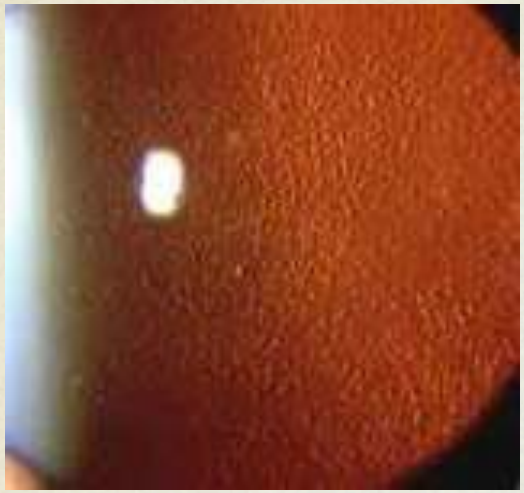
Compromised Corneas and Cataract Surgery: How to Achieve the Best Outcomes



Deepinder K. Dhaliwal, MD, L.Ac

Associate Professor, University of Pittsburgh School of Medicine

Director, Cornea and External Disease Service

Director, Refractive Surgery Service

Director and Founder, Center for Integrative Eye Care

Associate Director, Campbell Ocular Microbiology Laboratory

Medical Director, Refractive Laser Center,

University of Pittsburgh Medical Center

Fellowship Director, Cornea, External Disease, and Refractive Surgery,

University of Pittsburgh

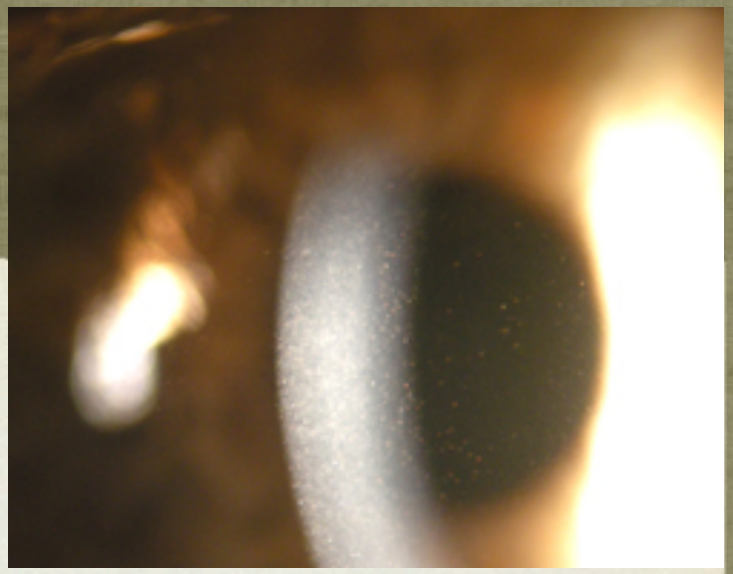
Disclosures

Consultant: Bausch & Lomb, Novabay

Research/Speaker: Ocular Therapeutix, Sightlife, Staar, Imprimis

Trainer: VISX and Intralase Lasers

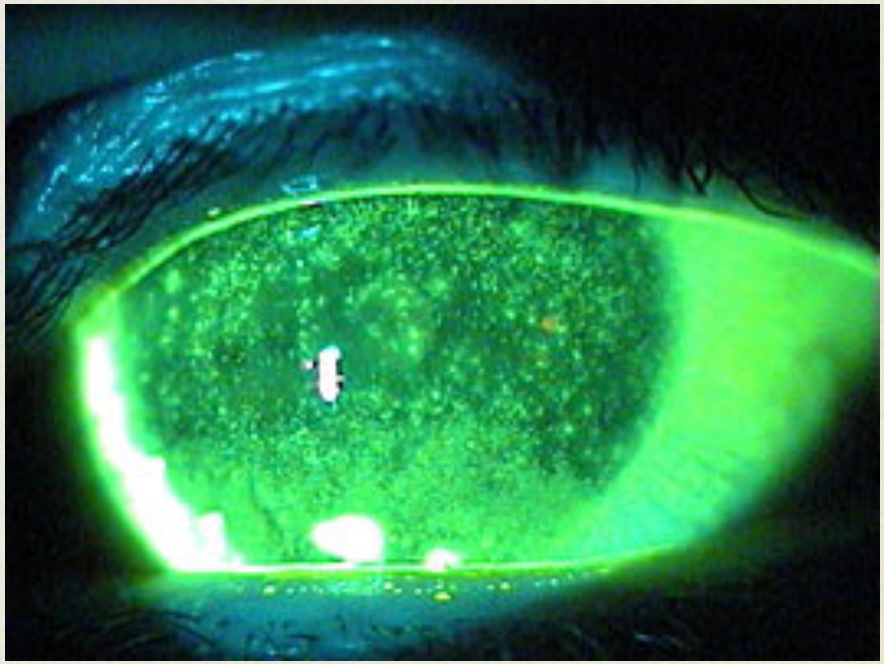
Respect the Cornea!



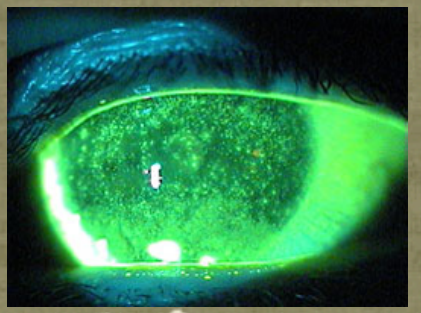
- Post-op vision can be compromised even after *perfect* cataract surgery if cornea is not respected
- Remember to optimize pre-op, be gentle intra-op and treat aggressively post-op

Compromised Corneas

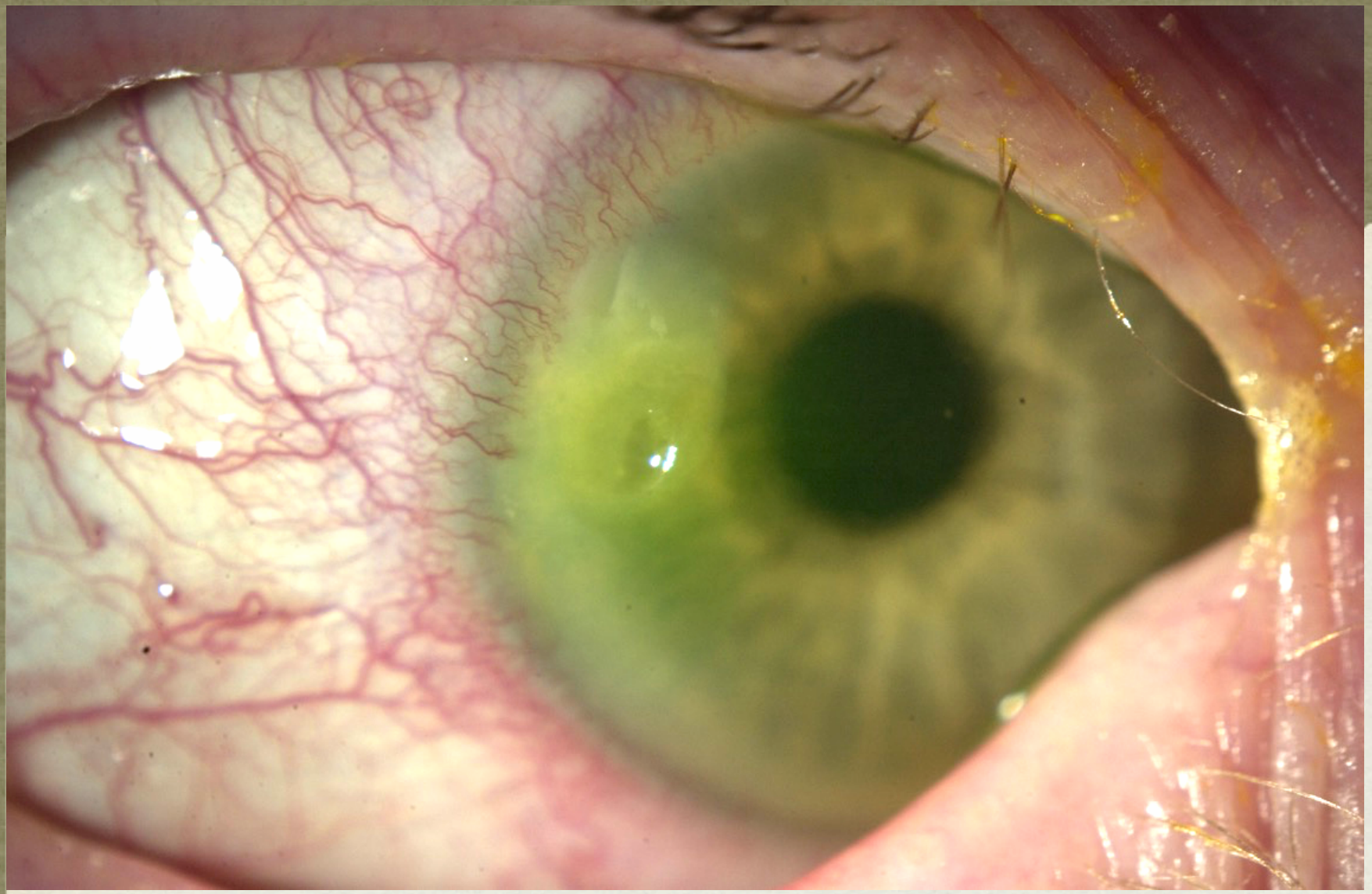
- ANTERIOR cornea
  - Dry eye/dysfunctional tear syndrome
  - EBMD
  - Pterygia/Salzmann's nodules
  - Scars (HSV)
- POSTERIOR cornea
  - Fuchs



