

CORNEAL COMPLICATIONS IN CATARACT SURGERY: ETIOLOGY, PREVENTION, & TREATMENT

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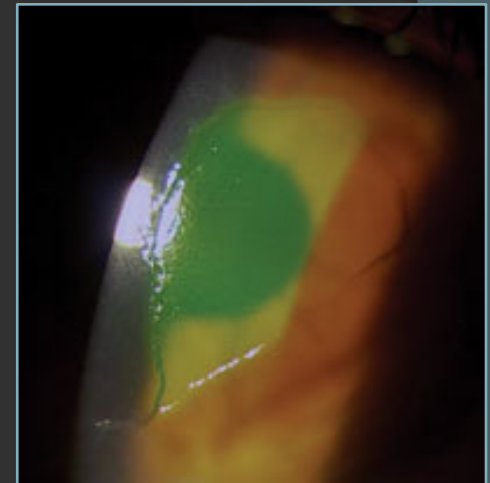
Epithelial Complications

Corneal Abrasion: Etiology

- Excessive topical anesthetics
- Drying of ocular surface
- Trauma from speculum
- Inadvertent eye movement
- Significance: Can hinder visualization, cause postoperative pain, prolonged recovery, and cause recurrent erosion.

Corneal Abrasion: Prevention

- ① Lubricate ocular surface prior to application of speculum
- ① Avoid drying of ocular surface during procedure
- ① More care with diabetics and Epithelial basement membrane dystrophy



Corneal Abrasion: Treatment

- ◎ Piece together pieces of epithelium like puzzle, and consider a bandage contact lens (BCTL)
- ◎ Remove BCTL when epithelium clearly secure and adherent
- ◎ Back up on NSAIDs and steroid until heals

Stromal Complications

Thermal Injuries: Etiology

- ⦿ Older equipment
- ⦿ Low flow: poor cooling of tip
- ⦿ High phaco energy
- ⦿ Viscoelastics blocking flow



Thermal Injuries: Etiology

- Small or tight incision (restricting flow)
- Torquing phaco tip in incision
- Patient movement: persistent Bell's
- Most often combination of several mechanisms

Thermal Injury: Sequelae

- ◎ Mild: foreign body sensation, mild wound gape, scar
- ◎ Moderate: Wound leak, need for suturing, induced astigmatism
- ◎ Severe:
 - Unsuturable, or severe astigmatism with suture closure

Thermal Injury Prevention

- Create empty working space in AC without viscoelastic (Pre Phaco mode)
- Avoid tight incision or torquing phaco
- Use modern phaco units: Whitestar excellent at thermal protection, Ozil

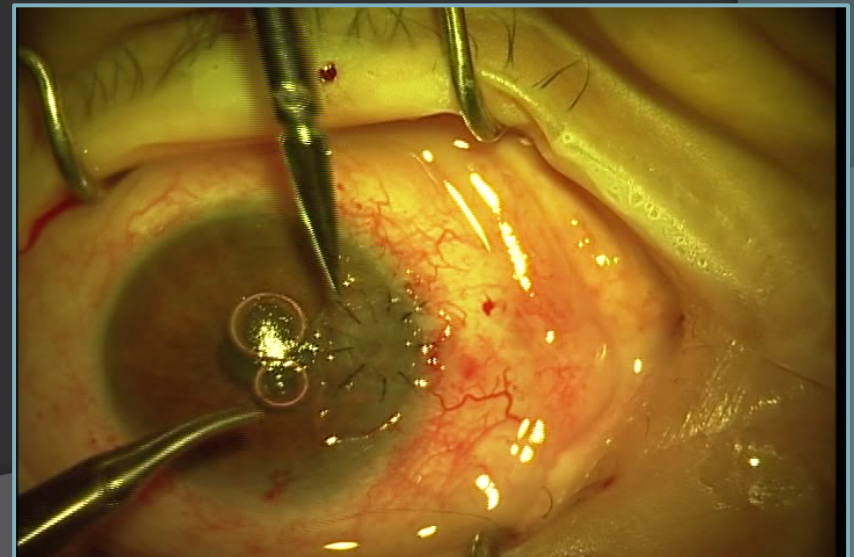
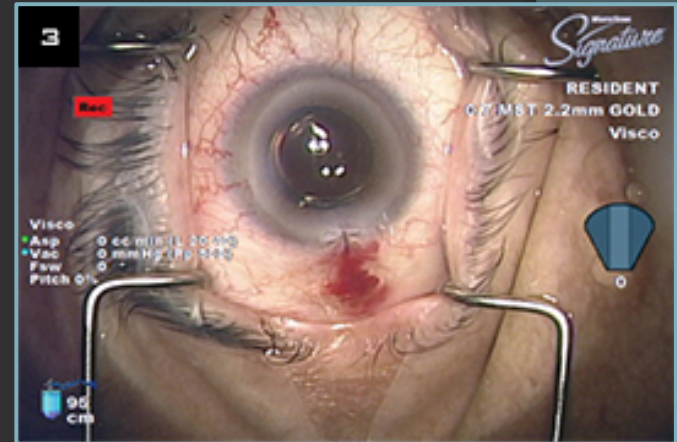


