophakic CME: Differential Diagnosis

CSR

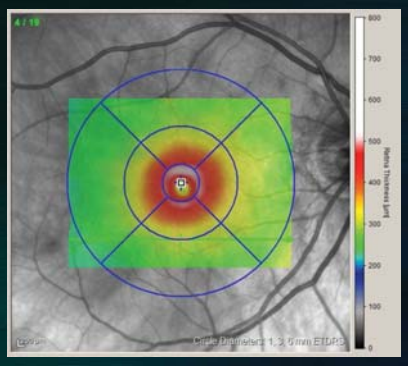


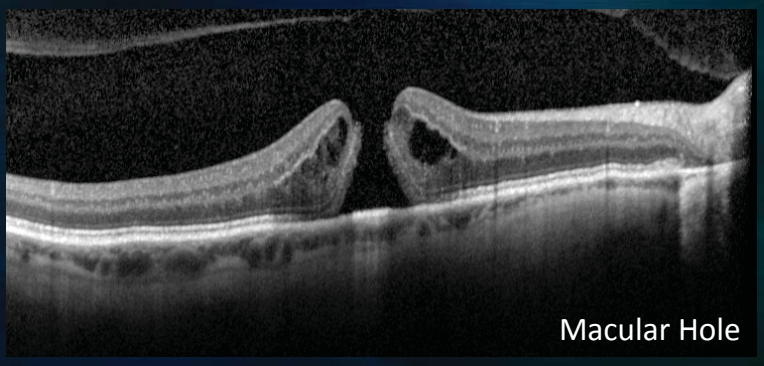


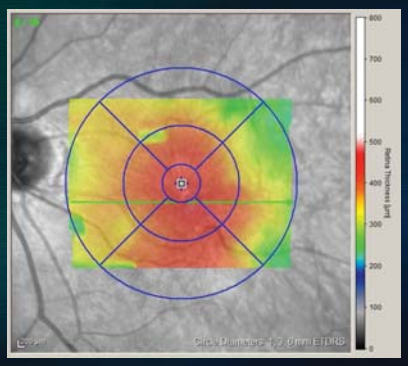


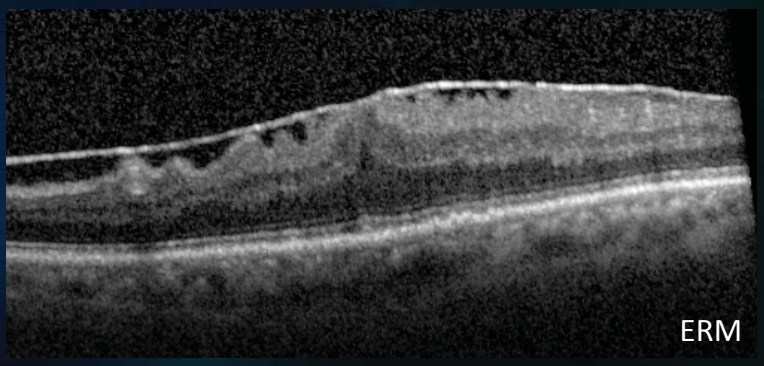


Pseudophakic CME: Differential Diagnosis









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
?systemic steroid
VMT: surgery
ocriplasmin

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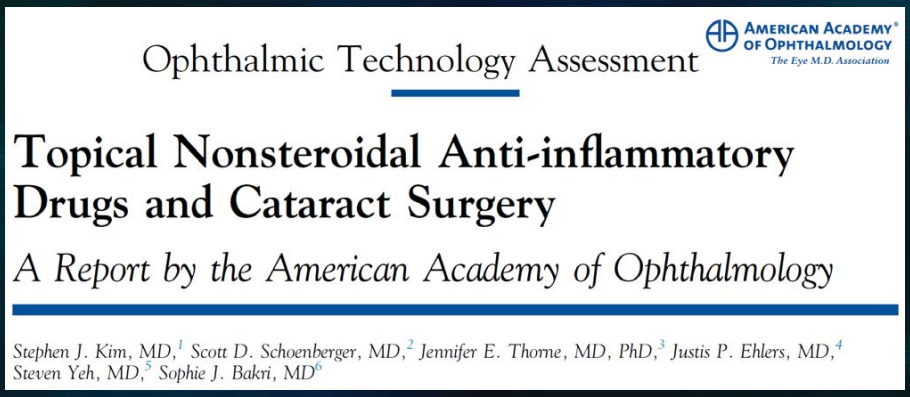
Cystoid Macular Edema: Prophylaxis



Ophthalmic Technology Assessment

AMERICAN ACADEMY OF OPHTHALMOLOGY
The Eye M.D. Association

Topical Nonsteroidal Anti-inflammatory Drugs and Cataract Surgery

A Report by the American Academy of Ophthalmology

Stephen J. Kim, MD,[1] Scott D. Schoenberger, MD,[2] Jennifer E. Thorne, MD, PhD,[3] Justis P. Ehlers, MD,[4] Steven Yeh, MD,[5] Sophie J. Bakri, MD[6]

