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Long-term Clinical Outcomes of a Hydrofilic Extended Depth-of-focus Intraocular Lens After Bilateral Cataract Surgery

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Research Article

Keywords: Extended depth-of-focus intraocular lens, EDOF IOL, cataract surgery, Visual outcomes

Posted Date: June 25th, 2026

DOI: https://doi.org/10.21203/rs.3.rs-9993344/v1

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Additional Declarations:
No competing interests reported.

Tables are available in the Supplementary Files section.

Original Article

LONG-TERM CLINICAL OUTCOMES OF A HYDROFILIC EXTENDED DEPTH-OF-FOCUS INTRAOCULAR LENS AFTER BILATERAL CATARACT SURGERY

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STATEMENTS & DECLARATIONS

Funding and competing interests

No funding was received to assist with the preparation of this manuscript. The authors have no competing interests to declare that are relevant to the content of this article.

Ethical Approval

The study was conducted in accordance with the Declaration of Helsinki. Approval was granted by the Ethics Committee of Gemini Eye Clinics, Czech Republic.

ABSTRACT

PURPOSE

To evaluate the long-term refractive and visual outcomes after bilateral implantation of an extended depth-of-focus (EDOF) intraocular lens (IOL).

MATERIALS AND METHODS

Forty eyes of 20 patients (mean age 66 years, range 54–74 years) underwent bilateral cataract surgery with implantation of the Synthesis Plus EDOF IOL (Cutting Edge, France). This hydrophilic IOL incorporates a blue-light filter and a 2-mm EDOF center created using fourth- and sixth-order spherical aberrations with opposite polarity. Patients were examined 1 week, 1 month, 3 months, 6 months, and 3 years postoperatively. Evaluated parameters included subjective refraction, uncorrected and corrected distance visual acuity (UDVA, CDVA), intermediate visual acuity at 66 cm and 80 cm (UIVA, DCIVA), defocus curve, contrast sensitivity under photopic and mesopic conditions, and slit-lamp findings.

RESULTS

Mean spherical equivalent was -0.15 ± 0.27 D at 6 months and -0.05 ± 0.19 D at 3 years. Mean UDVA was 0.02 ± 0.12 logMAR at 6 months and 0.03 ± 0.08 logMAR at 3 years. Mean CDVA was -0.02 ± 0.07 logMAR and 0.02 ± 0.07 logMAR at the respective follow-ups. CDVA of 0.2 logMAR or better was achieved in 100% and 95% of eyes at 6 months and 3 years, respectively. At 3 years, the defocus curve maintained visual acuity of 0.2 logMAR or better from +0.5 D to -1.5 D. Contrast sensitivity remained near the lower limit of normal values.

CONCLUSION

The evaluated EDOF IOL provided stable long-term refractive results and very good distance and intermediate visual acuity over a 3-year follow-up period.

KEYWORDS

Extended depth-of-focus intraocular lens; EDOF IOL; cataract surgery; Visual outcomes.

INTRODUCTION

Extended depth-of-focus (EDOF) intraocular lenses (IOLs) have been developed to improve functional vision across a continuous range of distances while reducing photic phenomena commonly associated with multifocal IOLs. Unlike conventional multifocal designs that create distinct focal points, EDOF optics aim to elongate the focal area and provide smoother transitions between distance and intermediate vision. Recent studies demonstrated that EDOF IOLs can achieve good uncorrected distance and intermediate visual acuity with lower rates of glare and halos compared with trifocal lenses.[1–3]

Several optical principles are currently used in EDOF technology. Diffractive platforms, such as the Tecnis Symfony (Johnson & Johnson Vision), use echelette diffraction and chromatic aberration correction to extend the depth of focus and generally provide excellent intermediate and relatively good near vision.[4,5] However, dysphotopsias and reduced contrast sensitivity may still occur due to diffractive optics.[6] Non-diffractive wavefront-shaping IOLs, e.g. AcrySof IQ Vivity (Alcon), were introduced to reduce photic phenomena while maintaining functional intermediate vision. Comparative studies reported similar distance and intermediate visual outcomes between Symfony and Vivity lenses, whereas Symfony tended to provide more glare and starbursts.[7,8]

The Synthesis Plus IOL (Cutting Edge, France) represents another EDOF approach based on controlled induction of fourth- and sixth-order spherical aberrations with opposite polarity within a central 2-mm optical zone. The Synthesis Plus lens is manufactured from hydrophilic acrylic material with a blue-light filter.[9] Hydrophilic acrylic IOLs generally provide good uveal biocompatibility and flexibility during implantation, although long-term evaluation of optical stability and posterior capsule behavior remains clinically important.

Although multiple studies have evaluated established EDOF IOLs, long-term data on newer aberration-based EDOF designs remain limited. The purpose of this study was therefore to evaluate the long-term refractive stability, visual performance, defocus characteristics, and contrast sensitivity after bilateral implantation of the Synthesis Plus EDOF IOL over a 3-year follow-up period.

METHODS

STUDY DESIGN

This prospective, observational single-center study was conducted at the Gemini Eye Clinic in Ostrava in Czech Republic between January 2021 and November 2025. This study was approved by the Ethics Committee of Gemini Eye Clinics (Etická komise oční kliniky Gemini, U Gemini 360, Zlin, Czech Republic) and adhered to the tenets of the Declaration of Helsinki. All patients provided a written informed consent before entering the trial.

PARTICIPANTS

This study included 40 eyes of 20 patients who underwent bilateral cataract surgery with implantation of the Synthesis Plus extended depth-of-focus (EDOF) intraocular lens (Cutting Edge, France).