Thermal Injury Prevention

- Lowest phaco power needed
- Stop if see no flow in AC, whitening of cornea, or “white milk”
- Assistant to irrigate and cool wound in dense cataracts

Thermal Injury Treatment

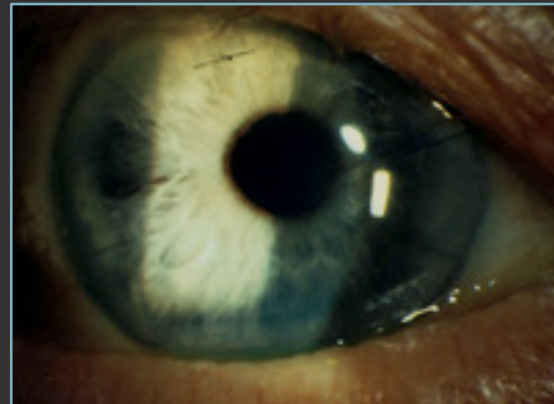
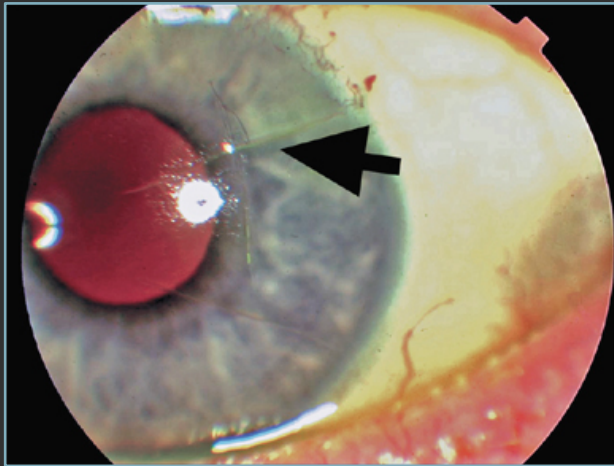
- Radial suture if mild
- Horizontal mattress suture if more severe
- Corneal gluing for moderate cases
- Patch Graft for severe cases



Wound Tear: Etiology

- ① Thin stromal over corneal tunnel
- ① Keratome movement and lateral cut in to tunnel
- ① Cystotome removal from eye
- ① Excessive torquing movements
- ① Previous radial keratotomy: incisions splay open very easily
- ① Previous penetrating keratoplasty: wound may dehisce easily