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

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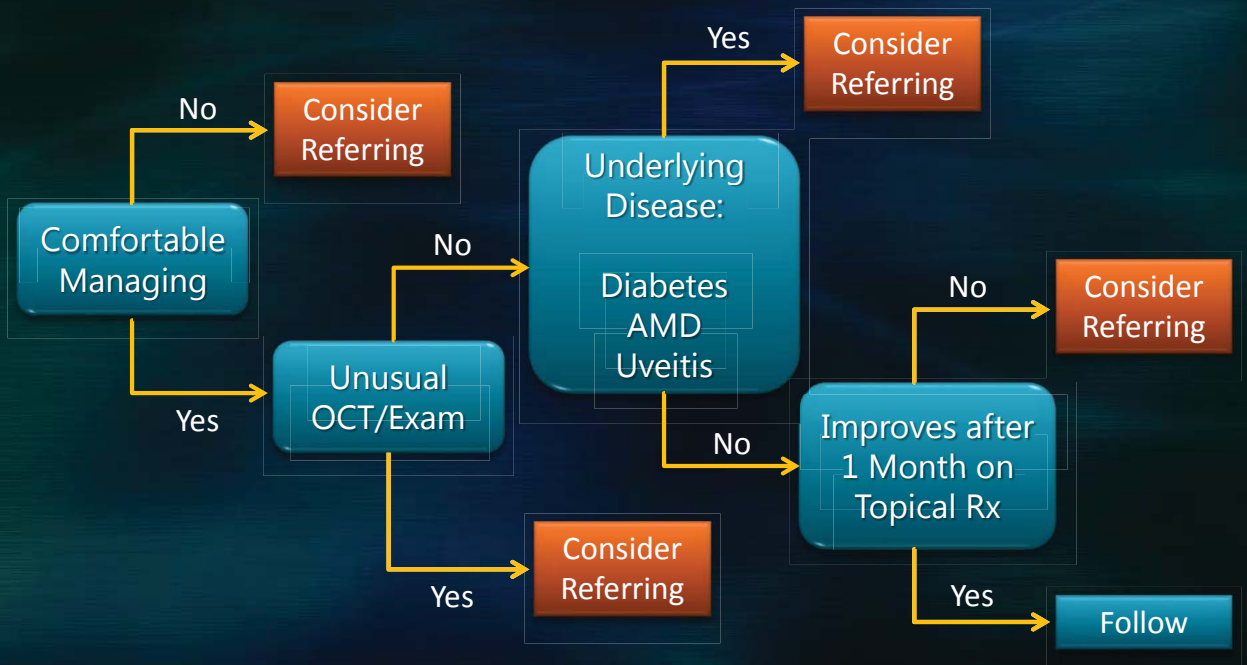
CME: When to Seek 2nd Opinion



CME: Key Points

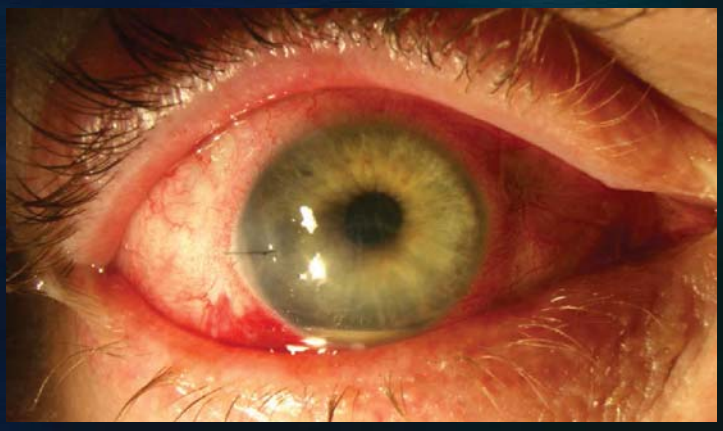
- Rare with modern surgical techniques but overall prevalence is still significant
- Best evidence still supports traditional topical NSAIDs for treatment; not clear if routine prophylaxis is beneficial
- Newer therapies may be better for chronic CME but larger studies needed

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

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CLASSIFICATION OF ENDOPHTHALMITIS

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

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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

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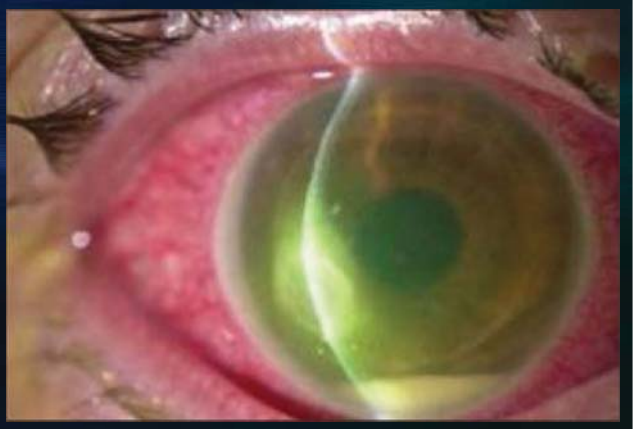
Signs and Symptoms

