

Cataract Surgery in Patients with Corneal Pathology

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Financial Disclosure

- I have the following financial interests or relationships to disclose:
 - Alcon
 - Bausch + Lomb
 - Zeiss
 - CorneaGen
 - Allergan
 - Novartis

Corneal Pathology

- Epithelial Basement Membrane Dystrophy
- Trauma/Corneal Scars
- Steven's Johnson Syndrome/Graft vs. Host Disease
- KCN
- Fuchs Dystrophy
- Cataract surgery combined with corneal transplantation (PKP, DSEK, DMEK)

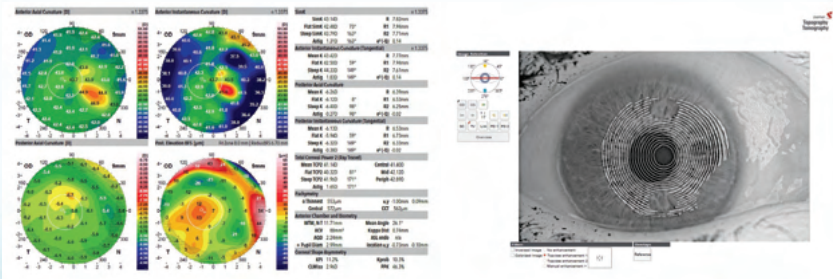
Why Does it Matter?

- Corneal Disease can affect IOL calculations
- Cataract Surgery can worsen pre-existing corneal disease
- Visual outcomes can be limited after cataract surgery because of corneal disease – patient expectations

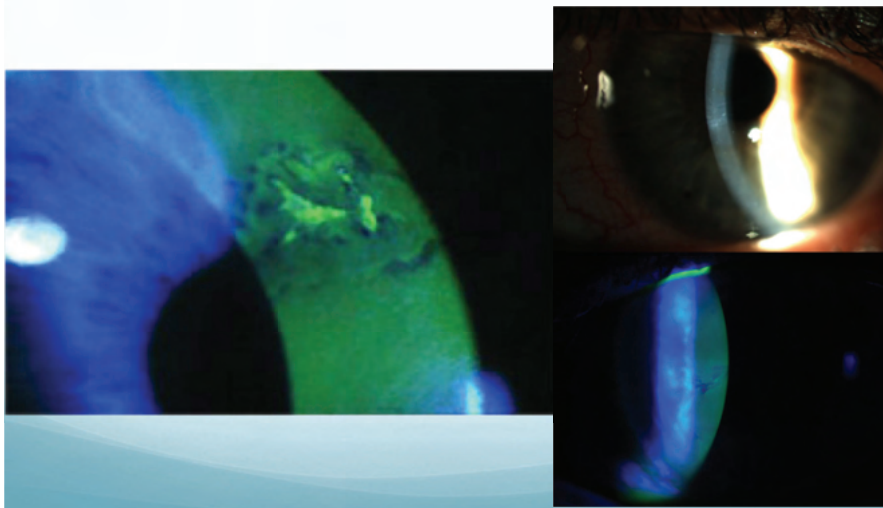
Case Presentation

70 y/o Female
Consults for Cataract eval.

