



The Influence of Intraocular Monofocal Lens Position During Phacoemulsification Cataract Surgery on the Occurrence of Dysphotopsia

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Abstract

Objectives: The study aimed to evaluate the occurrence and intensity of positive and negative dysphotopsias in patients with different intraocular lens (IOL) positions – vertical, horizontal, superonasal, and inferonasal – and to determine whether IOL position correlates positive or negative dysphotopsias.

Methods: This prospective cohort study included 80 patients, divided into four equal groups based on IOL positioning. Each group received a monofocal hydrophobic acrylic IOL during ultrasound phacoemulsification cataract surgery. Patients with horizontally placed IOL served as the control group. In each group, there were twenty participants. Clinical assessments, including visual acuity and biometry measurements, were recorded preoperatively and 1 month postoperatively. Post-surgery, patients completed a questionnaire evaluating the presence and severity of dysphotopsias.

Results: Positive dysphotopsia was reported by 26.3% of patients, with no significant difference among the groups (Fisher's exact test, $p=0.63$). Negative dysphotopsia appeared in 11.3% of patients, significantly more frequent in those with superonasal and inferonasal IOL positions (Fisher's exact test, $p=0.01$). Regarding the IOL location, there was no discernible difference in the severity of positive (Kruskal–Wallis test, $p=0.33$) and negative (Kruskal–Wallis test, $p=0.23$) dysphotopsias among patients who were experiencing them. Postoperatively, all patients demonstrated improved visual acuity, anterior chamber depth, and axial length measurements.

Conclusion: The study found a significant association between IOL position and the incidence of negative dysphotopsia, especially with inferonasal and superonasal placements. However, the IOL position did not influence the intensity of either positive or negative dysphotopsia. This implies that post-surgery negative dysphotopsia perception is influenced by lens location. Patient satisfaction remained high, though negative dysphotopsia intensity negatively correlated with satisfaction scores.

Keywords: Cataract surgery, negative dysphotopsia, positive dysphotopsia

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Introduction

Even though cataract surgery generally leads to improved vision, higher quality of life, and excellent overall success rates, post-operative dysphotopsias may occur, potentially compromising visual quality and patient satisfaction (1). Tester *et al.* (2) were the first to define dysphotopsia as “any light-related visual phenomenon experienced by phakic and pseudophakic patients.” Today, the term is commonly used to describe the subjective visual phenomena experienced by pseudophakic patients following cataract surgery (3).

Dysphotopsias remain an insufficiently studied complication of cataract surgery, yet they are of considerable importance because they can cause patient frustration and represent a key source of dissatisfaction despite an otherwise successful surgical outcome (4) research by Tester *et al.* (2) indicated that dysphotopsia can develop in up to 49% of patients postoperatively, whereas Bournas *et al.* (5) reported that 19.5% of patients experienced it on the 1st post-operative day. Although symptoms often resolve spontaneously over time, approximately one-fifth of patients suffer from severe and persistent dysphotopsia (6). Post-operative dysphotopsia can be categorized into two types: Positive and negative, based on symptomatology and etiology (7).

Positive dysphotopsias are perceived as light phenomena, typically described as streaks, rays, arcs, flashes, or an aura in the peripheral visual field, usually induced by an external light source (8,9) (Fig. 1).

Davison originally described negative dysphotopsia as a dark shadow appearing in the peripheral visual field, resembling a temporal scotoma (10). Patients typically perceive this shadow as an arc- or crescent-shaped area of darkness in the periphery of vision (11) (Fig. 2).

Positive dysphotopsias are believed to result from glare caused by internal reflections along the edge of the intraocular lens (IOL). Light entering the eye from one side of the visual field – or even from outside the field of view – may be reflected off the opposite edge of the IOL. These reflected rays are detected on the retina and perceived as peripheral flashes or arcs of light that appear to originate from no identifiable external source (12,13) (Fig. 3a).

The most widely accepted explanation for the occurrence of negative dysphotopsia is the illumination gap theory. According to this theory, an illumination gap forms on the nasal retina due to a discontinuity between light rays reflected from the nasal edge of the implanted IOL and those that bypass the IOL and directly reach the retina. As a result, the gap is bounded posteriorly by rays refracted through the lens and anteriorly by rays that pass outside the optic without refraction, creating a shadow perceived in the temporal visual field (14) (Fig. 3b).



