

Innovations in J&J Technology

Binocular visual performance after implantation of TECNIS Symphony® IOL targeting slight myopia

Kunihiko Nakamura, MD, PhD

TECNIS Symphony is an extended range of vision intraocular lens (IOL) that provides vision from far to intermediate distance. This IOL has an achromatic diffractive pattern that elongates the focus and compensates for chromatic aberration.

In preliminary data from Dr. Nakamura, TECNIS Symphony was compared with Acrysof IQ PanOptix in terms of monocular distance-corrected visual acuity.

Based on preliminary data, TECNIS Symphony might show better outcomes than PanOptix at intermediate distances, while PanOptix may be better than TECNIS Symphony at a near distance.

For emmetropia, though,

|| Contralateral implantation of TECNIS Symphony® and TECNIS® Multifocal IOLs may be able to relieve the need for spectacles for those patients with near vision issues. ||

PanOptix may be more advantage than TECNIS Symphony, and this begs the question: Do we need to target emmetropia for implantation of TECNIS Symphony? Dr. Nakamura further compared binocular uncorrected visual acuities between TECNIS Symphony L group (target refraction -0.5 D) and TECNIS Symphony E group (target 0D).

Between L and E group of IOLs, the data showed that binocular uncorrected visual acuity of L was significantly better than E at 50cm distance. There was no difference of contrast sensitivity at all spatial frequen-

cies as well as no difference in stereopsis. Additionally, bilateral implantation of TECNIS Symphony targeting -0.5D would expand working distance vision and improve spectacles dependence without aggravating uncorrected far vision. Thus from Dr. Nakamura data, in terms of expanding working distance, TECNIS Symphony is comparable to the PanOptix IOL.

Most patients are actually satisfied with the performance of TECNIS Symphony, which provides excellent vision from far to intermediate distance and acceptable near vision. However, some

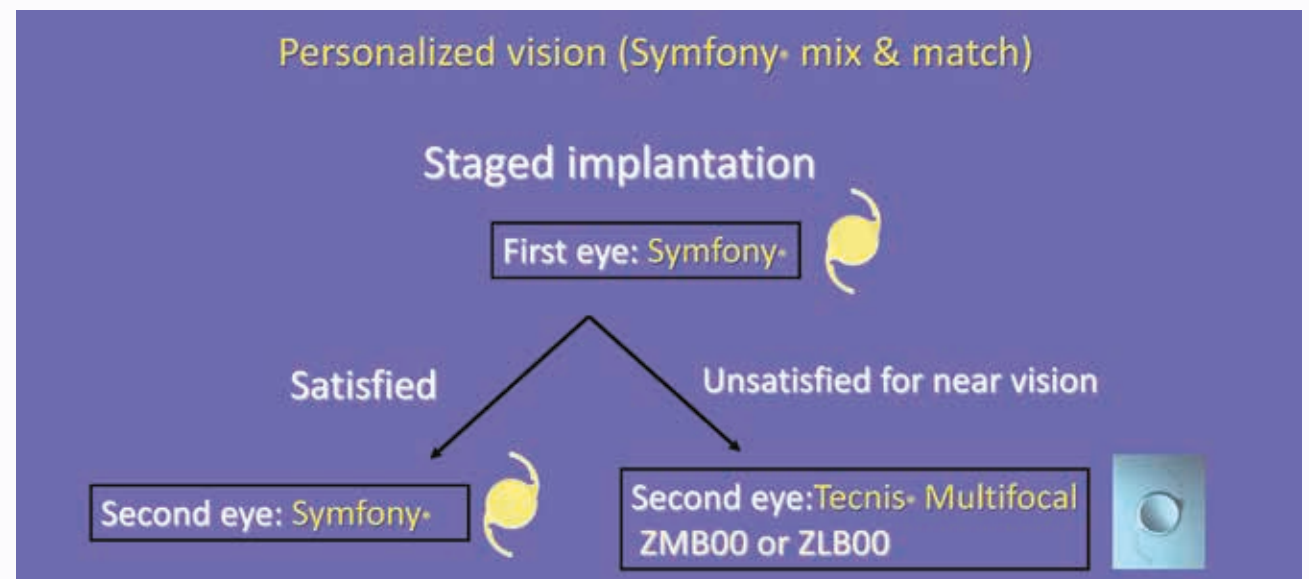


Figure 1. Personalized vision for TECNIS Symphony mix & match. Evaluations are made after the staged implantation of TECNIS Symphony in the first eye. Choice for second eye will depend on satisfaction of the first eye. (Image taken from Dr. Nakamura's presentation)

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patients did complain about near vision and having to use spectacles. What is the solution? Dr. Nakamura suggests that contralateral implantation of Symfony and TECNIS Multifocal IOLs may be able to relieve the need for spectacles for those patients with near vision issues.