MRx -1.00+ 2.25 x 183°
BCVA 20/50



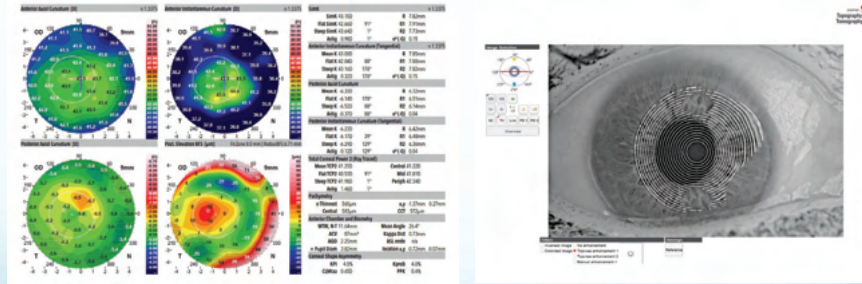
EBMD



Case Presentation

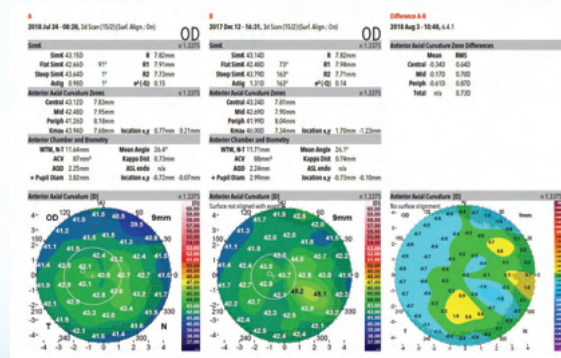
After Epi-Debridement was performed

MRx -1.00 + 2.75 x 163°
BCVA 20/30



Case Presentation

Difference map

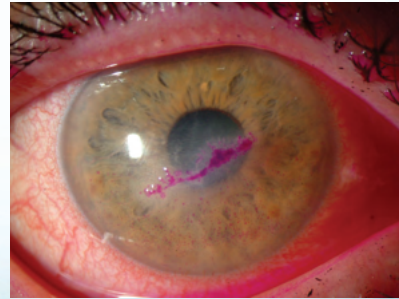


Epithelial Basement Membrane Dystrophy

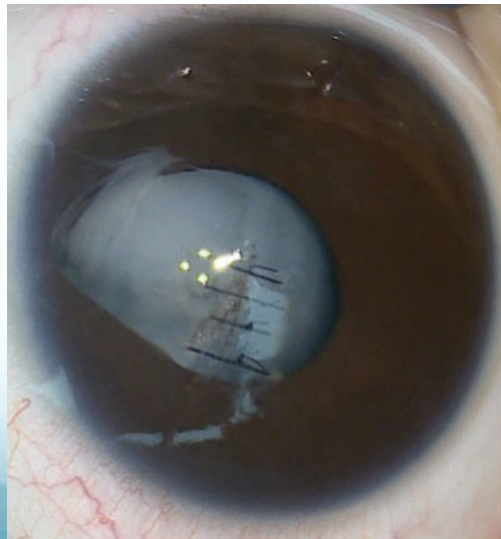
- Results in:
 - Decreased vision
 - Irregular astigmatism
 - Inaccurate keratometry & IOL calculations
- Treatment
 - Superficial keratectomy & Phototherapeutic keratectomy

Herpes Simplex Virus

- HEDS trial:
prophylactic acyclovir
decreases risk of
recurrence
- Inactive for 3 months
prior to surgery
- Acyclovir 400mg 5X a
day perioperatively

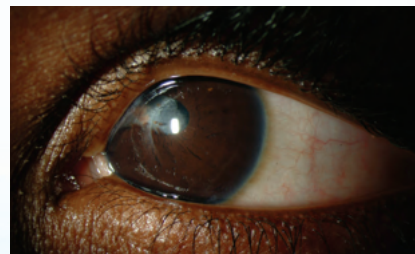


4 yold s/p open globe



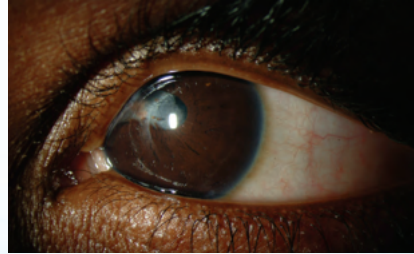
Timing of cataract surgery

- Open Globe with disrupted
anterior capsule
 - Primary cataract extraction
during Open Globe:
 - Control inflammation
 - Post op view of posterior
segment & nerve
 - Prevention of amblyopia
 - Cost effectiveness & patient
convenience; less risk for
patient

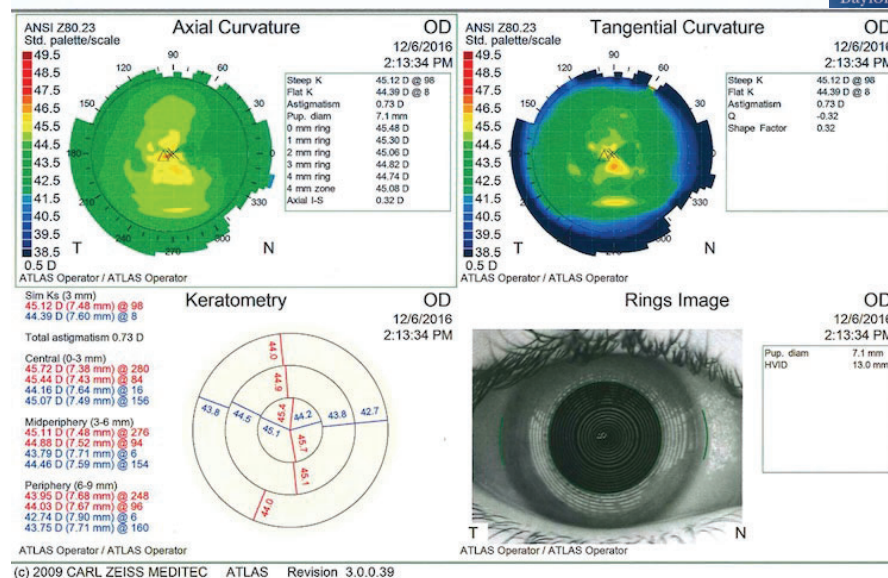
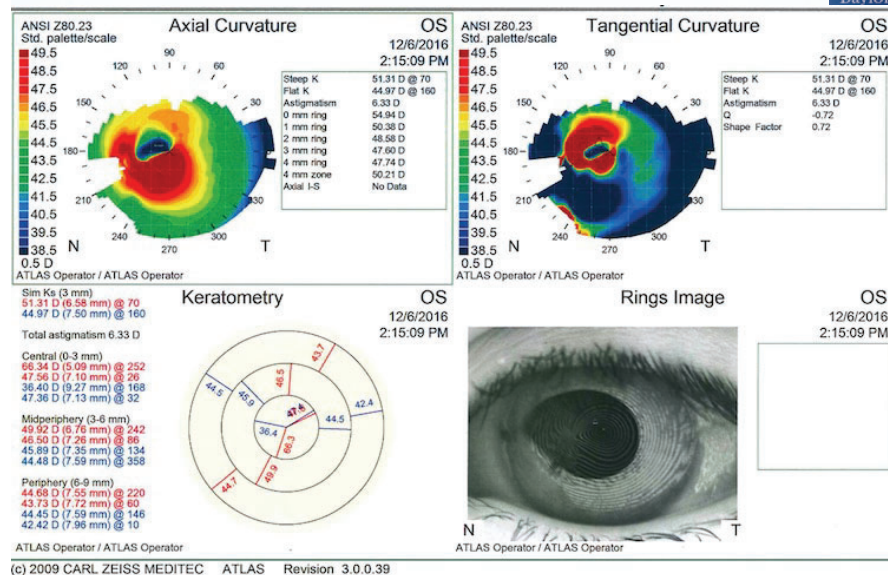