Eligible patients had age-related cataract and a desire for postoperative spectacle independence, particularly for distance and intermediate vision. Inclusion criteria included bilateral cataract suitable for phacoemulsification and no ocular pathology expected to limit postoperative visual acuity. Exclusion criteria comprised ocular surgery in the previous 3 months, irregular corneal astigmatism, glaucoma with visual field defects, severe retinal disease, corneal pathology, amblyopia and neuro-ophthalmic disease.

PREOPERATIVE, INTRAOPERATIVE AND POSTOPERATIVE INTERVENTIONS

All eyes were assessed at least once preoperatively, including – endothelial cell density (ECD), axial length (AL), anterior chamber depth (ACD), intraocular pressure (IOP) measurement and slit lamp biomicroscopy assessment of the eye.

Patients were evaluated postoperatively at 1 week, 1 month, 3 months, 6 months, and 3 years. Postoperative examinations included subjective refraction, monocular uncorrected and

corrected distance visual acuity (UDVA, CDVA) measured using a Bailey–Lovie chart, uncorrected and distance-corrected intermediate visual acuity at 66 and 80 cm (UIVA, DCIVA) measured using ETDRS charts, uncorrected and distance-corrected near visual acuity (UNVA, DCNVA) assessed using Jaeger charts, defocus curve testing, contrast sensitivity under photopic and mesopic conditions, and slit-lamp examination.

Any adverse events were recorded. ECD was measured on the CEM-530 specular microscope by Nidek. AL and ACD were measured on the IOLMaster 700 optical biometer by ZEISS. IOP was measured using tonometer Tonoref II or III by Nidek.

SURGICAL TECHNIQUE

All surgeries were performed by experienced cataract surgeons using standard phacoemulsification techniques with bilateral implantation of the same IOL model. The Synthesis Plus is a hydrophilic acrylic IOL with a blue-light filter and a central 2-mm EDOF optical zone based on the induction of fourth- and sixth-order spherical aberrations with opposite polarity to increase depth of focus.

Surgery was performed under topical and intracameral anesthesia using an operating microscope (Lumera 700, Carl Zeiss Meditec AG, Jena, Germany) and a phacoemulsification system (Stellaris Elite, Bausch + Lomb, USA). Preoperatively, pupil dilation was achieved with topical 10% phenylephrine (Neosynephrin™, Ursapharm, Germany) and 0.5% tropicamide (Unitropic™, Unimed Pharma, Slovakia) administered at 10-minute intervals over 30 minutes. Patients received topical tobramycin/dexamethasone drops (Tobradex™, Alcon Laboratories, USA) before surgery, and topical anesthesia was induced with 0.4% oxybuprocaine hydrochloride (Benoxi®, Unimed Pharma, Slovakia). Intracameral 1% lidocaine was administered after creation of the paracenteses. Following standard antiseptic preparation and draping, a 2.0–2.2 mm clear corneal incision was created, typically on the steep corneal meridian. After injection of a dispersive ophthalmic viscosurgical device (OcuCoat®, Bausch

+ Lomb, USA), continuous curvilinear capsulorhexis, hydrodissection, phacoemulsification, and bimanual irrigation/aspiration of residual cortical material were performed. The IOL was implanted into the capsular bag using an injector system. Following implantation, 1 mg intracameral cefuroxime (Axetine®) was administered, residual OVD was removed, and the surgical wounds were hydrated and checked for watertight closure.

Postoperatively, patients received tobramycin/dexamethasone eye drops (Tobradex™, Alcon Laboratories, USA) five times daily for the first 3 days and then three times daily for 10–14 days, together with diclofenac sodium eye drops (Dicloabak™, Laboratoires Théa, France) three times daily until the bottle was finished.

OUTCOMES

The primary outcome measures were long-term refractive stability and postoperative visual performance following bilateral implantation of the Synthesis Plus EDOF intraocular lens. Refractive outcomes included manifest refraction and manifest refraction spherical equivalent (MRSE).

Visual outcomes focused on distance, intermediate, and near visual acuity, as well as the functional range of vision assessed by the defocus curve. Additional functional evaluation included contrast sensitivity testing under photopic and mesopic conditions.

Secondary outcome measures included safety and anatomical stability assessed by slit-lamp biomicroscopy, endothelial cell density (ECD), intraocular pressure (IOP), and the occurrence of postoperative complications or adverse events during the follow-up period.

Visual acuity results were recorded in logMAR notation. Data are presented as mean ± standard deviation.

STATISTICAL ANALYSIS

Descriptive statistics including mean, standard deviation (SD), median, minimum (min), and maximum (max) values were used to summarize the data. The Shapiro–Wilk test was applied to assess normality of data distribution. As several variables did not demonstrate normal distribution, nonparametric statistical methods were used.

Differences between postoperative follow-up visits were analyzed using the Wilcoxon signed-rank test for paired samples. A p value of < 0.05 was considered statistically significant.

Statistical analysis was performed using GraphPad Prism software (version 10.1.0; GraphPad Software, San Diego, CA, USA).

RESULTS

PREOPERATIVE AND INTRAOPERATIVE CHARACTERISTICS

The study included 40 eyes of 20 patients who underwent bilateral cataract surgery with implantation of the Synthesis Plus extended depth-of-focus intraocular lens. The mean patient age was 66 ± 6 years (range 54–74 years). All surgeries were completed without intraoperative complications. Preoperative and intraoperative characteristics are summarized in Table 1.

