Vaulting the Scleral Hurdle: Implementing Scleral Lenses into Your Practice

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Best Education for Patient Care and Business Management

OPTOMETRIC Management SYMPOSIUM

Disclosures

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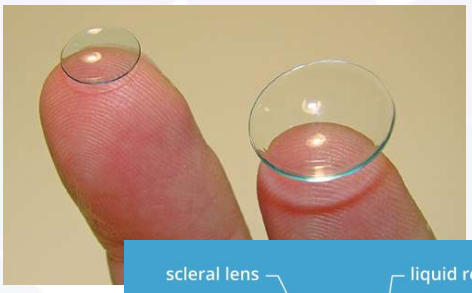
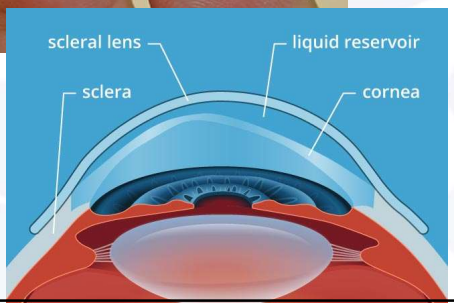
Objectives

- Basic introduction to scleral lens fitting
- Learn when to implement scleral lenses into your practice
- Troubleshooting common scleral lens fitting challenges
- How to overcome challenges with patients and staffing

Scleral lens basics

- Large diameter gas permeable lens
- Vaults the entire corneal surface
- Fluid reservoir covers the entire ocular surface
- Lands gently on the sclera





Common Conditions treated

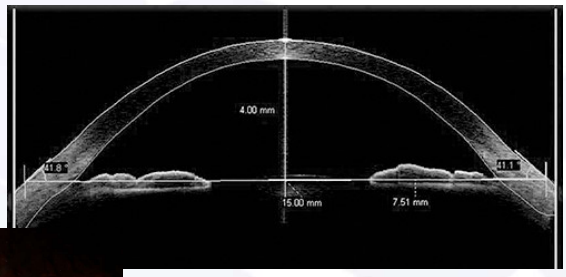
- Keratoconus
- Pellucid Marginal Degeneration
- Moderate to Severe Dry Eye
- Post-Graft
- Post-RK
- Post-LASIK Ectasia
- High Ametropia or Astigmatism
- Exposure Keratopathy
- Corneal Scarring

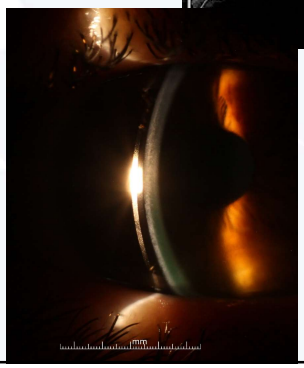
Scleral lens care

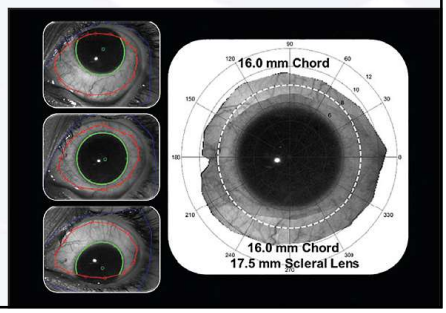
- Insertion
  - Using plunger or tripod method
  - Fill with sterile saline – Addipaks, Lacripure, ScleralFil, Nutrifil, Purilens
- Removal
  - Using small DMV device to remove
  - Apply to the edge of the lens, NOT the center
- Cleaning
  - Multipurpose GP solution
  - Hydrogen Perioxide based cleaners
    - PROSE case
- http://www.sclerallens.org/
  - Great I&R Video!

Basic fitting tools

- Utilize topography
  - Overall elevation and shape, K's, HVID
- Anterior Segment OCT
  - Identify sagittal depth
- Scleral Mapping Devices
  - sMAP 3D, Eaglet-Eye, Pentacam CSP
- Slit Lamp
  - Diagnostic Fit Set from labs







Starting the fit

- Choosing diameter
  - First look at HVID
  - What condition being treated
- Choosing Base Curve / Sagittal Depth
  - Look at K's
  - Measure sagittal depth with OCT
  - Fit set recommendations
- Utilize elevation maps on topographer to see expected pattern
  - Look for large differences in elevation between major meridians
- "Just Eyeball It"

Prolate or oblate?