“Dry Eye”



- Very common: affects vision, preoperative measurements, post-operative healing
- Need to delay surgery until ocular surface is optimized
- Obtain better K readings for IOL selection
- What happens if patient can’t wait?
  - Possible IOL surprise or…



Sjogren's syndrome melt

POD #10 s/p uncomplicated phaco

PRE-OP Treatment

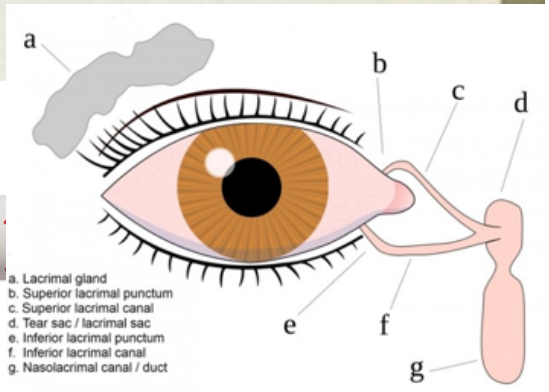
- Should be targeted based on history and exam findings

Treatment: targeting inflammation and low tear volume

- Artificial tears on schedule (qid), not only when symptoms
- **Do not** allow artificial tears every hour (even preservative free): "Dish-pan EYES"
- Topical mild steroids
- Topical cyclosporine A
- Punctal plugs (ONLY after surface inflammation improves)
- Punctal cautery if severe aqueous deficiency

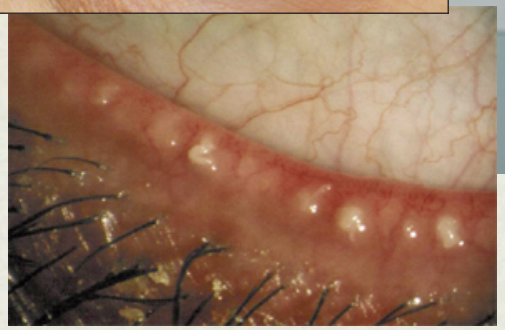
If no response to above, add:

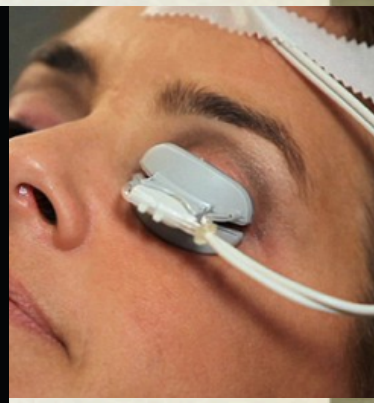
- Autologous serum



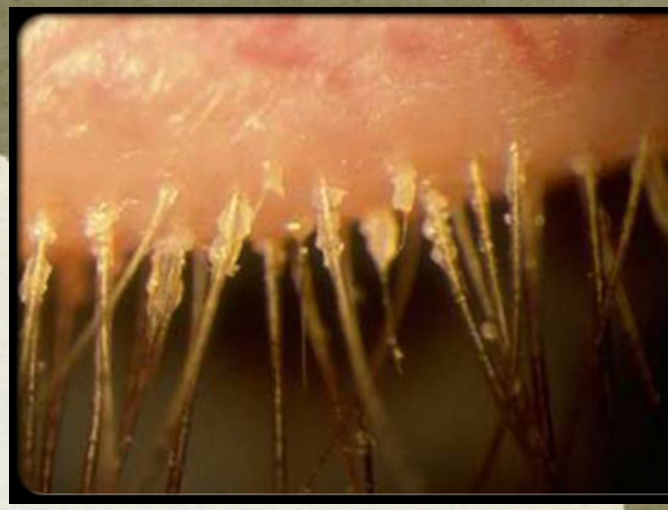
Treatment: targeting meibomian gland disease

- Warm compresses/lid massage
  - Rice in a sock, Bruder
  - Lipiflow, MiBo
- ORAL omega 3, gamma linoleic acid
- Low dose doxycycline 20-50 mg po bid for 3 weeks, then q day
- Topical azithromycin
- Metronidazole topical gel





Treatment targeting demodex and allergy



- Tea tree oil lid scrubs if **demodex**

- Treat **allergy** locally as much as possible (vs systemically)
  - Eye drops, nasal spray, inhaler
- If systemic allergy control needed, *try singulair (anti-leukotriene) instead of an anti-histamine* (which has significant ocular drying effects)

Treatment targeting lagophthalmos, poor blink

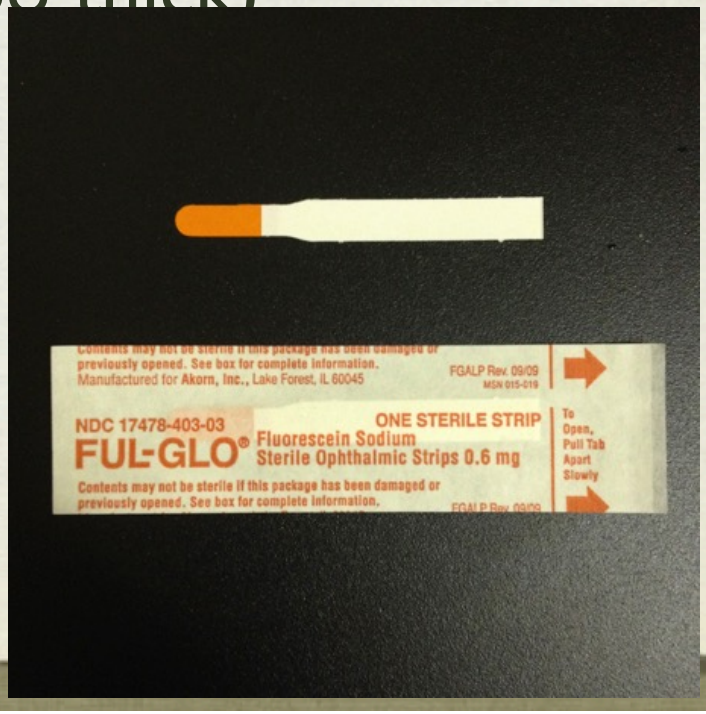
- "Think Blink", education
- Moisture goggles/glasses
- Avoid all drafts, ceiling fans, etc
- Humidifier
- Tape lids at night
- Moisture chamber for CPAP
- Lateral tarsorrhaphy, gold weight

Epithelial Basement Membrane Dystrophy (EBMD)

