TECNIS EYHANCE™ IOL: REDEFINING THE CONCEPT OF MONOFOCAL IOLs

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ATTENDEES


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INTRODUCTION

Until recently, available monofocal lenses for patients with cataracts were only able to correct for distance vision with no ability to improve the intermediate vision that is important for many daily tasks (e.g. personal grooming, household tasks, food preparation) and social activities (e.g. reading tablets, gardening, playing mahjong and participating in sports).

Intermediate vision has become an increasingly important patient need, reflecting increased use of computers and smart technology.[1]

In recognition of the lifestyle needs of today's patients and the limitation of traditional monofocal intraocular lens (IOL), Johnson & Johnson Vision developed the TECNIS Eyhance™ intraocular lens (IOL). This represents the first monofocal IOL in Asia-Pacific that provides both intermediate and distance vision.[2] TECNIS Eyhance™ IOL allows patients to achieve significantly improved intermediate vision, compared with a standard aspheric monofocal IOL, along with 6/6 distance vision.[2]

Positive patient outcomes from the innovation of TECNIS Eyhance™ are reflected in a recent published study[3] where visual outcomes, optical quality, spectacle independence and patient satisfaction were compared with a standard aspherical monofocal IOL.[3]

While the study results for the two groups show similar monocular and binocular distance and near visual acuities, the monocular and binocular UIVA were significantly higher in the Eyhance group. Thus giving better spectacle independence with TECNIS Eyhance™ than the standard IOL.[3]

TECNIS Eyhance™ had higher patients' satisfaction than the standard aspherical IOL as the two groups did not show any statistical difference in terms of photopic contrast sensitivity, objective scatter index (OSI),

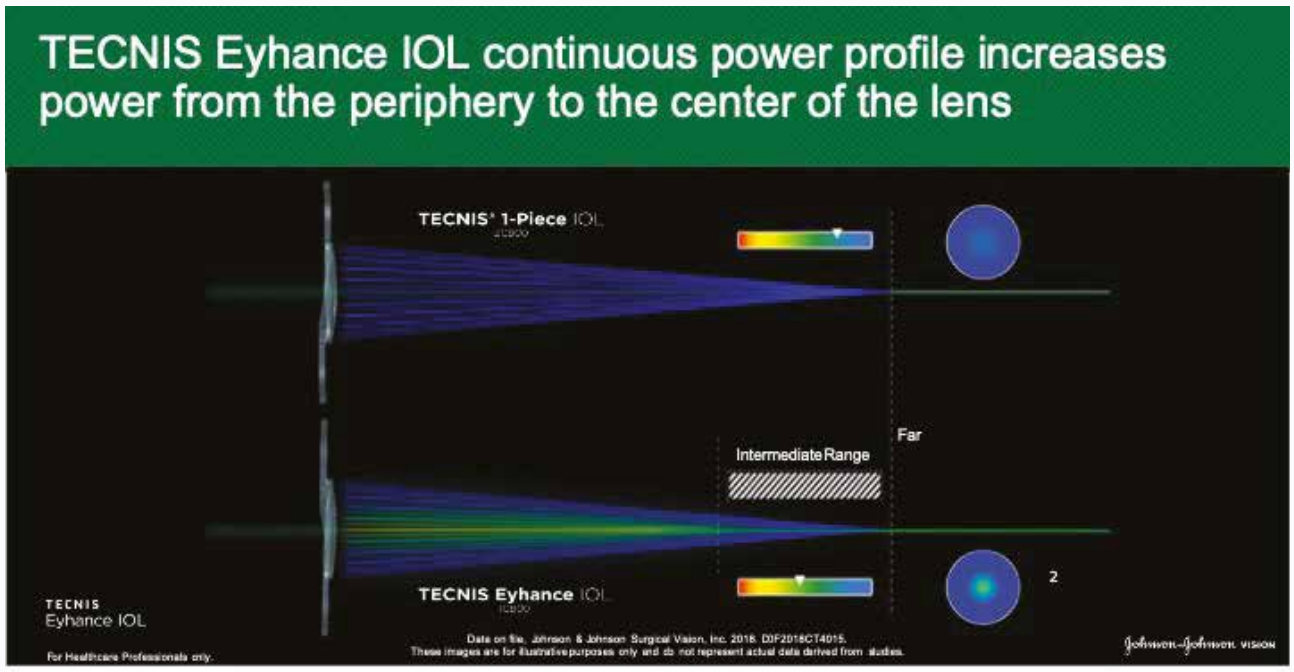

Figure 2: TECNIS Eyhance™ IOL provides improved intermediate vision and similar distance vision to TECNIS® 1-piece IOL due to its higher-order aspheric surface, resulting in continuous increase in power from the periphery to the centre of the lens, while reducing spherical aberration to nearly zero.[6]