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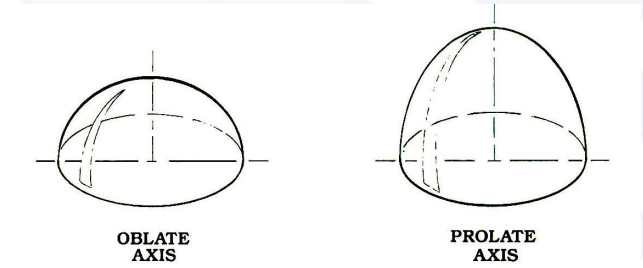
- Prolate
  - Designed for “normal” corneas, keratoconus, etc.
- Oblate
  - Designed with a reverse curve
  - Better for post-RK, post-graft, post-LASIK



Initial lens assessment

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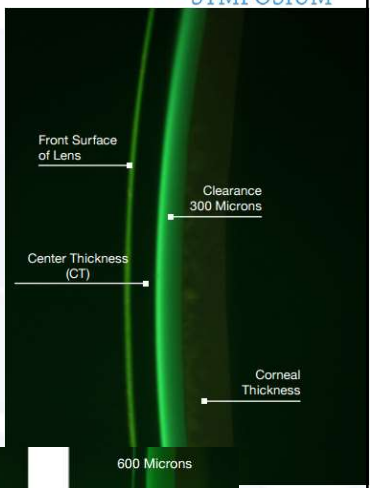
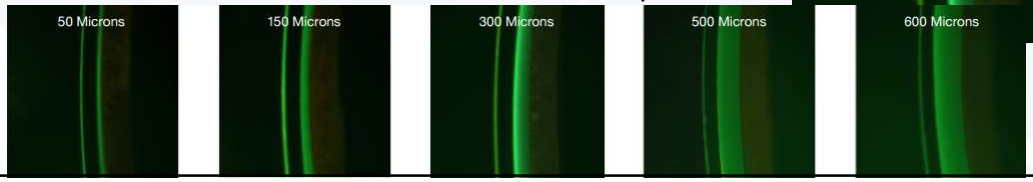
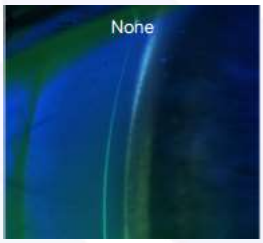
- Insert lens from fitting set with fluorescein
  - Look for insertion bubble with blue light
  - Wait 20-30 minutes to settle
- Central Vault
  - Check initial vault after insertion to see if you are in the ballpark
  - Want 250-350um initially after 20 minutes of settling
  - Expect to settle 100-150um through the day
- Move to the next lens if more or less vault is required

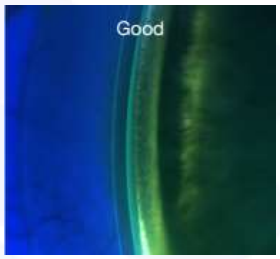


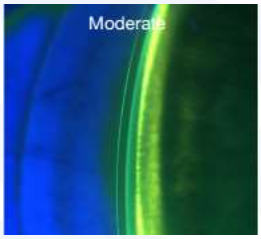


Limbal clearance

- Minimal limbal clearance
  - Fl should extend past the limbus
  - Goal ~50um
  - Protect the precious stem cells
  - Staining with occur if bearing is present
- Too much limbal clearance?
  - Will cause corneal hypoxia if too much vault is present
  - Also can cause issues with conjunctival prolapse

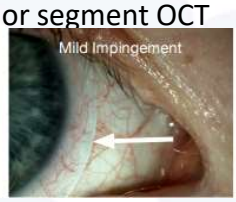


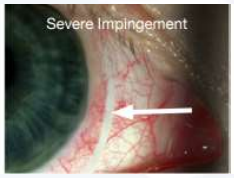


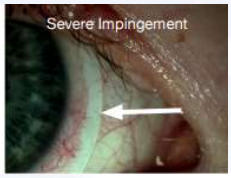


Scleral landing zone

- Want good edge alignment without vessel blanching or edge lift
- Lens should NOT move with the blink, but should be able to “spin” the lens after settled
- Goal = very minimal tear exchange
  - Too much = lens fogging
- Scleral Toricity?
  - Back surface toric or quadrant specific landing zones available – most fit sets have toric back surfaces incorporated already
  - Check with slit lamp or anterior segment OCT