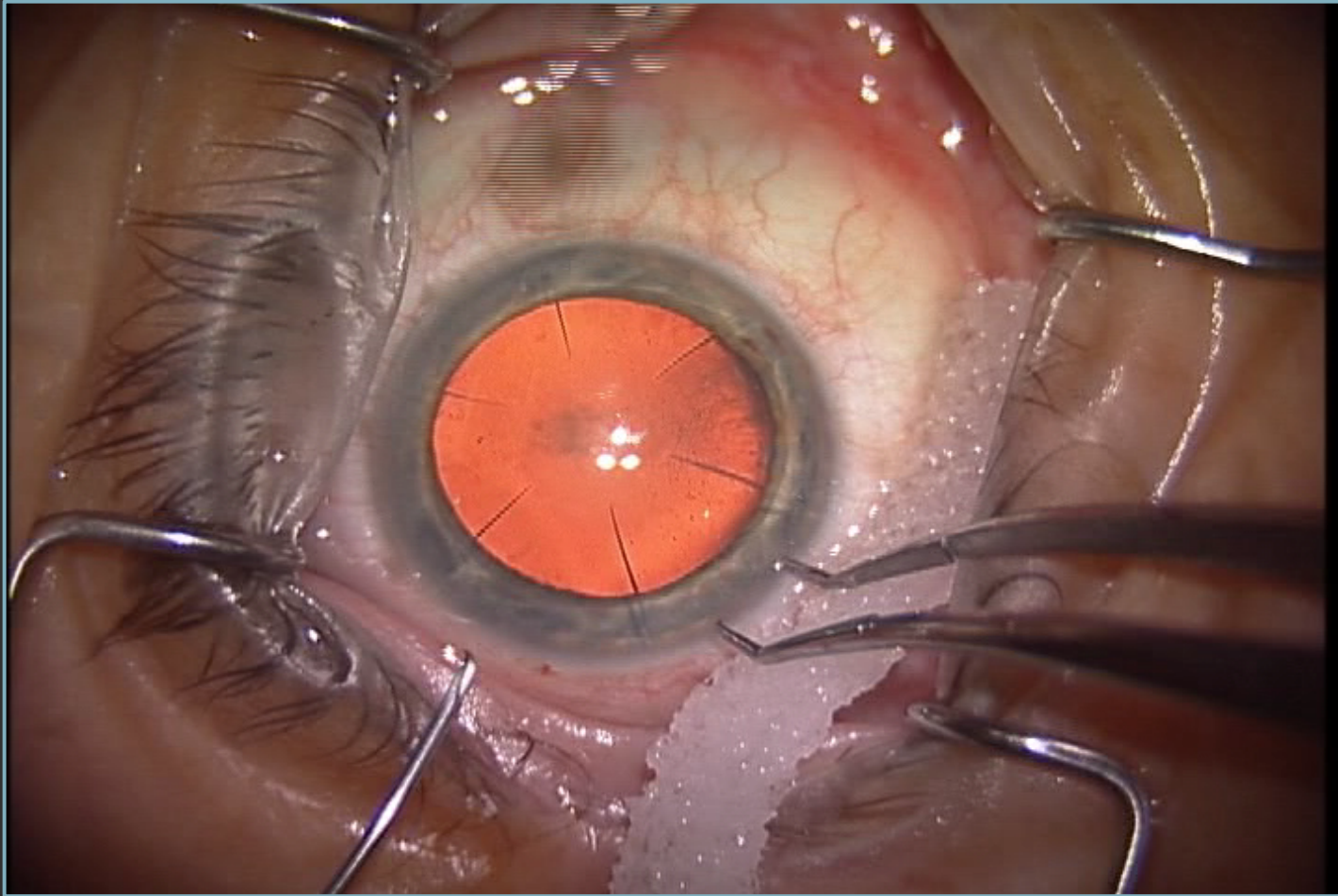
Dehisced RK Wound With Suture



Wound Tear: Prevention

- Gentle manipulation during surgery, avoid torque in wound
- Careful when removing cystotome from eye: can cut corneal tunnel roof
- Place clear corneal incisions between RK incisions, consider scleral tunnel
- For post PKP consider scleral tunnel, and end tunnel before host graft junction