REFRACTIVE OUTCOMES

Postoperative refractive outcomes demonstrated good predictability and long-term stability throughout the 3-year follow-up period. The mean preoperative MRSE was 0.76 ± 1.65 D and shifted toward slight postoperative myopia after surgery. Mean MRSE was -0.20 ± 0.28 D at 1 week, -0.19 ± 0.35 D at 1 month, -0.21 ± 0.31 D at 3 months, -0.15 ± 0.27 D at 6 months, and -0.05 ± 0.19 D at 3 years postoperatively (Table 2). Refractive outcomes remained clinically stable between 6 months and 3 years, despite a statistically significant difference ($p = 0.032$).

At 6 months, 97.3% of eyes were within -0.50 to 0.50 D of emmetropia compared to 95.0% at 3 years (Figure 1A). No eyes demonstrated postoperative SE greater than ±1.0 D at either follow-up visit (Table 2).

Mean absolute refractive cylinder decreased from 0.42 ± 0.51 D preoperatively to 0.35 ± 0.38 D at 1 week, 0.29 ± 0.40 D at 1 month, 0.21 ± 0.33 D at 3 months, 0.13 ± 0.27 D at 6 months, and 0.08 ± 0.28 D at 3 years (Table 2, Figure 1B). At 6 months, 81.1% of eyes had postoperative refractive cylinder ≤ 0.25 D and 94.6% ≤ 0.50 D. At 3 years, 90.0% of eyes had cylinder ≤ 0.25 D and 95.0% ≤ 0.50 D. One eye demonstrated refractive cylinder between > 0.75 at the 3-year follow-up (Figure 1B).

Overall, the Synthesis Plus EDOF IOL demonstrated stable long-term refractive predictability with low residual astigmatism.

VISUAL OUTCOMES

Postoperative visual acuity outcomes remained stable throughout the 3-year follow-up period (Table 2). Mean monocular uncorrected distance visual acuity (UDVA) improved from 0.52 ± 0.33 logMAR preoperatively to 0.09 ± 0.11 logMAR at 1 week, further improving to 0.02 ± 0.11 logMAR at 6 months and remaining stable at 0.01 ± 0.10 logMAR at 3 years ($p = 0.8044$ for the comparison between 6 months and 3 years). At 6 months, 73% of eyes achieved monocular UDVA of 0.0 logMAR or better, increasing to 83% at 3 years. UDVA of 0.1 logMAR or better was achieved in 86% and 90% of eyes at 6 months and 3 years, respectively (Figure 2A).

Mean corrected distance visual acuity (CDVA) improved from 0.17 ± 0.17 logMAR preoperatively to 0.02 ± 0.06 logMAR at 1 week, reaching -0.02 ± 0.07 logMAR at 6 months and -0.01 ± 0.08 logMAR at 3 years ($p = 0.4978$ for the comparison between 6 months and 3 years). CDVA of 0.0 logMAR or better was achieved in 92% of eyes at 6 months and 95% at 3

years. CDVA of 0.2 logMAR or better was observed in 100% and 95% of eyes at the respective follow-ups (Figure 2B).

Intermediate visual acuity outcomes were favorable at both tested distances. At 66 cm, mean uncorrected intermediate visual acuity (UIVA) was 0.18 ± 0.12 logMAR at 6 months and remained stable at 0.13 ± 0.10 logMAR at 3 years ($p = 0.1170$). Mean distance-corrected intermediate visual acuity (DCIVA) at 66 cm improved significantly from 0.22 ± 0.13 logMAR at 6 months to 0.15 ± 0.10 logMAR at 3 years ($p = 0.018$). At 80 cm, mean UIVA was 0.12 ± 0.13 logMAR at 6 months and 0.08 ± 0.11 logMAR at 3 years ($p = 0.2114$), while mean DCIVA improved from 0.14 ± 0.14 logMAR to 0.08 ± 0.09 logMAR during the same period ($p = 0.049$). At 3 years, UIVA of 0.2 logMAR or better was achieved in 92% of eyes at 66 cm and 92% at 80 cm. DCIVA of 0.2 logMAR or better was achieved in 87% of eyes at 66 cm and 95% at 80 cm (Figure 2C, 2D, 2E, 2F). Overall, intermediate visual acuity was consistently slightly better at 80 cm than at 66 cm.

Binocular visual acuity outcomes demonstrated further improvement compared with monocular measurements and remained stable during long-term follow-up (Table 3). At 66 cm, mean binocular uncorrected intermediate visual acuity (UIVA) was 0.06 ± 0.09 logMAR at 6 months and remained stable at 0.06 ± 0.09 logMAR at 3 years ($p = 0.6875$). Mean binocular distance-corrected intermediate visual acuity (DCIVA) at 66 cm did not significantly change with DCIVA of 0.10 ± 0.10 logMAR at 6 months and 0.07 ± 0.09 logMAR at 3 years ($p = 0.3242$). At 80 cm, mean binocular UIVA was 0.03 ± 0.10 logMAR at 6 months and 0.02 ± 0.06 logMAR at 3 years ($p = 0.5703$). Mean binocular DCIVA remained stable at 0.05 ± 0.10 logMAR at 6 months and 0.02 ± 0.06 logMAR at 3 years ($p = 0.2656$). At the 3-year follow-up, binocular UIVA of 0.1 logMAR or better was achieved in 89% of eyes at 66 cm and in 100% at 80 cm (Figure 3A, 3C). Binocular DCIVA of 0.1 logMAR or better was achieved in 84% of eyes at 66 cm and 100% at 80 cm (Figure 3B, 3D). Visual acuity of 0.2 logMAR or better was achieved

in 95–100% of patients across all binocular intermediate visual acuity measurements. Overall, binocular testing demonstrated excellent functional intermediate vision with stable long-term performance over the 3-year follow-up period.