- 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



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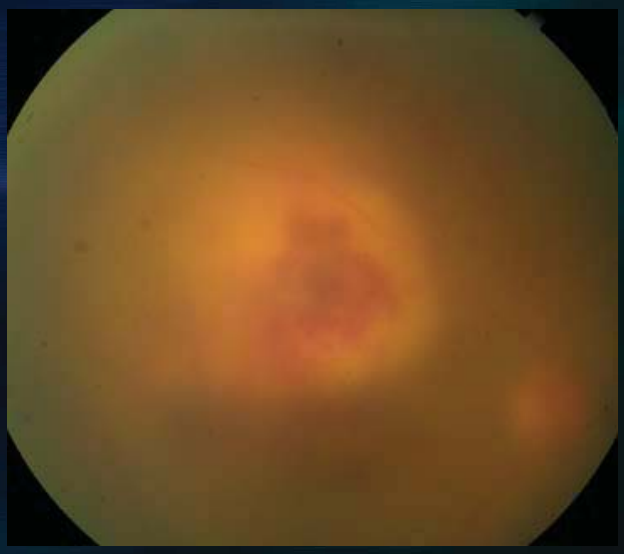
Critical findings on dilated examination include

- vitritis
- scattered retinal hemorrhages
- peri-phlebitis (if the retina is visible)
- no view



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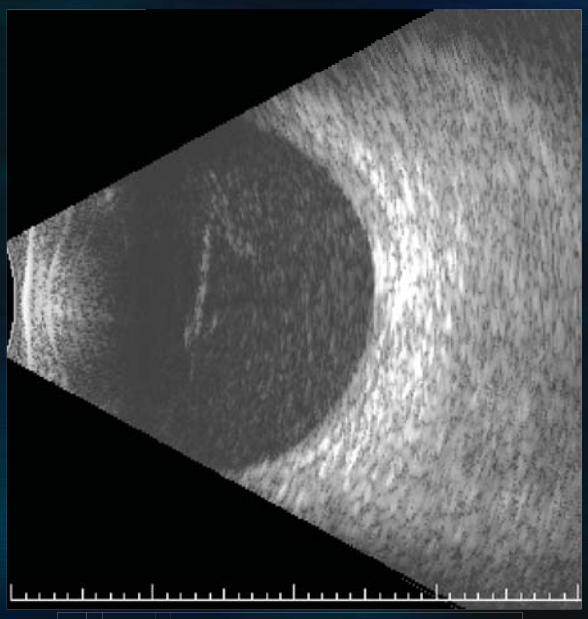
Vitritis



B-Scan Ultrasound

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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)

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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%

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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

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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

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Don't Forget Late Complications (EVS)

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

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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

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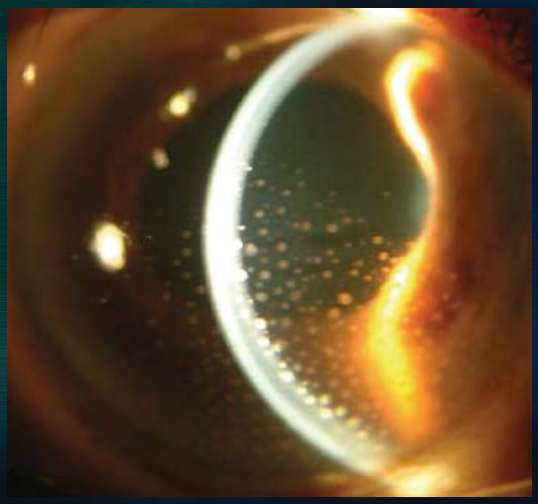
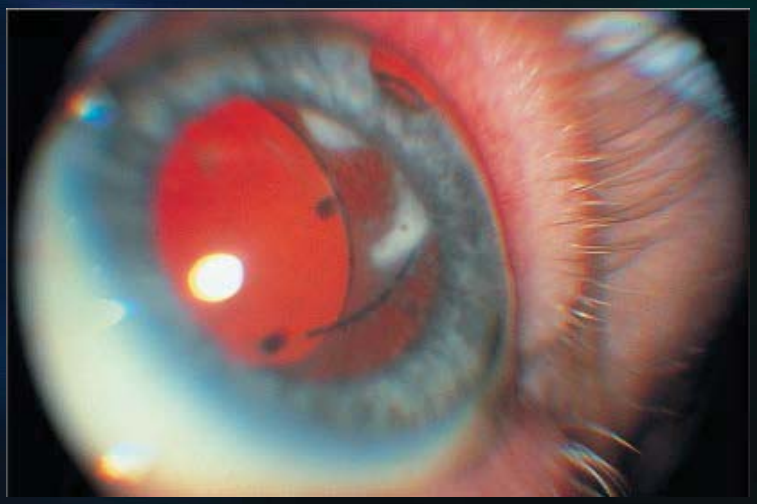
- Signs include
  - keratic precipitates
  - anterior chamber and vitreous cells and flare
  - Hypopyon LESS frequent
  - a capsular plaque is very typical in P. acnes endophthalmitis