Timing of cataract surgery

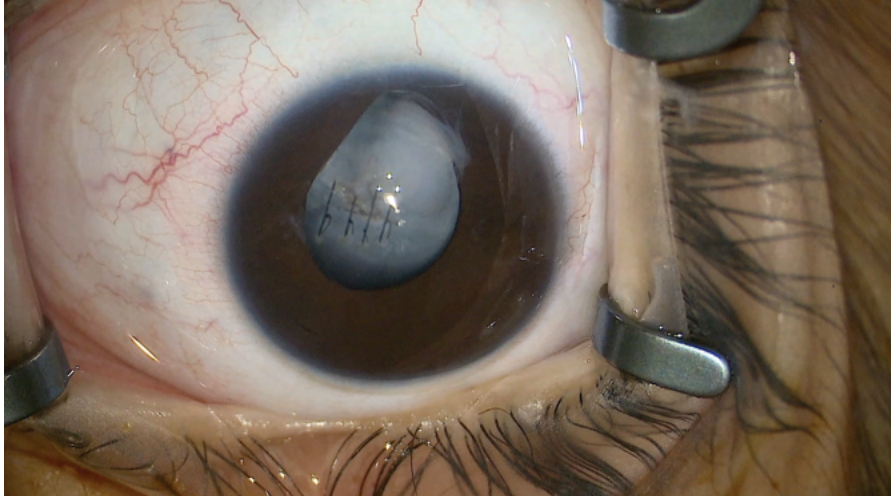
- Open Globe with disrupted anterior capsule
 - Delayed cataract extraction after Open Globe repair:
 - More controlled surgery: good control of inflammation, media clarity, & stable wound
 - Better visual outcome (2-30 days)
 - More accurate IOL power calculation
 - More knowledgeable staff, infrastructure, equipment, ect



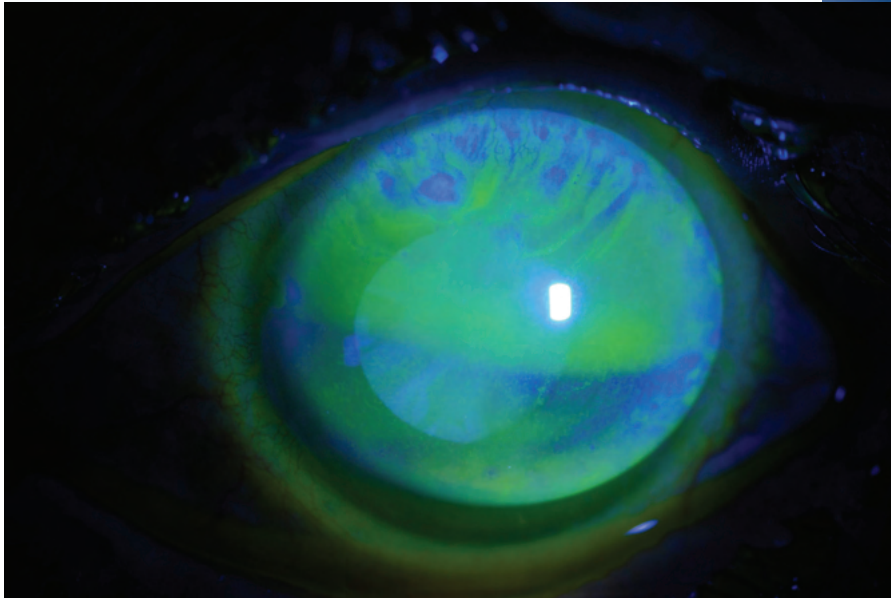
Shah MA, Shah SM, Shah SB, et al. Effect of interval between time of injury and timing of intervention on final visual outcome in cases of traumatic cataract. Eur J Ophthalmol. 2011;21:760-5.
SB, Shah MA, Shah SM, Shah SB, et al. Comparative study of final visual outcome between open- and closed-globe injuries following surgical treatment of traumatic cataract. Graefes Arch Clin Exp Ophthalmol. 2011;249:1775-