DEFOCUS CURVE AND CONTRAST SENSITIVITY

The monocular defocus curve demonstrated a continuous range of functional vision with stable performance between the 3-month and 3-year follow-up visits (Figure 4). At 3 years, visual acuity of 0.2 logMAR or better was maintained across a defocus range from +0.5 D to -1.5 D. The best visual acuity values were observed between 0.0 D and -0.5 D of defocus, where mean visual acuity remained close to 0.0 logMAR. Visual acuity gradually decreased at higher positive and negative defocus levels, reaching approximately 0.4–0.45 logMAR at +1.5 D and -2.5 D.

Contrast sensitivity remained relatively stable over time under both photopic and mesopic conditions (Figure 5). Under photopic conditions, contrast sensitivity values at 3 and 6 cycles per degree (cpd) were within the lower range of normative values, while a mild reduction was observed at higher spatial frequencies, particularly at 12 cpd. Under mesopic conditions, contrast sensitivity demonstrated a similar pattern, with values remaining near the lower limit of normal at higher spatial frequencies and below the normal limit at lower special frequencies. No clinically significant deterioration in contrast sensitivity was observed between the 6-month and 3-year follow-up visits.

Overall, the Synthesis Plus EDOF IOL provided a broad functional defocus range with stable long-term optical performance and acceptable contrast sensitivity under both photopic and mesopic lighting conditions.

SLIT LAMP EXAMINATION/COMPLICATIONS SAFETY AND POSTOPERATIVE FINDINGS

No intraoperative or postoperative adverse events requiring surgical or medical intervention were observed during the follow-up period. All implanted intraocular lenses remained well centered and in-the-bag throughout the study period.

Posterior capsule opacification (PCO) was the most common postoperative finding during long-term follow-up. Nd:YAG laser posterior capsulotomy was performed in 28 of 40 eyes (70.0%) due to clinically significant PCO associated with reduced visual quality or subjective visual complaints. Of these, 8 eyes (20.0%) underwent Nd:YAG capsulotomy within 6 months postoperatively, whereas 20 eyes (50.0%) required treatment later than 6 months after surgery.

No retinal complications, persistent intraocular inflammation, cystoid macular edema, or IOL dislocation were observed. Endothelial cell loss remained within clinically acceptable limits during follow-up, and no eye required corneal intervention. No clinically significant glistenings were observed during slit-lamp examination. Subjective photic phenomena such as glare or halos were not systematically evaluated; however, patients generally reported good postoperative visual satisfaction and functional vision at follow-up visits.

DISCUSSION

The present study demonstrated that the Synthesis PLUS EDOF intraocular lens provides stable long-term refractive outcomes together with very good distance and intermediate visual performance over a 3-year follow-up period. The refractive predictability observed in our cohort was high, with the majority of eyes remaining within ±0.50 D of emmetropia and with minimal residual astigmatism. These outcomes are comparable to those reported for other contemporary nondiffractive EDOF IOLs, including AcrySof IQ Vivity (Alcon) and LuxSmart

(Bausch & Lomb), suggesting that the optical concept of the Synthesis PLUS allows reliable refractive targeting and stable postoperative positioning.[10–12]

A major strength of the Synthesis PLUS lens was the quality of intermediate vision. Both monocular and binocular intermediate visual acuities were particularly favorable at 80 cm, while functional performance at 66 cm also remained very good. This finding likely reflects the optical design of the lens, which combines a central EDOF zone with controlled induction of opposite-sign spherical aberrations to elongate the focal area. Similar behavior has been described for other nondiffractive refractive EDOF lenses, which generally favor distance and intermediate vision over very near vision.[13] Compared with diffractive multifocal or trifocal lenses, this optical strategy may provide a more natural visual transition and improved tolerance to visual disturbances.[14,15]

The defocus curve obtained in our study demonstrated a continuous functional range of vision without pronounced focal gaps. Visual acuity of 0.2 logMAR or better was maintained across a broad defocus interval, confirming the ability of the lens to provide extended depth of focus rather than distinct multifocal focal points. This defocus profile appears comparable to previously published outcomes for nondiffractive EDOF technologies such as AcrySof IQ Vivity or LuxSmart, which also rely on wavefront modulation and higher-order aberration manipulation rather than diffractive optics.[10–12]

An important finding of the present study was the relatively stable contrast sensitivity over long-term follow-up. Although a mild reduction at higher spatial frequencies was observed, particularly under mesopic conditions, values remained within clinically acceptable limits. This may represent one of the advantages of nondiffractive EDOF optics compared with diffractive multifocal technologies, which are more frequently associated with reduced contrast sensitivity due to light splitting.[7] The absence of clinically significant glistenings and the generally good subjective patient satisfaction further support the favorable optical quality of the lens.

The relatively high Nd:YAG capsulotomy rate represented the main limitation observed during follow-up. Posterior capsule opacification is likely related to the hydrophilic acrylic material, which has been associated with increased lens epithelial cell proliferation and a higher incidence of PCO compared with hydrophobic acrylic platforms.[16–18] However, the hydrophilic material also offers practical surgical advantages, including implantation through incisions as small as 2.0 mm and controlled, rapid unfolding of the IOL within the capsular bag. In addition, patients implanted with EDOF IOLs may be more sensitive to reductions in contrast sensitivity and visual quality caused by even mild posterior capsule opacification than patients with monofocal IOLs, potentially leading to earlier indication for Nd:YAG treatment. Despite the high capsulotomy rate, refractive and visual outcomes remained stable throughout follow-up.

