

Improvement of Uncorrected Visual Acuity and Contrast Sensitivity Using Aurovue Vivid Continuous Focus Vision (CFV) Lens in Cataract Patients at RSCM Kirana

Irma Suwandi Sadikin

irmaswans@gmail.com

Ophthalmology Department, Faculty of Medicine Universitas Indonesia, Cipto Mangunkusumo General Hospital

Jessica Zarwan

Ophthalmology Department, Faculty of Medicine Universitas Indonesia, Cipto Mangunkusumo General Hospital

Syska Widyawati

Ophthalmology Department, Faculty of Medicine Universitas Indonesia, Cipto Mangunkusumo General Hospital

Faraby Martha

Ophthalmology Department, Faculty of Medicine Universitas Indonesia, Cipto Mangunkusumo General Hospital

Rio Rhendy

Ophthalmology Department, Faculty of Medicine Universitas Indonesia, Cipto Mangunkusumo General Hospital

Syougie Ali

Departement of Community Medicine, Faculty of Medicine Universitas Indonesia

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Abstract

Background

The primary goal of cataract surgery has evolved beyond visual restoration toward comprehensive refractive outcomes. In aging yet functionally active populations such as Indonesia, access to premium multifocal intraocular lenses (IOLs) remains limited, creating demand for cost-effective extended-depth-of-focus (EDOF) alternatives.

Objective

To evaluate visual performance, contrast sensitivity, defocus profile, IOL stability, and patient-reported outcomes following implantation of the Aurovue Vivid Continuous Focus Vision (CFV) IOL developed by Aurolab.

Methods

This prospective interventional study included 25 eyes undergoing phacoemulsification with Aurovue® Vivid CFV implantation. Assessments at baseline and postoperative days 1, 7, and 30 included uncorrected distance (UCDVA), intermediate (UCIVA), and near (UCNVA) visual acuity, binocular defocus curve, photopic contrast sensitivity, ultrasound biomicroscopy for tilt/decentration, and patient satisfaction.

Results

All eyes completed follow-up. Statistically significant improvements were observed: UCDVA from 1.06 ± 0.49 to 0.06 ± 0.11 logMAR ($p < 0.001$), UCIVA from 0.97 ± 0.41 to 0.19 ± 0.12 logMAR ($p < 0.001$), UCNVA from 1.06 ± 0.50 to 0.34 ± 0.14 logMAR ($p < 0.001$), and photopic contrast sensitivity from 1.20 ± 0.26 to 1.68 ± 0.14 log units ($p < 0.001$). The defocus curve showed maintained acuity up to approximately -2.0 D, with a gradual decline beyond that range. IOL stability was excellent: mean tilt angles 90.30° – 90.50° and median decentration 0.06 mm. Patient satisfaction reached 100% with 76% spectacle independence; mild non-functional glare was reported by 20%. No sight-threatening adverse events were recorded.

Conclusion

In this short-term series, the Aurovue Vivid CFV achieved satisfactory visual outcomes across all distances, with preserved contrast sensitivity, stable IOL positioning, and excellent patient-reported comfort. These data suggest the lens is a viable, cost-effective option to bridge the gap between monofocal and premium multifocal solutions in settings where access to high-end devices is

constrained; longer-term, comparative studies are warranted to confirm durability and relative performance.

Introduction

Cataract is a degenerative disease characterized by lens opacity and remains the leading cause of blindness worldwide, particularly in South Asia, Oceania, and Southeast Asia.^{1,2} In Indonesia, the burden of cataract blindness remains high: recent surveys found a 3.0% national blindness prevalence with untreated cataract as the commonest cause (71–96% of cases).^{3,4} As population longevity increases, Indonesia's over-60 population is projected to rise from ~ 10.8% in 2022 to ~ 25% by 2050, the demand for high-quality post-operative vision at all distances has grown.^{3,4} Modern cataract surgery thus aims not only to restore visual clarity but also to achieve refractive independence across all distances, including intermediate and near ranges.^{6–8} However, standard monofocal IOLs provide focus at a single distance only, leaving most patients reliant on reading glasses for near and intermediate tasks.^{6–8}

This has driven the development of various premium IOL technologies, including multifocal, accommodative, enhanced monofocal, and extended depth-of-focus (EDOF) lenses.^{6,9} EDOF lenses are designed to provide distance and intermediate vision with minimal photic phenomena (halos and glare) compared to traditional multifocal lenses.^{9,10} Unlike multifocal lenses that create two or three discrete focal points, EDOF lenses extend the depth of focus to create a continuous range of vision, thereby reducing the light dispersion responsible for photic side effects (Fig. 1).^{11,12} The ANSI/AAO Z80.35-2018 standard establishes four primary criteria for EDOF classification: non-inferior distance visual acuity, a minimum depth-of-focus increase of 0.5 D, superior intermediate visual acuity, and visual quality assessment including mesopic contrast sensitivity.¹³

The Aurolab® Aurovue Vivid CFV (Aurolab, Madurai, Tamil Nadu, India) is a newly available hybrid refractive-diffractive EDOF lens with no prior published clinical evaluation (Fig. 2).^{14,15} The lens is designed to extend focus from 40 cm to ≥ 4 m using aspheric optics and smooth edge technology.¹⁴ Compared to imported EDOF lenses, its lower acquisition cost may offer a more accessible option within Indonesia's healthcare system. This study therefore aimed to evaluate its clinical performance, including visual acuity at distance, intermediate, and near, defocus curve, contrast sensitivity, IOL positional stability, and patient-reported outcomes.

