

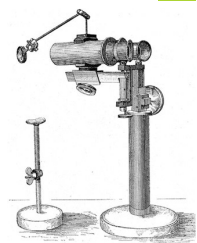




Objectives

- Provide an update on anterior segment and cornea diagnostics
- Demonstrate real world applications via case studies

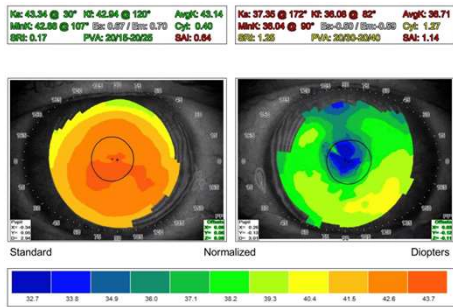
► the first binocular microscope
► “corneal loupe”
(von Zehender & Westien 1887)

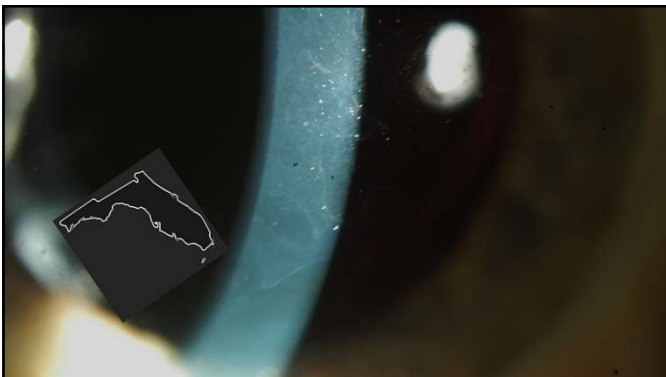


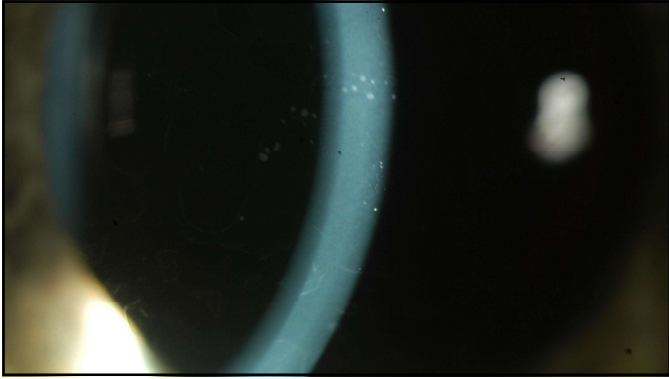
A Case

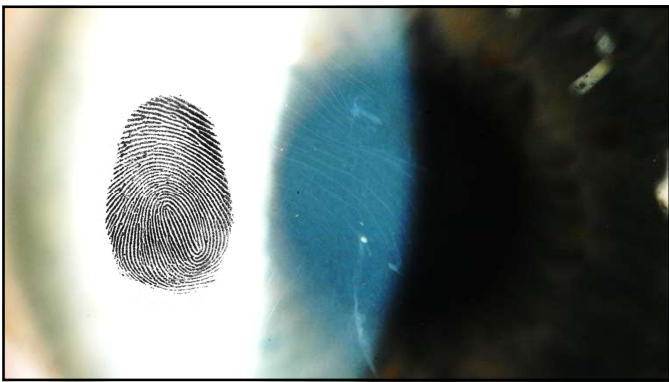


- ▶ 66yo WM p/w decreased vision after uncomplicated phaco w/Vivity toric IOL OS (POM1)
- ▶ UCVA OS 20/200 PH 20/50+1
- ▶ MRx OS -3.00 +1.00 x 105 = 20/40-2
- ▶ Exam grossly unremarkable, centered Vivity IOL