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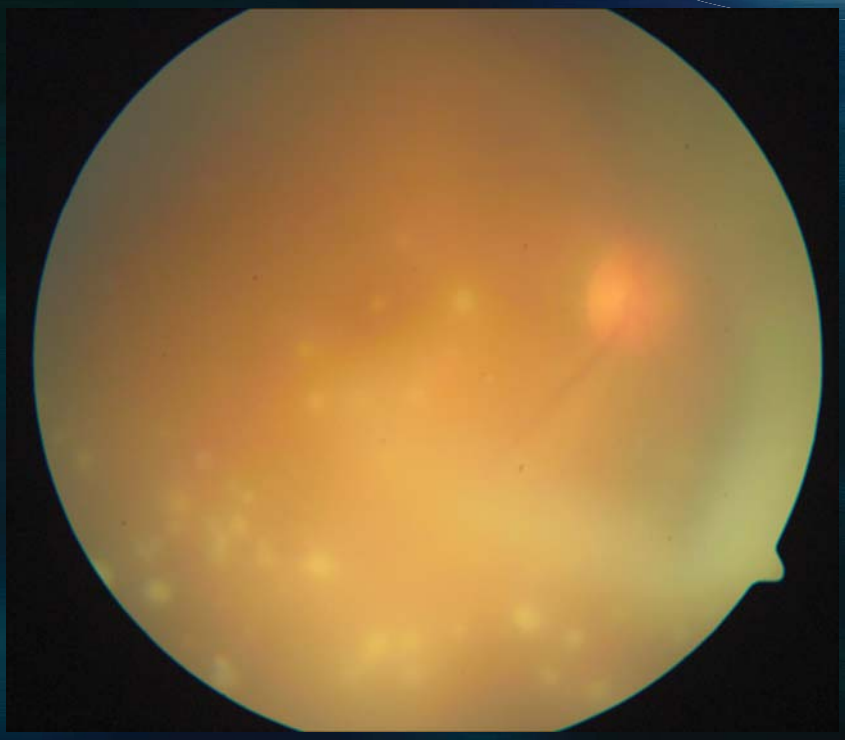

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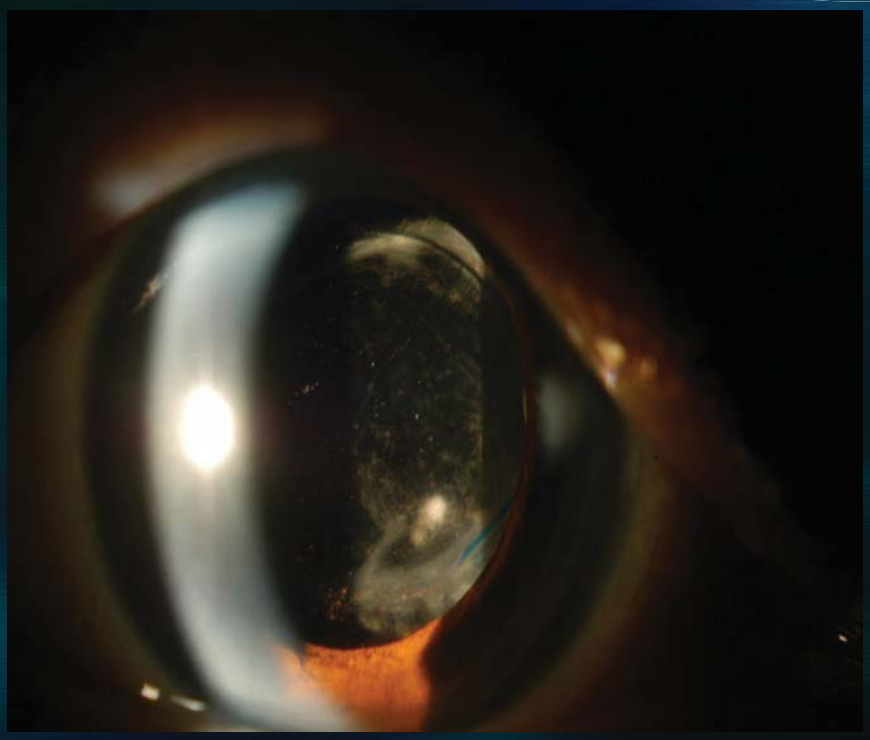

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Current Management

- Controversial
- Vitrectomy/Partial capsulectomy
  - If recurs: Vitrectomy/total capsulectomy/IOL removal
- Intravitreal Vancomycin and Ceftazidime
  - +/- Voriconazole

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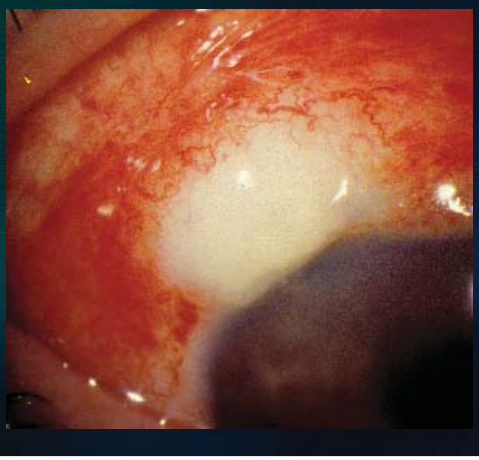
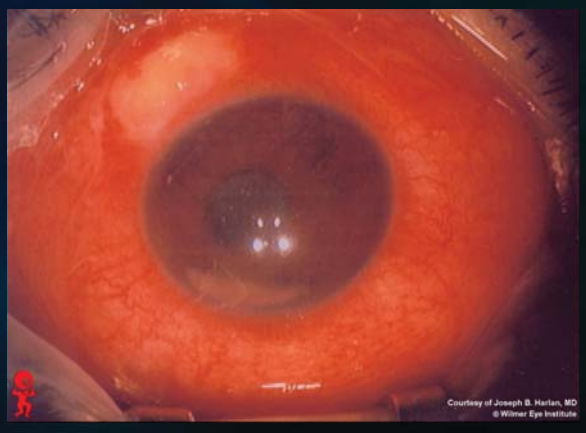
BLEB-ASSOCIATED INFECTIOUS ENDOPHTHALMITIS