Methods

Study Design and Patients

This experimental, single-group pretest–posttest study was conducted in the outpatient clinic and operating theatre of RSCM Kirana outpatient clinic, Department of Ophthalmology, Faculty of Medicine, Faculty of Medicine, Universitas Indonesia: Cipto Mangunkusumo Hospital (RSCM), between July 1, 2025 and October 20, 2025. Ethical approval was obtained from the institutional Health Research Ethics

Committee of the Faculty of Medicine, Universitas Indonesia (KET-352/UN2.F1/ETIK/PPM.00.02/2025), and site permission from Cipto Mangunkusumo Hospital (YR.02.01/D.IX.2.3/906/2025); all participants provided written informed consent.

Subjects were recruited consecutively from senile cataract patients attending the outpatient clinic. To be eligible, patients were required to have senile cataract graded $\leq$ N05NC5 in one or both eyes, regular corneal astigmatism < 1.00 D, retinometry ≥ 0.80 (≤ 0.1 logMAR / 6/7.5), clear refractive media aside from the cataract, and a pupil diameter of 3.0–3.5 mm. Patients were excluded if they had a history of prior ocular surgery (including corneal or refractive procedures) or ocular comorbidities likely to influence visual acuity or pupil size, including chronic uveitis, glaucoma, diabetic retinopathy, pseudoexfoliation syndrome, keratoconus, age-related macular degeneration, or corneal dystrophy. Patients who failed to complete scheduled follow-up, experienced intra- or postoperative events affecting pupil size or IOL stability, or withdrew consent were classified as drop-outs. A total of 25 subjects were enrolled based on statistical calculations for paired numerical comparative analysis using consecutive sampling.

Clinical Evaluation and Surgical Protocol

Clinical Evaluation and Surgical Protocol

Subjects underwent a standardized preoperative assessment that included a structured history and a full ophthalmic examination. Visual acuity measures comprised uncorrected and corrected distance visual acuity (UDVA, CDVA), uncorrected intermediate visual acuity at 80 cm (UIVA) and uncorrected near visual acuity at 40 cm (UNVA), all recorded with the Logarithmic Visual Acuity Chart 2000 (“new ETDRS”). Contrast sensitivity was measured with the Pelli–Robson chart. Biometry and keratometry were performed using the IOLMaster 500 (Carl Zeiss Meditec). A complete anterior and posterior segment examination was obtained by slit-lamp biomicroscopy and intraocular pressure measurement by tonometry. Phacoemulsification was performed by surgeons of the Cataract–Cornea–Refractive Surgery Division with implantation of the Aurolab® Aurovue Vivid Continuous Focus Vision (CFV) IOL. Postoperative management followed a standardized regimen of topical levofloxacin and prednisolone acetate per protocol.

All subjects returned for a structured one-month postoperative assessment that included a complete ophthalmic examination; monocular and binocular UDVA, UIVA and UNVA; contrast sensitivity; and patient-reported visual comfort assessed with an open questionnaire. Defocus testing was performed using lenses from $+ 1.50$ D to $- 3.50$ D in 0.50 D increments to generate a defocus curve. Intraocular lens centration and position were evaluated by ultrasound biomicroscopy (VuMAX HD®).

Statistical Analysis

All data were entered and analyzed using IBM SPSS Statistics version 25.0. Categorical variables are reported as frequencies and percentages. Numerical variables were assessed for normality using the

Shapiro–Wilk test and reported as mean $\pm$ standard deviation for normally distributed data or median (minimum–maximum) for non-normally distributed data. For paired comparisons, the paired t-test was applied to parametric data and the Wilcoxon signed-rank test to non-parametric data. Longitudinal changes across four time points were analyzed using the General Linear Model (GLM) Repeated Measures ANOVA for normally distributed outcomes or the Friedman test for non-normal data. A p-value of < 0.05 was considered statistically significant, and 95% confidence intervals are reported where applicable. This study adhered to the ethical principles of the Declaration of Helsinki. Ethical approval was obtained from the Ethics Committee of the Faculty of Medicine, Universitas Indonesia (No. KET-352/UN2.F1/ETIK/PPM.00.02/2025), and research location permission was granted by Cipto Mangunkusumo Hospital (No. YR.02.01/D.IX.2.3/906/2025). Written informed consent was obtained from all participants.