Wound Tear: Prevention



Wound Tear: Treatment

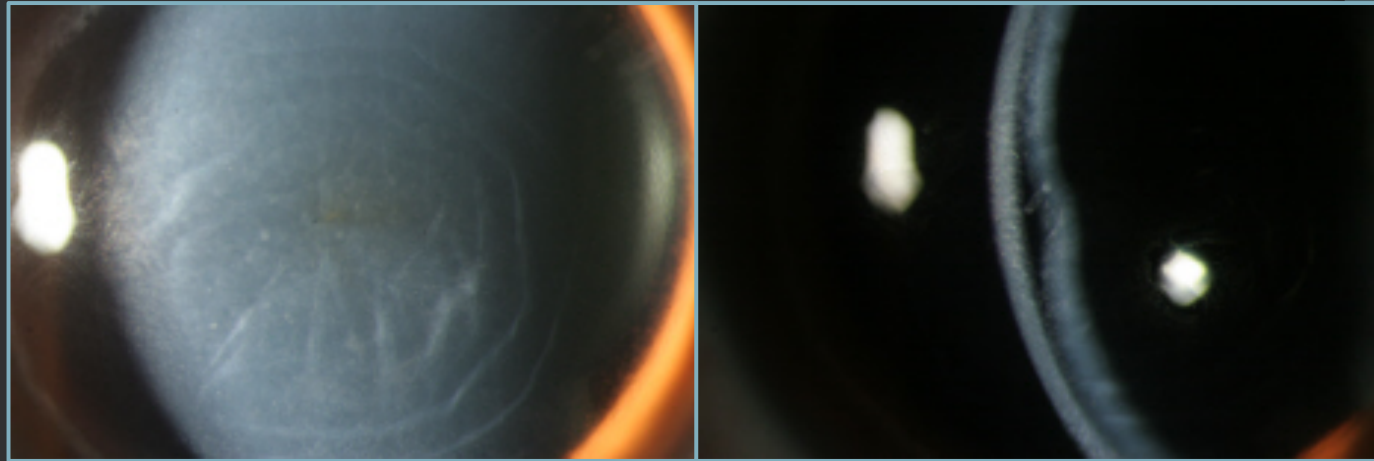
- ⦿ In PKP may need multiple sutures
- ⦿ In RK may need patchwork of sutures to close complex wounds/splayed incisions
- ⦿ Corneal glue
- ⦿ Sequela:
 - Induced astigmatism
 - Prolonged surgery and recovery

Viscoelastic Induced Stromal Keratopathy: VISK

- ⦿ Intrastromal injection of viscoelastic in post-LASIK eye through paracentesis, dissecting flap
- ⦿ Causes severe loss of vision
- ⦿ Treatment: Open edge of flap, remove viscoelastic, and avoid introduction of epithelium in interface to avoid epithelial ingrowth
- ⦿ Prevention: ensure viscoelastic cannula is in AC prior to injection