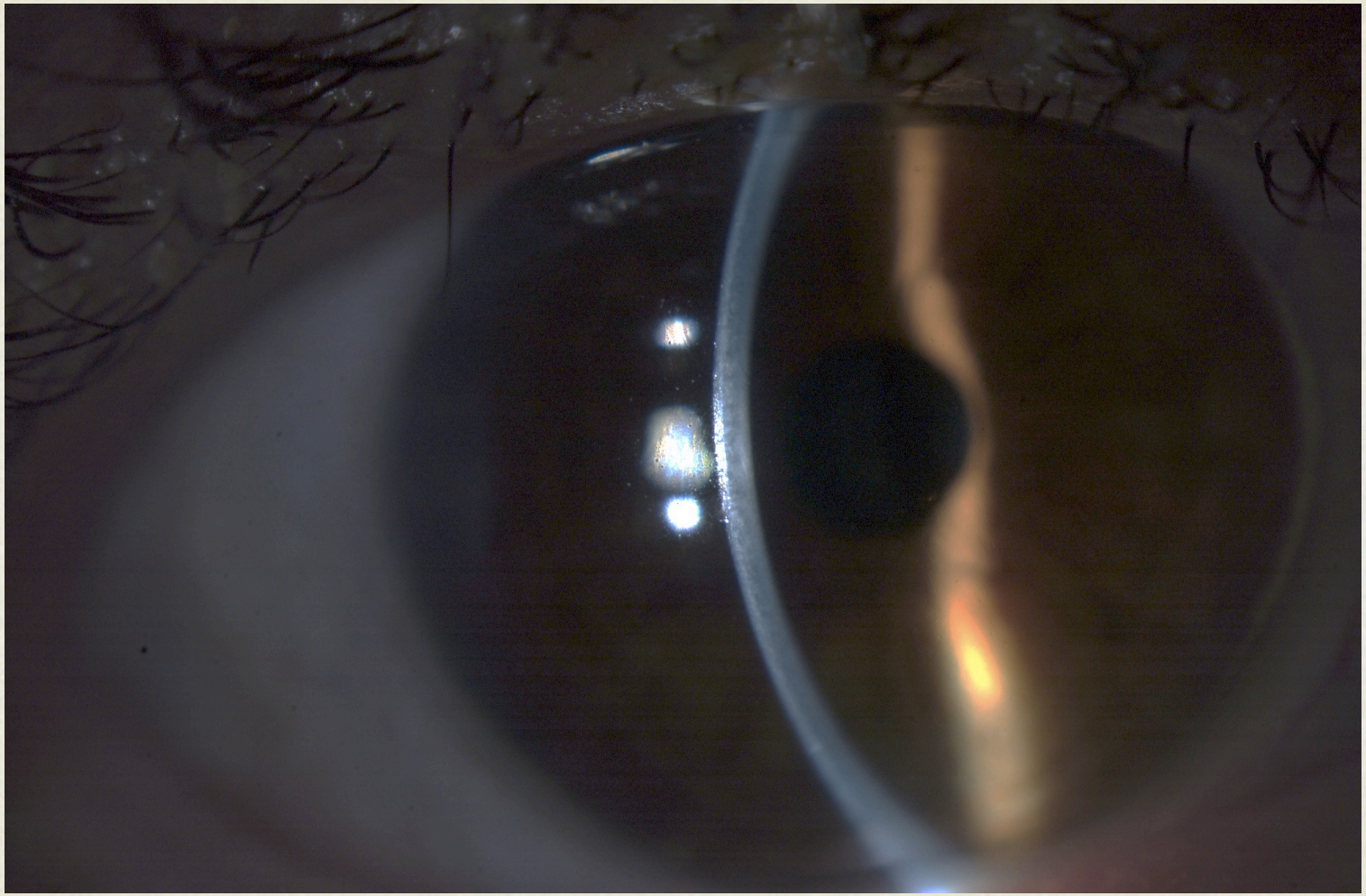
- very common, affects pre and postoperative visual quality, pre-op K readings, *often unrecognized*
- identify
- if significant irregular astigmatism (irregular mires, irregular topography), consider treatment prior to cataract surgery

Epithelial Basement Membrane Dystrophy (EBMD)

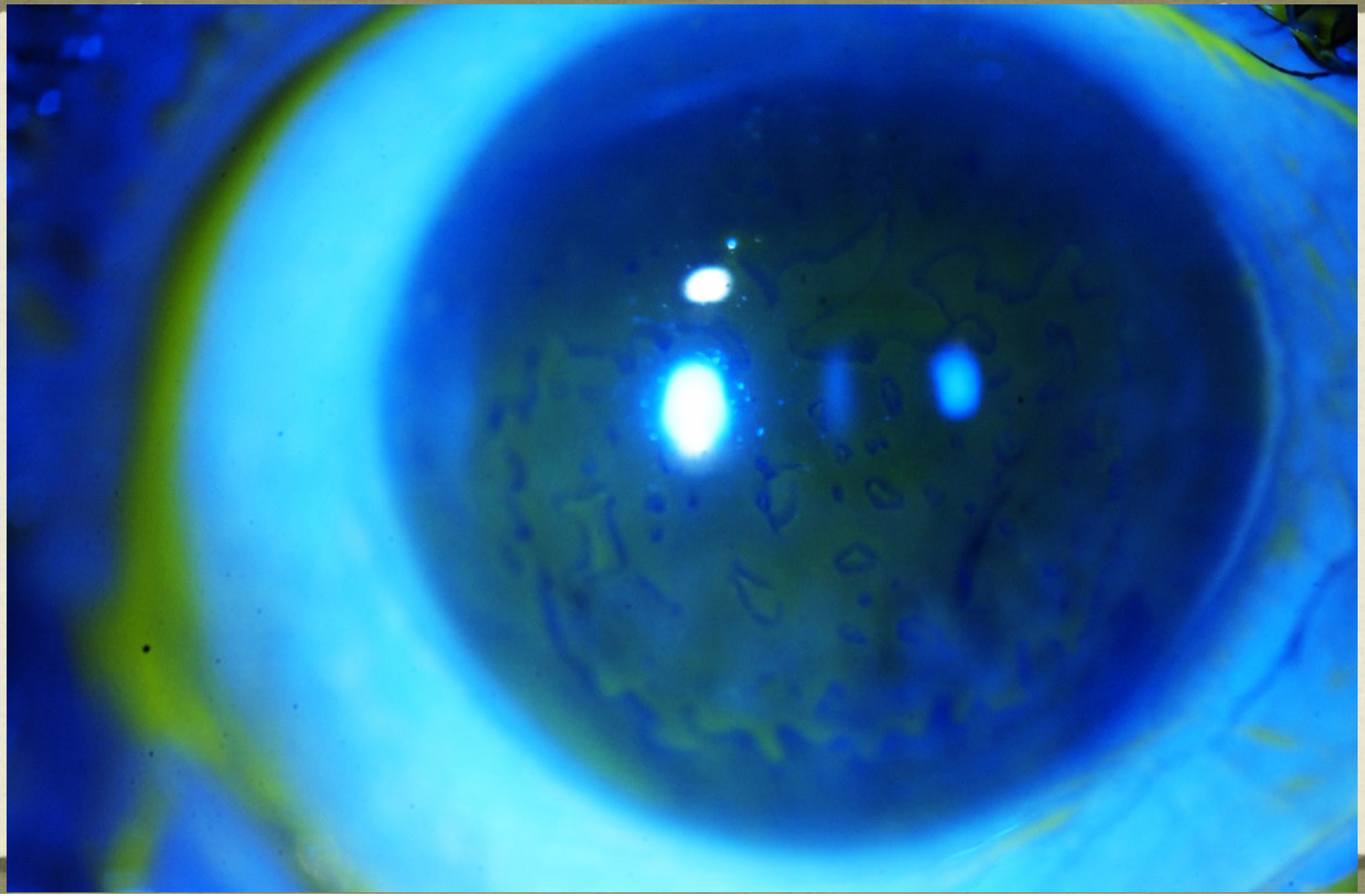
- HOW TO IDENTIFY:
- instill fluorescein with moistened strip just inside lower lid, NOT fluress (combination anesthetic/fluorescein drops too thick)
- diffuse blue light...and voila!



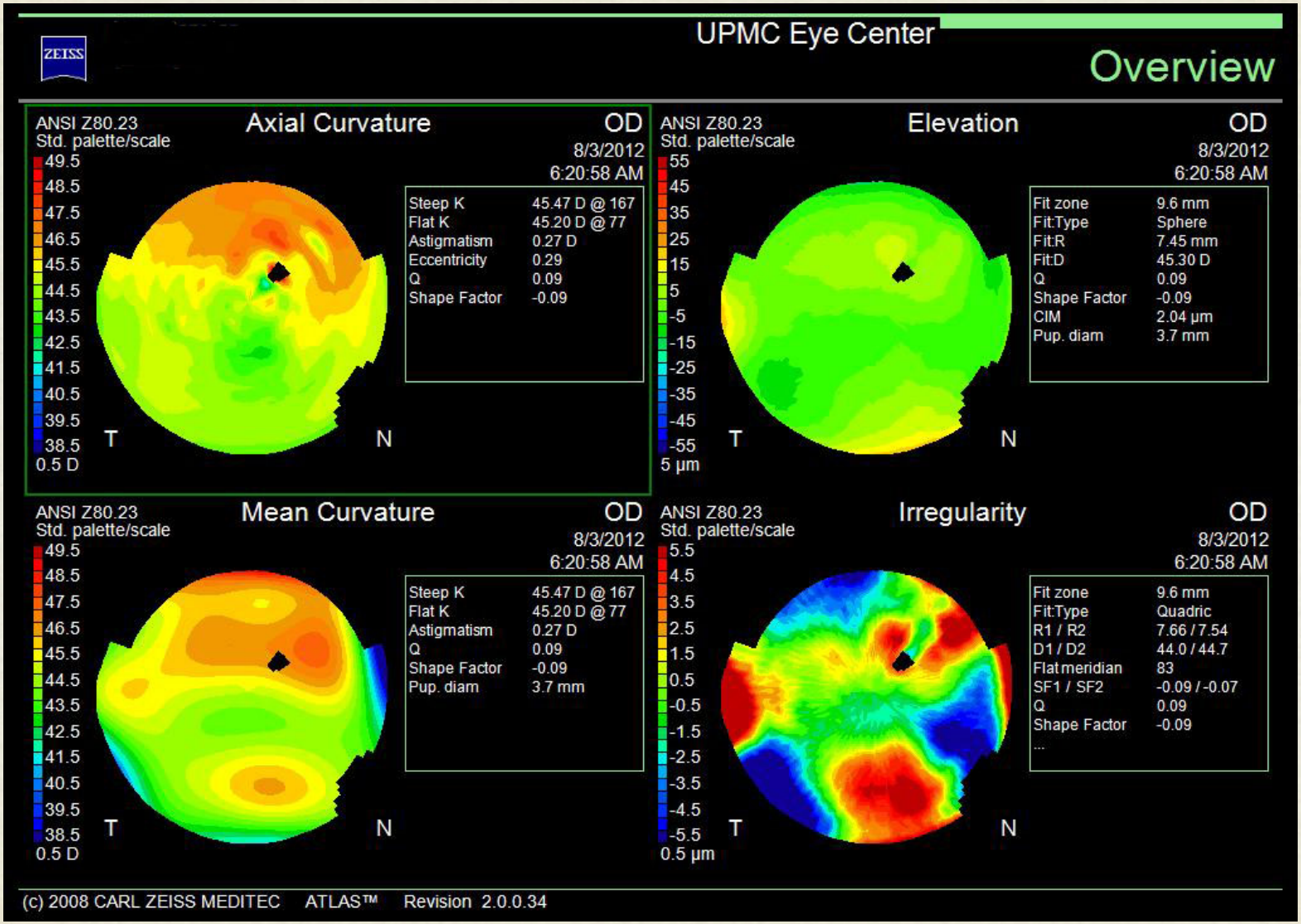
Epithelial Basement Membrane Dystrophy (EBMD)