- 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





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- 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

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Table 1. Differentiating Toxic Anterior Segment Syndrome and Infectious Endophthalmitis

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

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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

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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

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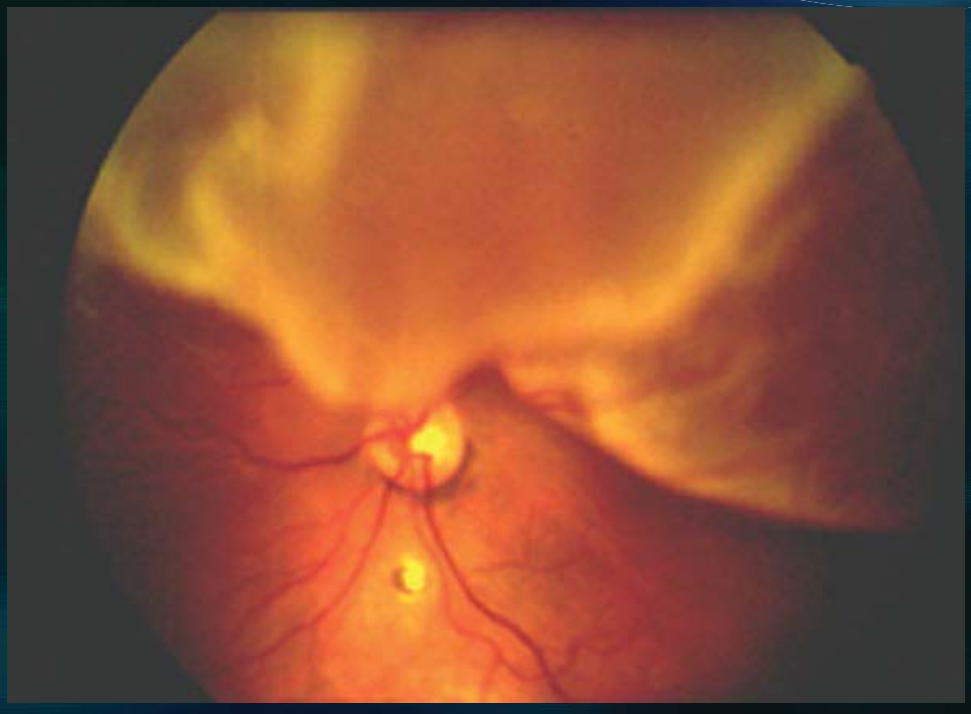
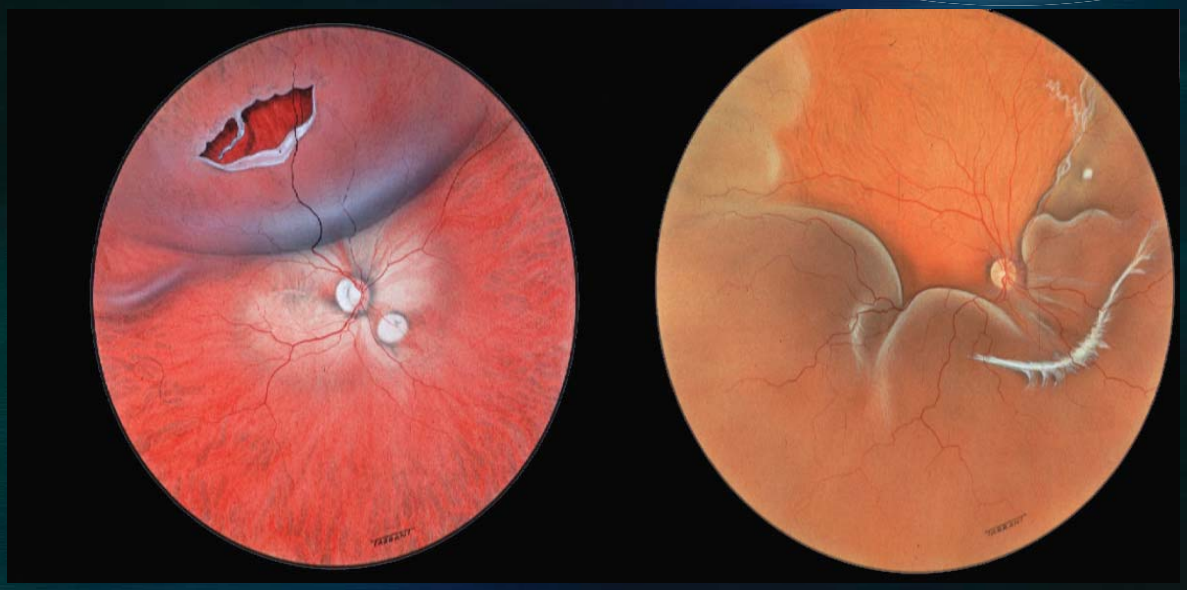