A major strength of the present study is the relatively long 3-year follow-up period. Many currently available studies evaluating EDOF intraocular lenses report outcomes only within the first postoperative months, whereas long-term data remain limited. Extended follow-up is particularly important in EDOF technologies because subtle changes in capsular behavior, posterior capsule opacification, refractive stability, optical quality, and neuroadaptation may influence functional visual outcomes over time. The present study therefore provides valuable information regarding the long-term stability and clinical behavior of this hydrophilic nondiffractive EDOF platform.

The present study is limited by its relatively small sample size, lack of a control group, and absence of systematic patient-reported outcome measures evaluating dysphotopsia and spectacle independence. Nevertheless, the long-term follow-up and detailed functional analysis provide valuable information regarding the clinical performance of this less frequently studied EDOF platform.

CONCLUSION

In conclusion, the Synthesis PLUS EDOF IOL provided stable refractive outcomes, very good distance and intermediate visual acuity, and a broad functional defocus range over 3 years of follow-up. Its nondiffractive aberration-based optical design appears to preserve optical quality and contrast sensitivity while extending functional vision. However, the relatively high rate of posterior capsule opacification should be considered during long-term follow-up of this hydrophilic EDOF platform.

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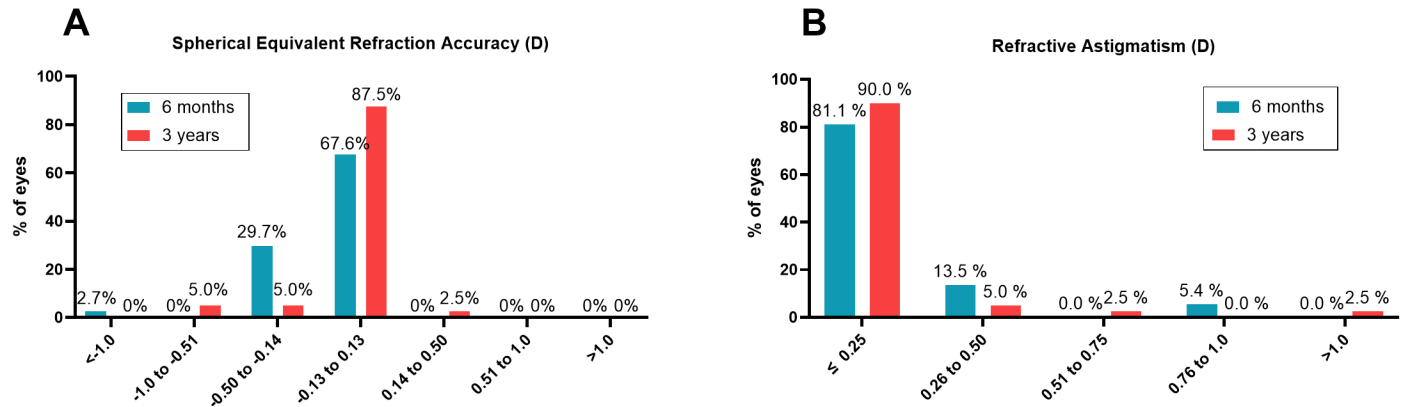
Fig. 1. Subjective refraction spherical equivalent (A) and subjective absolute cylinder (B) expressed as percentages

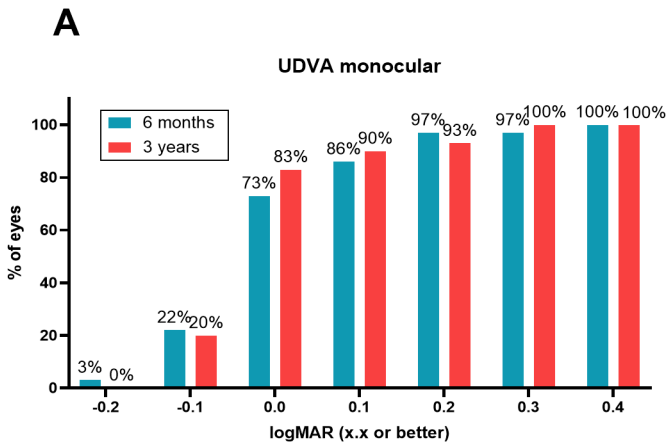
Fig. 2. Cumulative monocular visual acuities x.x logMAR or better expressed as percentages: UDVA (A); CDVA (B); UIVA at 66 cm (C); DCIVA at 66 cm (D); UIVA at 80 cm (E); DCIVA at 80 cm (F).

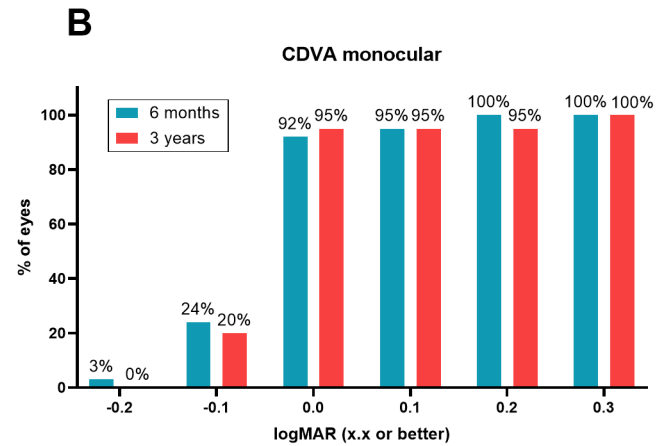
Fig. 3. Cumulative binocular visual acuities x.x logMAR or better expressed as percentages: UIVA at 66 cm (A); DCIVA at 66 cm (B); UIVA at 80 cm (C); DCIVA at 80 cm (D).