Epithelial Basement Membrane Dystrophy (EBMD)



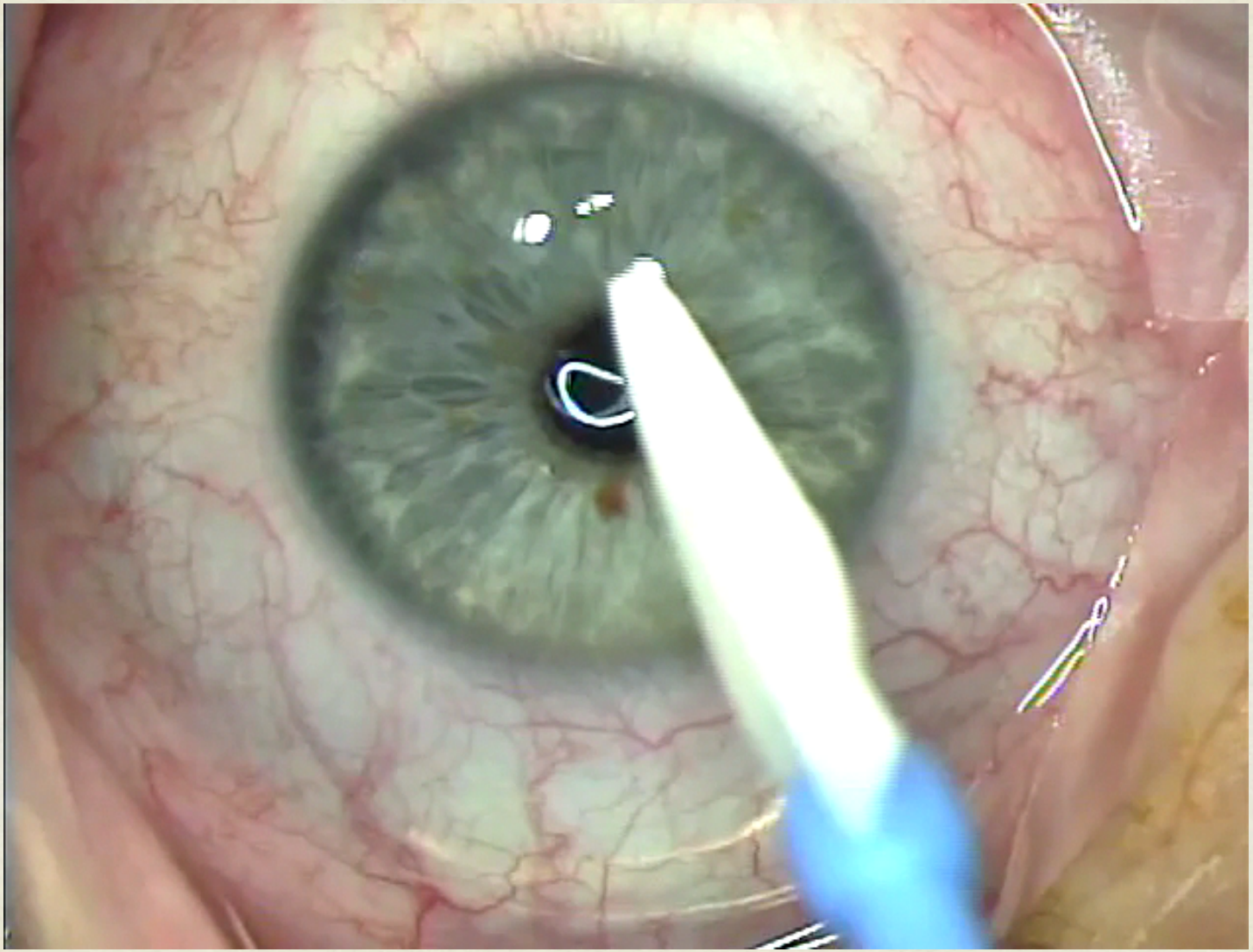
Epithelial Basement Membrane Dystrophy (EBMD)



How to treat EBMD

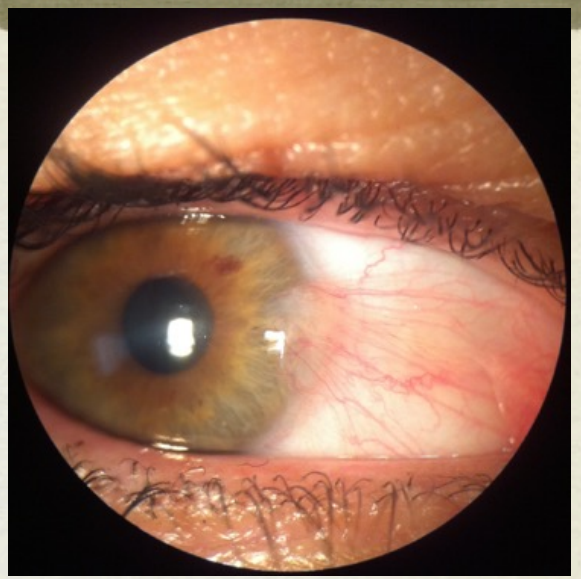
- **medical** treatment: lubrication, muro 128 drops and ung
- **surgical treatment**: remove epithelium centrally (at least 6mm)
  - diamond burr polishing or PTK (especially if h/o recurrent erosions)
  - BCL, antibiotic qid, mild steroid qid, art tears qid
  - remove BCL after 4-5 days (after re-epithelialization)
  - wait 6-8 weeks, recheck K's

