

Custom scleral lens fitting

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BACKGROUND

A 59 year old female with the history of radial keratometry, Meibomian gland dysfunction and dry eyes in both eyes. The vision is an imperfect 20/20 for both eyes. She did fail with daily soft lenses and finally the decision was made to switch to scleral lenses. The patient preferred a multifocal (MF) design. Spectacle Rx is OD S+2.25=C -125 x 060, OS S+225 and ADD +250.

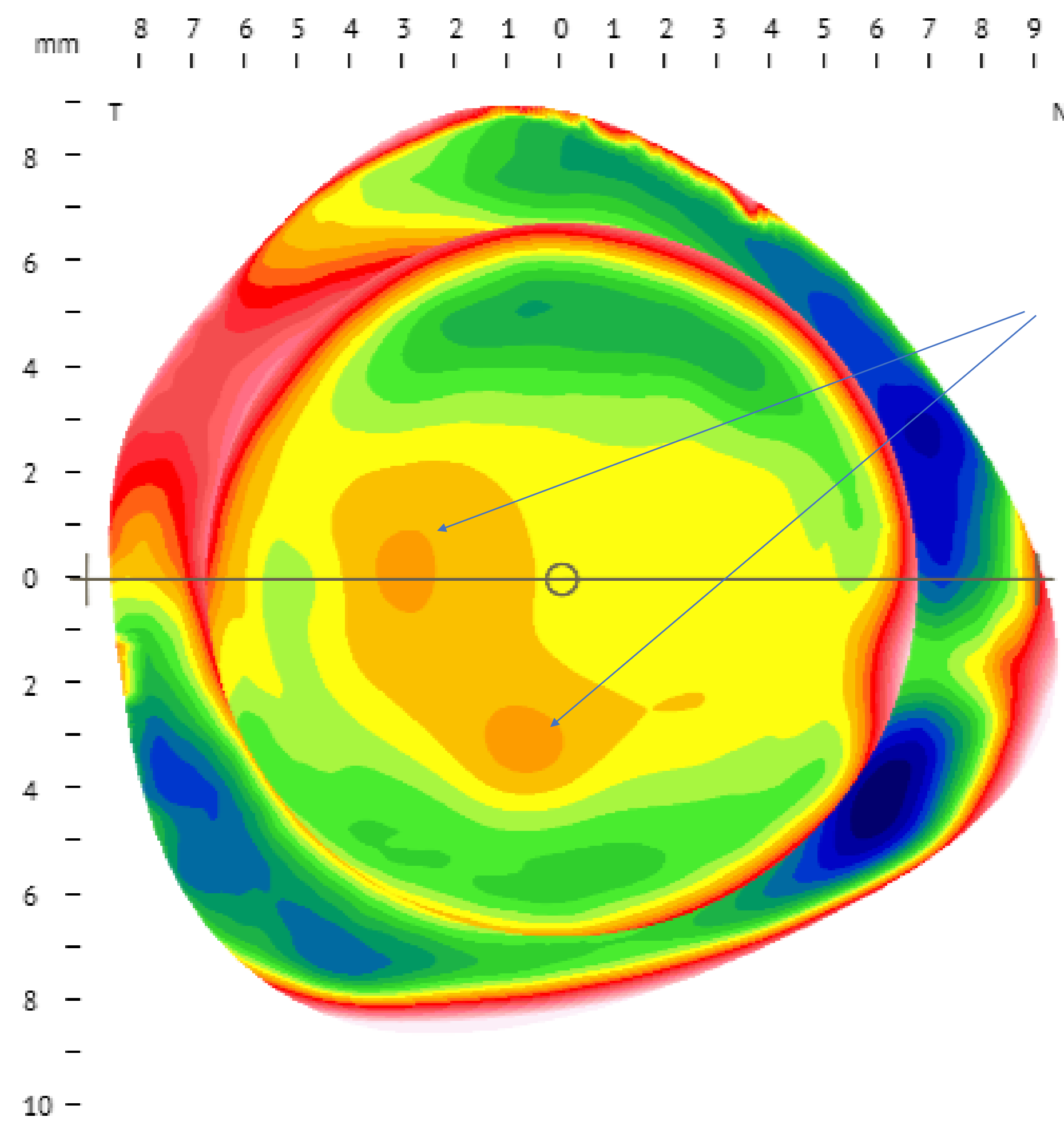


Figure 1: Bi-sphere elevation map showing the corneal and scleral profile. Mild corneal irregularities are seen (blue arrows) showing an oblate shaped cornea.

CASE DESCRIPTION

Scleral profilometry (Eye Surface Profiler, ESP, Eaglet Eye) measurements were made. The right eye is shown in image 1. The sagittal height (SAG) data was shared with Acculens to create a custom scleral lens (Maxim). The SAG was loaded into FocalPoints (Advance Medical) and used to create a fully customized scleral lens. The custom lens had a spherical optical zone, but all limbal and scleral zones were designed quad specific resulting in a uniform corneal clearance as well as good scleral alignment.