Retinal Detachment after CE

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

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Treatment Options

- Laser demarcation
- Pneumatic retinopexy
- Scleral buckle
- Vitrectomy

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Laser Demarcation

- Flat
- Non-tractional
- Anterior to equator

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Pneumatic Retinopexy

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

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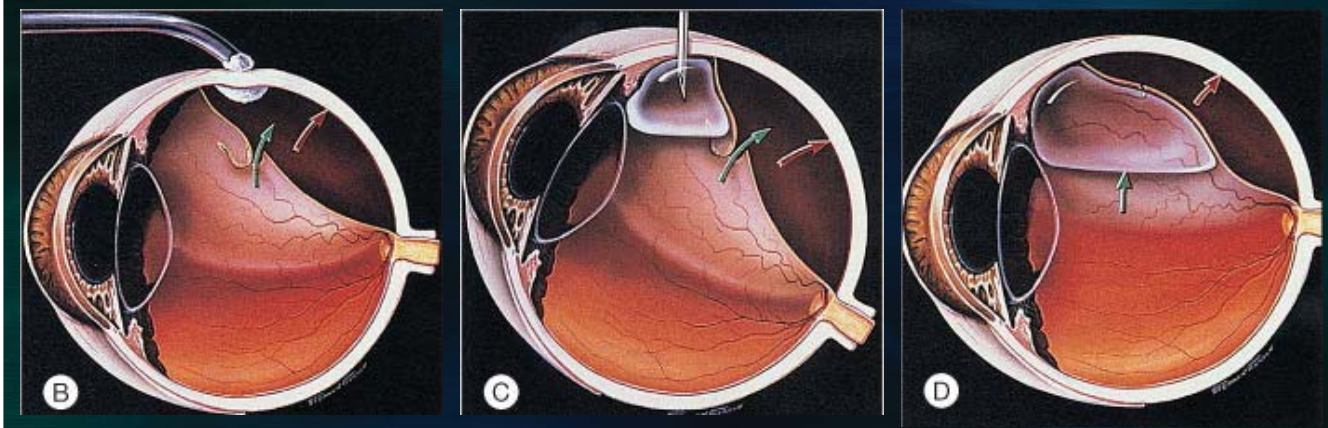

PNEUMATIC RETINOPEXY

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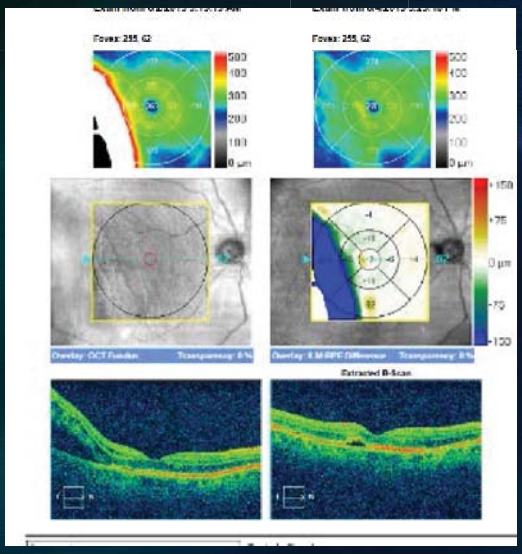
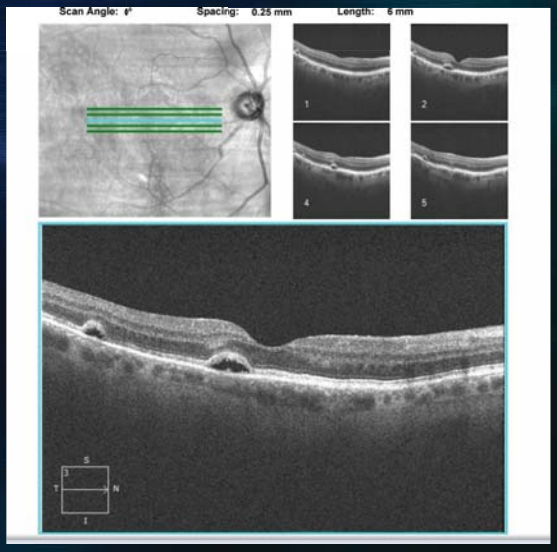
Pocket of submacular fluid





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Scleral Buckle

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

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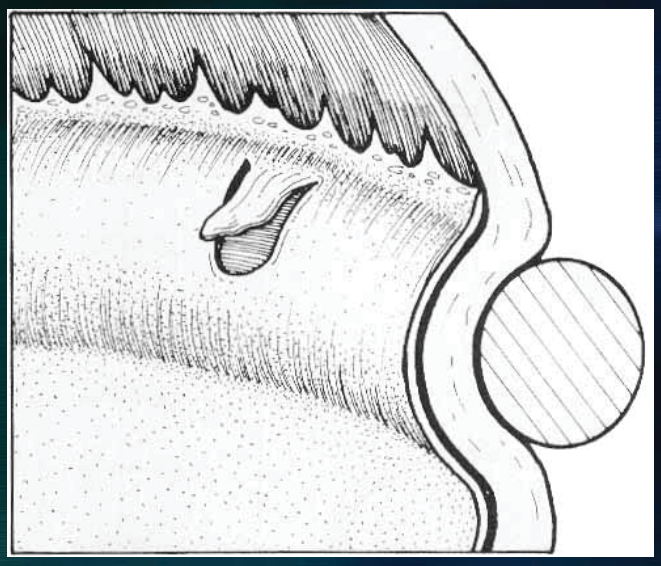