Viscoelastic Induced Stromal Keratopathy: VISK

Before



After



Stromal Melts: Etiology

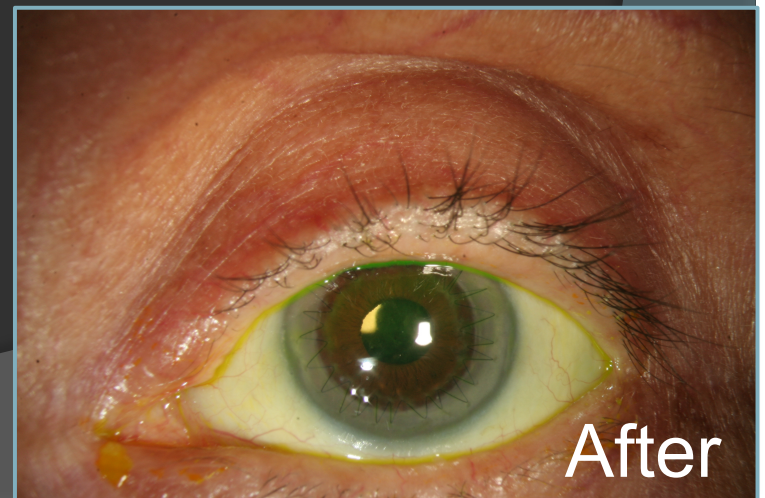
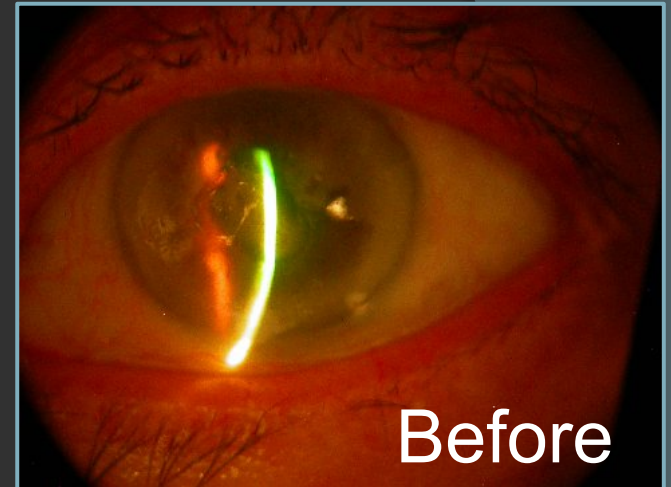
- Associated with use of NSAIDs
- Seen in patients with ocular surface disease: dry eye, neurotrophic, previous ocular surface
- Can scar or perforate in just a few days

Stromal Melt Prevention

- ⦿ Avoid indiscriminate topical NSAID use
- ⦿ Treat dry eye prior to cataract surgery
- ⦿ Close observation postoperatively of any epithelial defect, or greater than expected SPK on POD #1
- ⦿ Watch closely patients with risk factors:
 - Sjogren's, dry eye
 - Other autoimmune disease: RA
 - Neurotrophic

Stromal Melts: Treatment

- Stop NSAID
- Back up or stop steroid
- Bandage CTL
- Punctal occlusion, lubrication
- Tarsorrhaphy
- Corneal glue or PKP



Femtosecond Cataract Surgery

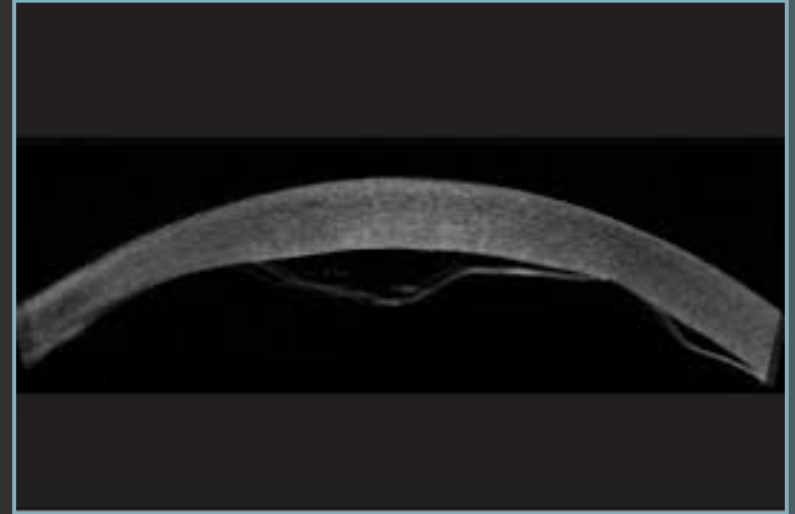
- ⦿ Incomplete wound due to:
 - Inadequate energy
 - Arcus or scar
 - Micro movements of eye
- ⦿ Prevention: Higher energy in arcus or scars, ideas?
- ⦿ Management: In same area incision with blade

Endothelial Complications

Descemet's Membrane (DM) Detachment

- ⦿ Caused by injection of viscoelastics or BSS in potential space
- ⦿ May also be caused by instruments and phaco sleeve
- ⦿ If early in surgery, may lead to combined capsulorrhexis/desmatorrhexis
- ⦿ May lead to prolonged recovery in mild to moderate cases, if severe will need DMEK or DSAEK

