

Title: Don't Leave Me in Isolation! Scleral Lens Integration in Ocular Surface Disease Management
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Course Description: Scleral lenses cannot be fit or prescribed in isolation. For patients with ocular surface disease, many treatment modalities are often needed. Optometrists need to understand how scleral lenses fit into management for dry eyes and how to titrate other therapies accordingly.

Outline:

1. Overview of Scleral Lens (SL) Indications: Irregular cornea vs Ocular Surface Disease (OSD)
 - a. Focus on Specific OSD Conditions that benefit from SLs
 - i. Systemic conditions: Sjogrens syndrome, Graft versus Host Disease, Autoimmune conditions- Lupus, RA; Stevens Johnson Syndrome
 - ii. Eyelid Exposure: Acoustic Neuroma, Bell's Palsy, Trauma, Eyelid cancer
 - iii. LSCD: Chronic SCL wear, s/p radiation
 - iv. Neurotrophic Keratitis: HZV, HSV, Persistent Epithelial Defects
 - v. Dry eyes s/p surgery: RK, LASIK, Corneal transplant
 - b. Review general dry eye treatments
 - i. Education, lid hygiene, environmental modifications
 - ii. Topical lubrication, prescription medications, oral meds, plugs
 - iii. Meibomian gland expression, IPL, BSCL, lid alteration
 - c. Tear Film and Ocular Surface Society (TFOS) Dry Eye Workshop (DEWS) II, July 2017
 - i. Emphasizes that dry eye is a disease, with multiple etiologies, but with common aspect of a loss of tear film homeostasis
 - ii. Point at which scleral lens wear may be indicated: stage 3 (out of 4)
 - d. Importance to understand role of multiple treatment modalities together
 - i. Order consideration for treatment modalities
 - ii. When to start and stop specific therapies
 - e. Scleral lenses cannot be prescribed in isolation for OSD
 - i. Initial evaluations must include in-office, lens-on-eye consultation and feedback
 - ii. Must consider all past treatments and contact lenses tried
 - iii. Must consider tear film quality and effect of lens on conjunctival and lids
 - iv. Not fitting just the "eye shape" in OSD, be cautious with empirical fitting
2. Case Examples
 - a. Graft Versus Host Disease (1)
 - i. 50s F, referred for DES eval, 2017
 - ii. Hx AML s/p BMT and mild DES OU, low OSDI score
 - iii. Prescribed PF 1% 2 gtts OU q4hrs/steroid cream by hematologist
 - iv. Need to collaborate with referring providers, education on proper initial therapy
 - v. Developed steroid response and subsequent glaucoma, addressed and treated
 - vi. Treated DES with: lifitegrast, topical drops, environment, lid hygiene, later switch to cyclosporine A
 - vii. No scleral lenses needed, even years later
 - viii. Decreased VA due to PSC cataracts, due to chronic oral prednisone use
 - b. Graft Versus Host Disease with Microbial Keratitis and Descemetocoele Development (2)

- i. 60s M, treated successfully with SLs since 2013
 - 1. Past and concurrent OHx: Tears, lifitegrast, IPL, serum tears
 - 2. Past MHx: various immunosuppressants, photophoresis
 - ii. Developed corneal ulcer in 2017 which led to descemetocoele
 - 1. Role of scleral lens wear during corneal ulceration
 - iii. Discussion: Xu M, Randleman JB, Chiu GB. Long-Term Descemetocoele Management With Prosthetic Replacement of the Ocular Surface Ecosystem (PROSE) Treatment. Eye Contact Lens. 2020 Mar;46(2):e7-e10.
 - iv. Discussion: Gelles JD, Bekerman VP, Greenstein SA, Shafiq M, Hersh PS. Descemetocoele Management With Therapeutic Scleral Lens Wear. Eye Contact Lens. 2020 Dec 1.
 - v. Updates on patient condition in current state 2022
 - 1. Management with ophthalmology and hematology
 - 2. Initiation of oral therapy for corneal ulceration
 - vi. Discussion: How thin of a cornea can you fit safely in scleral lens? When is lens wear helping vs hurting?
- c. Stevens-Johnson Syndrome
 - i. 30s M, secondary to acetaminophen
 - ii. Presented with scleral lens wear OU already, 2018
 - iii. POHx: Tears, Serum tears, erythromycin ung, cyclosporine A drops
 - iv. Continued surface keratinization and inflammation
 - 1. Intervention with topical steroids, antibiotics
 - a. Developed steroid response
 - v. In addition to challenges with mucus, mid-day fogging, also has symblepharon and K scarring
 - vi. Developed PED in OD, management with ophthalmologist
 - vii. Discussion: Need to anticipate challenges with SJS, monitor frequently
 - 1. Refer to vision rehabilitation provider
- d. Limbal Stem Cell Deficiency (1)
 - i. 60s F, wearing SLs since 2013
 - ii. OHx: DES, LASIK ectasia
 - iii. MHx: Graves, hyperthyroid
 - 1. Presented with LSCD OS
 - 2. Documentation with photos over many years
 - a. Epithelial changes stable with SL daily wear x many years
 - iv. Discussion: Role of SLs in LSCD and literature review
 - 1. Changes in the corneal thickness and limbus after 1 year of scleral contact lens use. Eye (Lond). 2020 Sep;34(9):1654-1661. Epub 2019 Dec 10. PMID: 31822857
 - a. Suggested no LSCD after 1 year SL wear
 - 2. Limbal stem cell disease: management with scleral lenses. Clin Exp Optom. 2011 Nov;94(6):592-4. Epub 2011 Apr 25. PMID: 21517973
 - 3. Global Consensus on the Management of Limbal Stem Cell Deficiency. Cornea. 2020 Oct;39(10):1291-1302. PMID: 32639314