Results

Patient characteristics

Twenty-six eyes of 22 patients were enrolled; six patients underwent bilateral implantation. One eye (from a unilateral patient) was excluded because of a postoperative retinal detachment requiring vitrectomy, leaving 25 eyes of 21 patients for final analysis. The cohort had a mean age of 63 ± 7 years (range 52–79); 64% were female. Most patients (76%) habitually used spectacles preoperatively. Occupational and educational profiles were typical of a working-to-retirement–age population, with homemakers (36%) and retirees (32%) comprising the largest groups and the majority having at least secondary education (Table 1). Baseline refraction and axial length varied widely (spherical equivalents -10.50 to $+2.00$ D; axial lengths 21.2–25.9 mm). Planned refractive target aimed for emmetropia (mean target -0.26 D); two eyes were intentionally targeted at slight myopia (-1.00 D and -1.25 D) because of limited lens power availability in highly myopic patients. IOP was within normal limits for all subjects preoperatively (Table 2). The preoperative biometry characteristics are provided in Table 3.

Visual acuity outcomes

Preoperative uncorrected visual acuity was markedly reduced across all distances (UCDVA 1.06 ± 0.49 logMAR, UCIVA 0.97 ± 0.41 logMAR, UCNVA 1.06 ± 0.50 logMAR) (Table 2). At 1 month following phacoemulsification with Aurovue Vivid CFV implantation, mean uncorrected visual acuity improved significantly at all distances ($p < 0.001$): UCDVA to 0.18 ± 0.16 logMAR, UCIVA to 0.35 ± 0.23 logMAR, and UCNVA to 0.55 ± 0.16 logMAR (Table 4; Fig. 3). The greatest improvement was observed at postoperative day 1, with values remaining stable at day 7 and 1 month (Table 5). The median postoperative spherical equivalent was 0.00 D (range -1.00 to $+0.25$ D). Spectacle independence was reported in 19 of 25 eyes (76%), with four of the six spectacle-dependent eyes requiring reading glasses only for near tasks at approximately 30 cm.

Table 1
Demographic Characteristics of Study
Subjects (n = 25)

Variable	n (%)
Gender	
Male	9 (36)
Female	16 (64)
Age; years	63 ± 7 ^a
Laterality	
Unilateral	19 (76)
Bilateral	6 (24)
Cataract Eye Side	
Right	12 (48)
Left	13 (52)
History of Cataract Surgery	
Yes	10 (40)
No	15 (60)
History of Spectacle Use	
Yes	19 (76)
No	6 (24)
Occupation	
Private Employee	2 (8)
Housewife	9 (36)
Retired	8 (32)
Others	4 (16)
Latest Education Level	
Elementary School	3 (12)
Junior High School	1 (4)
Senior High School	10 (40)
^a Mean ± SD	

Variable	n (%)
Gender	
Bachelor's Degree	4 (16)
Postgraduate	3 (12)
Others	4 (16)
^a Mean ± SD	

Table 2
Preoperative Clinical Characteristics of the Eye (n = 25)

Variable	Mean ± SD
UCDVA ¹	1.06 ± 0.49
UCIVA ²	0.97 ± 0.41
UCNVA ³	1.06 ± 0.50
Intraocular Pressure	14.58 ± 3.63
Contrast Sensitivity	1.2 ± 0.26
Preoperative Spherical Equivalent Refraction (n = 8)	-3.63 (-9.50 - +2.5) ^b
¹ UCDVA: Uncorrected Distance Visual Acuity; ² UCIVA: Uncorrected Intermediate Visual Acuity; ³ UCNVA: Uncorrected Near Visual Acuity	

Table 3
Preoperative Biometry Characteristics

Optical Biometry Parameters	Mean ± SD / Median (minimum-maximum)
K1; Diopters	44.25 ± 1.37
K2; Diopters	44.95 ± 1.75
AXL; mm ¹	23.66 (22.08–26.95) ^a
ACD ²	3.02 ± 0.34
Corneal Cylinder; Diopters	-0.59 ± 0.47
Intraocular Lens Power; Diopters	20 (10–24) ^a
Target Refraction; Diopters	-0.26 (-1.25 - -0.02) ^a
¹ AXL: Axial Length; ² ACD: Anterior Chamber Depth	

Contrast sensitivity

Median photopic contrast sensitivity improved significantly from 1.20 log units (range 0.94–1.50) preoperatively to 1.68 log units (range 1.50–1.86) postoperatively ($p < 0.001$) (Table 4). Postoperative values were within or slightly above age-adjusted normative limits, consistent with restoration of optical clarity following cataract extraction.

Defocus curve

The binocular defocus curve is shown in Fig. 4. Peak visual acuity of 0.06 logMAR was achieved at 0 D defocus. Visual acuity remained ≤ 0.20 logMAR between 0 D and -2.0 D defocus (approximately 50–66 cm), representing a functional intermediate range. Beyond -2.0 D, acuity declined progressively: 0.22 logMAR at -2.50 D (~ 40 cm), 0.45 logMAR at -3.00 D (~ 33 cm), and 0.65 logMAR at -3.50 D (~ 29 cm). No secondary peaks were observed, indicating a continuous and progressive decline in acuity with increasing defocus.