DM Detachments



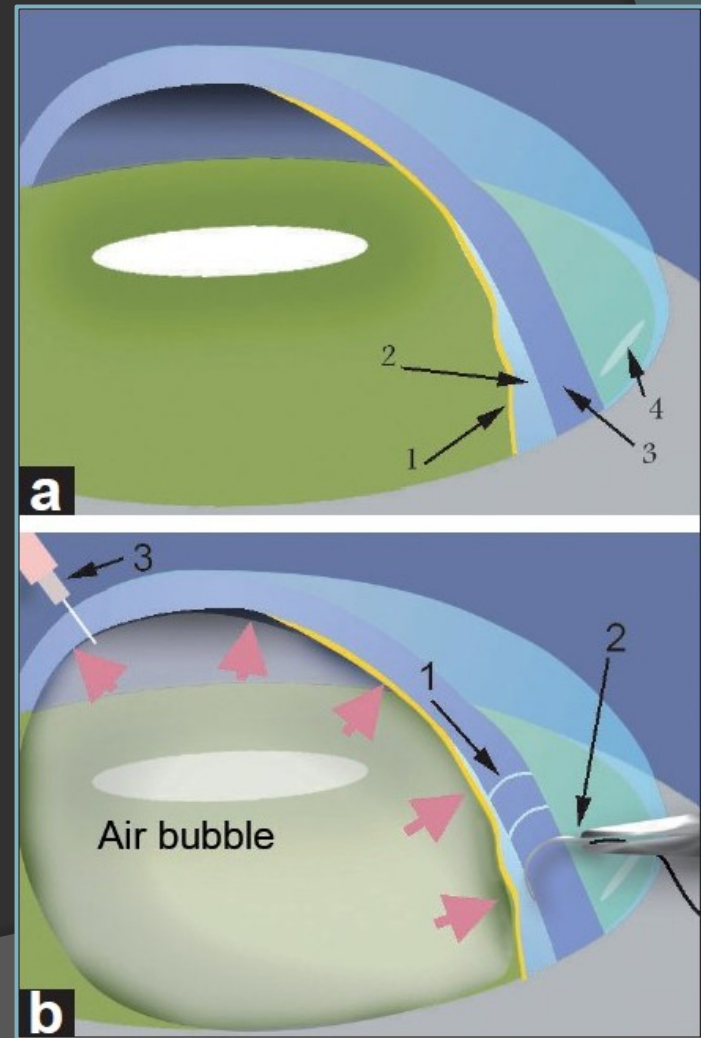
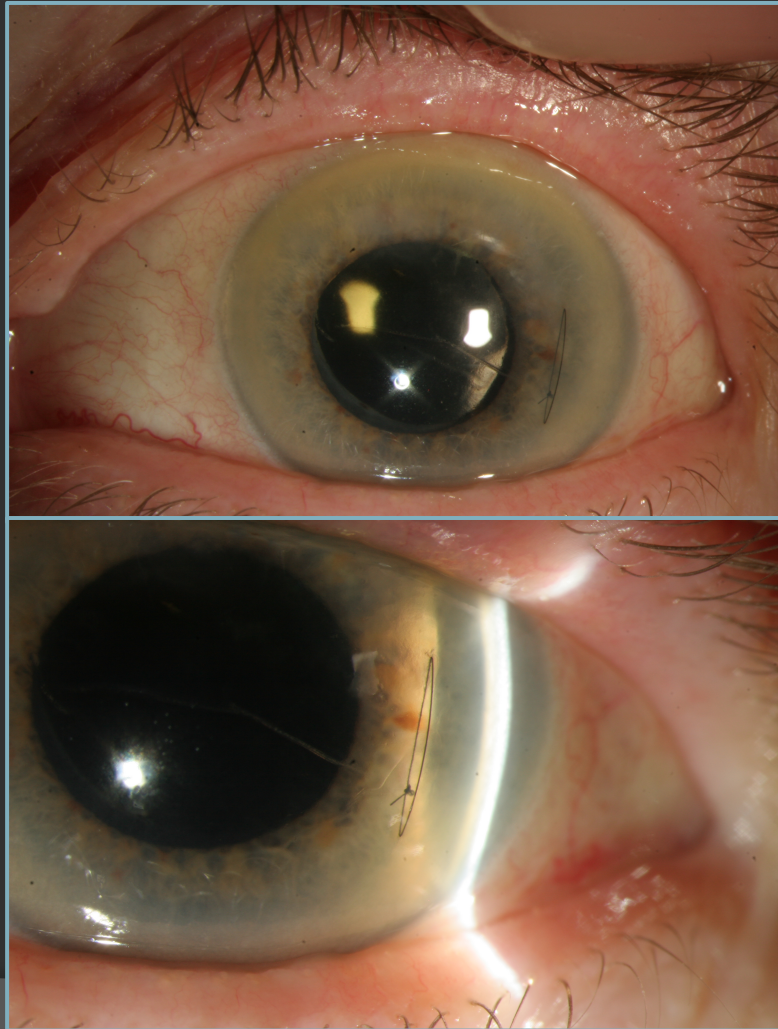
DM Detachment: Prevention