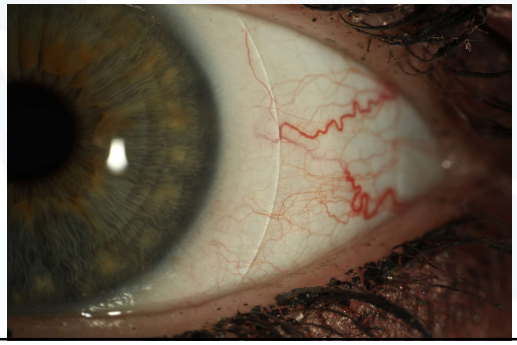


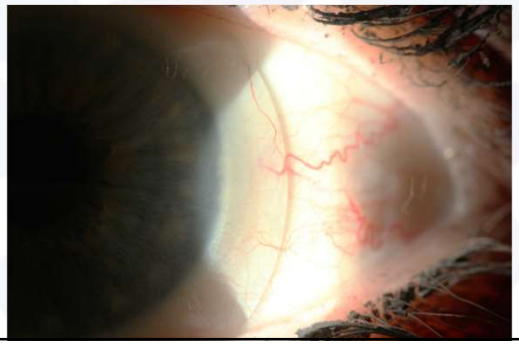




Scleral landing zone

- Edge lift can be misleading and difficult to find
- Make sure to use an angled light source (~45 degrees)
- Ask patients if they have lens awareness to pinpoint
- Edge lift can cause fogging of the tear reservoir and reduced VA throughout the day



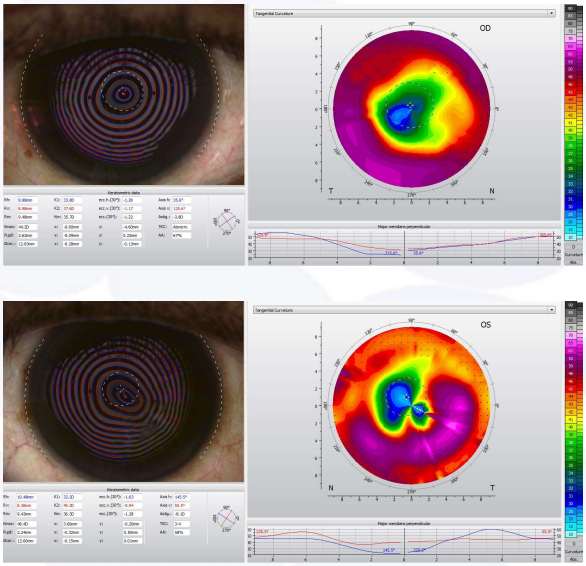


Rapid fire mini-case series

Cases seen in a typical primary care private practice

Post-RK ectasia

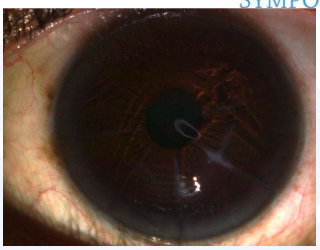
- 52 YO African American Male presents for blurry vision OS – add on "emergency visit"
- Hx of RK surgery, currently wearing glasses only
- Refraction:
  - OD: +2.25 -1.25 x 020 VA 20/25
  - OS: +3.25 -3.50 x 125 VA 20/60
- After topography patient was diagnosed with corneal ectasia OS>>OD
  - In the past was told his vision just fluctuated due to RK and only offered glasses
- Educated and told to return for a scleral lens fitting

