Assessing Soft Multifocal Contact Lens Centration with the Aid of Corneal Topography

Matthew Lampa OD FAAO, Kelvin So OD, Pat Caroline FAAO, Beth Kinoshita OD FAAO, Mark Andre FAAO, Randy Kojima FAAO

Pacific University College of Optometry

Introduction

Clinical experience has demonstrated that the success of soft multifocal contact lenses is multifactorial. Contact lens manufacturers have designed and incorporated incredibly precise and complex optics into their respective soft multifocal contact lenses. The end goal optically is to provide the patient crisp distance and near vision simultaneously. The factors for success in prescribing soft multifocals go beyond precise and complex optics to include a lens that is well fitted (centration, limbal coverage, movement on blink), provides all day comfort and well balanced distance and near vision while maintaining these characteristics throughout the day.

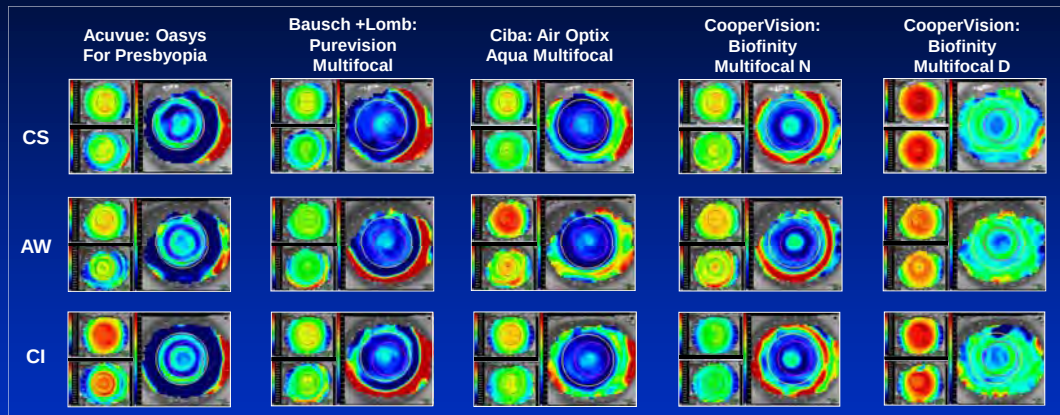
This poster will visually highlight the centration differences of commonly commercially available soft multifocal contact lenses with the aid of corneal topography performed over several multifocal soft contact lens designs.

Method

Subjects underwent Medmont corneal topography (Figure 1) without contact lenses as well as after wearing commonly commercially available soft multifocal contact lenses. Each lens was allowed to equilibrate on the eye as verified by slit lamp examination. The tangential power difference display map was utilized to identify where the optics were centered on the eye for each soft multifocal contact lens. Subjects were enrolled based on their ocular anatomic similarities that contribute to the overall sagittal height of the eye:

- horizontal visible iris diameter (11.6 mm to 12.0 mm)
- central keratometric values (42.50 D to 44.50 D)
- ≤ 0.75D toricity

Figure 1



Legend

Pupil

Ring Highlighting Optic Zone

Angle Lambda

Angle Lambda is formed by the difference between the pupillary axis and the line of sight. By utilizing the corneal topographer one is able to calculate angle lambda by measuring the displacement of the pupil center relative to the central ring of the videokeratoscopic image as it is centered over the patient's line of sight.

Summary

The perceived temporal decentration of the soft contact lens topographically is not thought to be a physical decentration. Through slit lamp observation, all lenses were well centered with at least 1 mm of coverage in all quadrants. The temporal displacement observed from the images appears to be related to the discrepancy between the pupillary axis and the line of sight (angle lambda) due to the temporal anatomic position of the fovea. Angle lambda can range from 3-11 degrees (citation) and even with a small angle can account for ~1.25 mm of difference between the pupillary axis and the line of sight topographically.

Clinical experience has demonstrated that the success of soft multifocal contact lenses can be multifactorial. The technique of utilizing the topographer to assess optical centration of the contact lens may aid the practitioner in better understanding reasons for success or failure with these lenses. By incorporating the angle lambda measurement, the practitioner may have one more tool in identifying a successful multifocal patient.