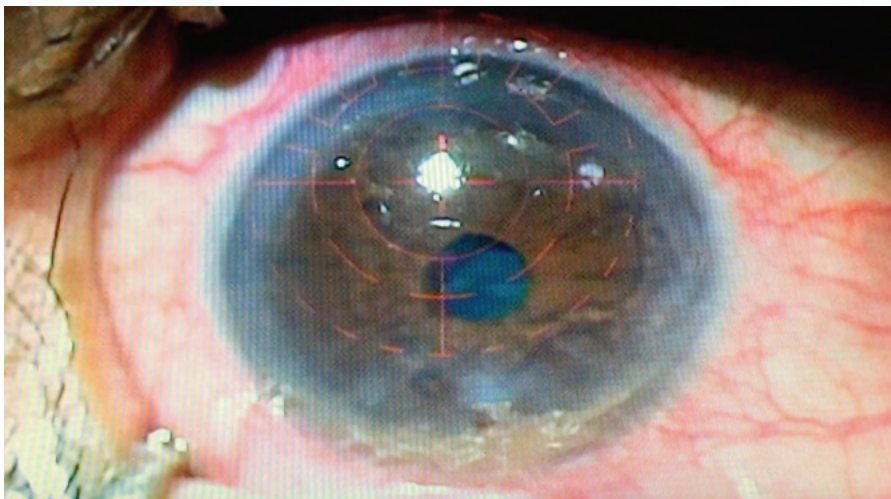
s/p open globe

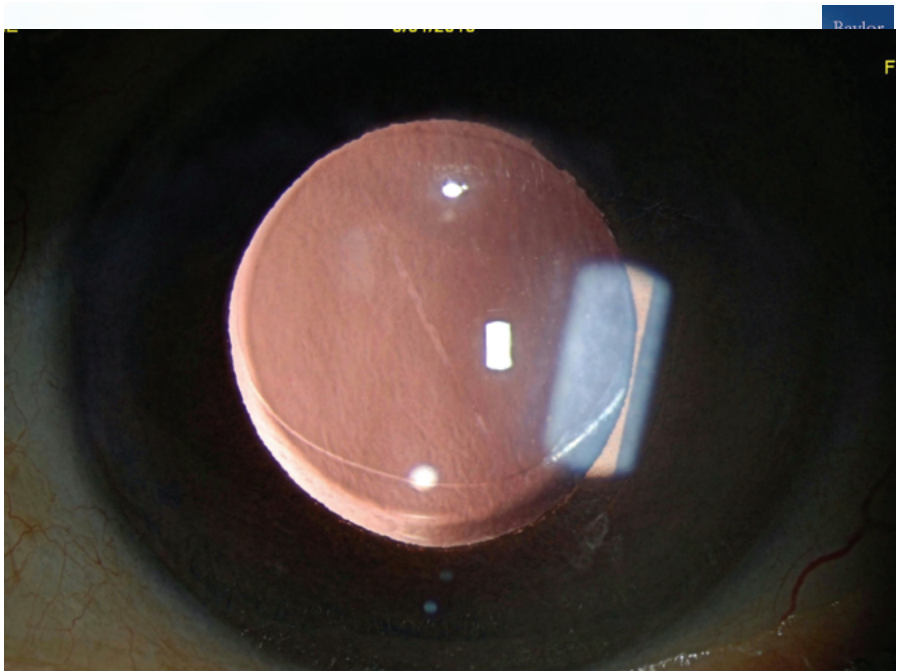
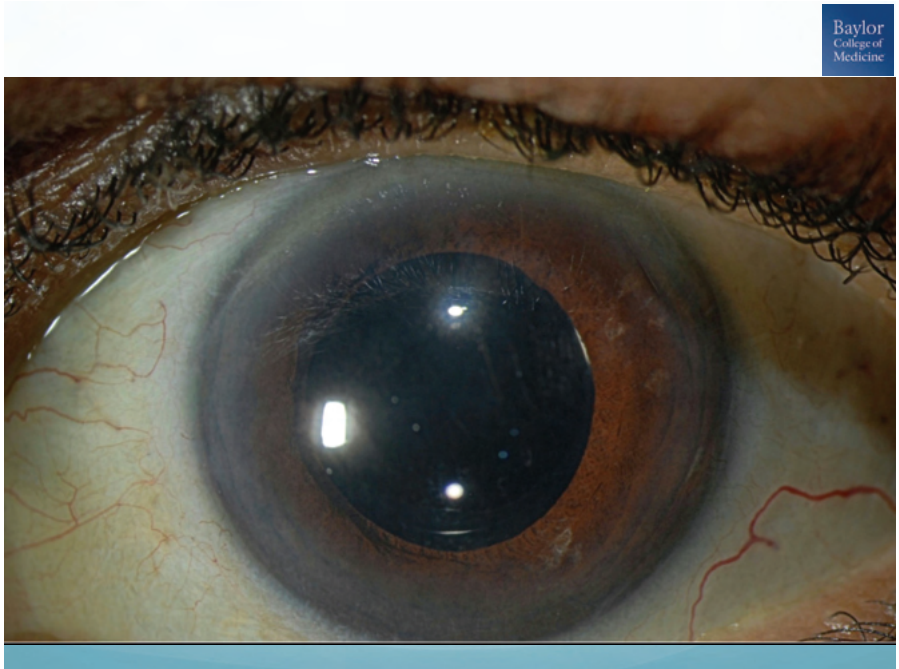
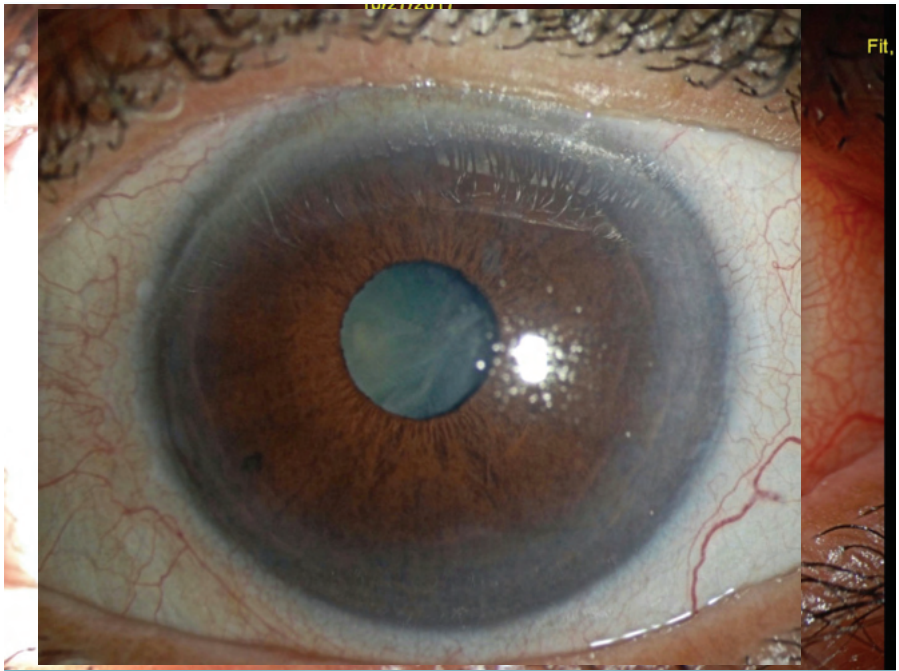


20 years of CL wear



Superficial Keratectomy +
AMG Video





Bilateral Limbal Stem Cell Deficiency

Br J Ophthalmol. 2001 May;85(5):567-75.

Amniotic membrane transplantation for partial limbal stem cell deficiency.

Anderson DE¹, Ellis P, Press RT, Tsiang SC.

Author information

Abstract

AIM: To examine the efficacy, safety, and long term outcomes of amniotic membrane transplantation for corneal surface reconstruction in cases of partial limbal stem cell deficiency.

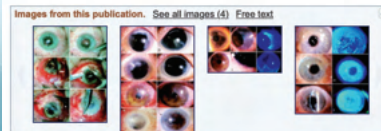
METHODS: 17 eyes of 15 patients with partial limbal stem cell deficiency underwent superficial keratectomy of the conjunctivalised corneal surface followed by amniotic membrane transplantation. Cases were followed up for at least a year.

RESULTS: All eyes exhibited a stable, intact corneal epithelial surface after a mean follow up period of 25.8 months with no eyes developing recurrent erosion or persistent epithelial defect. The mean time to re-epithelialisation was 22.8 days. Overall improvement in visual acuity was observed in 92.9% of 14 eyes with visual potential. Of those, five eyes gained six or more lines, two eyes gained between four and five lines, six eyes gained between one and three lines, and one eye lost three lines of Snellen acuity. Pain and photophobia were abolished in 86% of cases and substantially reduced in 14%, with all eyes exhibiting decreased vascularisation and inflammation at final follow up.