Custom Lens Design Process

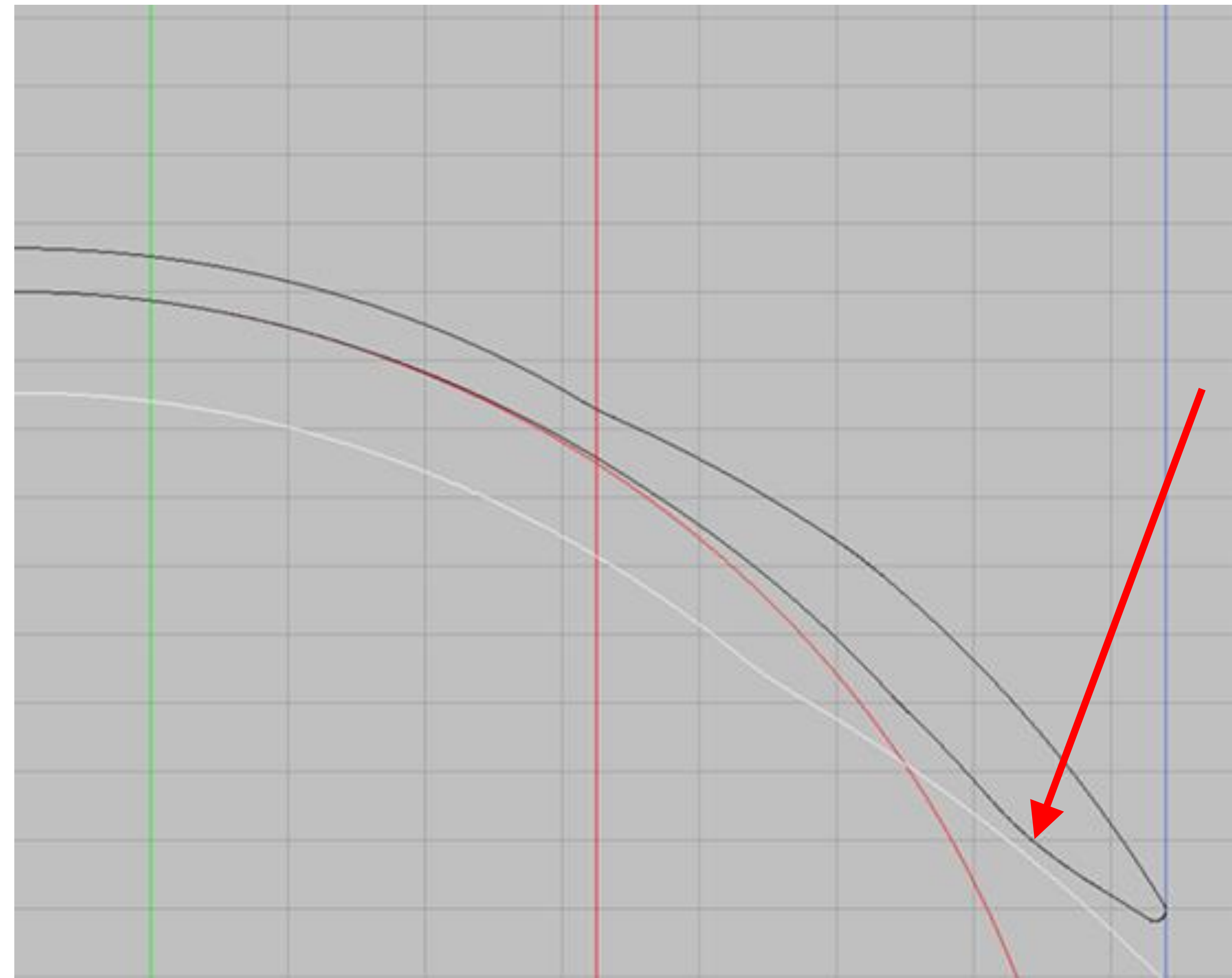


Image 2: Designing a custom Maxim requires the combination of ESP and FocalPoints data. The customization follows the next 5 steps:

- 1: ESP measurement is loaded into FocalPoints (white line represents the ocular shape over one semi-meridian)
- 2: Landing zone diameter of the Maxim is chosen based on HVID
- 3: A toric MAXIM lens is modelled as a starting point which is chosen based on the SAG of the eye.
- 4: The lens peripheral curves will be adjusted to match the shape of the eye. (arrow points to the gap between the lens and the eye)
- 5: 360 semi-meridians will be analyzed and adjusted allowing for customization in each quadrant as well as precise notching if required.

