Solving glare issues with scleral lens modifications

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Background

Scleral lenses have been used for many years to assist with patient conditions such as irregular astigmatism and ocular surface disease. The gas permeable lens material helps to correct optical issues on the cornea, and the size and shape of scleral lenses can result in comfortable wearing time. A newer approach to scleral lenses involves fitting them on patients with regular corneas. Good candidates may include patients with high amounts of regular astigmatism, patients intolerant to other contact lens modalities. One of the main reasons practitioners fit patients into scleral lenses is due to improved quality of vision. Due to the different curves and shapes of the lenses, along with each manufacturer's proprietary designs, many different modifications to the lenses are offered. In this case, the patient experienced glare, and making adjustments to the different parameters of the lens yielded improved visual quality.

Case Description

CURRENT LENSES

EH, a 33-year-old white female, presented to the clinic for her comprehensive eye exam on June 13, 2019. She had been wearing scleral lenses successfully for over 4 years. She arrived to the office requesting a lens update, along with a complete eye exam.

The vision through her current scleral lenses was 20/20 OD and 20/20 OS. She was currently wearing:
OD: Visionary Optics/Elara/ 7.5 BC/ 15.5 OAD/ 8.0 OZD/ PC1 7.9 (2.5)/ PC2 9.25 (0.75)/ PC3 14.0 (0.5)/ 4.23 sag/ CT 0.40/ Boston XO clear/ -9.25
OS: Visionary Optics/Elara/ 7.5 BC/ 15.5 OAD/ 8.0 OZD/ PC1 7.9 (2.5)/ PC2 9.25 (0.75)/ PC3 14.0 (0.5)/ 4.23 sag/ CT 0.40/ Boston XO blue/ -8.50
No significant over-refraction was found, and the lenses were well centered, aligned with adequate central and limbal clearance OD and OS.

Without lenses, manifest refraction:
OD: -11.00 +1.75 x 077 with 20/25 vision
OS: -10.75 + 2.00 x 090 with 20/25 vision

Keratometry values:
OD: 43.75x45.50@ 079
OS: 43.25x45.25@096

All ocular structures appeared normal OD and OS. New scleral lenses were ordered at this visit. Since the lenses yielded good vision, comfort, and ocular health, duplicate lenses were ordered.

Two weeks later, the patient returned to clinic for her scleral lens dispense. Vision remained at 20/20 OD, OS and OU and the lenses appeared well centered, stable, and aligned. The lenses were dispensed, and the patient set up a 2 week follow up.

NEW LENSES

At the two week follow up, the patient complained of issues with glare in in both eyes in low light environments. She stated when a room was dimly lit, such as a movie theater, she was seeing glare through her scleral lenses. The lenses still appeared well centered, stable and aligned. With lenses removed, the cornea and ocular surface remained unchanged. After consultation, the lab decided to increase the diameter by 0.5mm and increase the optic zone diameter in each eye to help accommodate increased pupil size during low light environments.

New lenses:
OD: Visionary Optics/Elara/ 7.5 BC/ 16.0 OAD/ 8.5 OZD/ PC1 7.9 (2.5)/ PC2 9.25 (0.75)/ PC3 14.0 (0.5)/ 4.60 sag/ CT 0.40/ Boston XO clear/ -9.25
OS: Visionary Optics/Elara/ 7.5 BC/ 16.0 OAD/ 8.5 OZD/ PC1 7.9 (2.5)/ PC2 9.25 (0.75)/ PC3 14.0 (0.5)/ 4.60 sag/ CT 0.40/ Boston XO blue/ -8.50
EH returned her first set of lenses in exchange for the new scleral lenses and the lenses were dispensed.
She wore the lenses for 2 weeks and returned for a follow up.

At the follow up, she claimed that she was no longer experiencing the glare issue, and she was happy with her vision.

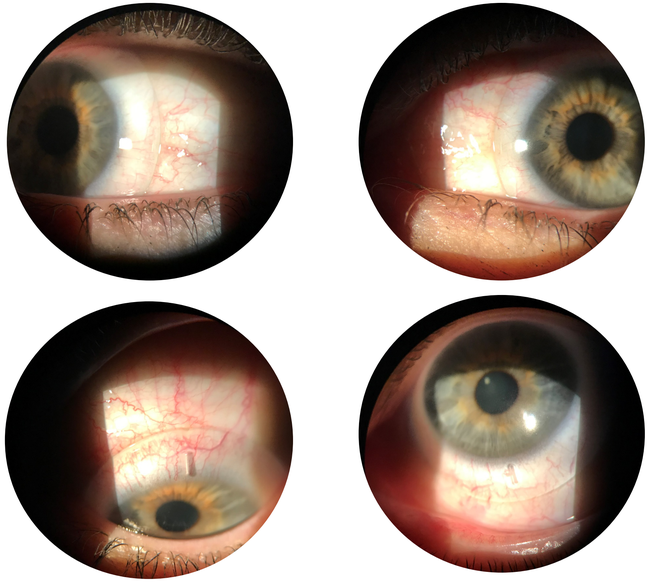
Disclosure: As of 10/29/2019, I have received honorarium from the following companies for speaking engagements or consulting: Alcon, Art Optical, Bausch and Lomb, Blanchard Contact Lenses, Essilor Contacts, X-Cel Contacts. Specialeyes, Biotissue, Katena, Visionary Optics, Shire, GPLI, STAPLE program, Scleral Lens Education Society, Contamac, Synergeyes, Triad Ophthalmics, Ophthalogix.

Conclusions

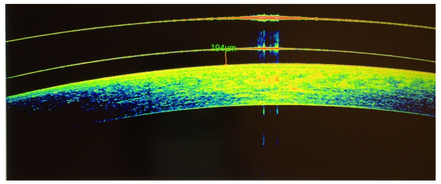
Adjusting various parameters of scleral lenses can help improve the quality of vision and solve optical complaints. Although a patient may see "20/20," they can sometimes have higher order aberrations and other optical issues, which can cause a decrease in visual quality. Asking the right questions and taking the right measurements can help with adjusting the lens parameters. Working with the laboratory consultants to help negate some of these issues can improve the patient's contact lens experience and overall vision.

IMAGES

NEW LENS ON PATIENT'S LEFT EYE (OS)

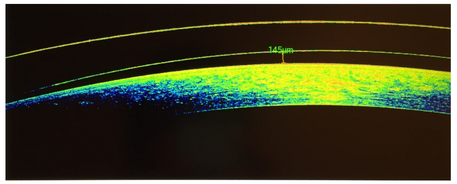


RIGHT EYE (OD)



194um centrally

LEFT EYE (OS)



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