CONCLUSIONS: Amniotic membrane transplantation appears to be a safe and effective method of restoring a stable corneal epithelium for cases of partial limbal stem cell deficiency and can be considered as an alternative to limbal autograft or allograft.

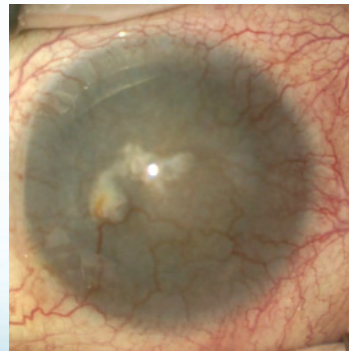
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Steven's Johnson Syndrome

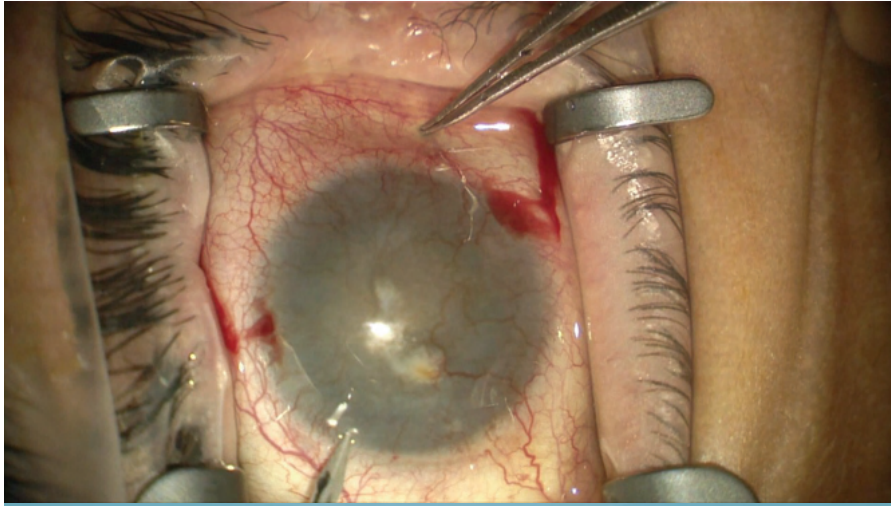
- s/p symblepharon lysis/superficial keratectomy/AMT both eyes
- s/p PROSE fit 20/200 OD; LP OS
- Old records show 20/70 OS
- Subconj Avastin/Kenalog; Argon laser vessel sectioning
- Aggressively optimized ocular surface & conjunctival inflammation



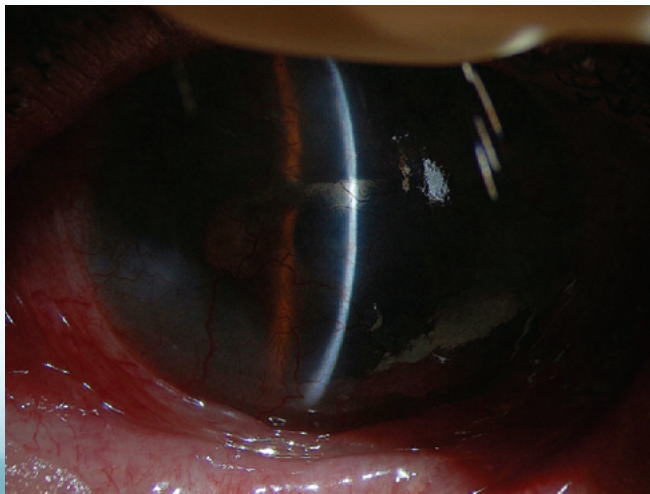
Steven's Johnson Syndrome

- Aggressively treat ocular surface & conjunctival inflammation:
 - MGD/Dry eyes
 - Symblepharon; trichiatric lashes/eyelid abnormalities
 - Mucous Membrane Grafts/AMT
 - Consider stem cell transplants
- Proceed with cataract surgery
 - Trypan, Lightpipe