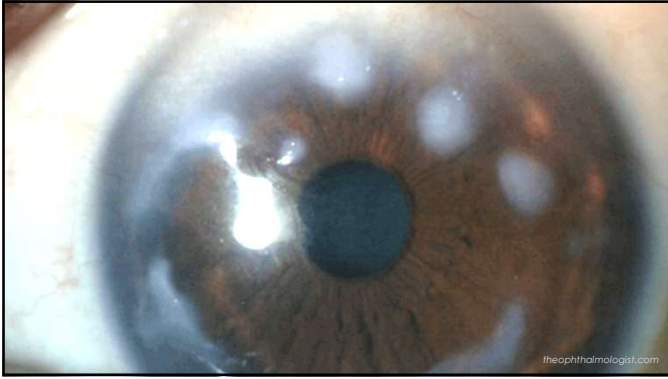


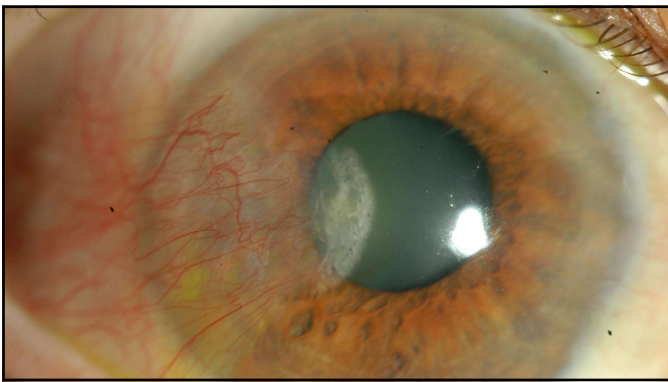


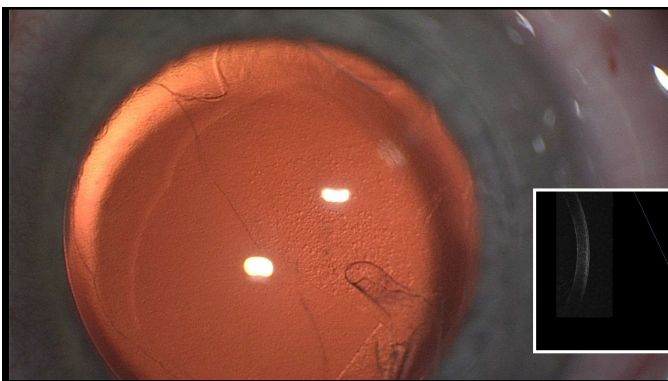




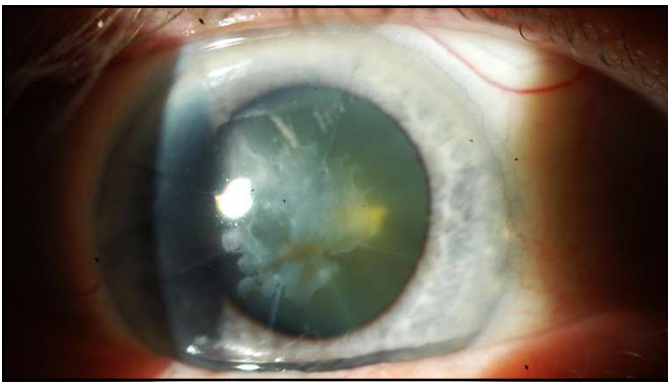


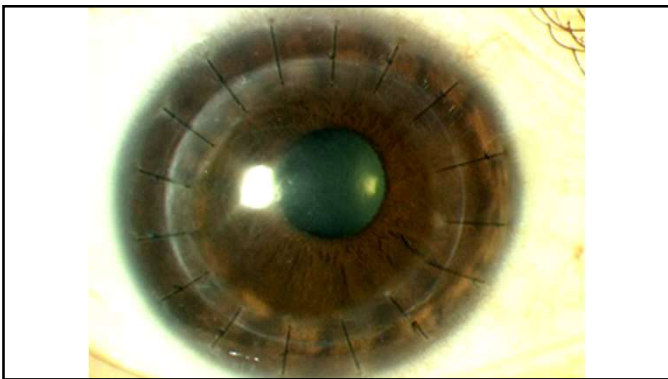


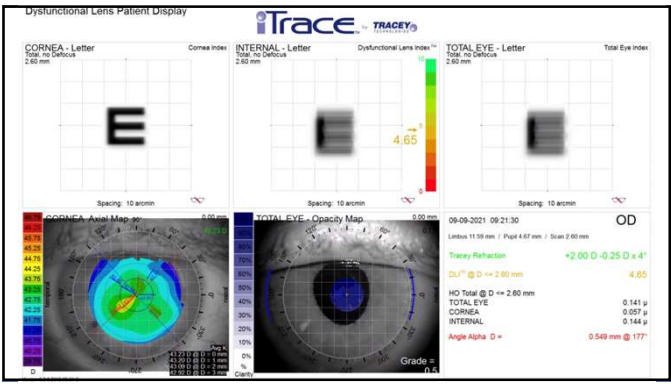


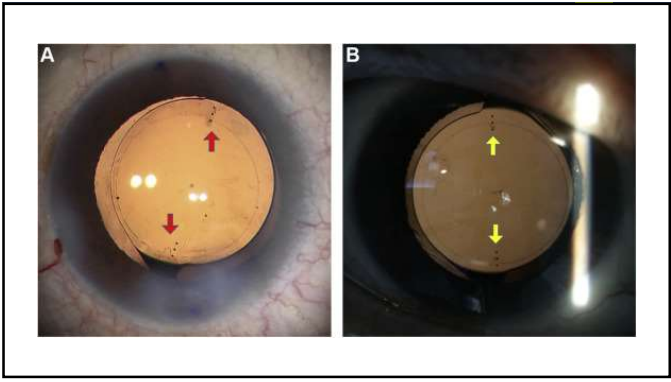


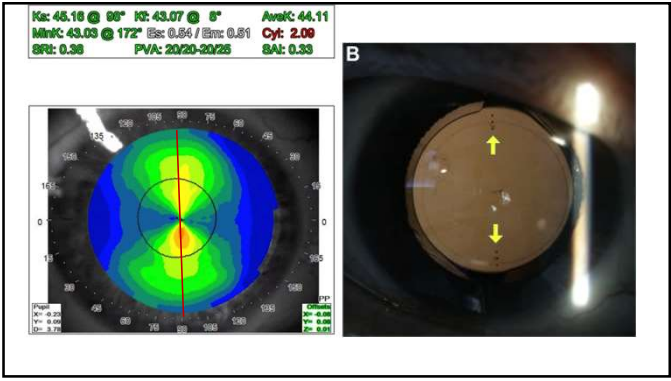


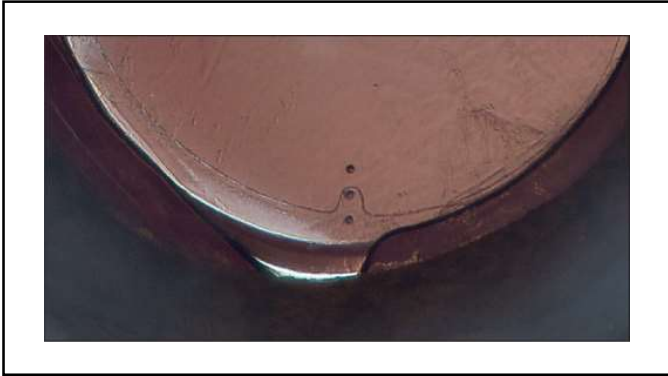


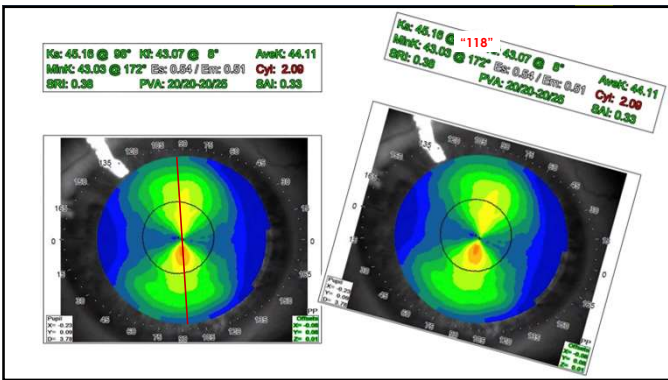