In one case study Dr. Nakamura presented, a 59 year-old female visited his clinic to undergo cataract surgery with a multifocal IOL because she often participated in athletic events and she desired relief from wearing contact lenses. The patient emphasized her need for far vision and selected the TECNIS Symfony IOL which was then implanted in her right eye. After implantation, far vision in right eye was 1.2 (n.c.) and near vision right eye at 0.3(0.9 x +1.75D).

While she was satisfied with the vision of TECNIS Symfony from far to intermediate distance, she was unsatisfied with her near vision. Therefore, Dr. Nakamura recommended implantation of the TECNIS Multifocal IOL in her other eye. After operation, far vision in both eyes was 1.2 (n.c.) and NVd = 0.3(1.0 x +2.0D:cyl-0.5Dax180) and NVs = 0.9(1.0 x +0.5D:-cyl-0.75Dax175). After this second operation, the patient no longer needed spectacles or contact lenses and was completely satisfied with her outcome.

Comparison of clinical outcomes of 'Mix-and-Match' (with EDoF/+3.25 add Bifocal IOLs) & Bilateral Trifocal IOLs

Chui Young Choi, MD, PhD

Dr. Choi first presented a clinical study that compared the bilateral TECNIS monofocal IOL and the Tecnis Symfony IOL over a period of 3 months in 60 patients. This prospective study showed that the uncorrected defocus curves, monocular and binocular visual acuity values were superior in the group that received the extended depth of focus (EDoF) IOL. Even with the same material and optical platform, the TECNIS Symfony IOL showed better tolerance to residual

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post-operative refractive error than the monofocal IOL.

In a "Mix & Match" prospective study, Dr. Choi studied 25 patients for 6 months in which patients had the visual potential of 20/25 or better in each eye while their pre-operative corneal astigmatism from the IOL Master was

less than 1 diopter. In the "Mix & Match" group, the TECNIS Symfony IOL was implanted in dominant eyes and TECNIS ZLB00 IOL was implanted in non-dominant eyes. Patients in the PanOptix group received the PanOptix IOL for both eyes.