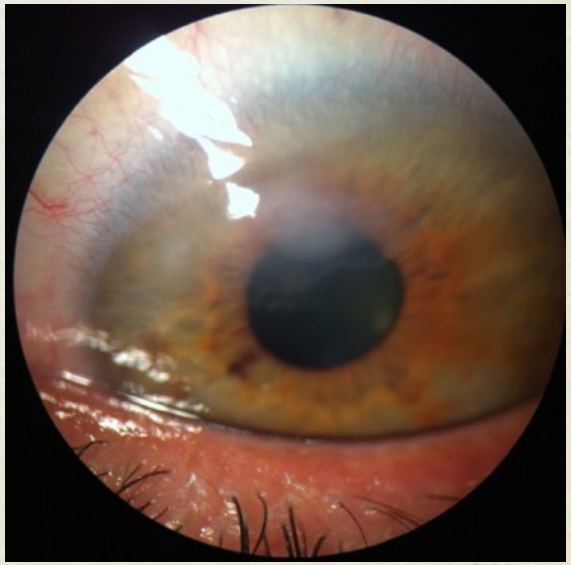
How to treat EBMD



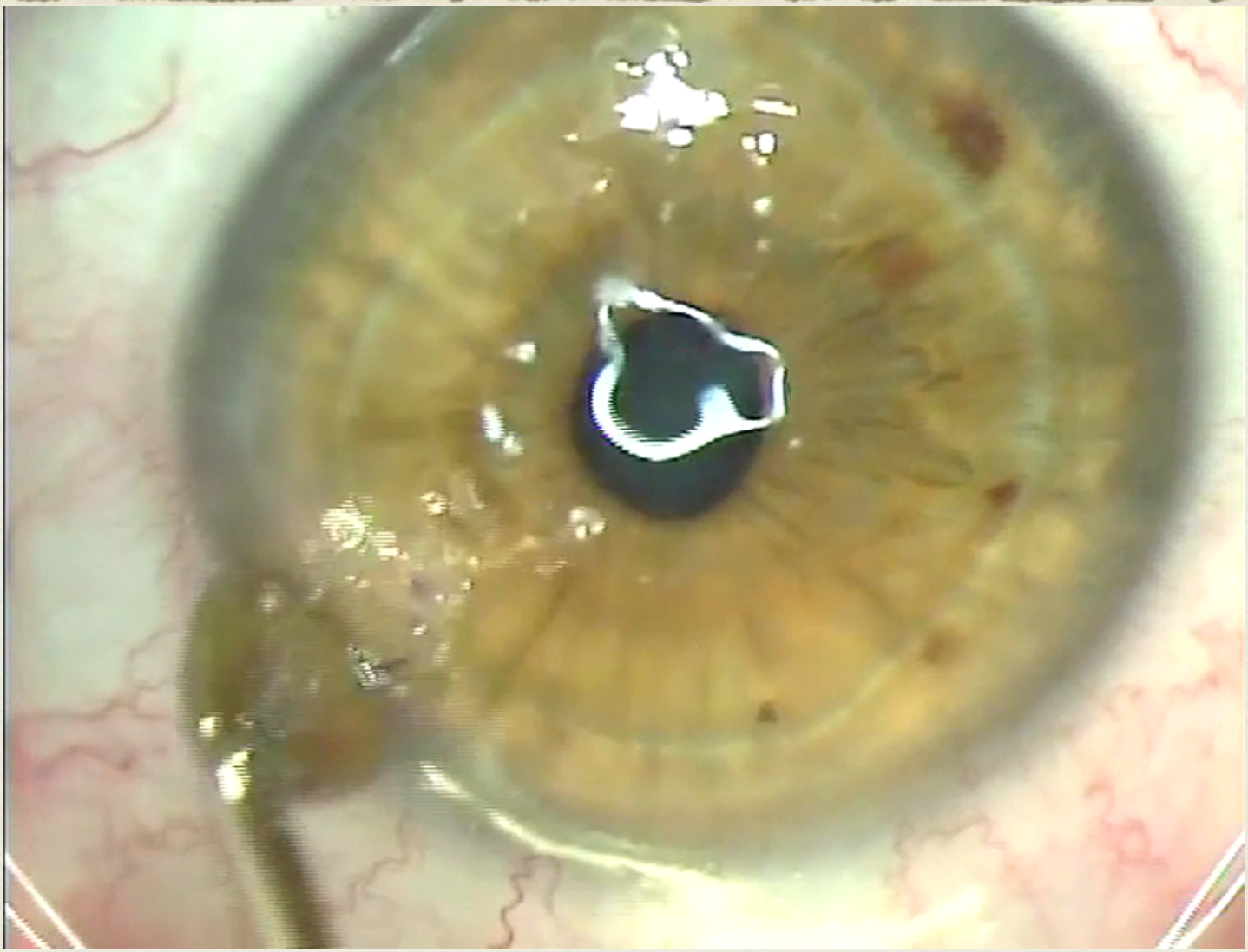
Pterygia/Salzmann's nodules

- if peripheral, non-progressive, not affecting vision or topography, no need to treat
- remember that peripheral pterygia/nodules can *induce* astigmatism centrally, so check topography if unsure
- important when considering TORIC IOLs

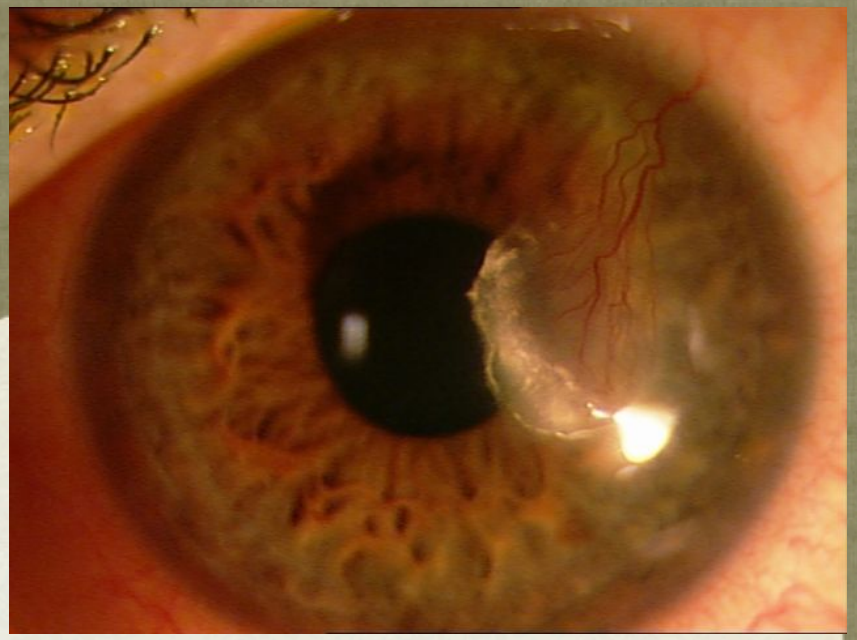




Salzmann's nodule removal



Corneal scars

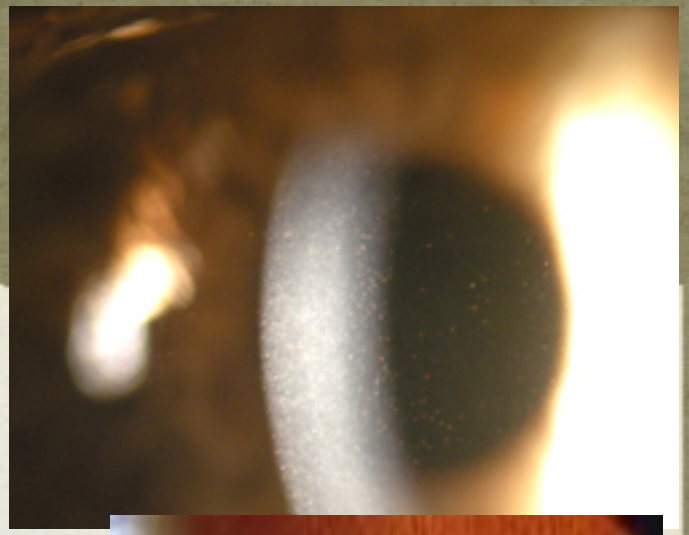


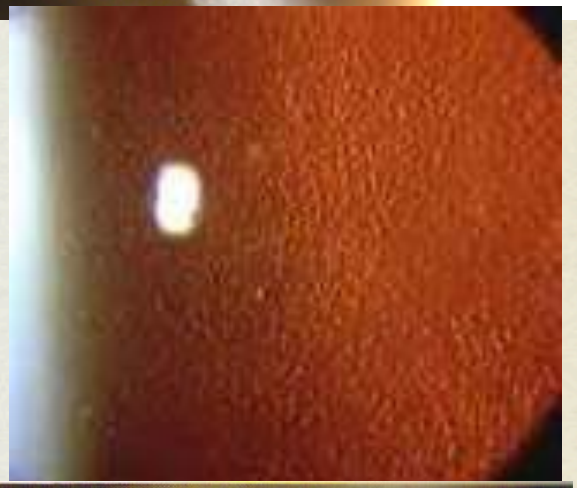
- if depressed scar causing *irregular* astigmatism, avoid toric and multifocal IOLs
- ask about history of HSV, cold sores
- if suspicious, oral antiviral prophylaxis is indicated
- acyclovir 800mg po TID starting 3 days prior. Continue until pt off topical steroids

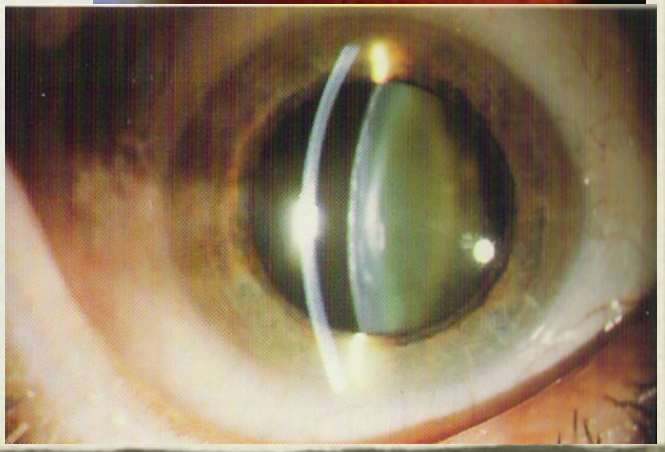
FUCHS DYSTROPHY and CATARACT

CASE STUDY

- 63 y/o woman with cataract
- Wants premium IOL ("hates glasses")
- BCVA is 20/60 OU
- Exam: 3+ guttae, 3+ NS
- Pach: 633 microns