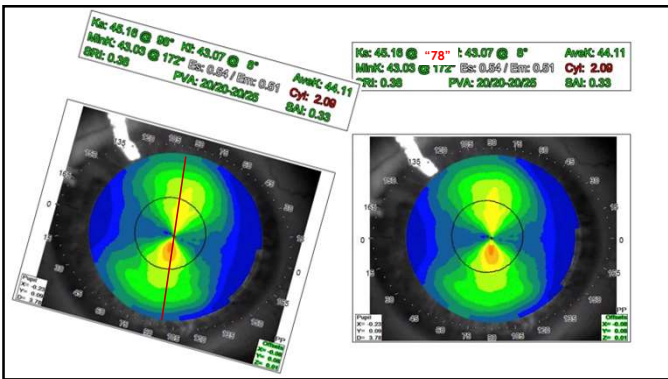




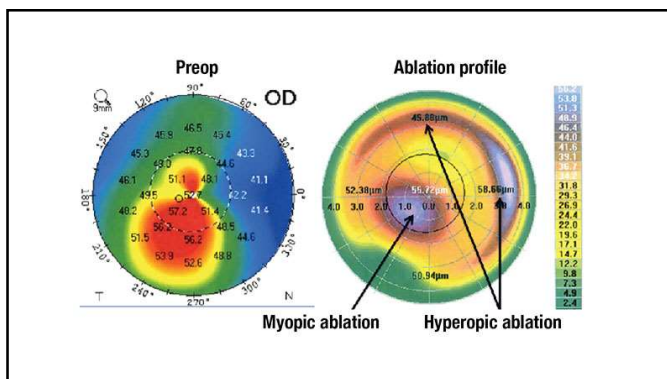
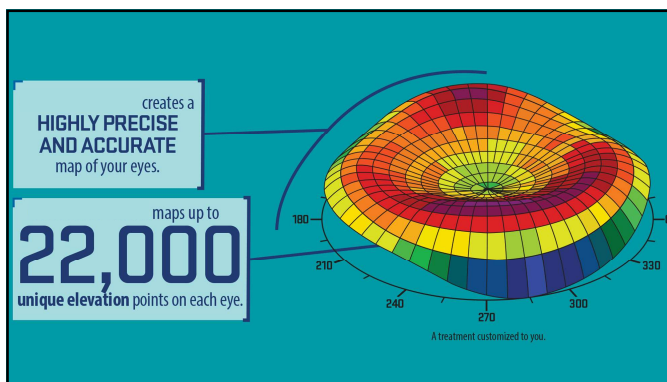
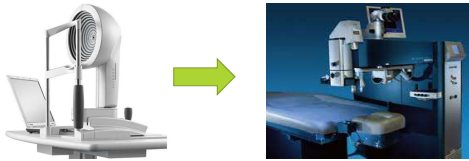


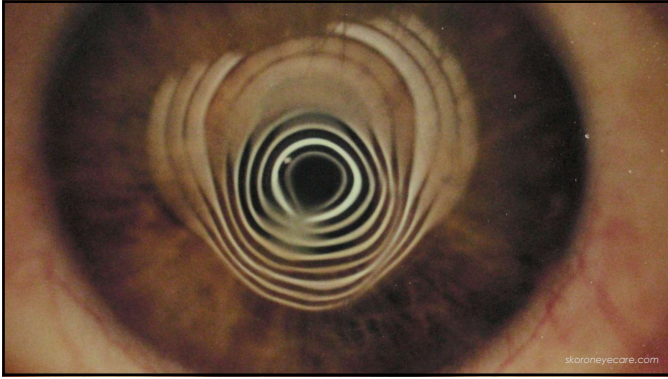


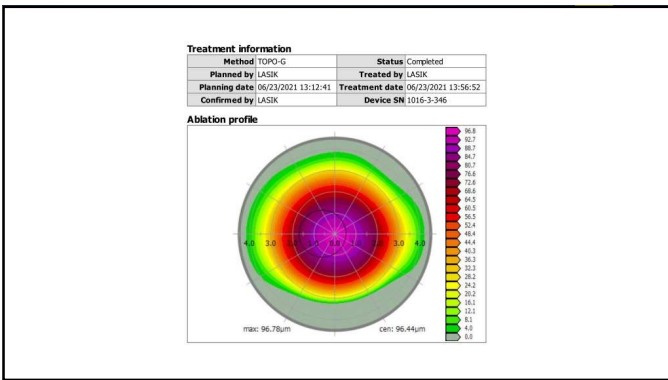




Topography-Guided LASIK & PRK





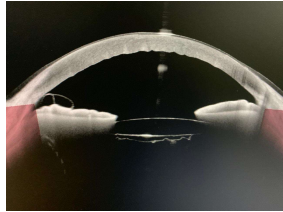


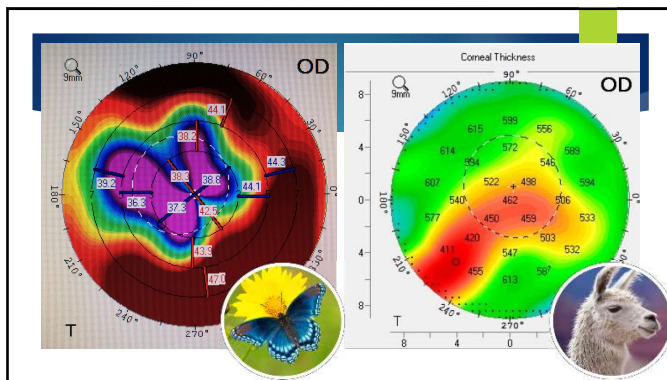
Including but not limited to...