The "Mix & Match" strategy indeed proved to

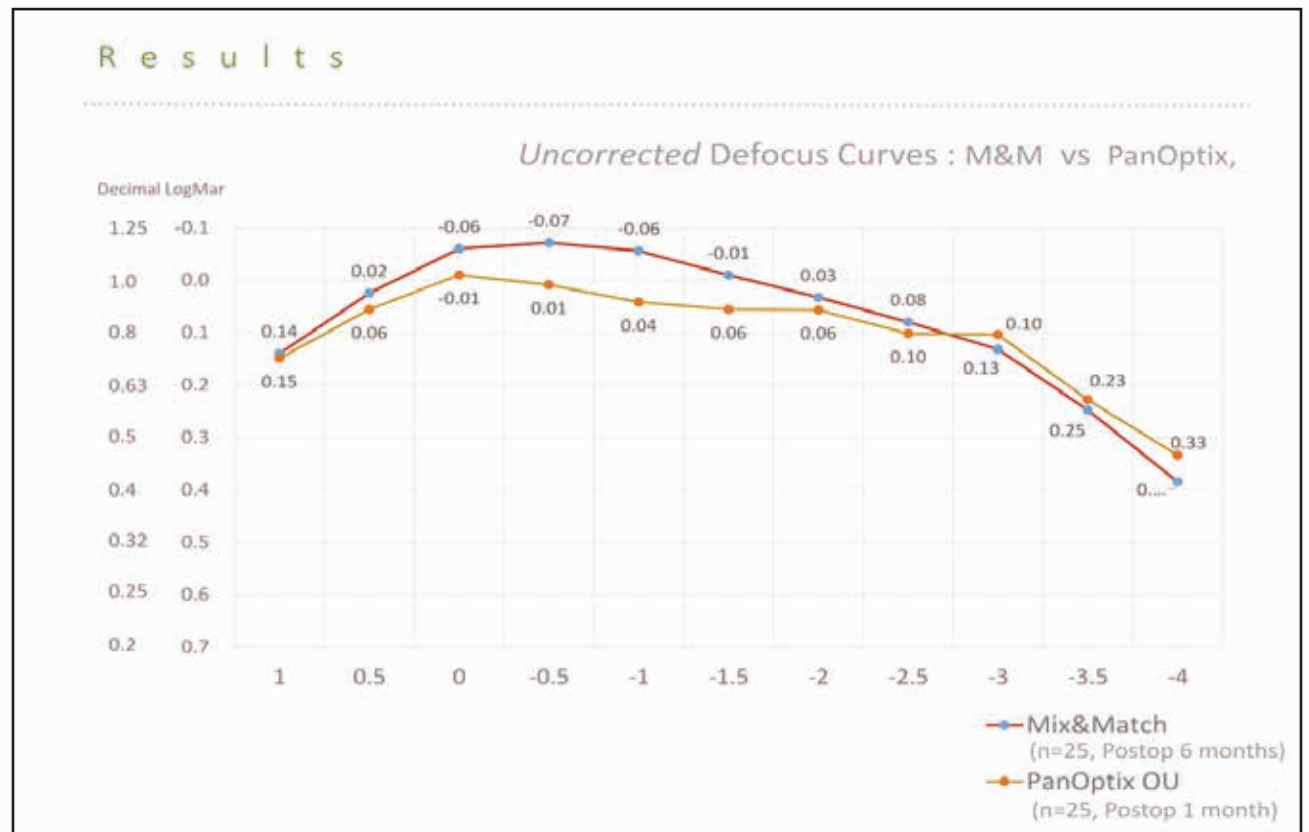


Figure 2. Uncorrected defocus curves for patients in the "Mix & Match" group compared with patients receiving PanOptix. (Image taken from Dr. Choi's presentation)



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be an effective option for improving near visual outcomes with excellent far and intermediate vision. Implanting the TECNIS Symphony IOL in the dominant eye with ZLB00 in the non-dominant eye resulted in a tolerable range and similar pattern of photic phenomena as well

as a higher rate of overall satisfaction for patients in all foci compared to the bilateral TECNIS Symphony IOLs. Finally, there was an overall improvement in patients for visual functioning (measured by the Visual Functioning Questionnaire-25) and reading speed, though still

comparable to the outcomes with bilateral trifocal IOL implantation. The strategy of “mixing” IOL types in order to fit the patients’ needs may be quite an effective and individualized option for patient satisfaction.

TECNIS Eyhance™ IOL

Oliver Findl, MD, MBA

The TECNIS Eyhance IOL is a refractive aspheric based on the TECNIS 1-Piece platform. “You don’t need to change the IOL constant and, don’t need to change the injector. Everything stays the same” since the lens have the same base geometry as other TECNIS 1-Piece IOLs.

“This proprietary aspheric optic creates a continuous power profile in order to enhance intermediate vision.”

This proprietary aspheric optic creates a continuous power profile in order to enhance intermediate vision. One aspect that is particularly distinct is that the power changes continuously

from the periphery to the center of the lens, creating a unique anterior surface. This surface then, in turn, provides for improved intermediate vision and distance vision compared to aspheric