modulation transfer function (MTF) cut-off, Strehl ratio, glare and halo perception.[3]

AN ERA OF MODERN MONOFOCAL IOLS: EXPERIENCES FROM ASIA-PACIFIC

The preliminary impressions of the visual performance of TECNIS Eyhance™ was shared by the experts to provide insights into how this IOL performs across different countries in Asia-Pacific and consequently in different patient demographics and eye types.

Dr. Warakorn Thiamthat discussed how TECNIS Eyhance™ IOL presents an important alternative option to the traditional monofocal IOLs for both the patient and doctor.

Reflecting on his first experience of using TECNIS Eyhance™ IOL in a male patient, unilateral implantation led to improved intermediate vision while with bilateral implantation, the patient was able to comfortably read text on his mobile phone at stretched arms-length, although not at the resting position. Similar clinical outcomes were also shared by other experts, including Dr. Debasish Bhattacharya, who explained how the experience of implanting TECNIS Eyhance™ in his first 10 patients was positive. At the six weeks post-operative review, patients reported no photic phenomena and reading vision was considered good especially for patients with residual myopia or some cylinder.

Dr. Douglas Lam also shared his six months of clinical experience using TECNIS Eyhance™ IOL. He explained that while different IOL formulas were used, target refraction was consistent across his patients as the larger landing zone of TECNIS Eyhance™ enabled 6/6 distance vision to be achieved more easily than with other lenses.

Targeting emmetropia in cataract surgery is frequently challenging with only 55% of eyes planned for emmetropia actually achieving this in practice. However, of the 47 patients fitted with TECNIS Eyhance™ IOL in his clinic, 33 achieved the target for emmetropia due to the larger landing zone of TECNIS Eyhance™.

Dr Brendan Cronin provided further insights into the TECNIS Eyhance™ IOL, having implanted this lens type in over a 100 patient cases. Reflecting on the clinical outcomes, he explained how none of the patients complained about dysphotopsia or poor or waxy vision. He believes that TECNIS Eyhance™ is the next evolution in monofocal lens surgery, and it's a great leap forward for patients.

Other positive attributes of TECNIS Eyhance™ that Dr Cronin mentioned include minimal chromatic aberration, extremely low rates of anterior capsular phimosis, no glistenings and being able to use the same A-constant as his other TECNIS IOLs.

In addition unlike multifocal IOLs, dry eye is not a contra-indication for use of this IOL, although it would be appropriate to address this prior to surgery. While he thinks it may be possible to use in cases of glaucoma, he believes there are a few situations where use of TECNIS Eyhance™ may not be appropriate: patients with corneal transplants, patients who have undergone photo-therapeutic keratectomy (PTK) or deep anterior lamellar keratoplasty (DALK), and patients being considered for a PTK.

Clinicians should weigh the potential risk/benefit ratio before implantation of an IOL, irrespective of its design but rather select the best IOL considering each patient's conditions.

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TECNIS EYHANCE™ IOL LEVERAGES A PROVEN IOL DESIGN:

- Refractive technology (no rings)[2]
- Based on a continuous higher order aspheric surface (no zones)[2]
- Visually indistinguishable from the TECNIS® 1-piece IOL (ZCB00)[2]
- Same base geometry as all other TECNIS® 1-piece lenses[2]
- Reduces spherical aberration to near zero[2]
- Delivers pupil-independent perfor mance similarly to TECNIS® 1-piece IOL[4]
- As tolerant as TECNIS® 1-piece IOL to decentrations[4]

Figure 1:

Left: TECNIS® 1-piece IOL (ZCB00)

