

# Reducing Visual Disturbances with Wavefront-Guided Optics in a Keratoconus Patient Who Failed Conventional Scleral Lenses

Submission No:

844

Submission Type:

Case Report Abstract

Author:

*Dr Clark Chang, OD, MSA, MSc*  
Wills Eye Hospital

Co-Author(s):

*Nicolas Brown*  
OVITZ Corporation  
*Jenny Wong, OD*  
Contact Lens Institute of Nevada

Submitter:

*Dr Clark Chang, OD, MSA, MSc*  
Wills Eye Hospital

Background:

Visual impairments such as glare and poor night vision can continue to burden Keratoconus (KC) patients post contact fitting. Despite gas permeable lens wear, significant residual higher order aberrations (HOA) may persist and cannot be corrected with a traditional spherocylindrical treatment approach. Wavefront-guided scleral lenses can be utilized to correct residual HOA, which improve patients' visual outcomes and quality of life.

Case Summary:

A 31-year-old male with history of KC, OD worse than OS, reported previous failure with scleral lenses due to persistent photic disturbances at night such as glare and ghosting in OD, worse in contact lens than in spectacle. Habitual spectacle VA at baseline were 20/40 OD and 20/20 OS. Scleral lens over-refraction with a diagnostic lens yielded a BCVA of 20/25 but with complaints of glare and ghosting. Aberrometry measurements taken over the diagnostic scleral lens revealed significant residual HOA with root-mean-square (RMS) of 0.64 $\mu$ m OD (captured over 7.3mm pupil diameter). The primary HOAs were secondary coma and spherical aberration. Due to large pupil

size, the wavefront-guided scleral lens OZ was increased to 9.5mm (ARES lens, Valley Contax, Eugene, OR) and a set of orientation dot markings were incorporated to better align the wavefront correction profile with patient's visual axis.

With the wavefront-guided scleral lens design, HOA RMS simulated at 7.3mm pupil diameter in OD was reduced to 0.49 $\mu$ m. At the last follow up examination, the patient achieved a BCVA of 20/15 with custom wavefront-guided scleral lens and all-day wear comfort. Also, he reported not only the resolution of subjective visual disturbances but also significantly improved quality of vision in both normal and low light conditions.

## Conclusions:

Wavefront-guided scleral lenses are an effective method of correcting residual HOA and improving overall vis performance in patients experiencing persistent visual disturbances with conventional scleral lenses.

## Case Report Abstract:

Contact Lens

---

## Submitted By

**Name:**

Dr Clark Chang, OD, MSA, MSc

**Institution:**

Wills Eye Hospital

**Position/Title:**

Director of Specialty Lenses

**Address1:**

840 Walnut St, Suite 920

**City:**

Philadelphia

**State/Province:**

PA

**Postal Code:**

19107