Table 4
Comparison of UCDVA, UCIVA, UCNVA, and Contrast Sensitivity Results

Variable	Preoperative	Postoperative (1 month)	P Value	Mean difference	CI (95%)
UCDVA ¹	1.06 $\pm$ 0.49	0.18 $\pm$ 0.16	< 0.001 ^a	0.888*	0.720–1.074
UCIVA ²	0.97 $\pm$ 0.41	0.35 $\pm$ 0.23	< 0.001 ^a	0.616*	0.452–0.780
UCNVA ³	1.05 $\pm$ 0.49	0.55 $\pm$ 0.16	< 0.001 ^a	0.500*	0.291–0.709
Contrast Sensitivity	1.05 (0–1.65)	1.65 (1.35–1.85)	< 0.001 ^b		
Postoperative Spherical Equivalent (D)	-3.63 (-9.50 - +2.5)	0 (-1 - +0.25)	NA		
^a Mean $\pm$ SD, Paired T-Test; ^b Median (Minimum-Maximum), Wilcoxon Test					
*) Significant at 0.05 level ($p < 0.05$); ¹ UCDVA: Uncorrected Distance Visual Acuity; ² UCIVA: Uncorrected Intermediate Visual Acuity; ³ UCNVA: Uncorrected Near Visual Acuity					

Table 5
Characteristics of UCDVA, UCIVA, UCNVA, and Intraocular Pressure Before Surgery, Day 1, Day 7, and 1 Month After Surgery

Variable	Preoperative	Postoperative (Day 1)	Postoperative (Day 7)	Postoperative (1 month)	P value ^a
UCDVA ¹	1.06 ± 0.49	0.19 ± 0.19	0.15 ± 0.13	0.18 ± 0.16	< 0.001
UCIVA ²	0.97 ± 0.41	0.37 ± 0.16	0.32 ± 0.14	0.35 ± 0.23	< 0.001
UCNVA ³	1.05 ± 0.49	0.56 ± 0.16	0.51 ± 0.15	0.55 ± 0.16	< 0.001
Intraocular Pressure	14.58 ± 3.63	15.90 ± 5.30	12.52 ± 3.08	12.70 ± 2.89	< 0.001
^a Analysis: GLM Repeated Measures ANOVA; ¹ UCDVA: Uncorrected Distance Visual Acuity; ² UCIVA: Uncorrected Intermediate Visual Acuity; ³ UCNVA: Uncorrected Near Visual Acuity					

Patient-reported outcomes

Patient-reported outcomes were favorable: at one month 100% of patients rated overall comfort as good (score ≥ 6/10), 80% reported no subjective complaints, and 20% described only mild, non-disabling dysphotopsia (predominantly transient glare in dim lighting) (Table 3). Overall, patient-reported comfort corresponded with the spectacle independence rate of 76%

Intraocular lens centration and stability

Ultrasound biomicroscopy at 1 month confirmed excellent positional stability of the IOLs (Table 6). Tilt angles were within normal limits (mean values approximating the expected vertical meridian), and the median decentration was 0.06 mm (range 0–2.75 mm). One outlier (decentration 2.75 mm) occurred secondary to an intraoperative haptic fracture; despite this, that eye achieved good functional acuity (~20/25), illustrating relative tolerance of the CFV diffractive–refractive design to misalignment.

Summary of longitudinal changes

Repeated-measures analyses across four time points (preoperative, day 1, day 7, and 1 month) demonstrated highly significant improvements for all tested parameters (visual acuity, contrast sensitivity, and refractive outcomes), with the most pronounced change occurring on day 1 followed by early stabilization through 1 month (Tables 4 and 5).

Table 6
Clinical Characteristics of IOL Tilt and Stability at 1 Month Postoperatively

<i>IOL tilt angle at 12 o'clock (°)</i>	Postoperative (1 month)	Normal Value^{20,21}
	90,46 ± 0,82^a	90–95⁰
<i>IOL tilt angle at 6 o'clock (°)</i>	90,50 ± 0,81 ^a	90–95 ⁰
<i>IOL tilt angle at 3 o'clock (°)</i>	90,30 (88,40–92,80) ^b	90–95 ⁰
<i>IOL tilt angle at 9 o'clock (°)</i>	90,30 (89,40–92,70) ^b	90–95 ⁰
<i>Average tilt (degrees)</i>	90,30 (88,98–93) ^b	90–95 ⁰
<i>Length 1 nasal area (mm)</i>	2,85 (1,39–3,28) ^b	
<i>Length 2 nasal area (mm)</i>	2,90 (2,23–4,14) ^b	
<i>IOL decentration (mm)</i>	0,06 (0–2,75) ^b	≤ 0,3 mm
^a Mean ± SD		
^b Median (Minimum-Maksimum)		

DISCUSSION

This study enrolled 25 cataract eyes with demographic characteristics consistent with published cataract epidemiology, with a mean age of 63 years and female predominance (64%).²² Most subjects had a history of spectacle use (76%), reflecting the practical demand for comprehensive visual correction.²³ Preoperative visual impairment was severe across all distances (UCDVA 1.06 ± 0.49, UCIVA 0.97 ± 0.41, UCNVA 1.06 ± 0.50 logMAR), with intraocular pressure within normal limits (14.58 ± 3.63 mmHg). Preoperative biometry confirmed fulfillment of the minimal astigmatism inclusion criterion (corneal cylinder – 0.59 ± 0.47 D), with a median refractive target of – 0.26 D aimed at emmetropia to optimize the functional range of the EDOF lens.²⁴