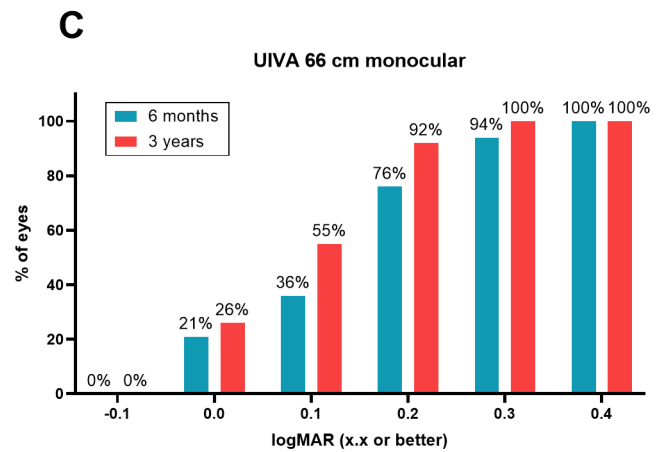
Fig. 4. Defocus curves at 6 months and 3 years.

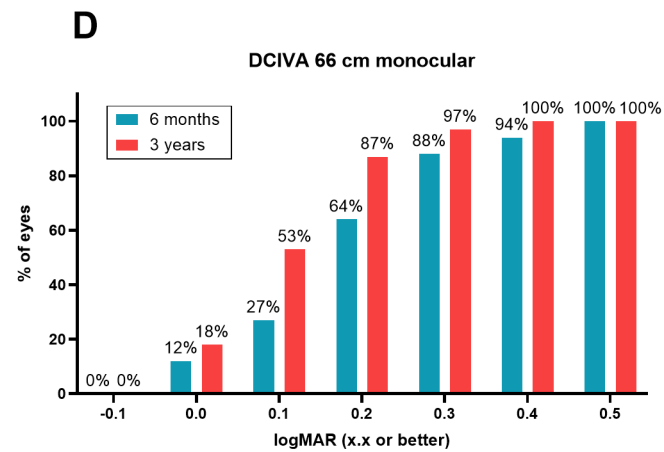
Fig. 5. Contrast sensitivity under photopic and mesopic conditions at 6 months and 3 years.

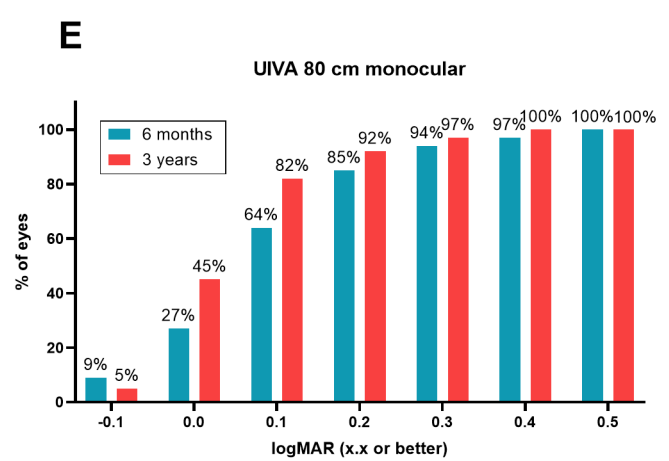

A
Spherical Equivalent Refraction Accuracy (D)
% of eyes
6 months
3 years
2.7%
0%
0%
5.0%
29.7%
5.0%
67.6%
87.5%
0%
2.5%
0%
0%
0%
0%
<-1.0
-1.0 to -0.51
-0.50 to -0.14
-0.13 to 0.13
0.14 to 0.50
0.51 to 1.0
>1.0
B
Refractive Astigmatism (D)
% of eyes
6 months
3 years
81.1 %
90.0 %
13.5 %
5.0 %
0.0 %
2.5 %
5.4 %
0.0 %
0.0 %
2.5 %
≤ 0.25
0.26 to 0.50
0.51 to 0.75
0.76 to 1.0
>1.0

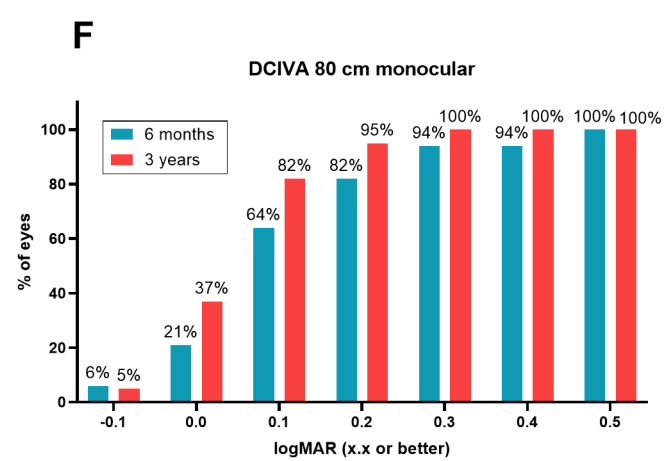

A
UDVA monocular
6 months
3 years
% of eyes
logMAR (x.x or better)
-0.2
-0.1
0.0
0.1
0.2
0.3
0.4
3%
0%
22%
20%
73%
83%
86%
90%
97%
93%
97%
100%
100%
100%