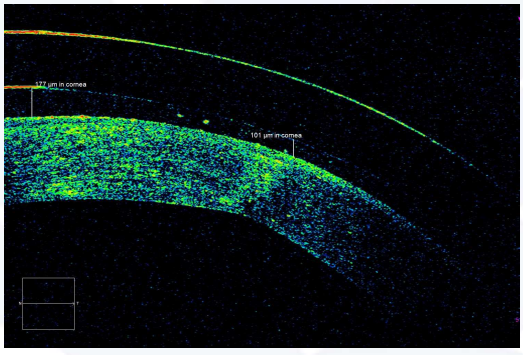


Post-rk ectasia

- Final Lens with clear, stable vision:
  - OD: Base Curve 8.65mm (3400um sag) Diameter 15.5mm 150um Toric Periphery
    Rx: -3.25 with 2.00 ADD
  - OD: Base curve 8.65mm (3500um sag) Diameter 15.5mm 150um Toric Periphery
    Rx: -4.25 with 2.00 ADD

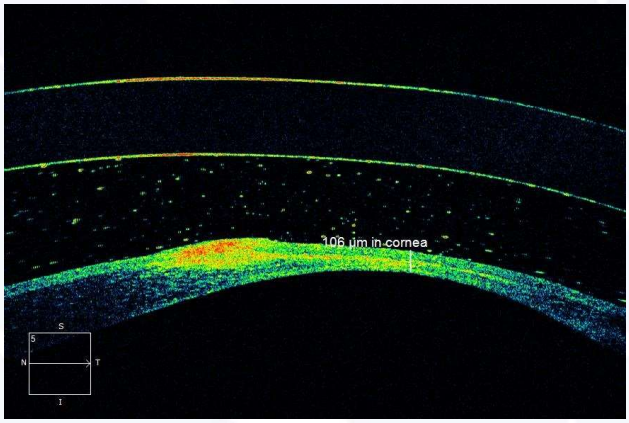
VA: 20/20 OU distance and 20/25 near





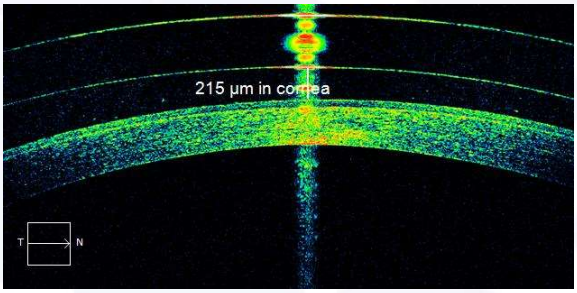
Severe Keratoconus

- 38 YO Keratoconic African American Male
- Presents for Routine Contact Lens Exam
- Current lenses:
  - OD: Spherical soft lens -6.50 VA 20/30—
  - OS: unable to refract / no lens VA CF@3ft
    - Also unable to obtain topography – maxed out
- Significant corneal scarring noted OS>OD
  - Likely past hydrops OS
- Previously told nothing could help his left eye, referred by area doctor, however did not have records, vaguely recalls something about keratoconus diagnosis



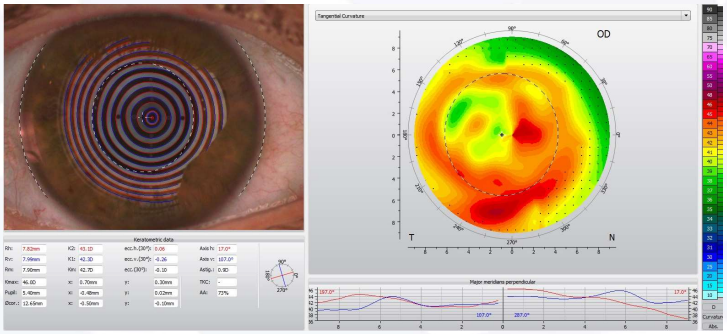
Severe keratoconus

- Final lens
  - OD: Base Curve 7.6mm 16.0 mm diameter, 4500 sag, -+100 limbal clearance, Steep 1 / Flat 3 periphery
  - OS: Base Curve 6.06mm, 16.0mm diameter, 5300 sag, -300 limbal clearance, Standard / Flat 3 periphery
  - BCVA 20/25 OD and 20/60++ OS
  - Depth perception for the first time in years!