- ▶ Topography
- ▶ Wavefront aberrometry
- ▶ Tomography
 - ▶ Scheimpflug
 - ▶ Anterior segment OCT
 - ▶ Intraoperative OCT

Including but not limited to...

- ▶ Topography
- ▶ Wavefront aberrometry
- ▶ **Tomography**
 - ▶ Scheimpflug
 - ▶ Anterior segment OCT
 - ▶ Intraoperative OCT





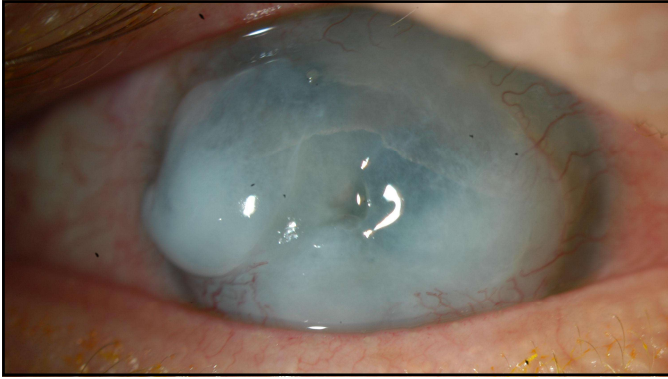
“

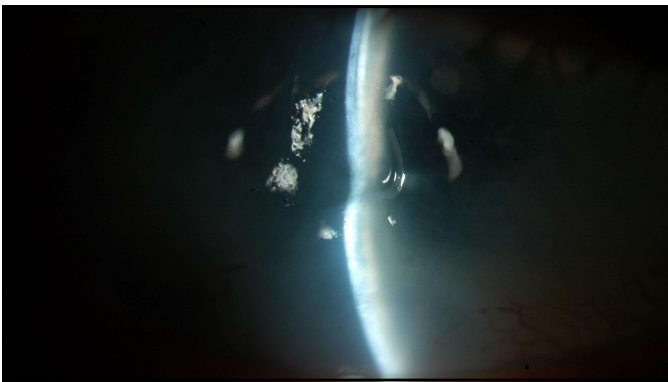
I had LASIK and I can't see.

”

- CHIEF COMPLAINT

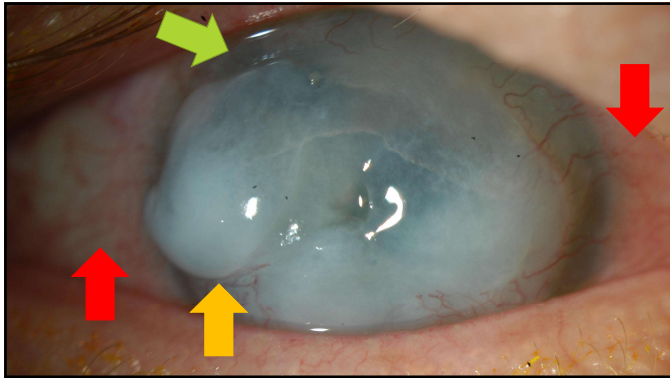
Another Case





Differential Diagnosis

- ▶ **WHAT**
- ▶ **THE**
- ▶ **FUCHS DYSTROPHY**
- ▶ **IS THIS?**



History

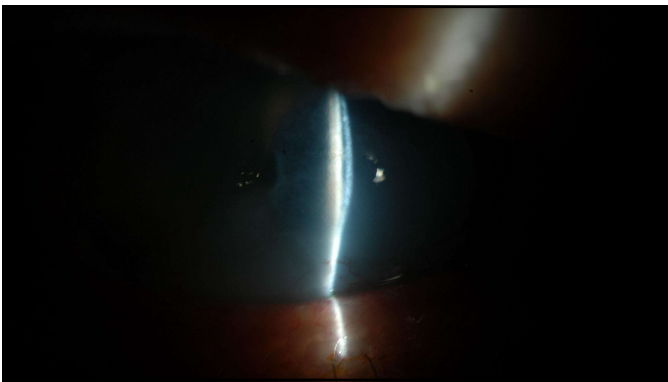
- ▶ 55yo white male
- ▶ Vision loss and pain OD x 3 years
- ▶ 1990s: Myopic LASIK OU 1990
- ▶ 2008: CEIOL OU
- ▶ OD c/b PCR and posteriorly dislocated IOL
- ▶ ACIOL placed OD over dislocated IOL

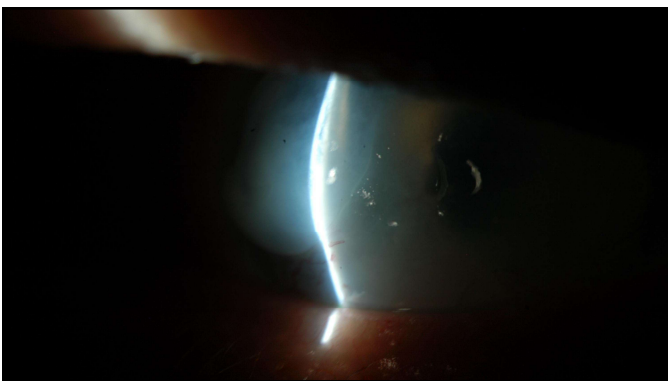
History (cont.)