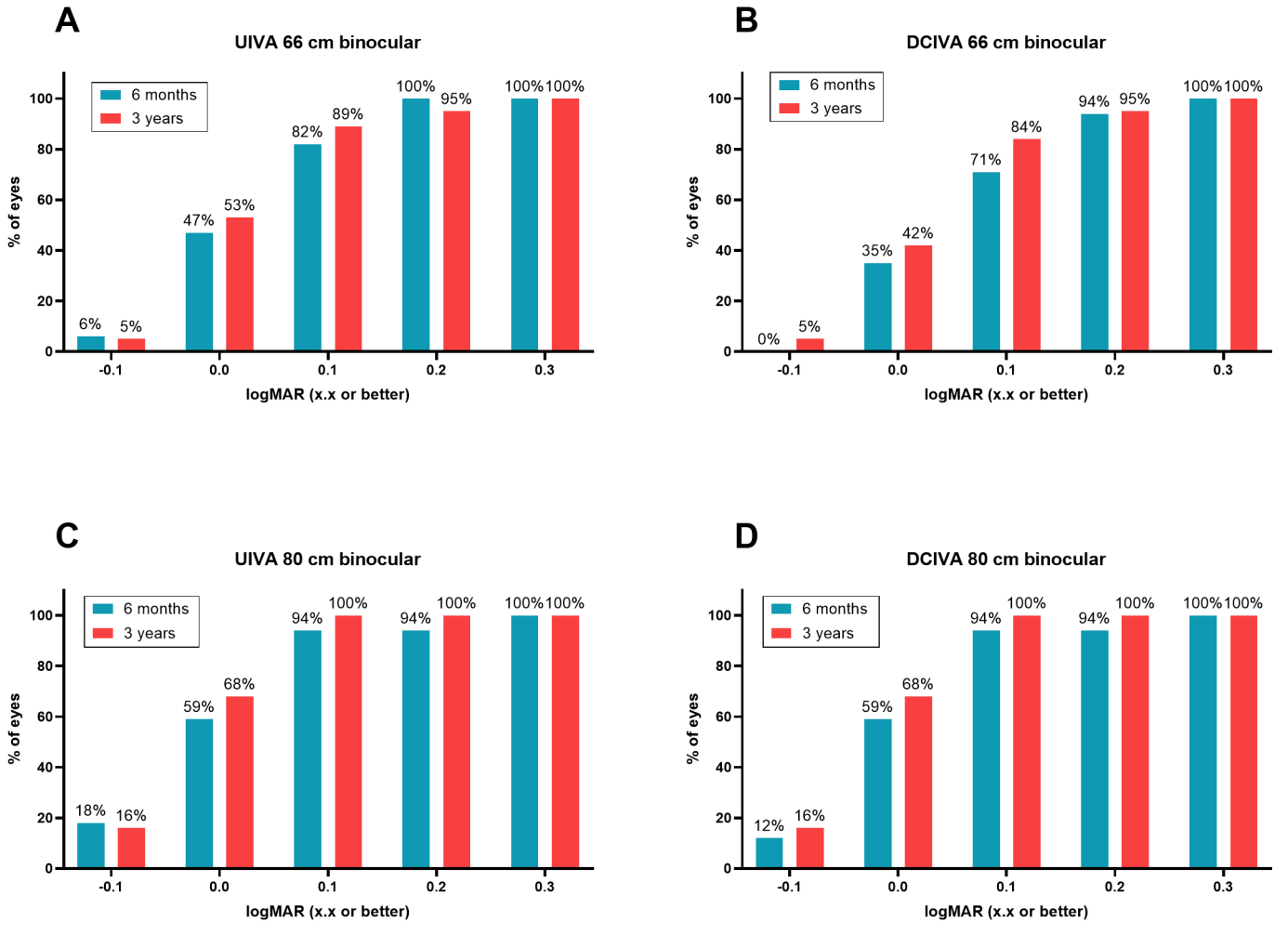

B
CDVA monocular
6 months
3 years
% of eyes
logMAR (x.x or better)
-0.2
-0.1
0.0
0.1
0.2
0.3
3%
0%
24%
20%
92%
95%
95%
95%
100%
95%
100%
100%