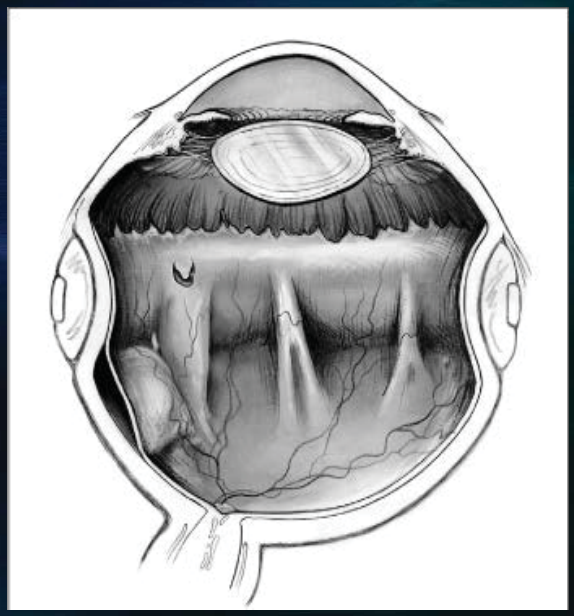

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Vitrectomy

- Opaque media
- Pseudophakia
- Superior breaks
- Posterior breaks
- PVR

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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”

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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

Schaal et al. 2011. Primary retinal detachment repair: Comparison of 1-Year Outcomes of Four Surgical Techniques. *Retina*. 31(8): 1500-04.

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Retinal Detachment: Key Points

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

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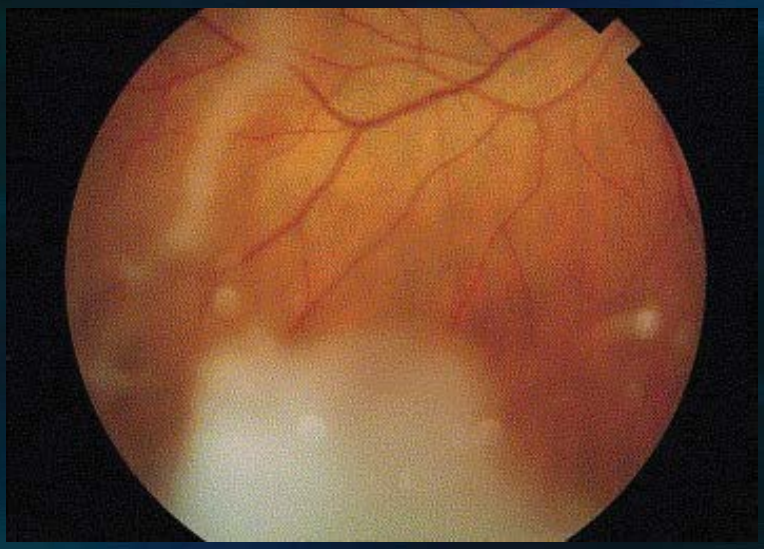

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Retained Lens Fragments

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

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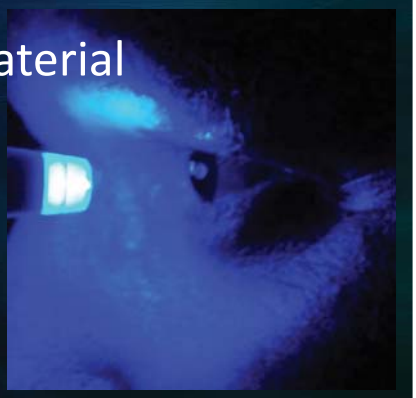
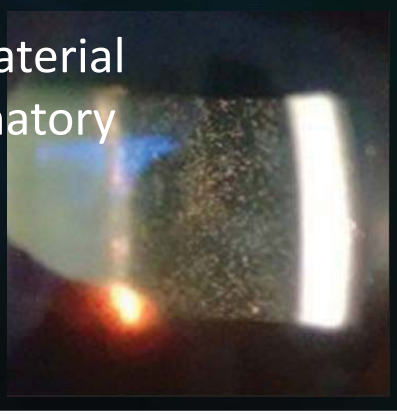
IOP Elevation