Right: TECNIS Eyhance™ IOL (ICB00)

KEY CONSIDERATIONS WITH TECNIS EYHANCE™ FOR OPTIMAL OUTCOMES[8]

Clinical pearls for optimizing outcomes with TECNIS Eyhance™

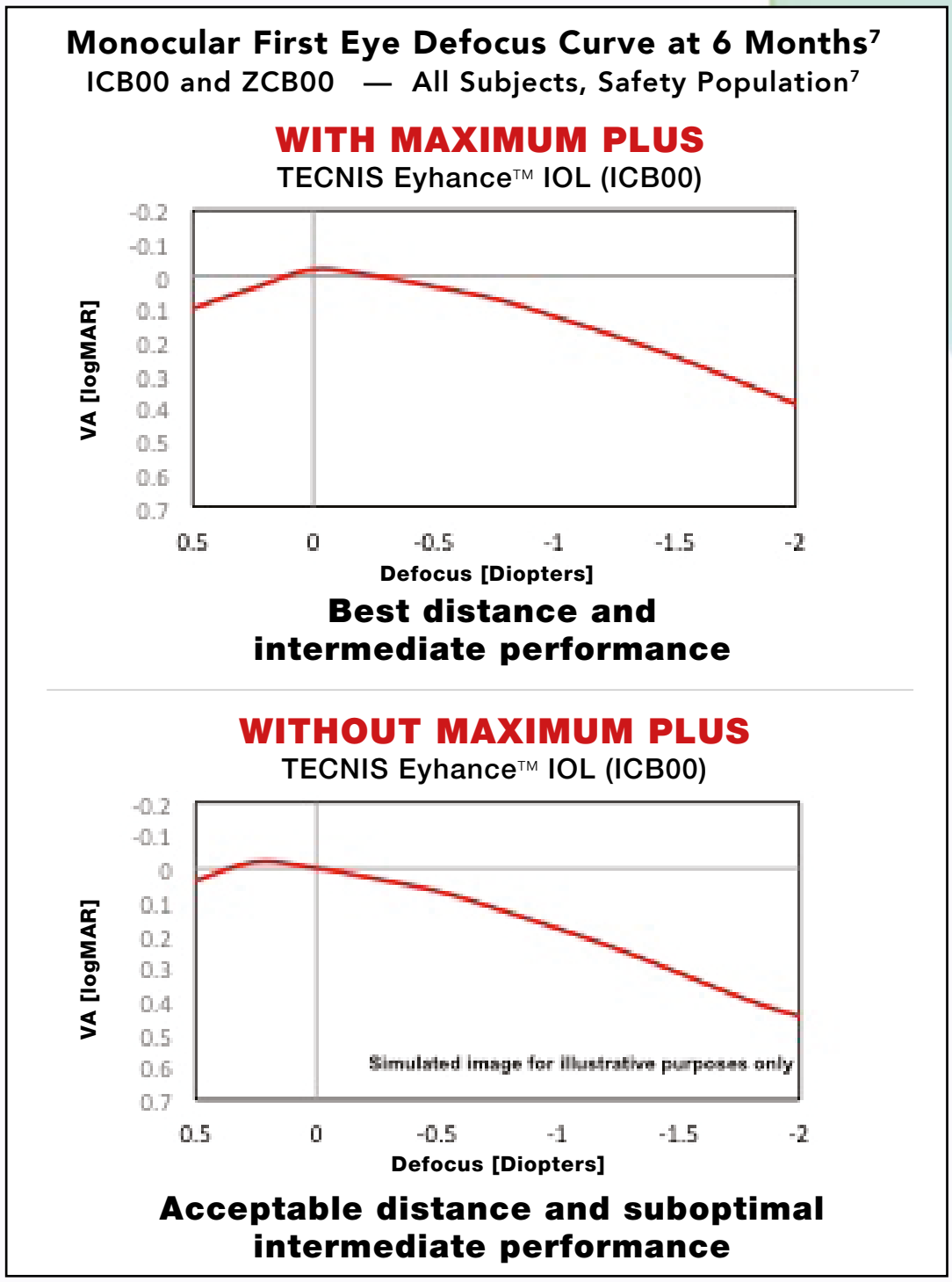
Who is suitable for TECNIS Eyhance™?	Patients for whom a monofocal IOL is being considered.
What A-constant should be used?	A-constant recommendations are 119.3 for optical biometry and 118.8 for ultrasound. For best possible outcomes, surgeons should personalize their A-constant based on their refractive outcomes using the maximum plus technique
What is the refraction goal?	Performing "maximum plus" refraction is strongly recommended. Pushing plus helps maximize both distance and intermediate vision with this IOL technology
What is the best way of achieving a maximum plus refraction?	This consists of refracting patients with the maximum plus (or least minus) power through which the best distance visual acuity is achieved. This refraction procedure is similar to that used for young phakic patients, that still retain their accommodation. • Measure UCDVA • Start with +0.75D using a phoropter or trial lens • If VA drops 1 line over UCDVA, add -0.25D lenses until patient achieves best VA (+0.75 -> +0.50 -> +0.25 -> PL -> -0.25 ...) • If VA drops less than 1 line over UCDVA, add an additional +0.75D • Best VA is reached when patient no longer sees more letters after adding -0.25D For optimal outcomes, cylinder should be addressed similar to monofocal IOLs.
Why not autorefractor?	Standard autorefractors use the central part of the eye to estimate refraction. Due to the continuous change in power from the center to the periphery of TECNIS Eyhance™ IOL, autorefractors may provide a wrong estimation of the total power of the eye.