Significant improvements in uncorrected visual acuity were observed at all distances following implantation ($p < 0.001$). UCDVA improved from 1.06 ± 0.49 logMAR preoperatively to 0.18 ± 0.16 logMAR at 1 month, corresponding to approximately 6/7.5–6/9. Early stabilization from day 1 suggests accurate effective lens position prediction, consistent with the use of the Barrett Universal II formula.²⁵ These results are comparable to established EDOF lenses including PureSee (0.03 ± 0.07 logMAR), IOL EDOF 877PEY (0.15 ± 0.16 logMAR), and Tecnis Symphony (0.08 ± 0.10 logMAR).^{26–28} UCIVA improved to 0.35 ± 0.23 logMAR at 1 month, approximately 6/12, consistent with PureSee (0.26 ± 0.13 logMAR) and IOL EDOF 877PEY (0.30 ± 0.17 logMAR).^{26,27} UCNVA improved to 0.55 ± 0.16 logMAR, approximately 6/21, permitting functional near tasks at 40 cm.^{10,17,29} Residual spectacle dependence for very close distances

(30–33 cm) is an expected characteristic of EDOF designs, which prioritize reduction of photic phenomena over maximal near acuity.^{11,30}

Transient IOP elevation at day 1 (15.90 ± 5.30 mmHg) was attributed to viscoelastic retention and temporary trabecular outflow resistance, without significant visual disturbance.³³ By day 7, IOP normalized to 12.52 ± 3.08 mmHg, corresponding with completion of corneal epithelialization and edema resolution.^{31,32} Subsequent IOP reduction reflects anterior chamber deepening, angle widening, and activation of the TM ELAM-1/IL-1/NF- κ B pathway.^{34,35}

Photopic contrast sensitivity improved significantly from a median of 1.05 to 1.65 log units ($p < 0.001$), within the normal functional range.³⁶ This improvement is attributable to elimination of cataract-induced light scatter, as well as the more uniform light distribution of the EDOF design compared to multifocal lenses that divide light energy into discrete foci.^{30,37} These findings are consistent with Kim et al. and Györy et al., who reported contrast sensitivity within or above normal limits across all spatial frequencies.^{26,27} Maintaining contrast sensitivity is clinically relevant, particularly for tasks such as night driving and low-illumination mobility.³⁶

The optical and material properties of the CFV IOL likely contributed to these outcomes. The hydrophobic acrylic platform is associated with stable capsular bag fixation, low inflammatory response, and long-term material durability; with optimized polymer processing, glistening formation can be minimized, preserving optical clarity.^{14,15} The aspheric anterior surface is designed to compensate for positive corneal spherical aberration, optimizing the overall ocular wavefront profile — an important consideration in presbyopia-correcting lenses, where excessive higher-order aberrations can degrade image quality despite good high-contrast acuity.^{14,15} Additionally, the more uniform light distribution of the CFV design, compared to diffractive multifocal systems, likely contributes to the favorable contrast sensitivity outcomes observed in this study. Tolerance to residual refractive error is another relevant clinical consideration. Diffractive multifocal IOLs are sensitive to small spherical or cylindrical deviations due to simultaneous light distribution across multiple foci.^{6–8} In our cohort, mild postoperative refractive deviations did not result in disproportionate deterioration of functional acuity, suggesting that the continuous-focus architecture of the CFV lens may be more tolerant of imperfect refractive outcomes in real-world clinical settings.

Defocus curve analysis demonstrated a continuous vision range with an inverted mountain-shaped profile. Applying the ANSI/AAO Z80.35-2018 criteria: (1) the distance acuity criterion was met, with BCDVA of 0 logMAR; (2) depth-of-focus increase was 1.5 D, though the absence of a monofocal control group precluded full ANSI comparative confirmation; (3) uncorrected intermediate acuity was 0.35 ± 0.23 logMAR at 66 cm, with only 40% of eyes achieving ≤ 0.2 logMAR without correction — best-corrected assessment with a monofocal comparator is required for full compliance; (4) contrast sensitivity and visual symptom criteria were met, though photopic-only testing limits complete standard adherence.¹³

All patients (100%) reported satisfactory visual comfort, with 80% experiencing no subjective complaints and 20% describing mild, non-disabling glare. Spectacle independence was achieved in 76% of patients, consistent with published EDOF series reporting rates of 74–80%.^{38,39} Among those still requiring correction, 67% used reading glasses only for near tasks at approximately 30 cm, while 33% required correction for both distance and near due to refractive targets outside emmetropia from lens power limitations in high myopia. IOL stability assessed by UBM demonstrated mean tilt angles of 90.30°–90.50° within the normal range (90–95°), and median decentration of 0.06 mm, below the accepted threshold of 0.3 mm. One case of decentration (2.75 mm) secondary to intraoperative haptic fracture retained acceptable functional acuity, consistent with the optical tolerance of hybrid refractive-diffractive designs to positional deviation.^{40–42}

The Aurovue Vivid CFV maintained functional visual acuity (≤ 0.3 logMAR) up to – 2.0 D defocus, with acuity of 0.18 logMAR at – 1.0 D and 0.22 logMAR at – 1.5 D, placing its intermediate performance within the range of contemporary EDOF lenses.^{26–28} While premium international alternatives may offer marginally superior near acuity or broader defocus ranges, the Aurovue Vivid CFV is available at substantially lower cost (approximately IDR 4 million versus IDR 12–20 million), potentially expanding access to EDOF technology for patients who would otherwise be limited to monofocal options.