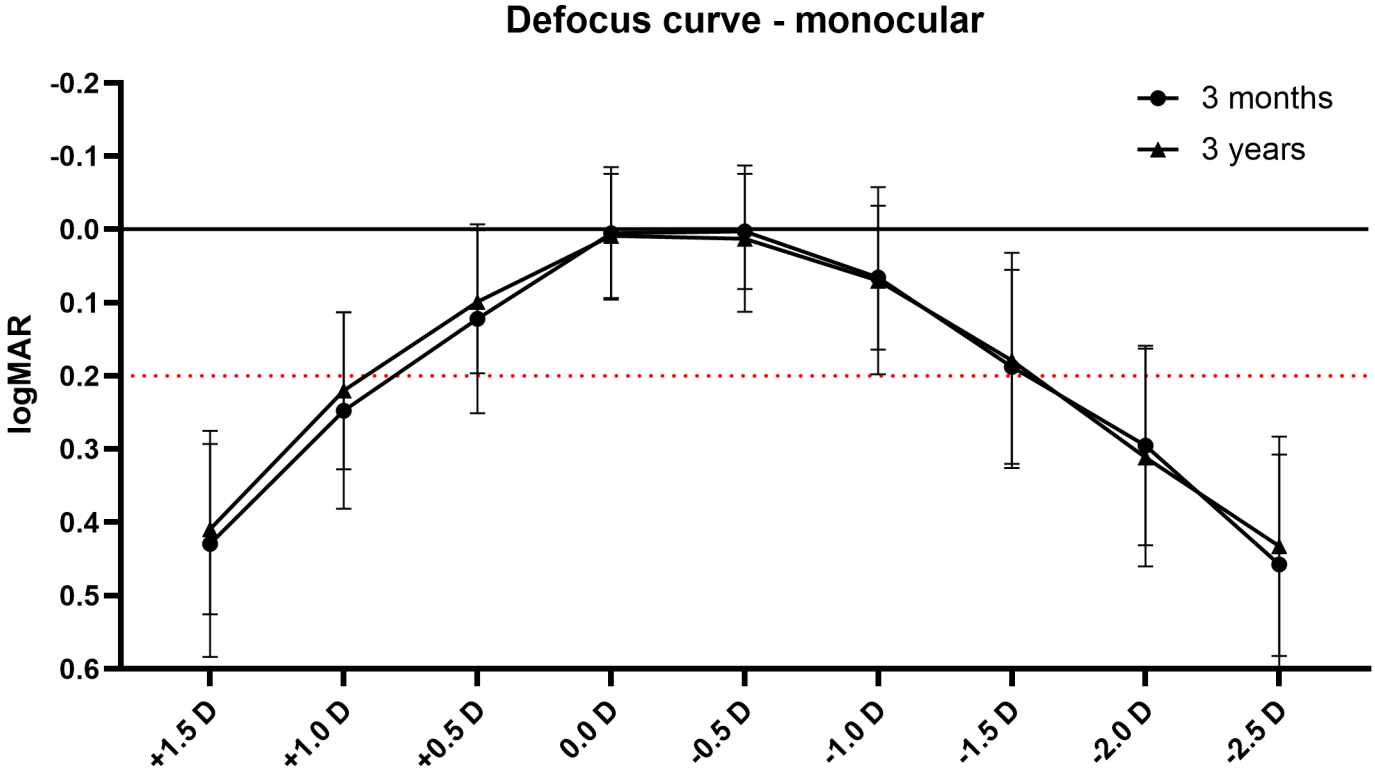

C
UIVA 66 cm monocular
6 months
3 years
% of eyes
logMAR (x.x or better)
-0.1
0.0
0.1
0.2
0.3
0.4
0%
0%
21%
26%
36%
55%
76%
92%
94%
100%
100%
100%

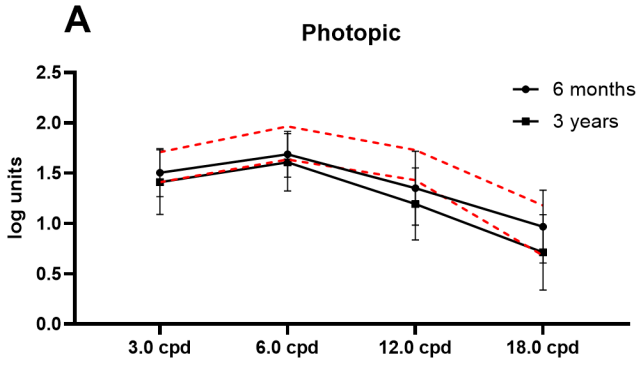

D
DCIVA 66 cm monocular
6 months
3 years
% of eyes
logMAR (x.x or better)
-0.1
0.0
0.1
0.2
0.3
0.4
0.5
0%
0%
12%
18%
27%
53%
64%
87%
88%
97%
94%
100%
100%
100%

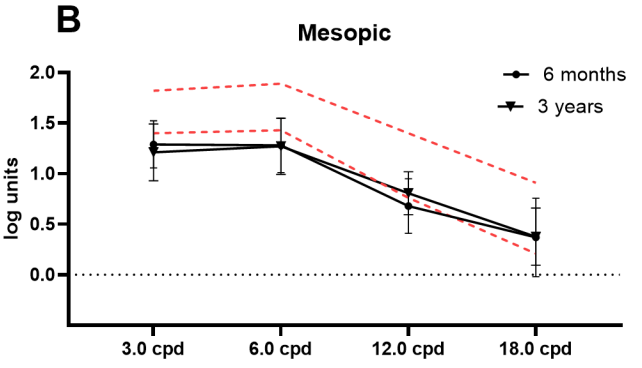

E
UIVA 80 cm monocular
6 months
3 years
% of eyes
logMAR (x.x or better)
-0.1
0.0
0.1
0.2
0.3
0.4
0.5
9%
5%
27%
45%
64%
82%
85%
92%
94%
97%
97%
100%
100%
100%


F
DCIVA 80 cm monocular
6 months
3 years
% of eyes
logMAR (x.x or better)
-0.1
0.0
0.1
0.2
0.3
0.4
0.5
6%
5%
21%
37%
64%
82%
82%
95%
94%
100%
94%
100%
100%
100%


A
UIVA 66 cm binocular
6 months
3 years
% of eyes
logMAR (x.x or better)
-0.1
0.0
0.1
0.2
0.3
6%
5%
47%
53%
82%
89%
100%
95%
100%
100%
B
DCIVA 66 cm binocular
6 months
3 years
% of eyes
logMAR (x.x or better)
0%
5%
35%
42%
71%
84%
94%
95%
100%
100%
C
UIVA 80 cm binocular
6 months
3 years
% of eyes
logMAR (x.x or better)
18%
16%
59%
68%
94%
100%
94%
100%
100%
100%
D
DCIVA 80 cm binocular
6 months
3 years
% of eyes
logMAR (x.x or better)
12%
16%
59%
68%
94%
100%
94%
100%
100%
100%


Defocus curve - monocular
3 months
3 years
logMAR
-0.2
-0.1
0.0
0.1
0.2
0.3
0.4
0.5
0.6
+1.5 D
+1.0 D
+0.5 D
0.0 D
-0.5 D
-1.0 D
-1.5 D
-2.0 D
-2.5 D


A
Photopic
6 months
3 years
log units
2.5
2.0
1.5
1.0
0.5
0.0
3.0 cpd
6.0 cpd
12.0 cpd
18.0 cpd


B
Mesopic
6 months
3 years
log units
2.0
1.5
1.0
0.5
0.0
3.0 cpd
6.0 cpd
12.0 cpd
18.0 cpd

Supplementary Files

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