The customization is aiming for a near-sealed fit. Meaning that the steepest quadrant of the lens will be slightly lifted

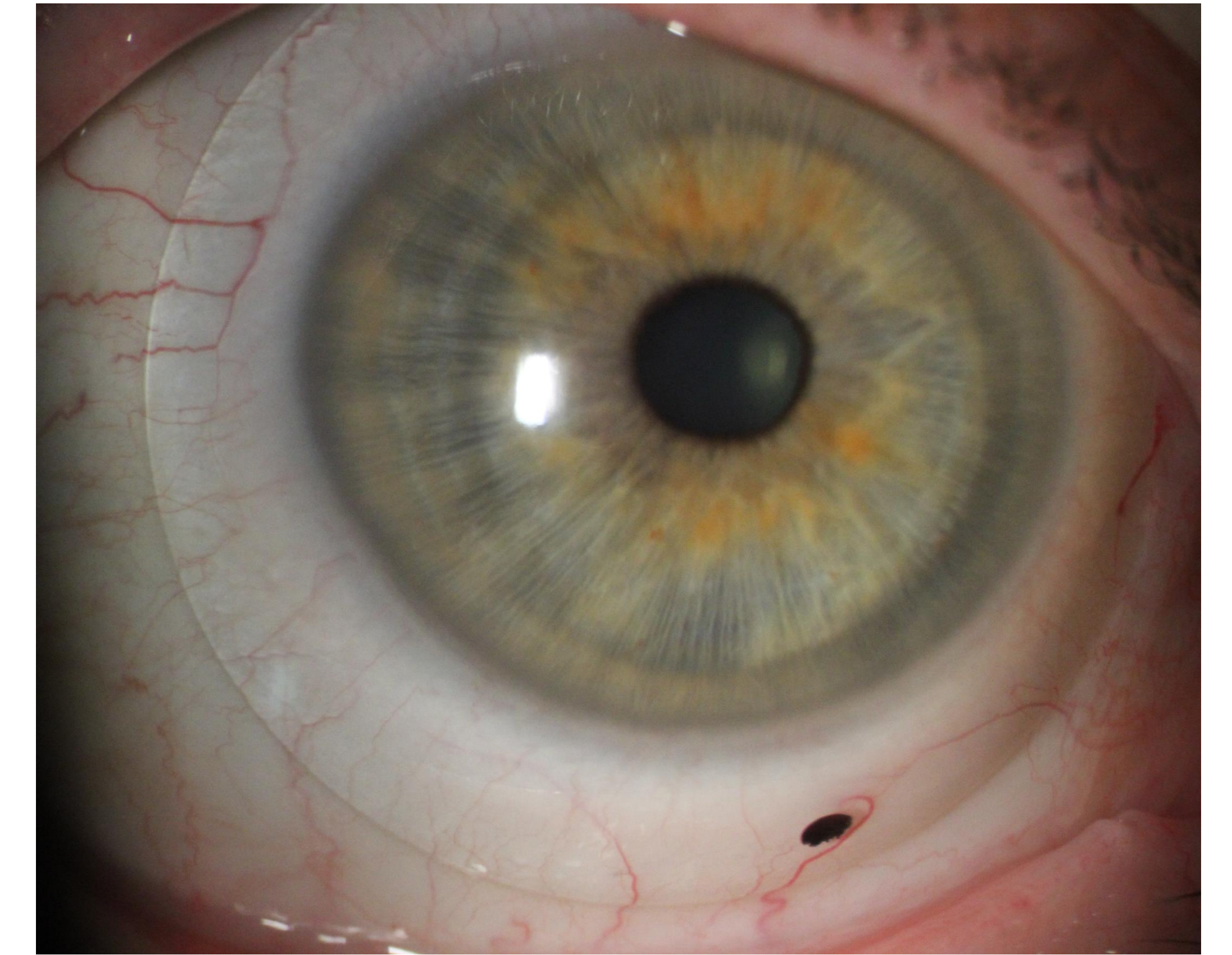


Figure 3: Scleral lens centration after 6 hours of wear

Due to the choice for a MF design lens centration is more critical compared to a conventional spherical optical zone. Figure 3 shows a nearly perfectly centering lens. Both eyes had a visual acuity of 20/20 as well as good reading possibilities as well.

Final dispensed lens: Maxim Quad Specific
BC 7.85 S-2.50add2.5 lens diameter 16.8 optical zone 9.4
Quadrant: flat 200 at 9:00 to 12:00

CONCLUSIONS

Profilometry helps to design custom scleral lenses with a good scleral alignment as well as good centration. Good centration is a critical factor with MF scleral lenses. Quadrant specific customization to receive a better centration compared to toric lenses resulting in a better alignment with the line of sight.

Contact and disclosure

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