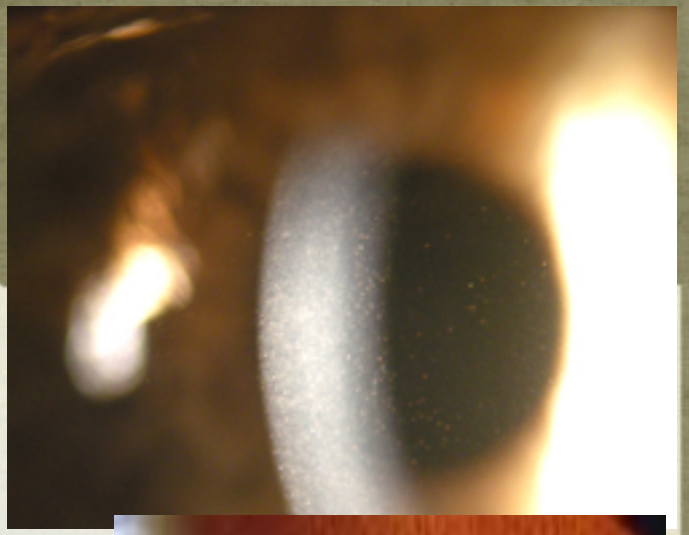


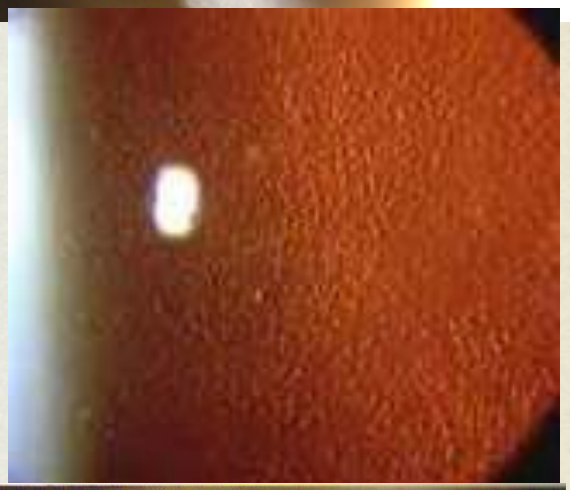


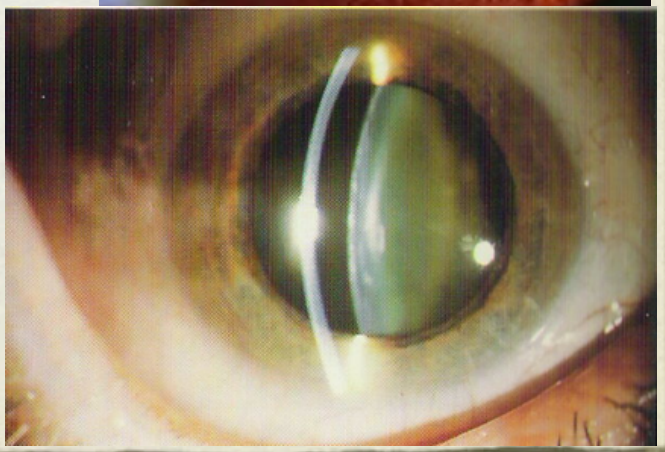


Fuchs' + Cataract

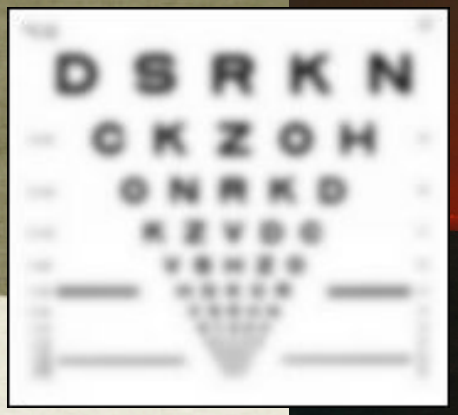
- Options include:
  A. Standard phaco with multifocal IOL
  B. "Gentle" cataract surgery with monofocal IOL
  C. Refer to cornea specialist for combined phaco/DSEK
  D. Leave for vacation

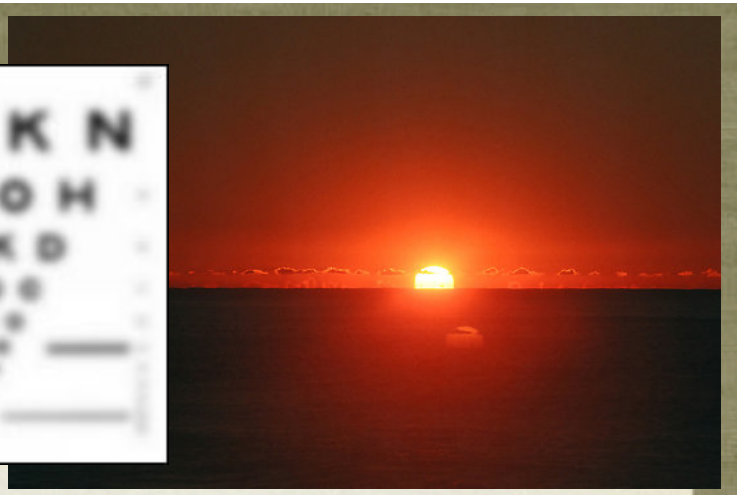






Listen





- LISTEN for symptoms of corneal decompensation
  - Ask about STEAMY/HAZY/CLOUDY VISION UPON AWAKENING that clears as the day progresses (sign of corneal edema upon awakening)

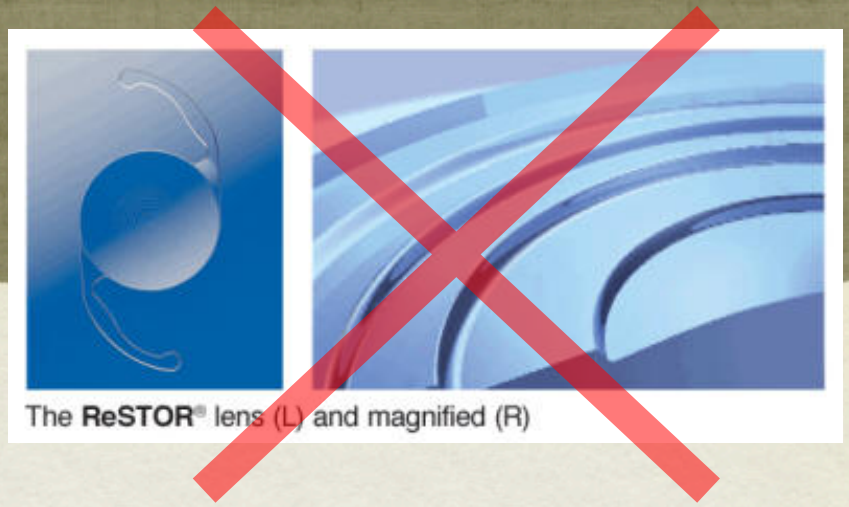
    **If cornea is decompensating overnight under closed eyelids, will likely decompensate after your cataract surgery as well
  - More important than signs

Decision tree

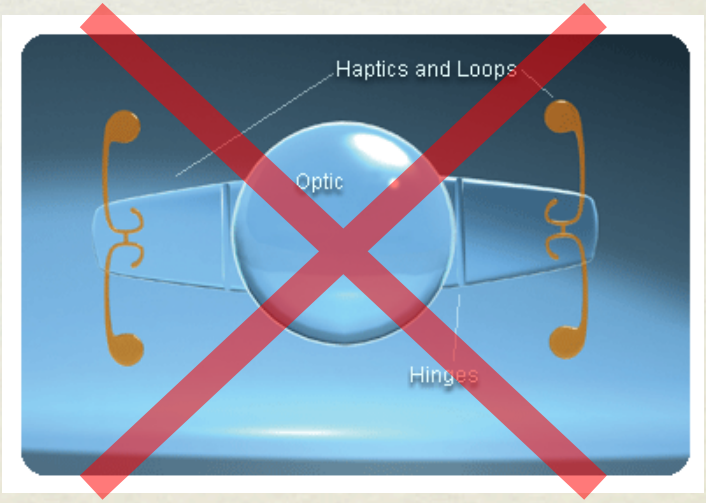
- If any morning blur or edema on SLE → combined phaco/DSEK
- If not → proceed with GENTLE phaco alone