Several limitations should be acknowledged. The absence of a monofocal or comparator EDOF control group limits strict ANSI-based classification. Contrast sensitivity was assessed under photopic conditions only. Future randomized comparative studies with mesopic testing and longer follow-up are needed to confirm the durability and relative performance of this lens.

In this prospective short-term series, implantation of the Aurovue Vivid CFV IOL resulted in significant improvements in uncorrected visual acuity across all distances, preserved photopic contrast sensitivity, satisfactory IOL positional stability, and high patient-reported comfort. Spectacle independence was achieved in 76% of patients. These results suggest that this lens is a clinically viable and cost-effective alternative within the EDOF category, particularly for patient populations with limited access to premium IOL technologies. Randomized comparative trials with longer follow-up are needed to confirm these findings.

Declarations

Competing Interests

The Aurovue Vivid CFV intraocular lenses used in this study were provided free of charge by Aurolab (Madurai, Tamil Nadu, India). The sponsor had no role in study design, data collection, patient follow-up, data analysis, interpretation of results, or the decision to submit for publication. The authors declare no other competing interests.

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Author Contribution

I.S.S. conceived and designed the study, collected clinical data, and wrote the main manuscript text. J.Z., S.W., F.M., and R.R. performed all surgical procedures, contributed to patient recruitment, clinical follow-up, and data collection. S. performed the statistical analysis and data interpretation. I.S.S. prepared all figures and tables. All authors reviewed and approved the final manuscript.

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Data Availability

The datasets used and analyzed during the current study are not publicly available due to patient privacy and confidentiality considerations, but are available from the corresponding author upon reasonable request