- a. Use of a scleral lens is considered essential before surgical treatment of LSCD
 - 4. Clinical outcomes and complications of fluid-filled scleral lens devices for the management of limbal stem cell deficiency. Cont Lens Anterior Eye. 2021
 - a. Worsening of the ocular surface might be a result of limbal hypoxia
- e. Limbal Stem Cell Deficiency (2)
 - i. 60s F, SL fitting since 2012, good comfort and VA
 - ii. OHx: Epithelial debridement OU, multiple times
 - iii. Past treatments: Muro 128, Tears, Punctal plugs, serum tears, amniotic membrane drops, topical steroids, ung, lid hygiene
 - iv. Due to flux in epithelial changes, decided to take break from SL wear
 - 1. Concern about limbal pressure and hypoxia
 - 2. No SL wear x almost 2 years
 - a. Epithelial changes worsened after break
 - v. Discussion: Can SL wear be harmful in LSCD? Need to consider Pros and Cons, QOL with improved vision vs corneal compromise
- f. Dry Eyes after PK secondary to Fuch's dystrophy
 - i. 60s F, very compliant patient
 - ii. s/p PK OU at different times; Wearing different scleral lenses in each eye from start, Fit OS 2014, OD not needed until 2017
 - iii. POHx and Treatments: CE OU and YAG OD, lid hygiene, topical steroids
 - iv. Transient edema in OD only: rainbows and halos in vision
 - 1. Management of transient edema
 - a. Topical steroids, Breaks with lens wear
 - v. Scleral lenses can provide many years of useful vision in patients with PKP, but graft edema can develop and progress
 - vi. Lens adjustments to minimize hypoxia and K edema: increase Dk of material, decreased CT, minimize vault, avoid tight fit, clear limbus fully
 - vii. Need to know when to discontinue scleral lens wear vs management with medications lens design adjustments
- g. Dry Eyes, Keratoconus and Recurrent Corneal Erosion (RCE)
 - i. 60s F, fit with scleral lenses OU, at different starting points
 - ii. CLHx: RGP CLs, Toric SCLs, piggyback modality, Scleral Lenses
 - iii. OHx: EKC OU, Herpes infection OD, RCE and corneal debridement, PTK OU
 - iv. Unique central corneal scarring, with nodules
 - 1. Breakdown in epi around nodule causing severe pain
 - 2. Complete relief of pain with scleral lens wear OU
 - v. Concurrent meds: Topical antibiotics, topical steroids, serum tears, lubrication, NSAIDs, acyclovir/famciclovir
 - 1. NSAIDs challenges
 - vi. Photos to demonstrate scarring and epithelial changes
 - vii. Discussion: Management of RCE with SL wear and other therapies

3. Summary

- a. Scleral Lenses cannot be prescribed in isolation for OSD patients
 - i. Need to understand root **cause** of OSD
 - 1. Scleral lenses are not a first line therapy for OSD
- b. Cannot expect a good “fit” will resolve OSD symptoms
- c. Need to do consultation with “lens on eye” to evaluate response
 - i. Need proper cleaning and maintenance
- d. OSD cannot be fixed by scleral lenses alone
 - i. Often will require other concurrent therapies
 - ii. Therapies will change over time
 - iii. Some trial and error involved
 - iv. OSD can be unpredictable
- e. Embrace co-management with other specialties