Visual Function and Optical Quality During Scleral Lens Wear in Eyes with Keratoconus

Gamze Ozkan[1], Semra Akkaya Turhan[2]

[1]Department of Ophthalmology, Marmara University School of Medicine, Istanbul, Türkiye

[2]Department of Ophthalmology, Acıbadem Mehmet Ali Aydınlar University School of Medicine, Istanbul, Türkiye

Purpose

To evaluate the impact of scleral lenses (SLs) on higher-order aberrations (HOAs), corrected distance visual acuity (CDVA), and contrast sensitivity (CS) in eyes with keratoconus.

Methods

Twenty-six keratoconic eyes were fitted with SLs.. CDVA (logMAR) and CS (Pelli–Robson) were measured prior to SL wear and after 30 minutes, 4 hours, and 8 hours of SL wear.

HOAs (the root mean square [RMS] of HOAs, coma, trefoil, and spherical aberration) and point spread function (PSF) metrics were recorded using Sirius corneal tomography with the SL on-eye at each time point.

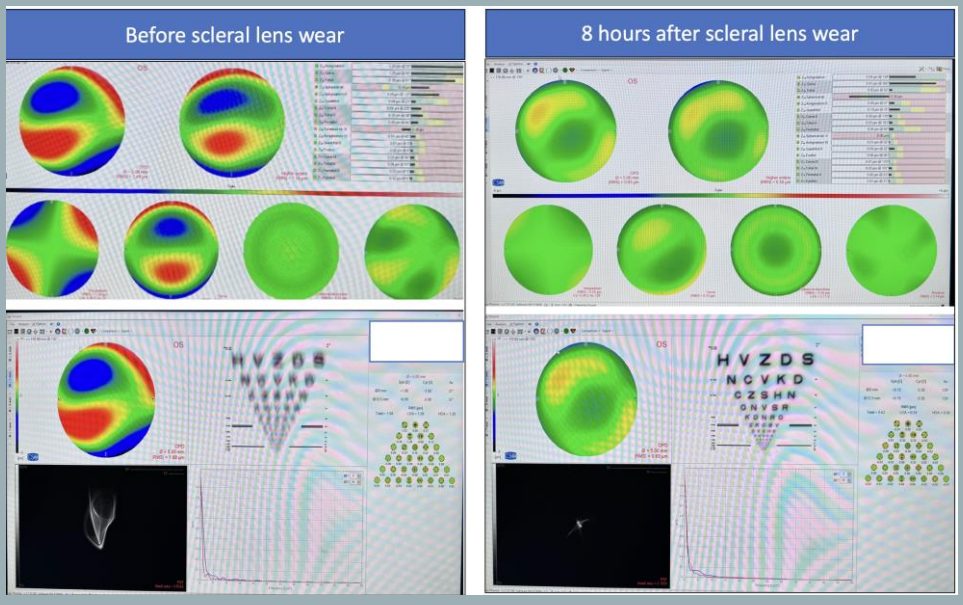

Figure 1. Representative case showing a reduction in higher-order aberrations and improvement in point spread function 8 hours after scleral lens wear .

Results

The mean age was 23.0 ± 6.6 years. Mean keratometry values were: K1; 48.39 ± 4.01 D, K2; 53.20 ± 4.83 D, Km; 50.59 ± 3.97 D, and Kmax; 58.23 ± 5.10 D.

Baseline CDVA was 0.44 ± 0.23 logMAR and baseline CS was 0.52 ± 0.21. CDVA and CS improved, and remained stable at all post-wear time points.

At 30 min, total HOA-RMS, coma, and trefoil decreased compared with baseline, PSF improved, and spherical aberration did not change. HOAs and PSF measurements at 4 and 8 hours were comparable to the 30-min values. (Figure 1)

Conclusion

SL wear improved visual performance in keratoconic eyes. Optical quality remained stable over 8 hours of SL wear, with reduced HOAs.