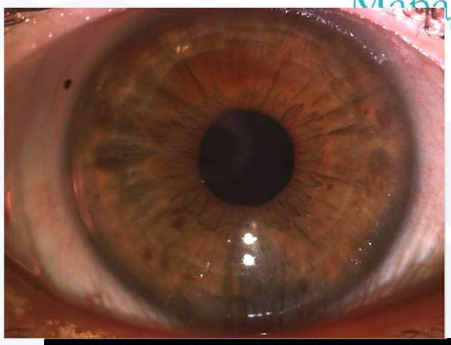
Central HSV Scarring

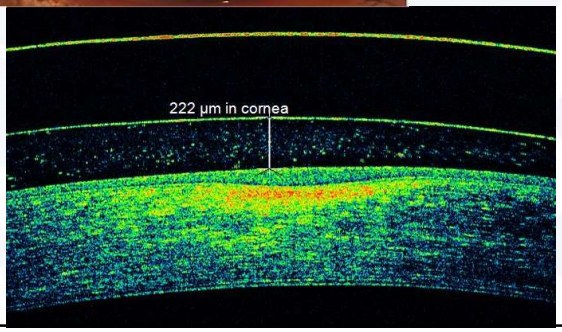
- 59 YO Caucasian Female
- Presents for comprehensive exam
- Currently wearing spectacles to correct astigmatism secondary to central scarring
  - Managed by local OMD for HSV flare ups over the past few years
- Spectacle Rx:
  - OD: +2.25 -1.50 x 100 20/40-
  - OS: +0.25 -0.50 x 090 20/20
- Has never considered a specialty contact for irregular astigmatism



Central HSV scarring

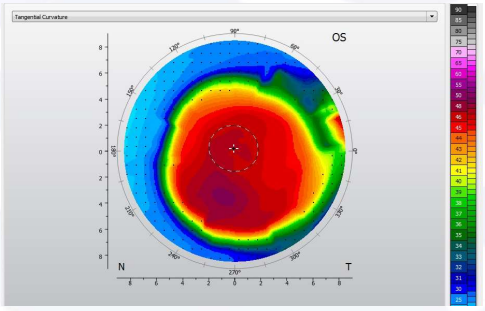
- Final lens ordered
  - OD: Base Curve 7.3mm, 3800um SAG, 17.0mm Diameter, +200 limbal clearance, Standard / Steep 9 periphery
  - BCVA 20/25++
- Only needs to wear reading glasses as needed for near or PAL over contact
- Feels she has significantly less glare at night
- OMD started referring more scleral cases after her success!





Multifocal scleral with vertical prism

- 50 YO Keratoconic Caucasian Male
- Currently wearing multifocal hybrid lenses to treat mild keratoconus
- Also has history of strabismus surgery as a child
  - Remaining OS hypertropia – causes fatigue and eye strain at work with current contact lenses
  - Comfortable vision with 1.5 BD OD in glasses
- Demanding job where he needs to read small font patents at work



Multifocal scleral with prism

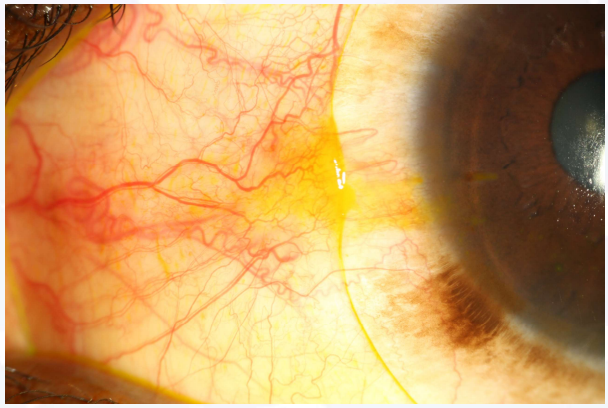
- Final lenses:
  - OD: 7.85 Base Curve, 14.8mm diameter +0.75 DS with 2.00D ADD 1.5 pd BD
  - OS: 7.50 Base Curve, 14.8mm diameter -4.50 DS with 2.00N ADD
  - VA 20/20 distance and 20/20 near with more comfortable vision