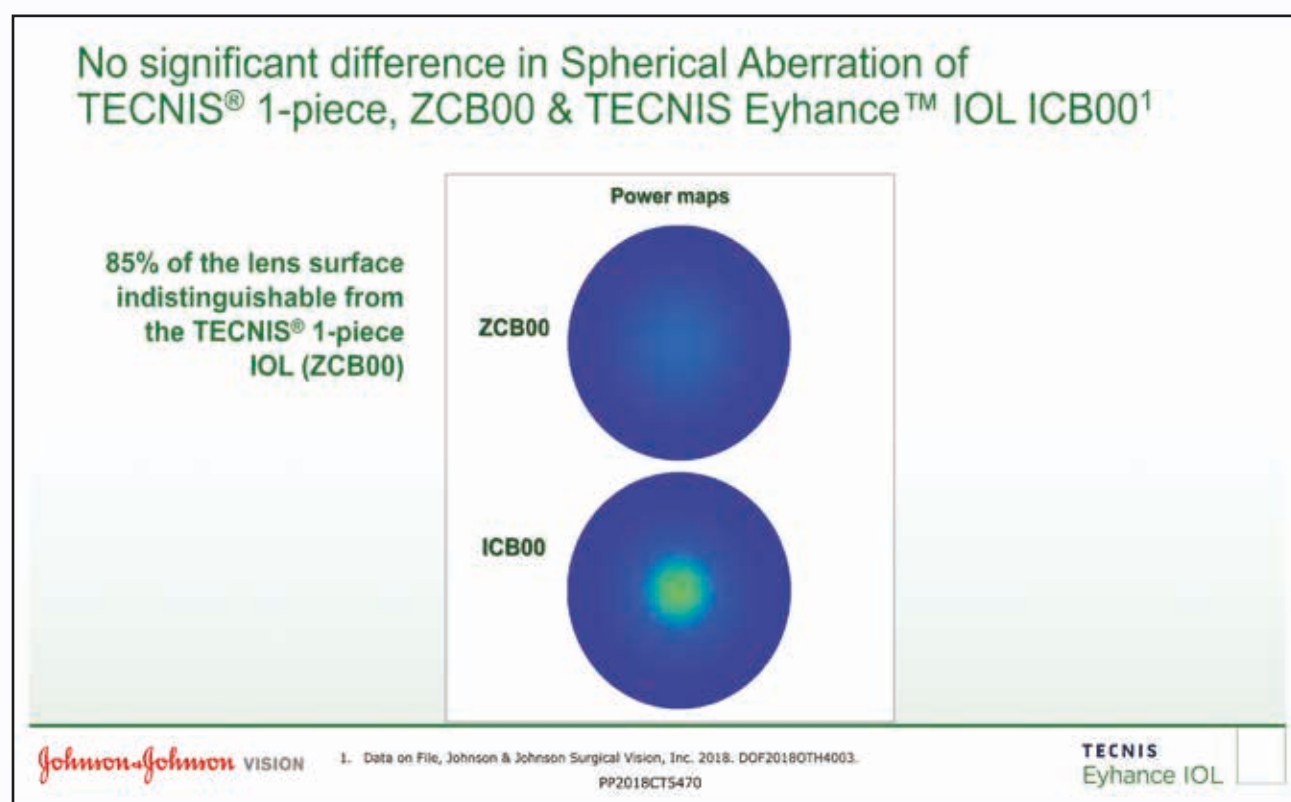


Figure 3. TECNIS Eyhance IOL is comparable in terms of spherical aberration to the TECNIS 1-Piece IOL.

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monofocal IOLs. It also delivers a dysphotopsia profile similar to monofocal IOLs while reducing spherical aberrations to nearly zero.

As for image contrast, the TECNIS Eyhance IOL modulation transfer function (MTF) show similar MTF at distance in photopic conditions (3mm pupil) and at least 31% better MTF in mesopic conditions (5mm pupil) in comparison to other monofocal IOLs.¹

In a prospective multi-center bilateral randomized study conducted in EMEA, TECNIS Eyhance IOL was compared to the TECNIS 1-Piece IOL ZCB00 (control). The objective was to evaluate the clinical performance of the TECNIS Eyhance IOL at 6-months. The results from this study showed that monocular distance vision with the TECNIS Eyhance IOL was comparable to that of the control IOL. Regarding contrast sensitivity, TECNIS Eyhance provided distance contrast sensitivity comparable to the monofocal control IOL; the differences in contrast sensitivity between the two IOLs were not statistically significant under both photopic and mesopic conditions. Similarly, the dysphotopsia profile of the TECNIS Eyhance was similar to that of the 1-piece con-