- ▶ Postop course c/b glaucoma, K decompensation
- ▶ 2013: combined ACIOL explant, anterior vitrectomy, DSAEK
- ▶ "Graft never worked"
- ▶ "This eye will never see"
- ▶ "Just want it to look and feel normal"
- ▶ (Lost to follow up)

Exam

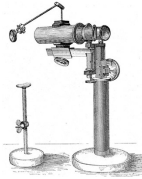
- ▶ **UCVA**
 - ▶ OD: LPP temporal island only, PHNI
 - ▶ OS: 20/40 PH 20/20
- ▶ **MRx**
 - ▶ OD: NI
 - ▶ -1.75 +2.00 x 100 = 20/30
- ▶ **Pupils**
 - ▶ OD: no view, 4+ RAPD by reverse
 - ▶ OS: RRLA
- ▶ **IOP**
 - ▶ OD: 10 mmHg
 - ▶ OS: 10 mmHg





Natural H/o Corneal Endothelial Failure

- ▶ Epithelial disease
- ▶ Graft failure/bullous keratopathy w/ central delle?



Plan

- ▶ **WHAT**
- ▶ **THE**
- ▶ **FUCHS DYSTROPHY**
- ▶ **DO I CONSENT THIS PT FOR?**

Plan

- | | |
|------------------------------|----------------------------------|
| ▶ Repeat DSAEK w/ SK OD? | ▶ Will post-SK view be adequate? |
| ▶ PKP OD? | ▶ Risk of choroidal, rejection? |
| ▶ Temporary KPro, PPV, IOLX? | ▶ Where is IOL? Where is graft? |

Healio > Ophthalmology > Journals > OSU

TECHNIQUE

Surgical Technique: Hand-Over-Hand Retrieval of a Posteriorly Dislocated DSAEK Graft in an Eye With an Iris Reconstruction Lens

John A. Wells, BS; Anthony J. Aldave, MD; Irena Tsui, MD

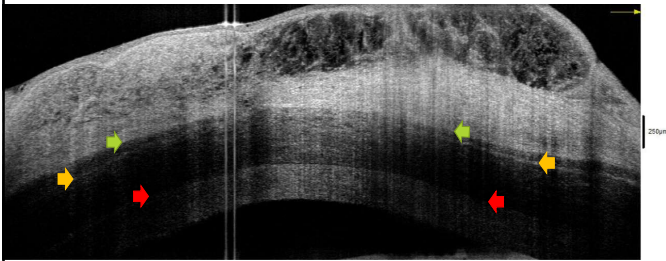
Ophthalmic Surgery, Lasers and Imaging Retina

November/December 2013 · Volume 44 · Issue 6: 569-571

Posted October 24, 2013

DOI: 10.3928/23258160-20131015-02

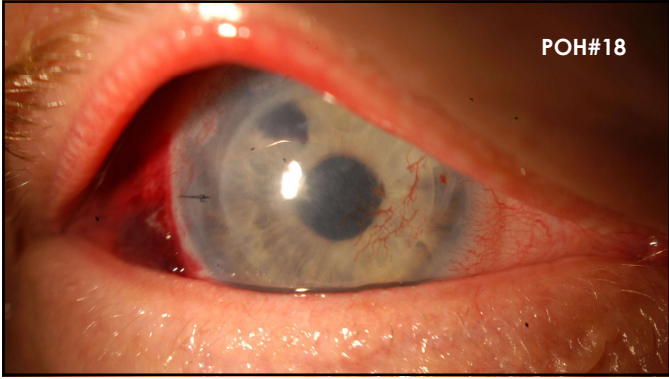
AS-OCT: no dells or ulcer!

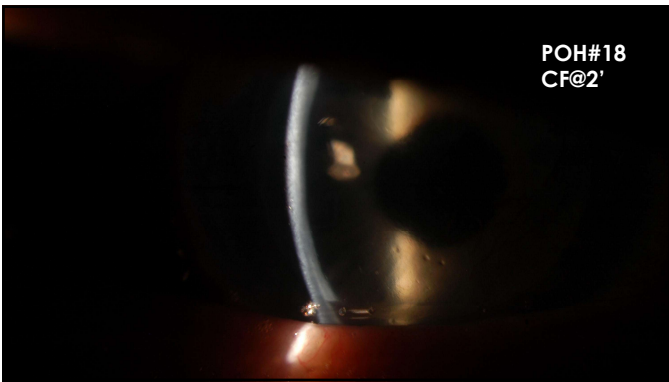


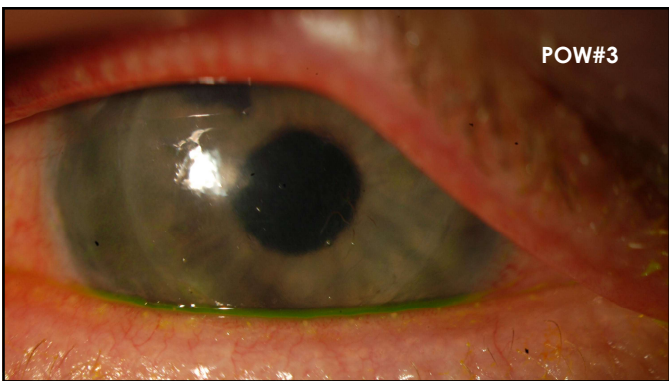
... B-scan: dislocated IOL

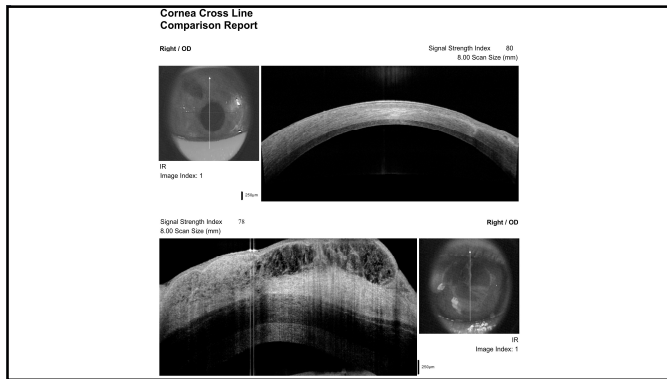
Plan

- ▶ Repeat DSAEK w/ SK OD?
- ▶ PKP-OD?
- ▶ Temporary KPro, PPV, IOLX?