How to perform "gentle" phaco

- BSS + (has glutathione to enhance endothelial recovery)
- Low flow settings (decrease turbulence and amount of fluid through eye)
- Dispersive viscoelastic to coat endothelium, reapply often
  - If trypan blue needed, paint onto anterior lens surface under viscoat
- Smaller capsulorhexis (to keep IOL back)
- Keep phaco energy away from endothelium
- *Aim for -1.25 D* (to compensate for hyperopic shift after DSAEK)



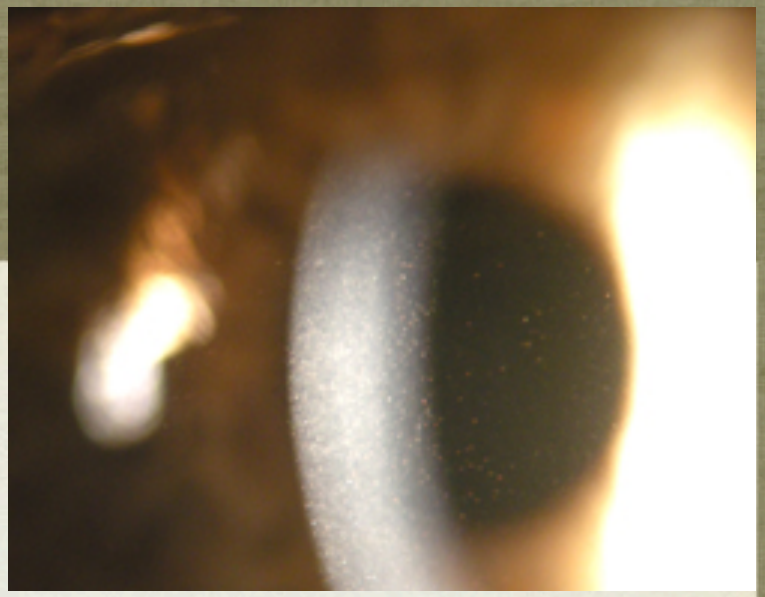
AVOID presbyopia-correcting IOLs



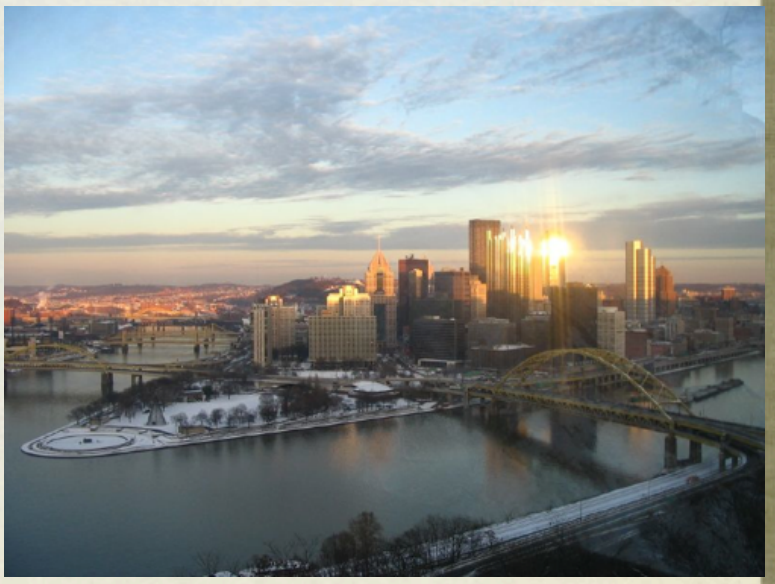
Post-operative considerations

- Increased corneal edema likely, prepare pt ahead of time
- Hourly prednisolone acetate or difluprednate initially
- Keep IOP low (under 18mmHg)
  - **Avoid CAIs** (affect pump function)
- *Topical muro ung or gtts (q5minX3 is one dose)*
- Wait 3 mos before considering DSEK or DMEK

When in doubt…

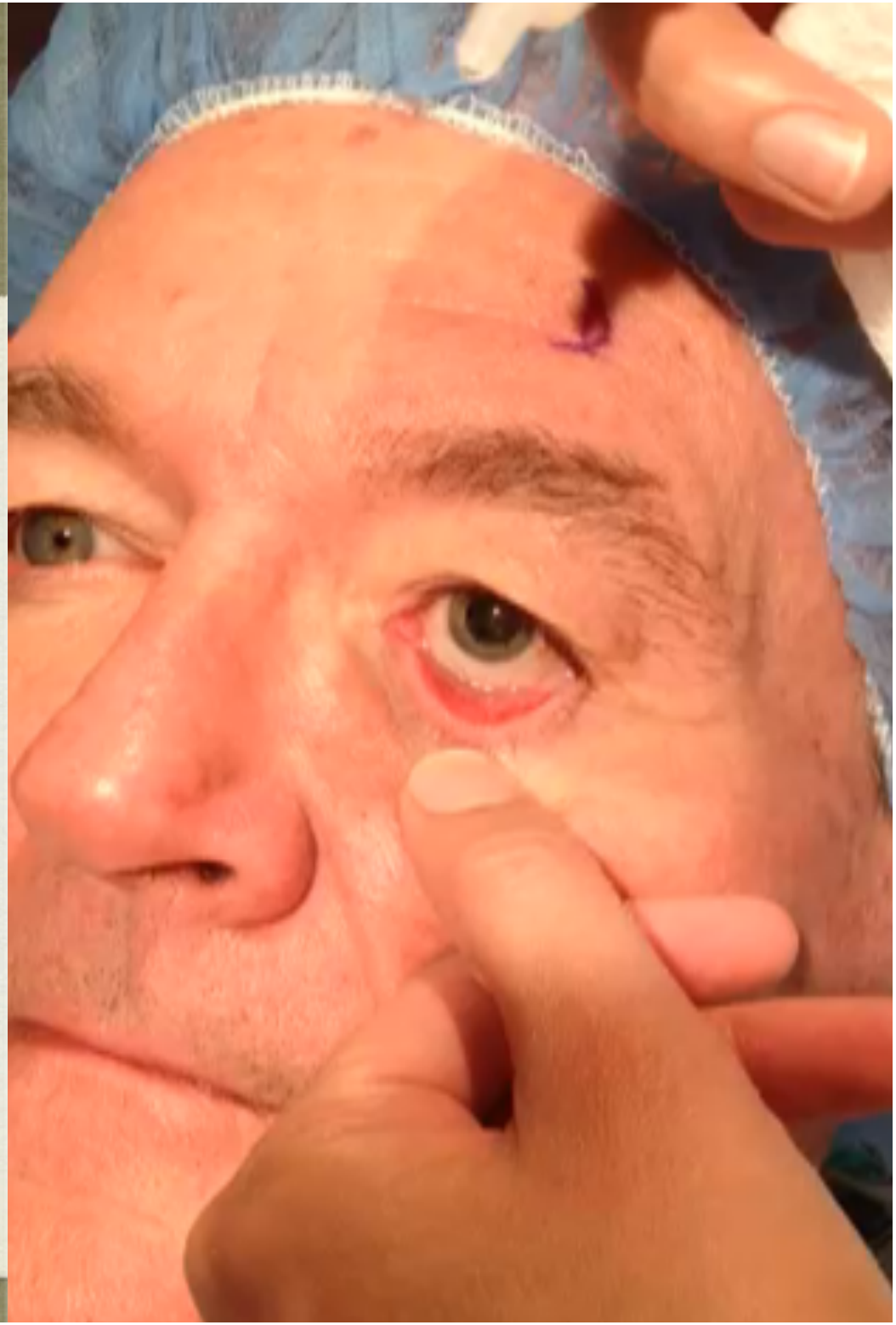


- Proceed with "gentle" phaco
  - Earlier may be better (lens is less dense, less traumatic surgery)
- Do not burn any bridges as long as patient is on same page
  - Unlike in PKP, want all DSEK patients to be pseudophakic (unless pre-presbyopic)