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Figures

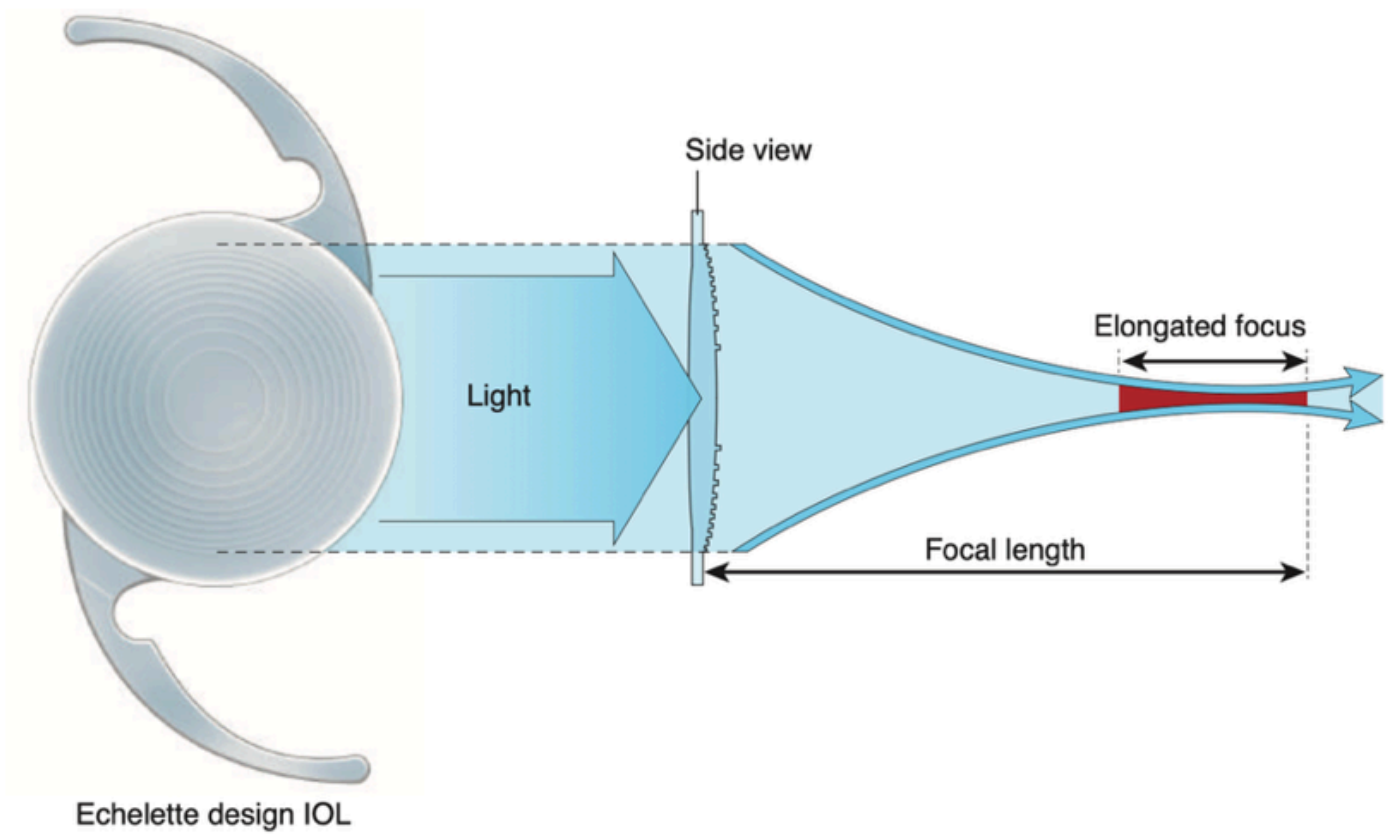


Figure 1

Extended depth-of-focus (EDOF) Lens

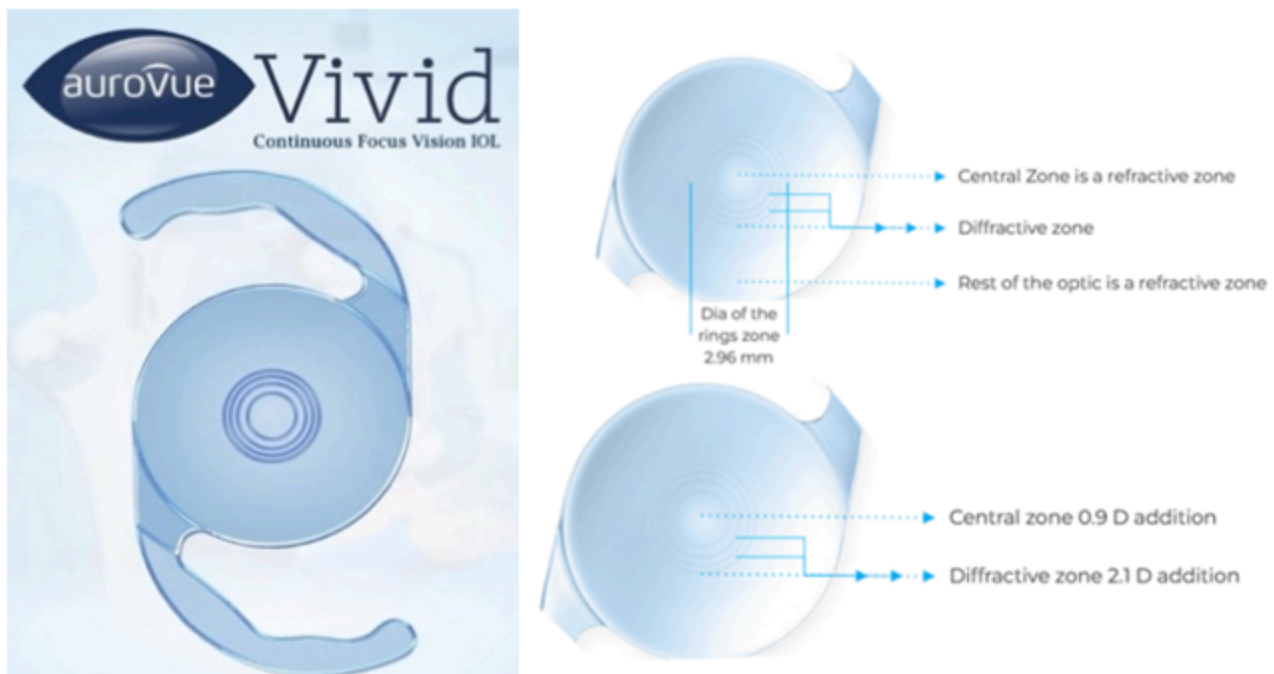


Figure 2

Aurovue vivid continuous focus vision Lens