GETTING THE BEST OUT OF TECNIS EYHANCE™ IOL IN PRACTICE

The real-world experiences shared by the experts indicated favourable vision outcomes and patient satisfaction – driven by the ability to perform daily and social tasks that require intermediate vision. For those patients seeking freedom from spectacle use, the experts expressed preference for presbyopia-correcting IOLs. However, if spectacle-freedom is not a patient's priority, then the experts agreed that TECNIS Eyhance™ would be an appropriate choice. Understanding patients' goals and preferences, which in turn determines the clinical goals, is instrumental in determining the most appropriate choice of IOL.

Discussion on the choice of target for the IOL calculation (plano, first plus or first minus), led some experts to explain how a target of PL is a supported concept in young patients, although for the older patients, the target is more commonly -0.5 D. However, due to the strong need to retain near vision in the Asian context, there was debate for selecting the first minus closest to emmetropia. A few experts believed that targeting minus for TECNIS Eyhance™ is likely to boost it by 0.5 diopter while still retaining distance vision. In the context of bilateral cataract surgery, the choice of target would depend on what has been inserted and achieved with the first eye. Figure 3 illustrates the importance of selecting the right IOL power to achieve the desired outcomes. The post-operative outcomes should be verified using the maximum plus refraction technique in order to unmask the high tolerance of this lens.

Figure 3: Unmask the full visual range of TECNIS Eyhance™ by performing "maximum plus" refraction



SUMMARY

TECNIS Eyhance™ IOL offers:

- 20/20 distance vision comparable to TECNIS® 1-piece IOL[8]
- Improved intermediate vision[1]: Statistically significant improvement in monocular and binocular intermediate vision vs. TECNIS® 1-piece IOL ($p<0.0001$).
- Higher spectacle independence without impairment of far vision and visual quality[3]
- Similar daytime but better night-time contrast performance vs. other IOLs[9]: Similar modulation transfer function performance vs. other IOLs
- Similar photic-phenomena profile of the TECNIS Eyhance™ IOL[1]: No statistical difference in the rates of halo, glare, or starbursts compared with the TECNIS® 1-piece IOL.

In addition, TECNIS Eyhance™ refractive (no rings) optic design, does not cause any impediment to posterior imaging and contrast imaging, thus making it safe to use in patients with coexisting optical comorbidities, and this was a key feature that is favoured by the experts. Other positive attributes of this lens type that contributed to the positive patient experiences was the lack of dysphotopsia following lens implantation. Addressing how soon vision is typically seen to improve following implantation of the TECNIS Eyhance™ IOL, experts explained that some patients may see no or little improvement in vision on day one which could be due to pupil constriction, but these patients report positively on the vision achieved at the next follow-up of one week or one month.

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