- 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



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Management

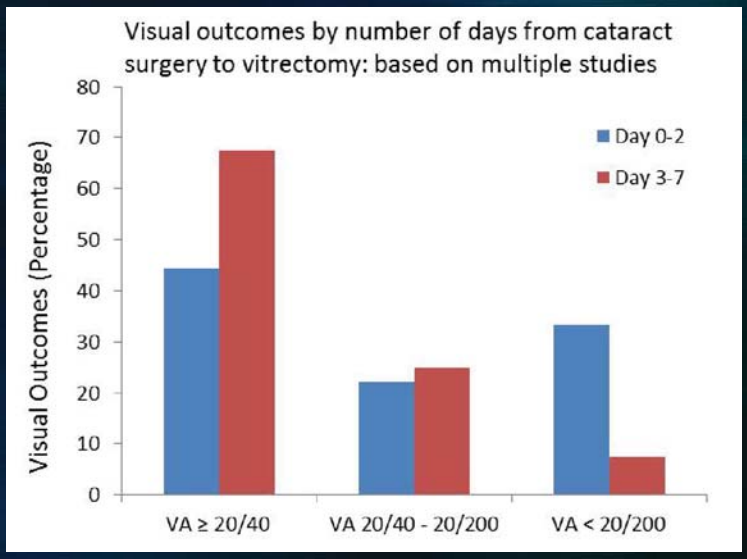
Vitrectomy vs. observation

- 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
Vanner and Stewart. Am J Ophthalmol. 2011; 152: 345-57

Outcomes

Variable: dependent on comorbidities and underlying pathology

Review of 223 cases

Final VA ≥ 20/40 in 71%

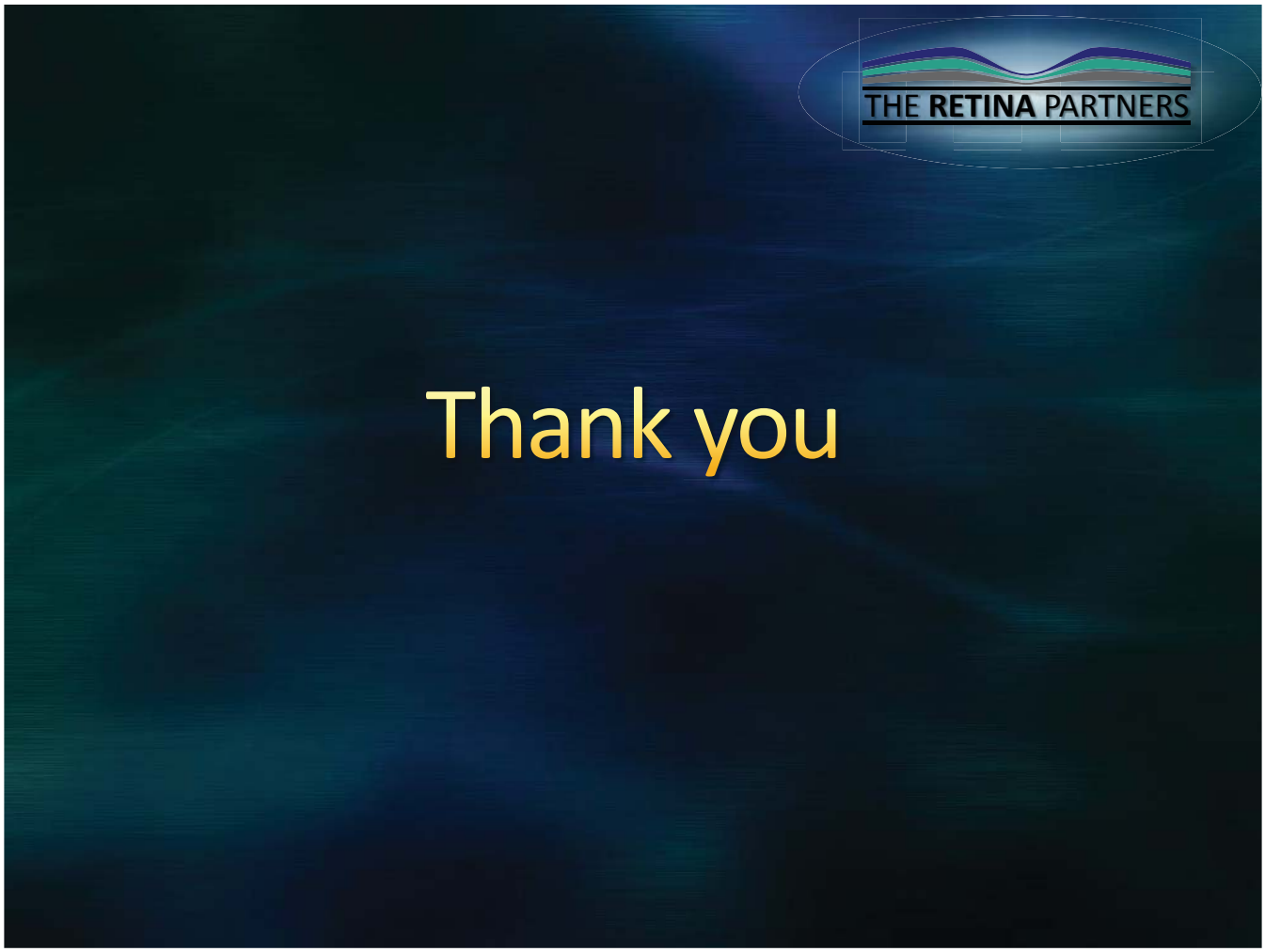
IOP > 25 in 45% at presentation, 5% after PPV

25% with CME, 9% with RD

Merani et al. 2007. Am J Ophthalmol. 144:364-70.

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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Thank you