

Scleral Lens Troubleshooting

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Outline

- I. Mid-peripheral bearing (4 minutes)
 - a. Problematic because:
 - i. Discomfort with long-term lens wear
 - ii. Especially if in one quadrant only
 - iii. Corneal staining /erosion
 - iv. Unknown impact on ocular physiology
 - v. Difficulty with lens removal
 - b. Strategies:
 - i. Design a true scleral lens
 - ii. Look for lens decentration
 - iii. Modify mid-peripheral curves
 - iv. Consider the use of a reverse geometry / oblate design
 - v. Flatten BCR and steepen midperipheral or limbal curves
 - vi. Increase the size of the lens (if possible)
 - vii. Larger optic zone and overall diameter
- II. Conjunctival compression (4 minutes)
 - a. Observation: Blanching or tightness in one or more quadrants
 - i. Spherical scleral lens on a toric conjunctival surface
 - ii. Haptic landing is steeper than sclera
 - iii. Scleral lens OAD is too small
 - b. Strategy:
 - i. Depends on the location of blanching
- III. Edge impingement (4 minutes)
 - a. Observation: Lens edge pinches into conjunctival tissue
 - b. Conjunctival tissue rolls over onto lens
 - c. Etiology
 - i. Peripheral curve (PC4) is much too steep
 - ii. Conjunctival elevation interacting with lens
 - d. Strategies
 - i. Flatten last peripheral curve
 - ii. Elevation: smaller OAD, vault, or notch
- IV. Edge Lift (4 minutes)
 - a. Observation: Small gap between lens edge and conjunctival tissue
 - b. Etiology
 - i. Peripheral curve (PC4) is too flat
 - ii. Spherical scleral lens on toric sclera
 - iii. OAD is too small
 - c. Strategies
 - i. Steepen PC4

- ii. Utilize toric peripheral haptics
 - iii. Increase sag: steeper BCR/larger OAD
- V. Tight lens syndrome (5 minutes)
 - a. Observations:
 - i. Good initial lens comfort
 - ii. Discomfort after 4-6 hours of lens wear
 - iii. Difficulty removing lens
 - b. Etiology
 - i. Boggy conjunctiva- lens settles more and becomes tight
 - ii. Excessive central clearance
 - iii. Lens haptic does not match conjunctival shape
 - iv. Landing zone too tight
 - c. Strategies
 - i. Widen landing curves
 - ii. Reduce central clearance
 - iii. Improve haptic alignment
- VI. Reservoir debris (5 minutes)
 - a. Fogging is when debris accumulates between the scleral lens and cornea
 - b. Potential impact
 - c. Affects visual acuity
 - d. Affects convenience – lens removal /reinsertion multiple times per day
 - e. Potential causes of scleral lens fogging
 - f. Types of debris
 - i. Mucin
 - ii. Atopic
 - iii. Meibomian
 - g. Debris management
- VII. Lens decentration (3 minutes)
 - a. Observations
 - b. Etiology
 - c. Physiologic impact
 - d. Optical effects
 - e. Management strategies
- VIII. Hypoxia (4 minutes)
 - a. Observations
 - b. Etiology
 - c. Strategies:
 - i. Optimize lens vault < 200 μm
 - ii. Optimize lens thickness < 250 μm
 - iii. Optimize material: DK > 100
 - iv. Optimize edge alignment
 - v. Decrease wear time
 - vi. Topical hyperosmotics may help
- IX. Poor surface wettability (4 minutes)
 - a. Observations:
 - b. Deposits noted on front surface
 - c. Patient complains of dryness or intermittent blurred vision
 - d. Removing and cleaning lenses help

- e. Etiology
- f. Scleral lens degradation
- X. Scleral lens materials (5 minutes)
 - a. Plasma treatment
 - b. Tangible Hydra-PEG
 - c. Solutions
- XI. Epithelial bogging (2 minutes)
 - a. Observation
 - i. Scattered areas of water-logged epithelium that stains negatively
 - ii. Occurs after 10-12 hrs of wear time
 - iii. Asymptomatic, does not affect visual acuity
 - b. Etiology
 - i. Similar to skin wrinkling when in water for extensive period
 - ii. Electrolyte imbalance or altered homeostasis causes cells to swell
 - iii. Strategies
- XII. Conjunctival prolapse (2 minutes)
 - a. Observation
 - b. Etiology
 - c. Management strategies
- XIII. Localized staining (4 minutes)
 - a. Location
 - b. Etiology
 - i. Preservative toxicity exposure
 - ii. Lens over wear / abuse
- XIV. Scleral topography (4 minutes)
 - a. Eaglet-Eye ESP (Eye Surface Profiler)
 - b. sMap3D
 - c. Pentacam corneal scleral profile (CSP)
- XV. Impression based scleral lens technology (3 minutes)
 - a. EyePrint Pro
 - b. Indications
 - c. Quality of good impressions