CASE HISTORY

58-year-old woman presented with a request to explore options for vision correction that would meet the vision needs in her occupation as a commercial airline pilot. The patient, who is also a medical doctor, has a dual career as an Aeronautical Examiner. She had moderate myopia with low astigmatism in both eyes. Her uncorrected distance visual acuity (UDVA) was 20/160 in the right eye and 20/125 in the left eye. Her manifest refraction was 3.50 -0.50 x 146 (20/20) in the right eye and -2.25 -0.75 x 10 (20/20) in the left eye. Near vision was N10/44 binocularly. She was using varifocal glasses for distance and near vision and single vision glasses for intermediate vision.

As a pilot, she works in a complex visual environment that necessitates clear vision at a variety of distances. Near and various intermediate visual distances are important for patient safety and cockpit controls. Viewing an iPad for navigation is often challenging. When wearing varifocal glasses, viewing the iPad for navigation is also challenging. Previously, she had explored options for vision correction that would meet the needs of the patient in this case. The anisometropia is small enough that patients maintain functional stereo-acuity uncorrected and do not lose best spectacle corrected stereo-acuity. Compared with refractive lens exchange, PRESBYOND does not expose the patient to the potential risks for visual-on-threatening complications that can occur with intraocular surgery. If a patient experiences halos or glare from the small anisometropia in PRESBYOND, this is almost always reversed by a pair of spectacles that reduce the anisometropia given that spacial aberration is controlled within the focal range.

OUTCOME

By 1 month after surgery, the patient’s binocular vision was 20/16 (distance), J3 at intermediate and J1 at near. The manifest refraction was +0.50 DS (20/16) in the right eye and +1.50 DS (20/16) in the left eye. The UDVA in the right eye was 20/16 and 20/16 in the left eye. Contrast sensitivity was unchanged or slightly increased for 3, 6, 12, and 18 cpd. Straylight scatter measurement (C-Quant) had returned to the preoperative level. Subjectively, the patient reported night vision to be unchanged from before surgery.

Two months after surgery, the patient passed the United Kingdom Civil Aviation Authority vision standards for a Class 1 medical certificate without spectacle restrictions, with UDVA in the left eye improving another line to 20/40. The result has been stable in the longer term with the same binocular vision at follow-up, 3.5 years after surgery. The manifest refraction was +0.50 -0.50 x 7 (20/16) in the right eye and -1.75 -0.75 x 10 in the left eye.

PRESBYOND offers the advantage of being a routine bilateral laser procedure performed in 15 minutes, with patients being able to read and watch TV within a few hours and return to most activities the next day as is the case in general for LASIK. The treatment is performed using proprietary software for the CRS-Master workstation (Carl Zeiss Meditec AG, Jena/Germany) based on a profile created using proprietary software for the CRS-Master workstation (Carl Zeiss Meditec AG, Jena/Germany). The treatment plan for each patient is customized for preoperative ametropia (including plano presbyopia) and pupil size and takes into account preoperative spherical aberration and optical nerve function of the eye. The ablation creates a continuous refractive power gradient for the entire optical zone.

CONCLUSION

PRESBYOND using a nonlinear aspheric ablation profile with a well-tolerated modified binocular vision approach delivers continuous quality vision from near to far along with the refractive accuracy and safety of a standard LASIK procedure. The outcomes and advantages are highlighted by this case where the very demanding visual needs of a presbyopic commercial airline pilot were achieved. By contrast, use of multifocal and diffractive IOLs are currently not compatible with pilot certification in the United Kingdom. The outcome for this patient is also echoed by my personal experience of performing 15,000 treatments over the last 12 years.

References