SJS Cataract



POM#3



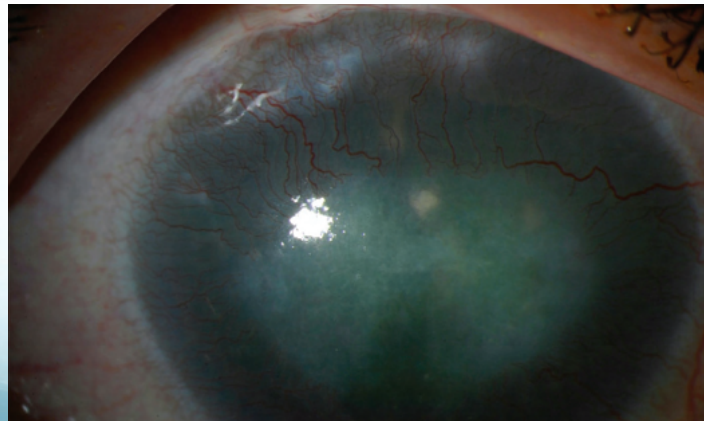
POM#3





Aniridia and Limbal Stem Cell Deficiency

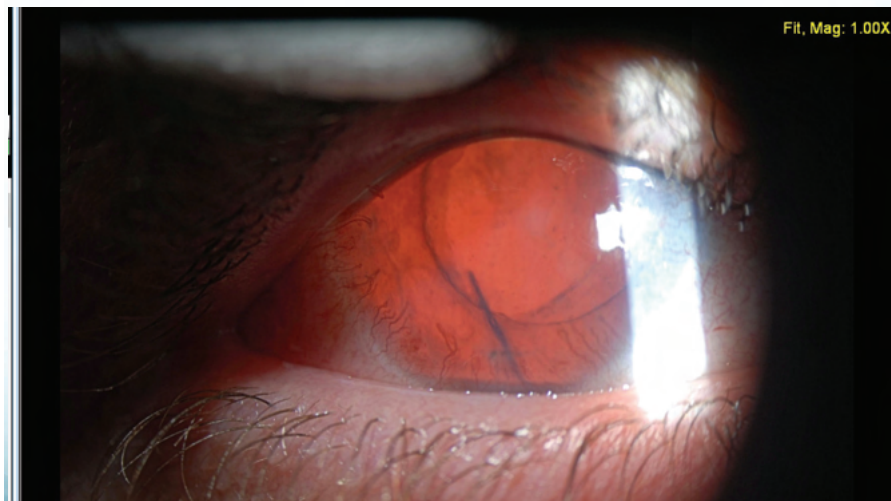
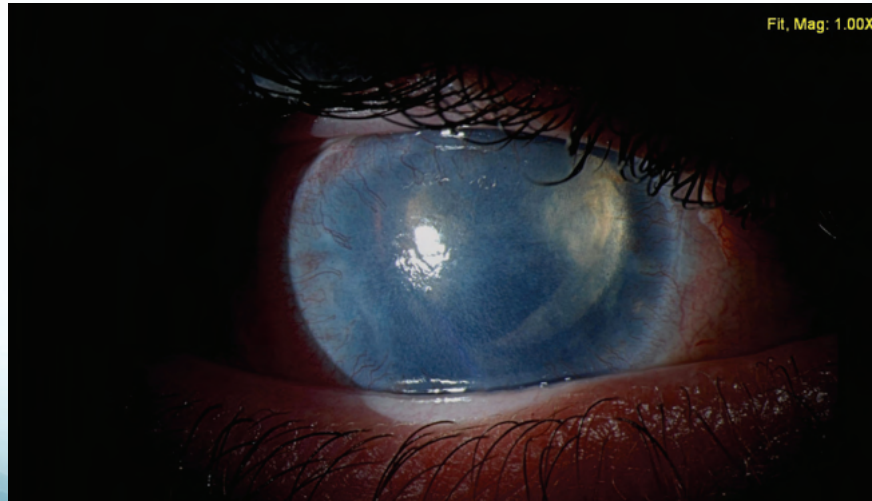
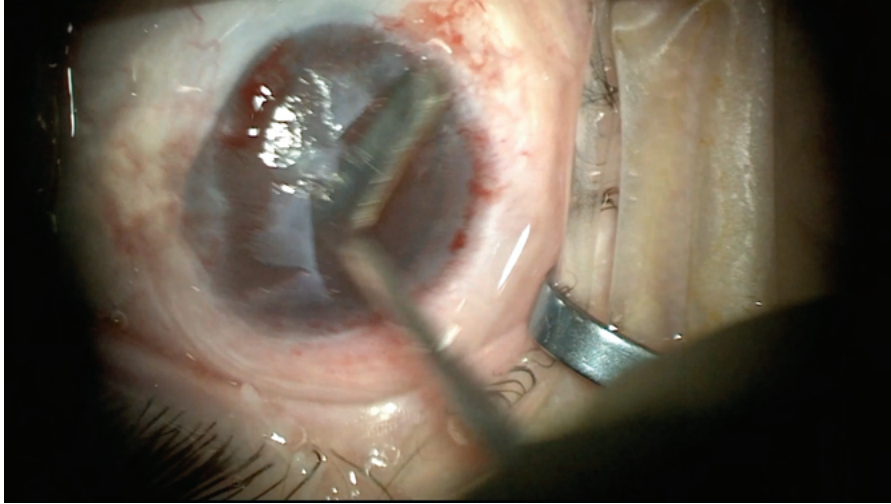
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CE/IOL and Superficial Keratectomy