Common Troubleshooting with Scleral Lenses

Case Series

Keratoconus

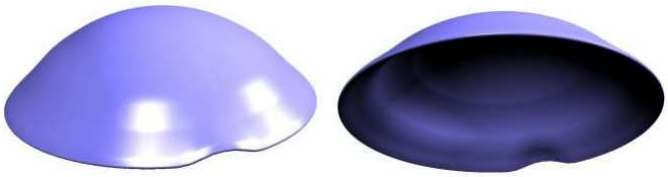
- 39 YO Keratoconic African American Male
- Presents with complaint of redness and discomfort OS with current lenses
- Also experiencing mid-day fogging
- Spec Rx:
  - OD: -14.50 -3.00 x 180 VA 20/30
  - OS: -15.50 -2.00 x 005 VA 20/200-
- Current lenses:
  - OD: BC 8.71mm Diameter 16.5mm with nasal notch
    - Rx: +0.50 -0.75 x 180 VA 20/20
  - OS: BC 7.85mm Diameter 16.1mm showing impingement nasally
    - Rx: -4.50 -1.75 x 100 VA 20/30-



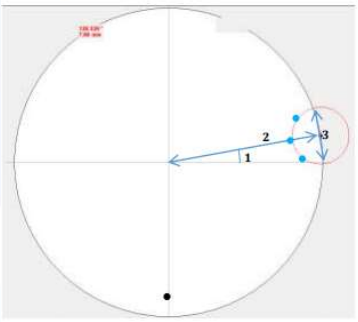
Common problem presented

- Conjunctival/Scleral abnormality!
  - Ex. bleb or pinguecula
- Can either lead to redness and irritation or fogging
- Utilize quadrant specific lens design, notching, or microvault
- Also consider smaller diameter lens depending on location of abnormality
- With previous patient, added a microvault to the lens and the patient was happy and comfortable
  - Vision improved to 20/20- due to less lens fogging

Microvault



Defining the MicroVault Prescription

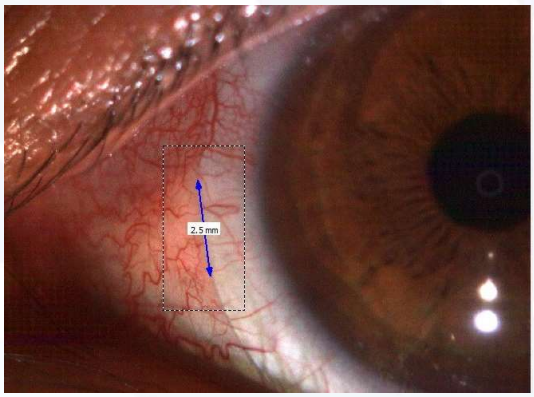


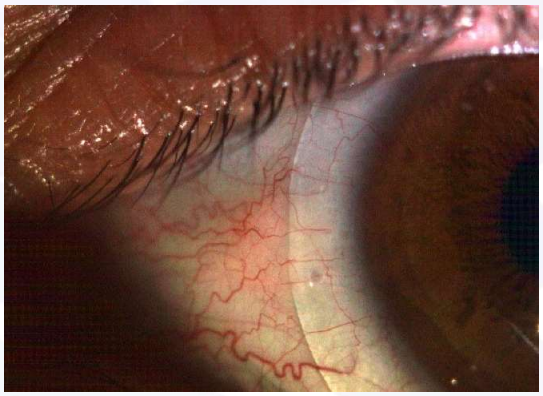
1-Axis	The optical axis location of the center of the MicroVault relative to the center of the Zenlens, presumably close to 0° or 180° depending on which eye is being fit and whether MV is to be nasal or temporal. May depend on the axis and orientation of the Toric PCs
2-Decentration	Distance from the center of the Zenlens to the center of the MicroVault. If you want the maximum clearance point of MicroVault to be right at the lens edge, this will be half the lens diameter, i.e. decentration of 8 mm on a 16 mm Zenlens or 8.5 mm on a 17 mm lens.
3-Width	Equal to the width of the MicroVault.
4-Depth	The Sagittal Depth of the MicroVault—how high the apex of the vault is above the ocular surface (up to 500 microns).

