MALONEY VISION INSTITUTE
CLINICAL UPDATE

Treatment of an Irregular Cornea after Refractive Surgery.

Volume 5

Corneal laser treatment can sometimes result in irregular astigmatism. This can be caused by decentered ablation, irregular laser energy being applied on the cornea, or irregular healing of the cornea post-operatively.

Recently, Custom-CAP was approved by the FDA under a humanitarian-use device exemption to treat decentrations and asymmetrical topography after laser treatment. We present a case in which Custom-CAP was used to eliminate the complaint of monocular diplopia caused by conventional laser treatment.

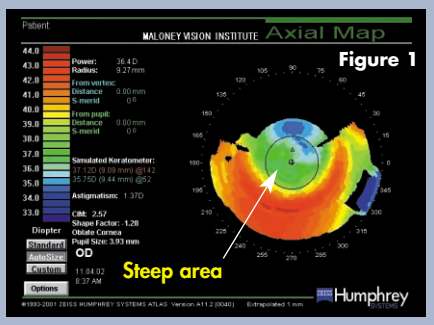
Case presentation:

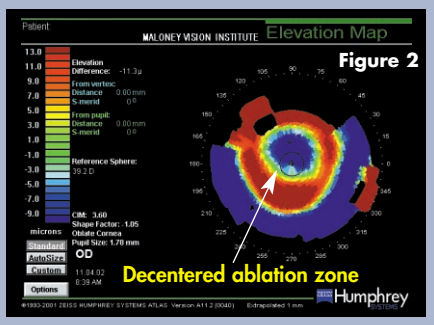
The patient, a 45 year old male, presented with a complaint of monocular diplopia and low contrast in his right eye following LASIK. His preoperative refraction had been -6.50 DS correcting him to 20/20 OD, and -5.70 DS correcting him to 20/20 OS. He had a LASIK procedure OU with LASIK enhancement OU. When he presented to us, uncorrected vision was OD 20/25-, and he complained of "constant ghosting and double vision." Manifest refraction OD was -0.50–0.25 x 52 correcting him to 20/20-. Even corrected, he complained of diplopia and poor contrast. Corneal topography revealed a decentered laser treatment *(Figure 1)*, which is more apparent on the elevation map *(Figure 2)*.

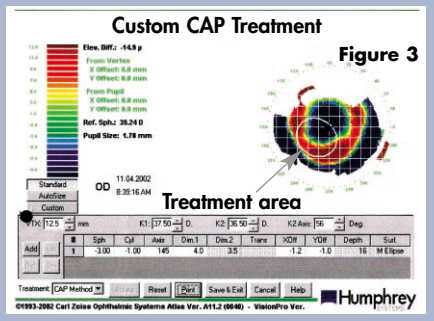
A compensating off-center ablation was determined using the Humphrey topography system *(Figure 3)*. The Custom-CAP treatment involved programming this ablation into the VISX S4 laser to ablate the designated area. Two months after treatment, the patient's monocular diplopia and ghosting had resolved. Manifest refraction was + 0.75 – 0.25 x 120 OD, correcting him to 20/20+. Corneal topography (axial and elevation maps) shows a well-centered ablation zone after the treatment (*Figures 4 & 5*).

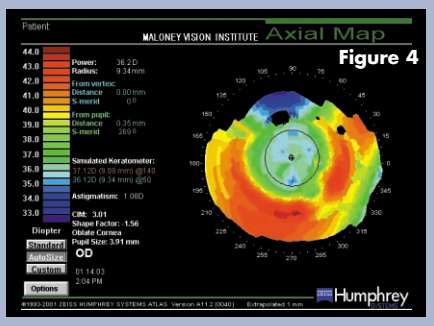
Discussion:

Patients who suffer from induced irregular astigmatism as a result of previous laser treatments can be helped by recent advancements in customized treatments. One such customized treatment is Custom-CAP, which is primarily used when topographic irregularity is present. Custom-CAP applies a predetermined pattern of spheres, cylinders and ellipses guided by a corneal topography. This area of treatment can be offset in any direction to achieve the desired correction *(Figure 3)*. By regularizing the topography, quality of vision can be significantly improved in selected patients.









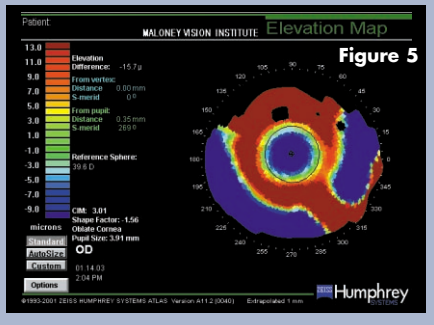


Figure 1:
This post-LASIK, pre Custom-CAP axial topography map shows a central area of irregular ablation. The inferiotemporal area within the central ablated zone is steeper than the superionasal area *(arrows)*. This causes monocular diplopia.

Figure 2:
The same eye on an elevation topography map shows that the ablation *(blue area)* is not centered on the pupil *(black circle, arrow)*.

Figure 3:
Planned laser treatment. A compensating ablation *(white circle)* in an elliptical pattern (4.0 x 3.5 in diameter) that has been offset by –1.2mm in the X-axis and by –1.00mm in the Y-axis was performed. 16μ of tissue was removed.

Figure 4:
After Custom-CAP, the axial map shows a uniform optical zone within the pupil.

Figure 5:
After Custom-CAP, the elevation map shows an ablation zone well-centered on the pupil.

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