Tips

- Good dilation
- Use topography & IOL calcs from other eye or average K
- Optimize ocular surface prior to cataract surgery
- Use Trypan Blue
- Adjust illumination to low or medium lighting because too much co-axial lighting can cause back scatter
- Use light pipe (from vitrectomy machine or photon laser light)
- Start capsulorhexis in transparent area in corneas with scarring
- Use three piece lenses

s/p Corneal Transplantation

- s/p PKP
 - Visualization
 - Endothelial cell loss
 - Astigmatism correction
 - Triple procedure

Corneal Stromal Scars & Cataracts

PKP + CE/IOL

- Difficulty with visualization
- Intraoperative complications (PC tear, ect)
- Refractive error
- Shorter rehabilitation
- No endothelial trauma
- One procedure

PKP then CE/IOL

- Can estimate IOL power more accurately
- Endothelial cell loss during CE/IOL
- Delay in visual rehabilitation



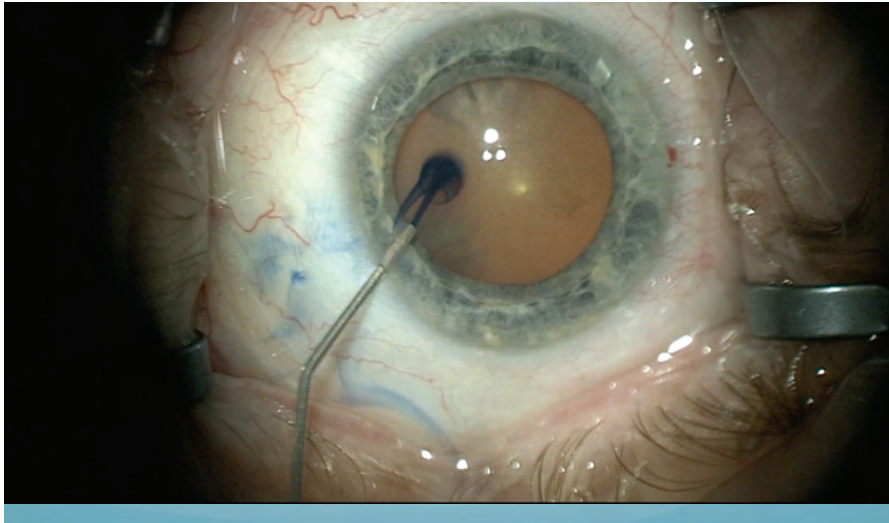
Endothelial Dysfunction & Cataracts

- No difference in donor dislocation, rebubble, graft failure, or endothelial cell loss in DMEK+CE/IOL procedures compared to DMEK only
- Avoids second surgery
- Dislocation or endothelial cell loss in sequential surgeries
- Accelerated cataracts in DMEK only eyes in >50 yold; 50% at 6 months
- Refractive stability in sequential surgeries

Terry MA, Shamie N, Chen ES, et al: Endothelial keratoplasty for Fuchs' dystrophy with cataract: complications and clinical results with the new triple procedure. Ophthalmology 116:631-9, 2009
Burkhart ZN, Feng MT, Price FW, Jr., et al: One-year outcomes in eyes remaining phakic after Descemet membrane endothelial keratoplasty. J Cataract Refract Surg 40:430-4, 2014
Chaurasia S, Price FW, Jr., Gunderson L, et al: Descemet's membrane endothelial keratoplasty: clinical results of single versus triple procedures (combined with cataract surgery). Ophthalmology 121:454-8, 2014

s/p Corneal Transplantation

- s/p DSEK/DMEK
 - Combined—no difference in donor dislocation or endothelial cell loss (Terry et al & Chaurasia et al)
 - Hyperopic shift



Corneal Transplantation: DMEK/DSEK TIPS

- Use cohesive OVD; not dispersive
- Can remove epithelium or strip endothelium to improve visualization for cataract surgery
- Use Trypan Blue
- Short, vertical paracentesis
- Smaller capsulorhexis
- Use Miostat
- Hyperopic shift: DSEK: 0.70–1.5D DMEK: 0.24–0.5D

Terry MA, Shamie N, Chen ES, et al: Endothelial keratoplasty for Fuchs' dystrophy with cataract: complications and clinical results with the new triple procedure. Ophthalmology 116:631-9, 2009

Conclusion

- Pupil dilation and zonular loss
- Trauma/Corneal Scars
- Steven's Johnson Syndrome/Graft vs. Host Disease
- Anterior Corneal Scars and Endothelial Dysfunction
- Corneal Transplantation (PKP, DSEK, DMEK)

Thank You

What Questions Do you Have?

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