The example above: Axis 10°, Decentration 8mm, and Width 3mm
3 Drilled Dots (shown in blue) help identify the position of the MicroVault; 1 point at the apex, and 2 points 45° from apex
1 Drilled Dot (black) at 270 base, blackened, for easier patient insertion

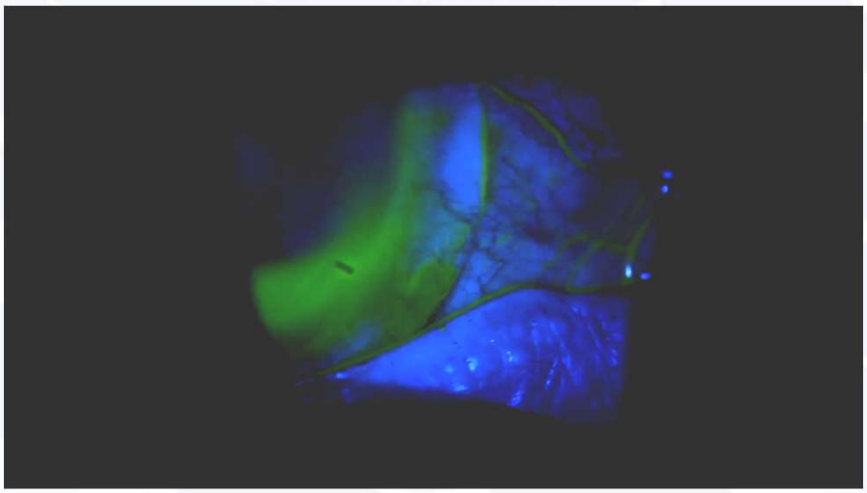
Measure with Anterior Segment Camera, Slit Lamp, Scleral Topography

Microvault – Close Up



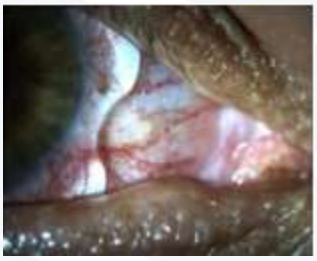


Microvault



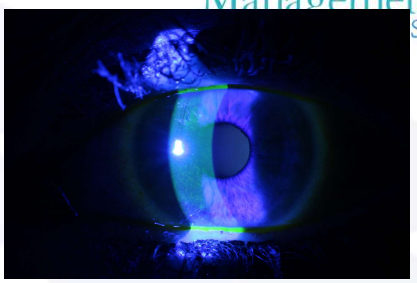
Notching

Before and after notching



Keratoconjunctivitis sicca

- 53 YO Caucasian Female
- Presents for scleral lens fitting due to severe MGD and dry eye
- Current treatment not relieving symptoms of dryness, Hx of corneal erosion
- Trial lenses ordered:
  - OD: 4000um SAG, 14.8mm Diameter, APS Steep 2
  - OS: 4000um SAG, 14.8mm Diameter, APS Steep 2
- However, patient is experiencing cloudy vision and the lens appears to be moving on the eye



Common problem #1 presented

- Post-lens tear reservoir fogging!
- Source: Tear exchange aka edges are too flat or misaligned
  - Typically will be superior
- Consider using toric peripheral curves or bielevation design for better alignment
- Adding a drop or two of celluvisc to bowl of the lens

How to identify source of fogging

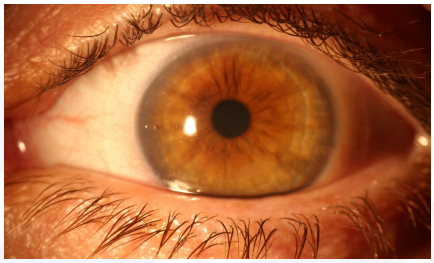
Common problem #2 presented

- After lens edge was properly aligned and fogging eliminated, patient was still experiencing fluctuating vision within minutes
- Surface not wetting properly!
- Inquire about makeup use, lotions, etc.
- Treat MGD as best as possible
- Tangible Hydra-PEG coating

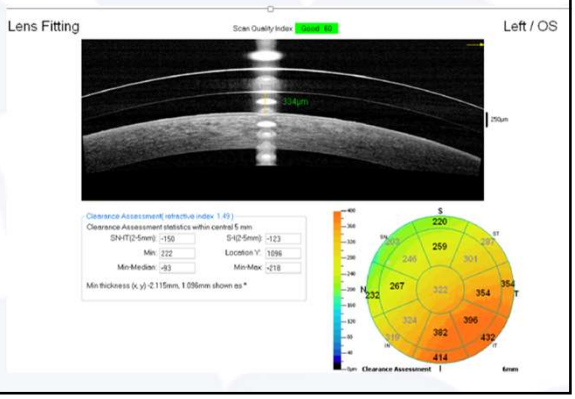
Tangible Hydra-PEG

- Water polymer coating that is permanently bonded to the surface of the contact lens.
- Shown to improve wettability, increase surface water retention and lubricity, and minimize deposits on lenses
- Applied to all contact lens materials including:
  - hydrogel, silicone hydrogel, gas permeable, hybrid