- ⦿ Prior to injection of BSS or viscoelastic, verify cannula completely in AC
- ⦿ Careful visualization during hydration of wound to avoid creation of large detachment
- ⦿ Careful insertion of instruments and irrigating sleeve

DM Detachment: Management

- ⦿ Attempt to reposition DM to its normal location with BSS currents
- ⦿ Place filtered air or an isoexpansile C3F8 14% mixture in AC and instruct patient to position to place air beneath DM
- ⦿ If large refer early to avoid fibrotic stiffening of DM which will require DMEK or DSAEK

DM Detachment s/p Repair



Endothelial Decompensation: Etiology

- ⦿ Excessive phaco power
- ⦿ Power close to endothelium
- ⦿ Inappropriate or insufficient viscoelastic use
 - Dispersive agents: Viscoat, Endocoat
- ⦿ Preexisting endothelial dystrophy
- ⦿ Previous anterior segment surgery
- ⦿ TASS

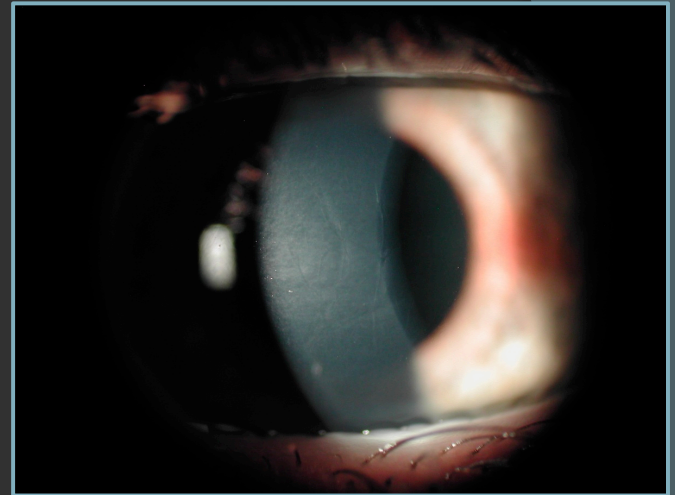
Endothelial Decompensation Prevention

- Use dispersive viscoelastics: Viscoat, Endocoat
- Refill AC with viscoelastic in cases at risk: i.e. two vials of viscoelastic
- Work away from the cornea
- Keep procedure time low and atraumatic
- Consider femtosecond cataract surgery?
- Endothelial cell count prior to surgery in eyes with previous surgery

