Scleral Lens Basics

Wet Lab: Introduction to Scleral Lens Fitting

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Disclosures

- Dr. Harthan speaks, consults and/or does research for:
  - Allergan
  - Contamac
  - Metro
  - Shire
  - SynergEyes
  - Tangible Science

Scleral Lens Fitting

- Geometry of the lens can be broken down into three zones:
  - The optical zone
    - Base curve minimal influence of the overall fit
  - The transition zone
    - Compensates and equilibrates other parameters
  - The landing zone
    - 3-5 curves aiming to vault over the limbus and land softly and evenly on the conjunctiva

Sclerals: Basic Principle

Completely vault the cornea and limbus while aligning to the bulbar conjunctiva

How do sclerals work?

- Corneal clearance - no corneal bearing
- Limbal clearance
- Tear reservoir between lens and eye
- Scleral bearing
  - Fit is based on sagittal height of eye
  - More than corneal curvature
- Final lens depends on:
  - Corneal elevation
  - Sagittal depth of eye at point of bearing on the sclera

Elevation vs Sagittal Height

1. Corneal apex is not always the most elevated point of the cornea
2. Keratoconus apex is not always the highest area of the cornea
3. Scleral lens should vault over the entire cornea, including the highest point (NO BEARING)
**Patient Expectations and Education**

- Advantages of sclerals:
  - Vision: similar or enhanced vs corneal GP lenses
  - Lens stability
  - No lens ejection
  - Comfortable
  - Improvement in dryness
  - Protection

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**Candidates**

**Uncomplicated Refractive Error**
- Irregular Corneas
  - Post-Hydrops
  - Keratoconus
  - Very uneven grafts
  - Post-LASIK and refractive surgery
  - Allows: increased wearing time, reduces corneal staining, improves VA

**Damaged or Diseased Ocular Surface**
- Stevens-Johnson Syndrome
- Sjogren’s Syndrome
- Graft Versus-Host Disease
- Instrumental in reducing further damage
- Serves as a tear reservoir to allow corneal healing and improved vision

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**Fitting Approach Overview**

1. Sagittal Depth Selection
2. Prepare Lens & Insert
3. Evaluate Lens Fit
   a. Central Clearance
   b. Limbal Clearance
   c. Edge Landing
   d. Spin Test
4. Determine Lens Power
5. Configure Add Power Option

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**OAD Selection**

- TD = HVID + limbal zone width x 2 + landing zone width x 2 + last peripheral zone width x 2
- Minimum = 3-4mm larger than HVID

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**Corneal Sagittal Height Evaluation**

- Direct observation
- OCT
- Topographic maps
- Eye profiler/3D mapping
- Quadrant specific and overall sag evaluation

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**Lens Evaluation**

**Central Clearance**
- An ideal fit will have a 1:1 fitting relationship.
- 150-250 microns of clearance
- Center thickness = 0.28-0.38
- Increased thickness for high plus lenses

**Limbal Clearance**
- An ideal fit will have slightly less clearance than observed centrally.
- 50-80 microns of clearance
- Should be observed in 5 directions of gaze
**Limbus**

- The limbus must be cleared
- Compression at the limbus could damage delicate stem cells
- Observe with optic section and fluorescein
  - Optic Section
  - Should be able to perceive clearance
  - Overall
  - Fluorescein should obscure pattern
- Observe with OCT

**Lens Evaluation**

**Edge Alignment**

- An ideal fit will land evenly on the sclera, not having any stand off or blood vessel blanching in the full circumference of the lens.
- An uneven fit may require a toric periphery.
  - Document clock hour position and severity.
  - Consultation

**Well-Fitting Scleral Lens**

**Lens Settling**

- Lenses settle 50-150 microns
- Varies with the "softness" of the conjunctiva
- Importance of follow-up visits with lenses on for 2 hours minimum

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Insertion Fluid = Non-Preserved!

**Tangible Hydra-PEG™: Patient Selection**
- May be used by any patient
- No contraindications
- Patients who may benefit the most:
  - Those experiencing dryness or discomfort associated with lens wear
  - Moderate to heavy depositors
  - Scleral lens wearers experiencing fogging

**Tangible Hydra-PEG™: Patient Education**
- Clean daily with a multi-purpose or peroxide based solution
- Avoid tap water
- Avoid abrasive or alcohol-based solutions
- May last permanently but it is variable
  - Shorter duration of effectiveness for heavy depositors or patients with lagophthalmos.
- Coated lenses require no changes to the fitting regime
- Educate patients that the Tangible Hydra-PEG surface will result in a more "slippery" lens.
- May require a brief adjustment period for handling, inserting and removing the lens.

**Care Systems**

**Scleral Lens Application**

**Scleral Lens Care Kits Available!**
Scleral Lens Removal

• Use one hand to push gently with the lid on the edge of the scleral lens to break the suction

• Apply suction cup just below line of sight

Scleral Lens Follow-up

- Patient dependent
- 2 weeks for every curvature change
- 1 month after “finalized” fit
- 6 months for first time wearers
- Re-evaluation every year

Hands-On Lens Application

1. Choose appropriate diagnostic lens from the available sets.
2. Apply the lens
   a. Fill the bowl with sterile non-preserved saline
   b. Swirl a NaFl strip in the bowl
   c. Have patient lean forward and tuck in their chin.
   d. Utilizing a suction cup, elastic band, or multiple fingers, apply the lens directly to the center of the cornea without tipping the lens
   e. Make sure the patient has adequate tissue or paper towel

Lens Evaluation

1. Evaluate the lenses
   a. Look at the overall with cobalt blue light and wratten filter or with blue flash light
   b. Make sure there is fluorescein throughout
   c. Use an optic section
   d. Compare clearance to lens thickness
   e. Evaluate the limbus; make sure you see green
   f. Evaluate the conjunctiva
   g. Should look like a well fit soft lens
   h. Movement: Should be minimal to up to 0.5mm

4. Repeat on contralateral eye with a different lens design
Case Discussion

Questions?

Thank you!
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