Exposure keratopathy



- 46 YO Caucasian Male, recently in motorcycle accident
- Experienced TBI partially paralyzing his arm and face including corneal neuropathy, OS
- Presents for scleral lens fitting to protect the surface since he does not want any more reconstructive surgeries
- VA (sc): OD: 20/20- OS: 20/400- PH 20/100-
- OS shows significant 3+ diffuse SPK even with frequent AT's and ointment q1h
- Trial Lens:
  - OS: 4350um SAG, 16.0mm Diameter, Standard/Steep 4 edge, Rx: -1.75D
    - VA: 20/20-
- However, patient experienced difficulty with insertion due to partial paralysis and scleral lens moving into superior fornix upon insertion



Common problem presented

- Insertion Difficulty
  - Can be due to previous TBI, Bell's reflex, Neuropathy
- Utilize stand inserters or lighted inserters
- Ring inserter
- Have a caregiver insert and remove the lens

Fitting troubleshooting pearls

- High Rx Over-Refractions
  - Patient may need a flatter base curve
  - Use a -10.00 DailiesTotal1 lens over scleral when over-refracting for a more accurate finding
  - DO RETINOSCOPY
- Wettability
  - Treat MGD!
  - Clean all new trial sets with Boston Cleaner and rinse with saline like Biotrue
  - Squeegee Method
- Contact Lens Overwear
  - Patient compliance is a MUST!
- Verify cleaning and insertion/removal techniques when something doesn't seem right
  - May be using the wrong cleaners, saline. May be inserting or removing too aggressively

Do's and Don't of Scleral Lens Implementation

Implementing scleral lenses into practice

- Equipment needed:
  - Topographer – Utilize ALL maps available – DO NOT FORGET ELEVATION MAPS
  - Slit Lamp
  - I&R plungers, non-preserved saline, fluorescein
- Optional, but helpful
  - Anterior Segment OCT
  - Scleral Topographer

What not to do when starting a specialty practice

- Losing patients to follow-ups >90 days
  - Implement specialty lens contract
  - Set up a system to track lenses and warranties to remind patients
- Not making patients aware of retail lens costs when completely covered
  - Insurance only covers lenses once per year, if lost the patient must pay for replacement!
- No knowing insurance reimbursements
  - Be educated on expected reimbursements and billing/coding for specialty lenses!
  - Medical insurance will RARELY cover materials of lenses, contrary to what they say
- Patients not returning previous lenses during remake period
  - This can create confusion at home not knowing which lens is the best fit
- Referral offices using benefits on glasses / contacts

Choosing the right fit set

- Work with a lab you have a good relationship with
  - Good remake policy
  - Lens that is easy to use for beginners and still offers options for advanced cases you might have
- Many will offer in office or virtual training

Staff training

- Many companies will send out reps to help train staff
  - I&R training
  - Webinars on billing and coding
  - In office workshops fitting patients in your own practice
- Educate staff on lens options, cost, follow-up protocol, etc.
  - Sclerals will take more chair time for follow-up visits than a typical soft lens fitting!
  - Never promise lenses will be “completely covered/free” – need contract
  - Make sure front desk knows you are fitting scleral lenses if patients call to inquire
- If staff is excited, patients are excited!
  - Scleral lens patients are now my staffs’ favorite patients!

Recruiting patients

- Recruit from your own patient base
  - Many of my patients walked in the door for their “annual” exam
- Begin with high ametropia or mild keratoconus
  - Easier to fit and likely already current patients
- Promote yourself to local OMD’s / OD’s at local dinners
  - Many are unaware of this new technology or who in the area is offering it
- Scleral lenses are a growing market that can set yourself apart
  - Create your own niche market and patients will find you
- Add scleral lenses to your website as a service you offer

Questions?