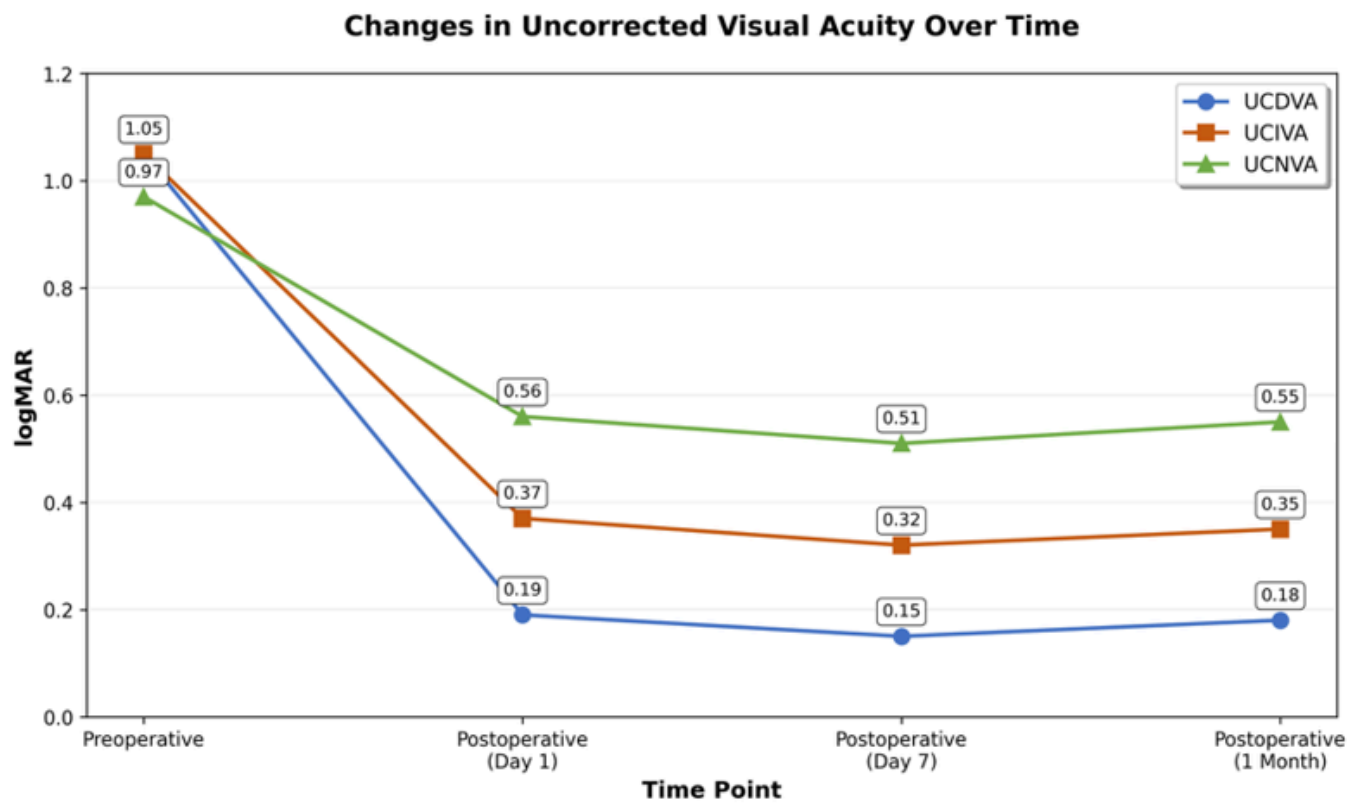


Figure 3

Uncorrected visual acuity changes over time (preoperative and postoperative)

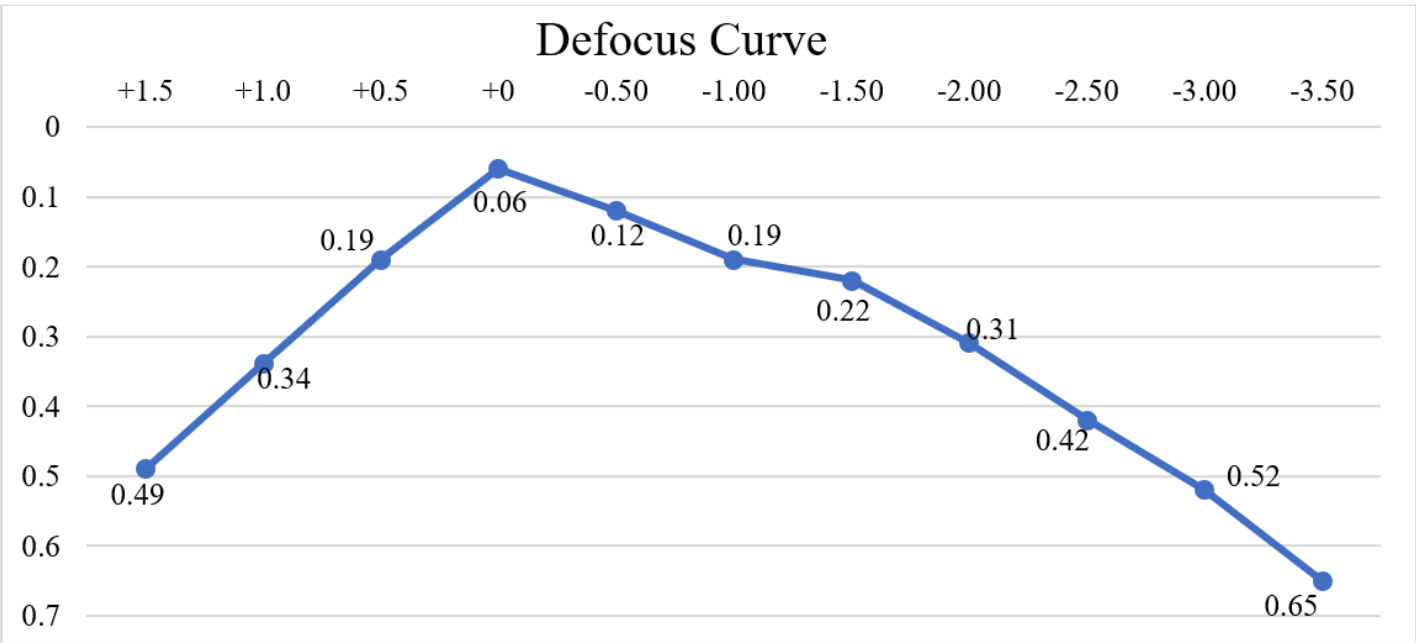


Figure 4

Defocus Curve of Aurovue VIVID CFV lens