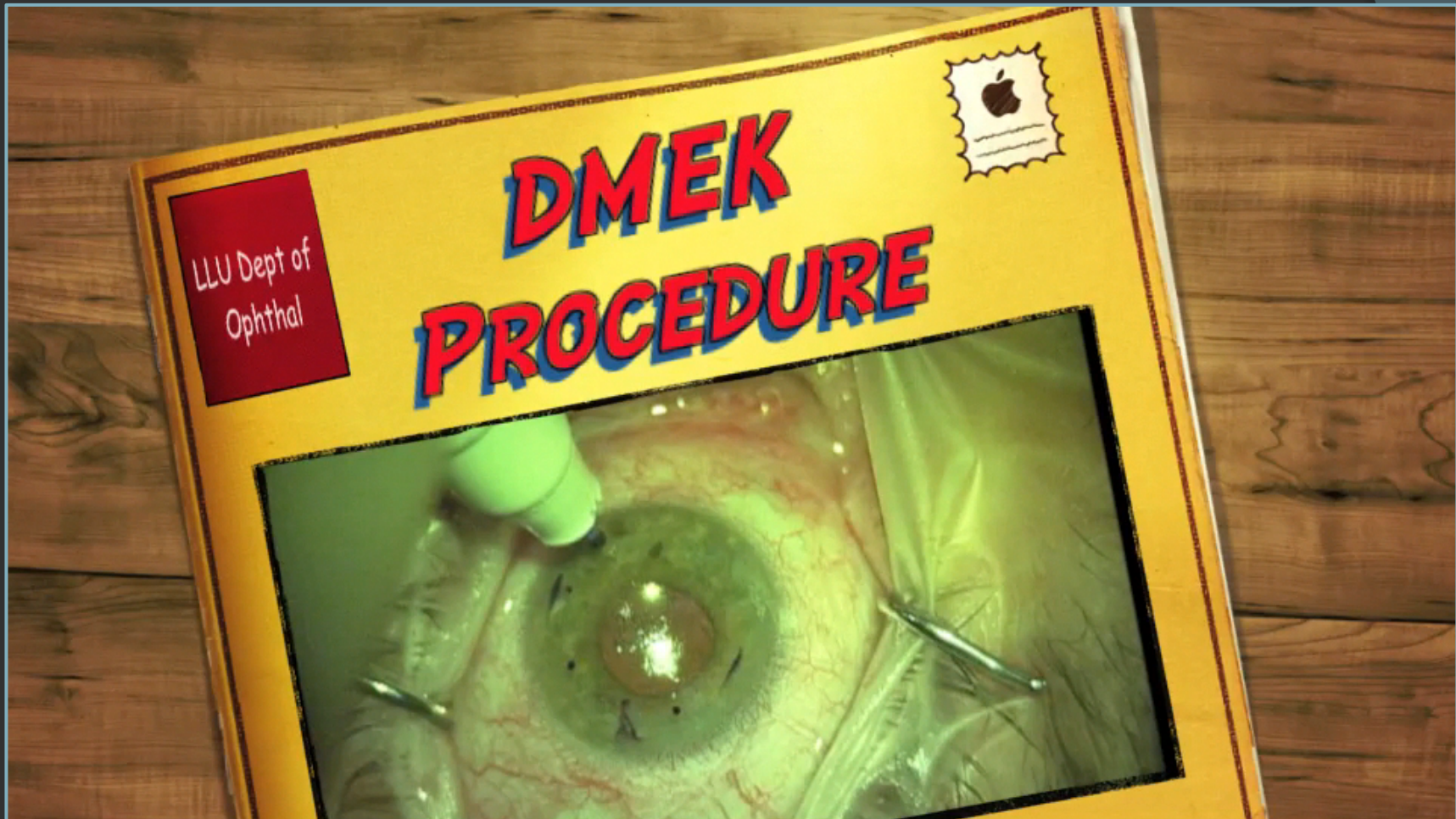
Endothelial Decompensation

Treatment: Surgical

- ⦿ DMEK
- ⦿ DSAEK
- ⦿ PKP only if there is significant stromal scarring
- ⦿ Early referral to have early surgery before anterior stromal scarring from longstanding corneal edema



Endothelial Decompensation Treatment of Choice: DMEK



Questions?