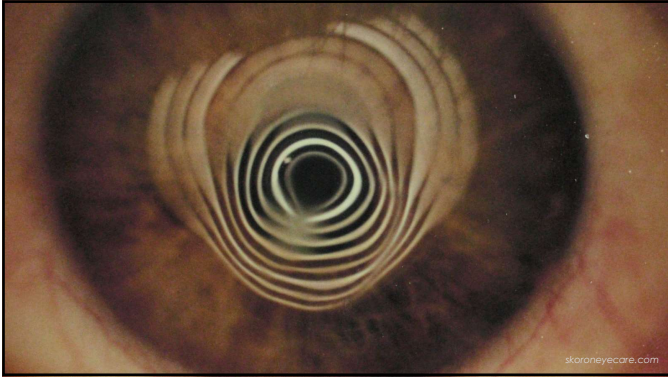
Anterior Segment Imaging Options

- ▶ Optical systems
 - ▶ Slit lamp photos
 - ▶ OCT
- ▶ Ultrasound systems
 - ▶ VHFDUS
 - ▶ UBM

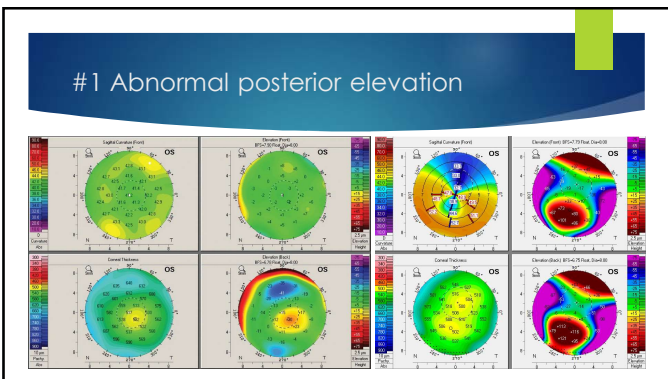
- ▶ Non-contact
- ▶ Blocked where light is blocked
- ▶ Can image the "dark side"
- ▶ Requires coupling
- ▶ Less available

Next Case

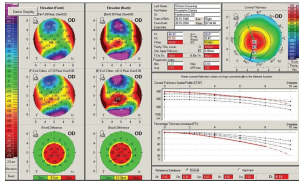
- ▶ 21yo AAM with asthma and eczema p/w
- ▶ UCVA 20/20 OD
- ▶ BSCVA 20/400 OS



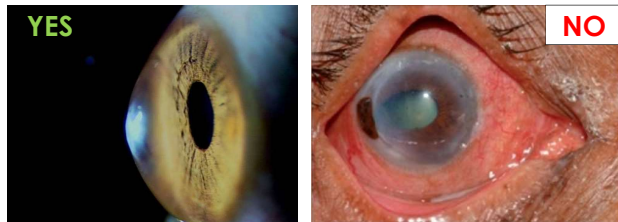




#2 Abnl corneal thickness distribution

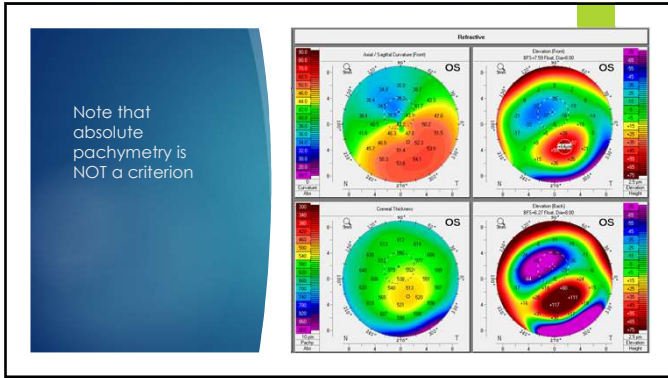


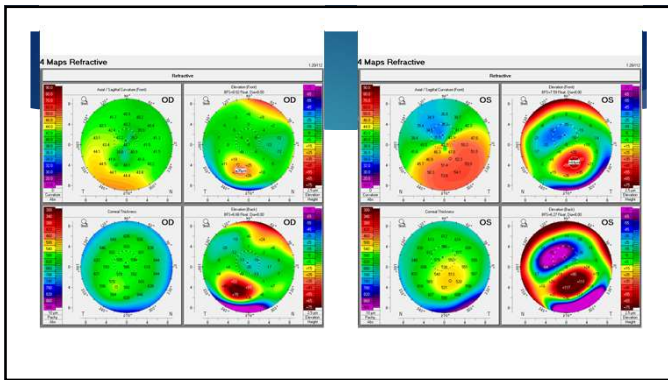
#3 Clinical noninflammatory thinning

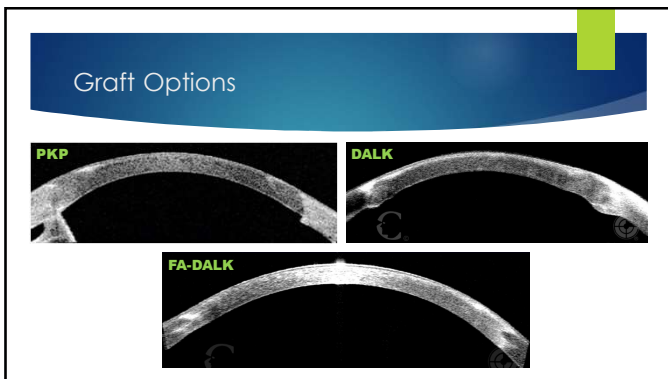


Mandatory Findings to Dx KCN

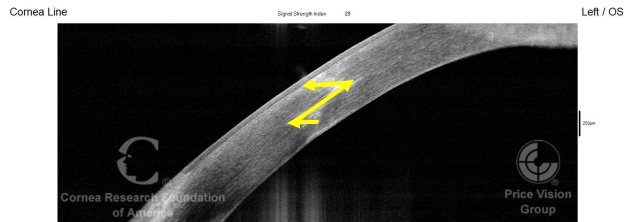
1. Abnormal posterior elevation
2. Abnormal corneal thickness distribution
3. Clinical noninflammatory corneal thinning