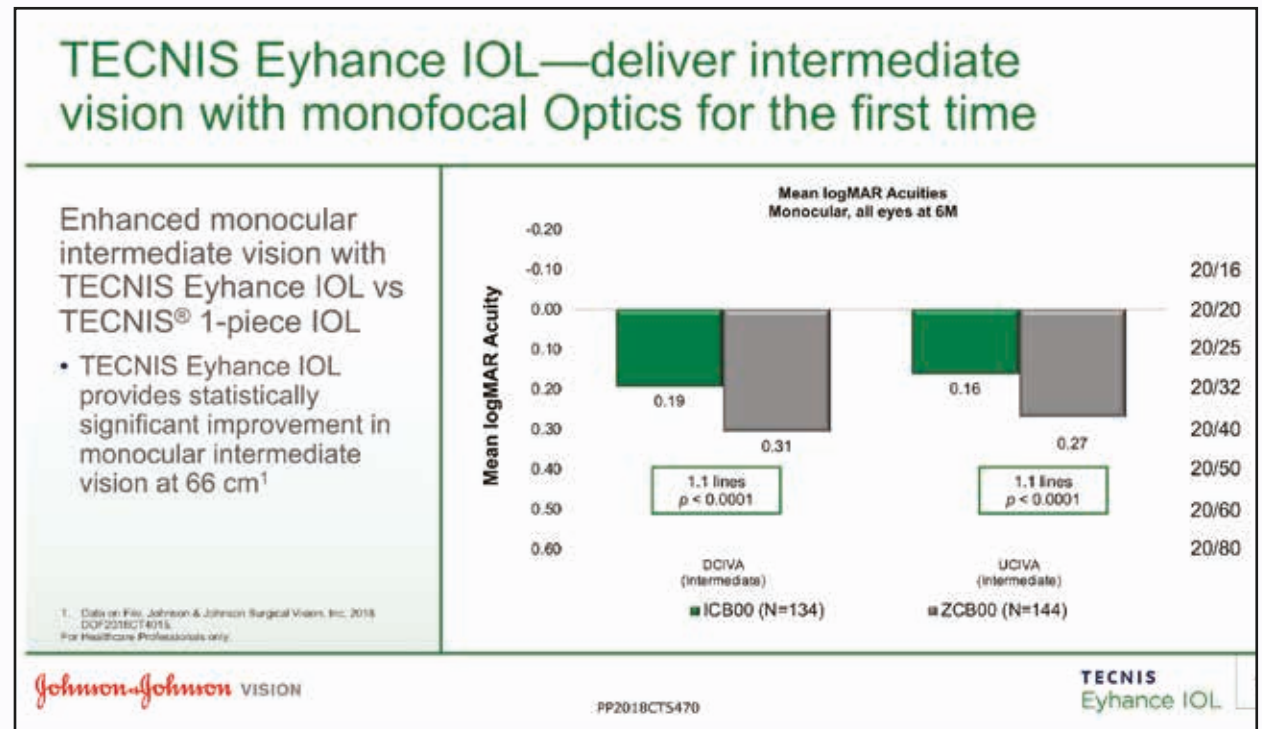


Figure 4. The TECNIS Eyhance IOL delivers intermediate vision with monofocal optics for the first time with statistically significant improvement.

trol IOL. However, for monocular intermediate vision at 66 cm, TECNIS Eyhance showed statistically significant improvement.²

With these results, it is promising to see what TECNIS Eyhance can achieve since it is able to deliver 20/20 BCDVA, offer significantly enhanced intermediate vision at 66cm, and has similar photic phenomena to the control IOL.

Regarding patient care and counseling with the TECNIS Eyhance, Dr. Findl said that he does not suggest explaining the intricate details and expected outcomes of the TECNIS Eyhance IOL

with his patients. "I think you should not try to [explain]. If you tell the patient they will have better intermediate vision, you are raising [their] expectations. Usually, I don't tell the patient about the lens. We just give the patient the lens. I don't promise anything."

For patients around 55-60 years old, they may have a life expectancy of about 90 years. These patients may develop one of the diseases that cause legal blindness later in life, such as AMD, DME or glaucoma. Thus it may not be ideal to implant a multifocal lens in their eyes. The procedure for exchanging lens in a

patient after about 10 years is not ideal and not great for these diseases that may develop in the elderly. For the TECNIS Eyhance IOL, "I tell patients that you will need reading glasses for reading at great lengths of time, for small print, and for low light." These are the three most important aspects for patients to be aware of post-operation, and typically patients will have no problem adjusting with these constraints in their daily life.

References:

1. Data on File: DOF2018OTH4004
2. Data on File: DOF2018OTH4004