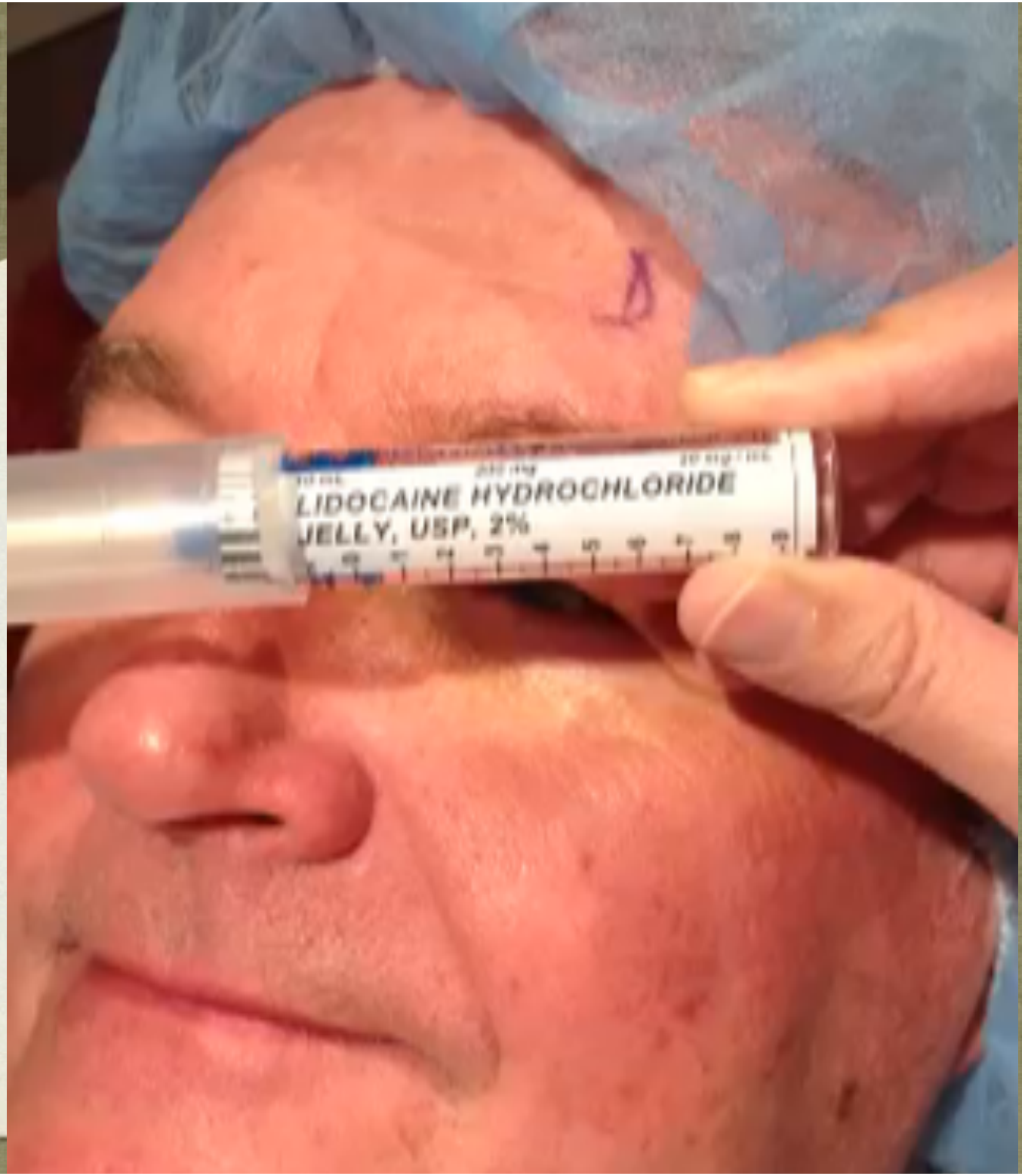


Infection Prophylaxis

Pre-op:
proparacaine
povidone iodine



Wait 3 minutes:
then instill lidocaine gel



Prospective Randomized Comparison of 2 Different Methods of 5% Povidone-Iodine Applications for Anterior Segment Intraocular Surgery

Herminia Miño de Kaspar, PhD; Robert T. Chang, MD; Kuldev Singh, MD; Peter R. Egbert, MD; Mark S. Blumenkranz, MD; Christopher N. Ta, MD

Objective: To determine the efficacy of reducing conjunctival bacteria flora with 2 different regimens of 5% povidone-iodine application: 2 drops on the conjunctiva cul-de-sac vs a 10-mL conjunctival irrigation of the fornices.

Methods: In this prospective controlled trial, 200 eyes undergoing anterior segment intraocular surgery were randomized to control and study groups. All patients from both groups received topical ofloxacin and a povidone-iodine scrub of the periorbital area before the surgical procedure. The eyes in the control group received 2 drops of povidone-iodine on the conjunctiva preoperatively, whereas eyes in the study group had irrigation of the fornices with 10 mL of povidone-iodine. Conjunctival cultures were obtained at 4 separate time points before and after surgery.

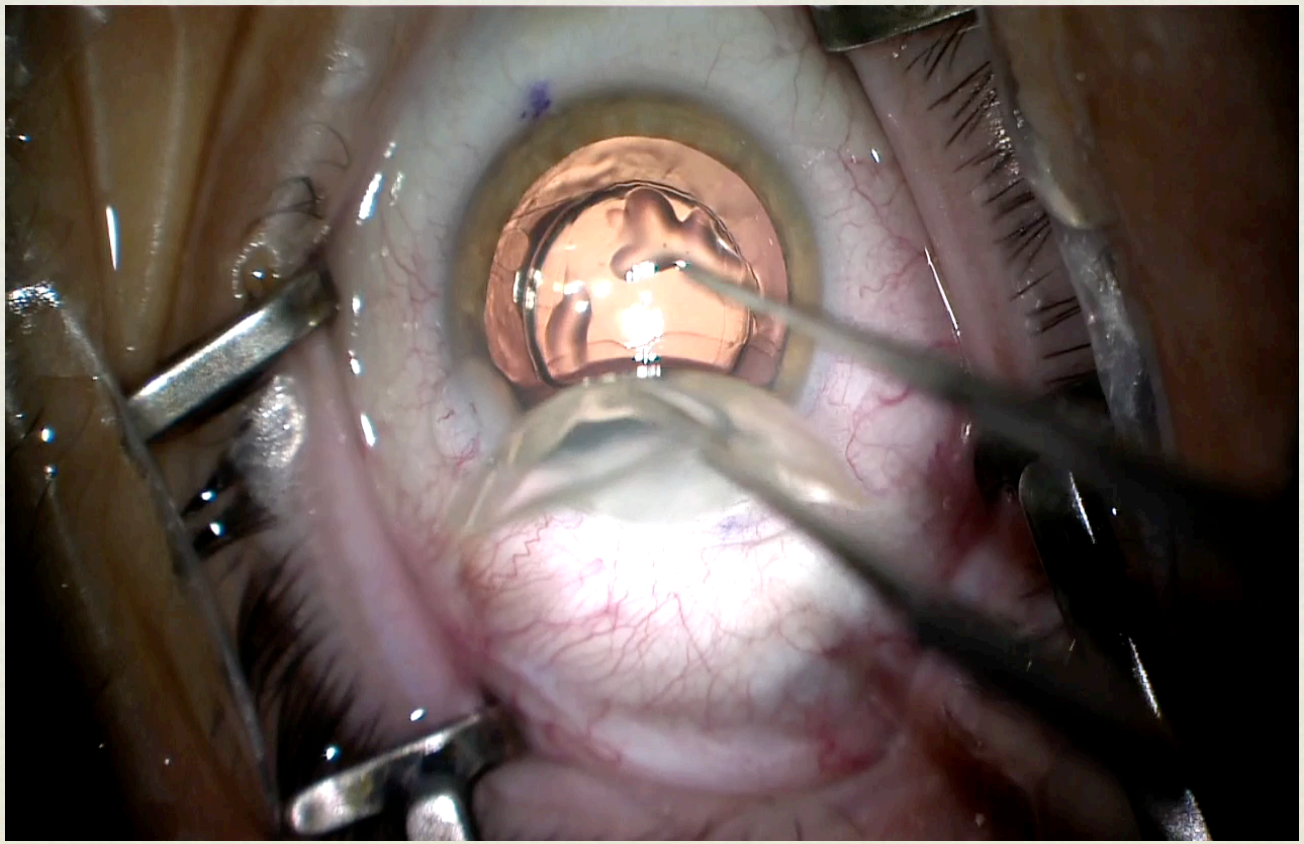
Results: Twenty (26%) of 78 eyes in the study group had positive conjunctival cultures immediately prior to surgery compared with 40 (43%) of 94 eyes in the control group ($P=.02$). At the conclusion of the surgery, 14 (18%) of 78 eyes and 30 (32%) of 94 eyes had positive cultures in the study and control groups, respectively ($P=.05$).

Conclusion: Irrigation of the fornices with 5% povidone-iodine was associated with significantly fewer positive conjunctival cultures at the time of surgery compared with the application of 2 drops on the conjunctiva.

Arch Ophthalmol. 2005;123:161-165

Another element of prophylaxis:

- **Collagen shield soaked in antibiotics**



Concluding pearls

- Cataract surgery can be successfully performed in patients with compromised corneas as long as a step-wise approach is utilized
- Identification of pathology and patient counseling are critical elements
- Improved surgical techniques expand treatment options

Thanks for your attention