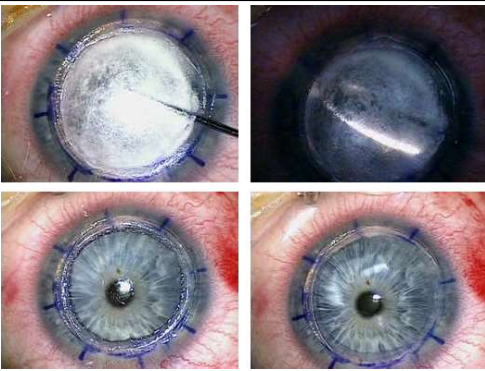






Zig Zag Cut





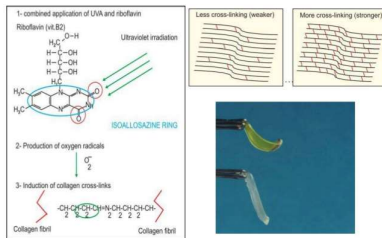
Dx of Ectasia Progression

- ▶ Need 2 of 3:
- ▶ Progressive steepening of anterior corneal surface
- ▶ Progression steepening of posterior corneal surface
- ▶ Progressive thinning and/or increased rate of thickness change from periphery to thinnest point
- ▶ **Change in vision is NOT required**

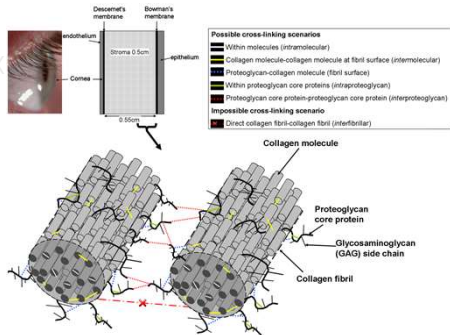
FDA Approvals

- **April 2016** Corneal crosslinking (CXL)
- **Sept 2013** Topography-guided excimer laser custom ablation treatment (TCAT)

CXL Mechanism of Action



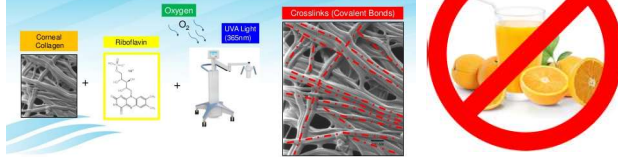
CXL



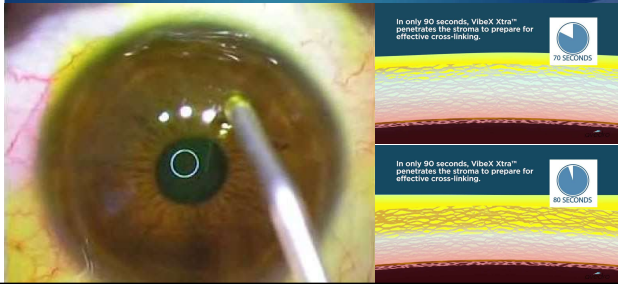
Oxygen and Antioxidants

Superior Outcomes with Oxygen

Oxygen is critical to the underlying photochemical kinetic mechanisms of crosslinking



Riboflavin 0.1%



UV-A 370 nm 3mW/cm² x 30 min





Goals & Efficacy

- ▶ **Halt progression** (99.6%, n = 717)
- ▶ $\Delta K_{max} -0.8 \pm 2.8$ D (flatter on average)
- ▶ $\Delta CDVA +0.07 \pm 0.1$ logMAR
- ▶ CDVA increased by 3+ lines in 10%

Risks

- ▶ Incomplete effect (treatment failure; 0.4%)
- ▶ Corneal haze/scarring (2.5%)
- ▶ Epitheliopathy (0.4%)
- ▶ Infectious keratitis (0.1%)
- ▶ Corneal decompensation (0%)

CXL Indications

- ▶ Progressive unstable KCN
- ▶ Post-LASIK ectasia
- ▶ Progressive marginal degeneration (e.g. PMD, Terrien)

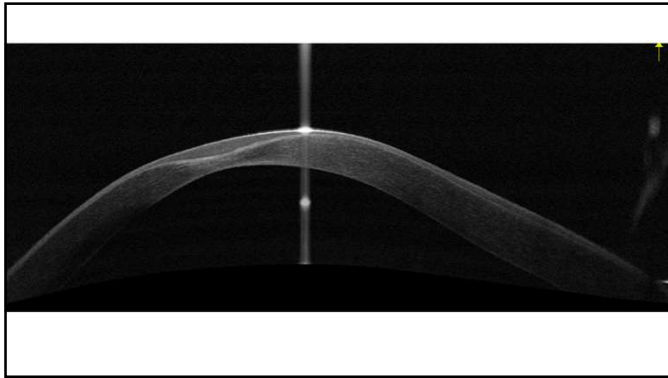
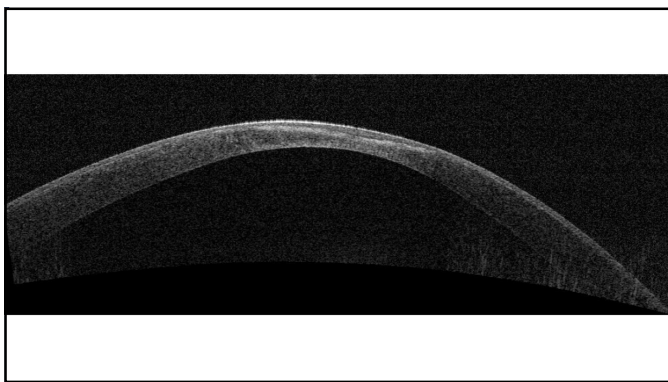
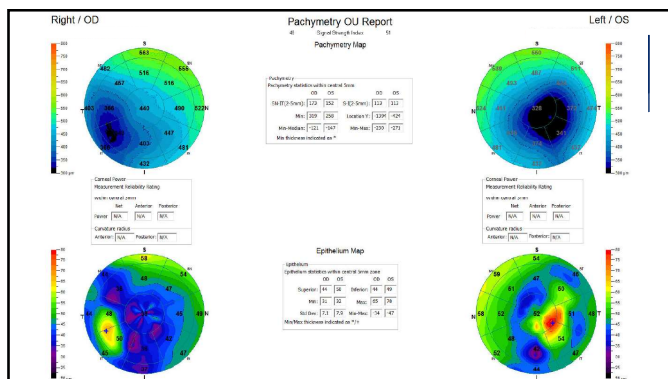
Burden of Proof (of Progression)*

