

From The Trenches: Advanced Scleral Lens Fitting Techniques from 4 Specialty Contact Lens Practice Owners (Part 2)

Breakout CE: One Hour (Part 2)

Speakers:

Stephanie Woo, OD, FAAO, FSLs (Part 2)

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Elise Kramer, OD, FAAO, FSLs (Part 2)

Owner: Miami Contact Lens Institute & Weston Contact Lens Institute (Miami, FL and Weston, FL)

Description:

Join four residency-trained cornea and contact lens specialists, all who own their own specialty lens practices, for a two-part panel discussion on interesting and novel “in the trenches” scleral lens fitting techniques.

Objectives:

Practitioners will learn exact, specific, clinical techniques to fix scleral lens complications, identify similarities and difficulties with each subgroup of patients, anticipate and fix complications before they arise, and have confidence caring for difficult patients.

Course Learning Objectives:

1. Start thinking beyond the “traditional” fit
2. Learn about the similarities of each subgroup of patients and the complications that arise from their fits.
3. Anticipate and fix complications before they arise
4. Have confidence in providing care to difficult patients
5. Take home specific techniques

1.0 Introduction (2 minutes)

1.1 Drs. Woo and Kramer

1.1.1 Sharing what made us start our own specialty practices

1.1.2 What made us want to take on the extremely complicated patients?

2.0 Blebs

2.1 Surgical procedures to lower IOP significantly change the ocular surface and conjunctiva through the intentional creation of a conjunctival bleb

2.2 This bulbar conjunctival elevation at the surgical site is the result of the new drainage route, which allows aqueous humour to drain from the anterior chamber into the subconjunctiva

2.3 The elevation and location of the bleb varies widely among patients and with the type of surgery

2.4 Fornix-based flaps experienced bleb leaks in 65% of patients after trabeculectomy, while limbus-based flaps showed bleb leaks in 24%

2.5 Analogous to drainage devices, blebs should be considered as limitations and challenges to fitting

2.6 These scleral obstacles may present a problem because the scleral lens will not drape over the bleb as a soft lens would

2.7 For blebs that are proximal to the limbus, mechanical friction between the scleral lens and the bleb can cause tissue erosion and bleb leakage

2.8 Moreover, a scleral lens may compress the bleb and lead to a reduction in functionality, resulting in increased IOP

2.9 The lens should be modified to avoid interaction with the bleb; notches can be beveled into a SL to enable it to bypass the bleb.

2.10 Corneoscleral topography is also very useful for the laboratory

2.11 Another option is a localized area of clearance or vault over the lens.

2.12 Customized scleral lens design or with a molded/impression technique may also be helpful

2.13 Case Example I

- 2.13.1 72-year-old male
- 2.13.2 s/p penetrating keratoplasty OD
- 2.13.3 s/p superior bleb OD
- 2.13.4 Fit with scleral lens to improve BCVA
- 2.13.5 Images of results
- 2.14 Case Example II
 - 2.14.1 79-year-old white female with severe dry eye, PKP and large bleb.
 - 2.14.2 Tried to fit into scleral lens with EyePrint but lab could not fabricate enough sagittal depth
 - 2.14.3 Used the impression of her eye to create a custom GP lens
 - 2.14.4 Patient super happy and can see 20/40
 - 2.14.5 Images of results

3.0 Fenestrations

- 3.1 What patients struggle with most: difficulty with lens handling, ocular injection, or blurry vision after several hours of wear
- 3.2 How to we circumvent these problems with scleral lens design?
- 3.3 Fenestrated scleral lenses first proposed in the 1930s
- 3.4 Brought into the mainstream by Josef Dallos (1946) and Norman Bier (1945)
- 3.5 Noted increased lens comfort and improved corneal physiology when a hole was ground into a glass scleral lens
- 3.6 Dr. Ezekiel recommends utilizing three fenestrations placed in a triangular shape over the cornea and limbus
- 3.7 This often creates a large air bubble under the lens in the corneolimbus area
- 3.8 It is important that this air bubble moves with the blink to prevent corneal desiccation and that it remains in the periphery for unobstructed vision
- 3.9 Following are some of the many benefits of fenestrations in scleral lenses
- 3.10 ***Easier Handling***
 - 3.10.1 Do not need to be filled with saline prior to application, although wetting the lens initially is recommended

3.10.2 Simplifies the application process, as patients would not need to be face-down when applying a lens

3.10.3 Application and removal plungers are not necessarily needed

3.10.4 The fenestrations reduce lens suction, so patients would be able to apply and remove their lenses with just their clean fingers

3.11 ***Improved Visual Quality***

3.11.1 Decreased vision after several hours of traditional scleral lens wear can be attributed to corneal hypoxia changes or, more commonly, to midday fogging, which occurs only with non-fenestrated sclerals

3.11.2 The cause of midday fogging is not entirely understood, but it appears to be multifactorial and may be related to mucin production secondary to conjunctival irritation combined with lens suction

3.11.3 Fenestrated scleral lenses described by Dr. Ezekiel were designed with a fluid reservoir depth of less than 100µm to 150µm

3.11.4 Lower central clearance offers overall improved visual quality and a potential reduction in midday fogging

3.11.5 The pressure difference under the lens is also minimized with the incorporation of a fenestration, which reduces lens suction, decreases conjunctival frictional forces, and allows constant debris removal via tear exchange

3.12 ***Free Oxygen and Tear Exchange***

3.12.1 Corneal hypoxia is a constant concern among scleral lens practitioners

3.12.2 A fenestrated scleral lens designed with a hyper-Dk material and thin fluid reservoir maximizes oxygen transmissibility and allows constant oxygen and fluid exchange

3.12.3 If patients are experiencing corneal edema with traditional scleral lenses and a surgical consult is their next stop, a fenestrated scleral lens may offer an alternative option

3.13 ***Hope for Scleral Lens Failures***

3.14 **Case Example I**

3.14.1 76 yo WM with glaucoma and s/p PKP OU

3.14.2 Fitted with scleral lenses back in 2019 with significantly improved visual acuity OU

3.14.3 Corneal edema OS developed with scleral lens wear even with high DK, low clearance and thinner lens

3.14.4 Added fenestration to the lens improved vision and reduced corneal edema

3.14.5 Images of results

3.15 **Case Example II**

3.15.1 52-year-old

3.15.2 post-LASIK ectasia OU, s/p PKP OS

3.15.3 Developed corneal edema with scleral lens OS, added fenestration to help oxygen transmission

3.15.4 Images of results

3.16 **Conclusion**

3.17 **Questions**