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Comparison of Two Different Sets of Aberrometer Data and Methods of Orientation, on the Same Contact Lens, with Resultant Measurements on the Same Eye Christine Sindt OD_{1,2} Marcus Noyes OD₁ METHODS

PURPOSE

Higher order aberrations (HOA) reduce functionality of otherwise well corrected irregular cornea, scleral lens wearing patients. Correct measurement and application of HOA optics is vital to the development of advanced optics contact lenses. Creating an algorithm to reduce the number of predicate lenses and streamline the fitting process is necessary for the doctor-patient experience. This case report compares low resolution HOA data to high resolution HOA data, as well as two different methods for placement measurement on the lens.



RESULTS

HRA HOA measures through Method 1 and Method 2 LOA lenses were 0.92 um and 0.93um respectively. LRA predicate lens was similar (0.92) as measured on the HRA, while it measured 1.16 on the LRA device. Both methods from the HRA device resulted in similar RMS HOA WFE (0.37 and 0.38 um) while the LRA system residual RMS was 0.56 um RMS. The patient had 20/20+ vision with the HRA lenses and 20/25-3 with the LRA lens.

CONCLUSIONS

Both LRA and HRA devices improved HOA measurements. The HRA corrected 50% more HOA than the LRA device.Using topography eliminates the need for the dotted predicate lens, with equal results.



Comparison of 2 machines and 3 orientation algorithms, using the same lens design on the same eye.

Higher order aberrations on scleral lenses, using 2 different aberrometers, were compared on a single eye. A post LASIK ectasia patient was fitted with a custom, elevation specific, stable, best corrected lower order aberration (LOA) lens (20/20- with glare complaints). The same lens design and LOA power was used for every measurement. Both patient and ECP were masked to the measuring device and orientation methods used on the final lenses. A low resolution aberrometer (64 data pts) (LRA) and a high resolution aberrometer (2400 pts) (HRA) were used. For the LRA device, the predicate scleral lens had 10 small fiducial marks, placed 4mm from the optical center, on the front surface. The WF was measured through this lens and the information used to create a wavefront correction. Using the HRA device, Method 1 used 3 fiducials to orient the HOA placement. Method 2 used the patient's habitual lens, without fiducials, and the instruments topographer to measure aberrations, tilt and pupil orientation. All results were evaluated using a standardized pupil size (6.5mm pupil). All results were measured and compared on the HRA device.