- ▶ Age < 32 yo
- ▶ Progression over last 3 years: (clear lens, *consult payer)
 - ▶ ≥ 1 D Δ in K_s
 - ▶ ≥ 1 D Δ in cyl on MRx
 - ▶ ≥ 0.5 D myopic shift on MRx
 - ▶ \downarrow VA with \uparrow irreg astig on topo
- ▶ Progression over last 3 years: (w/ lens changes)
 - ▶ ≥ 1 D Δ in K_s

CXL Contraindications

- ▶ Thinnest pachymetry <400/330um*
- ▶ Prior herpetic keratitis
- ▶ Severe corneal scar/haze
- ▶ Poor epithelium/ocular surface
- ▶ Autoimmune disorders

* assuming epithelial thickness of 50 um

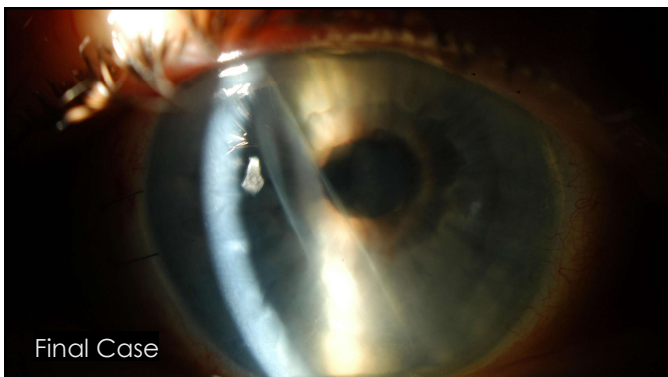
[illegible][illegible]

Controversies

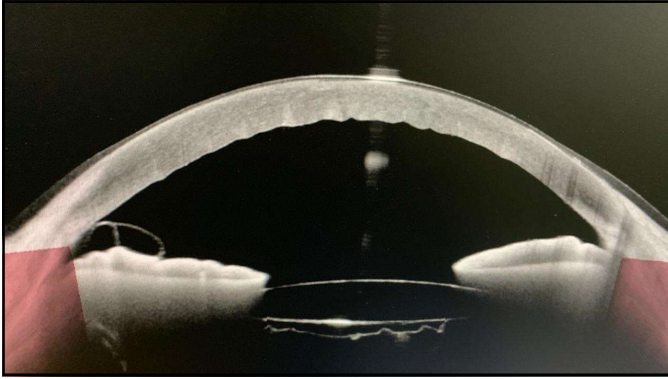
- ▶ Too good for CXL?

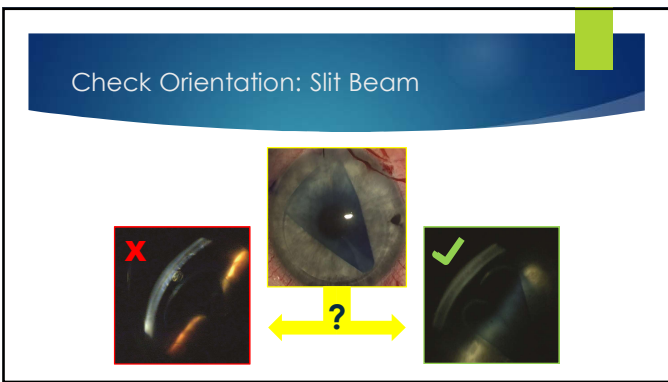
The Greek Experience

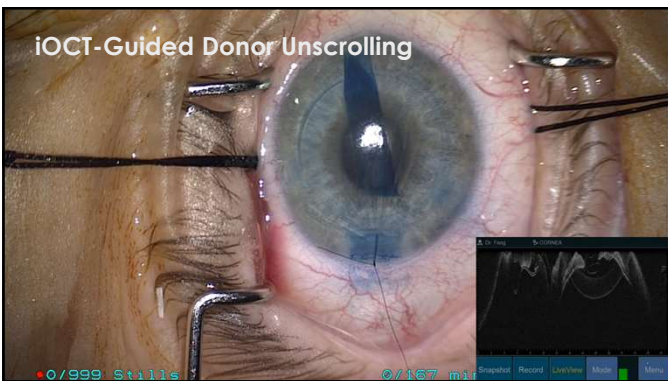
- ▶ CXL x ~20 yrs
- ▶ 80% HCL intolerant
- ▶ Needed surgery
- ▶ **>80% fewer PK/DALK over past 10-15 years**



Final Case







Summary: Top Three Takeaways

01

Topography can identify and localize areas of corneal surface irregularity warranting closer inspection as well as guide laser astigmatic treatments

02

B-scan is standard when posterior segment view is poor; similarly, consider anterior segment imaging when anterior segment view is poor

03

Tomography can inform treatment decisions and parameters and intraoperative OCT can reduce trips back to the OR

THANK YOU

mattfeng@pricevisiongroup.net

"Radical Possibilities" by Brinton Farrand