Figure 1. Illustrations of glare, aura, flash of light and ring-shaped dysphotopsia. (a) Aura; (b) Glare; (c) Flashes of light; (d) Ring-shaped dysphotopsia. Source: created by the author of the paper.

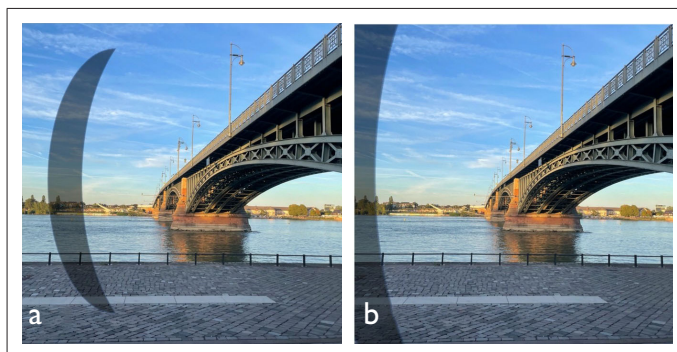


Figure 2. Crescent-shaped negative dysphotopsia (a), Arc-shaped negative dysphotopsia (b).

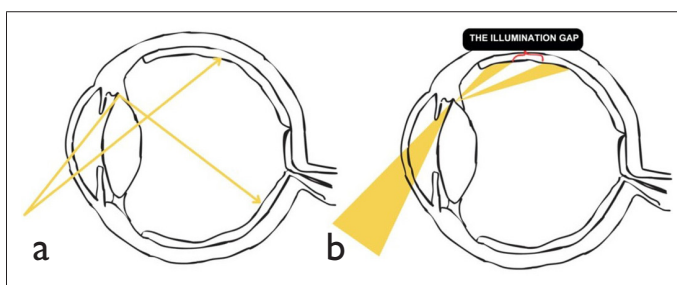


Figure 3. (a) Light falling on the edge of the intraocular lens (IOL) can be reflected elsewhere on the retina, leading to unwanted dysphotopsia. (b) Illumination gap theory – the gap created by the different refractions of rays hitting the periphery of the IOL and rays missing the IOL.

We hypothesized that the occurrence of dysphotopsias is associated with the position of the IOL. The objectives of this study were to evaluate the incidence and intensity of positive and negative dysphotopsias in four groups of patients with different IOL orientations (vertical, horizontal, superonasal, and inferonasal), and to determine whether a correlation exists between the type and intensity of dysphotopsia and the IOL position.

Methods

In collaboration with the Faculty of Medicine in Osijek this prospective cohort study was conducted at the Department Ophthalmology. Patients underwent cataract surgery between April and June of 2024.

Participants

Participants were randomized in a 1:1:1:1 ratio to one of four IOL orientation groups – horizontal (control), vertical, superonasal, or inferonasal – using computer-generated permuted block randomization with variable block sizes (4 and 8). The random sequence was prepared by an investigator not involved in recruitment or surgery, and allocation concealment was ensured using sequentially numbered, opaque, sealed envelopes. After confirming eligibility and obtaining consent, the next envelope in sequence was opened to reveal the assignment, which was masked to the operating surgeon until that moment. Deviations from the sequence, if any, were recorded. The IOL was implanted vertically in the vertical group, horizontally in the control group, superonasally (right eye 135°, left eye 45°) in the superonasal group, and inferonasally (right eye 45°, left eye 135°) in the inferonasal group.

Exclusion criteria included irregular pre-operative astigmatism, a history of corneal transplantation or refractive eye surgery, corneal diseases such as keratoconus, long-term topical therapy, dry eye syndrome, central vision impairment due to any pathology affecting the visual center, previous ocular surgery or laser procedures of any cause, and a history of blunt or penetrating ocular trauma. All participants provided written informed consent for anonymous post-operative data collection and analysis, after being informed of the potential risks associated with cataract surgery. The study was conducted in accordance with the ethical principles of the Declaration of Helsinki. Ethical approval was obtained from the Ethics Committee of the Faculty of Medicine Osijek at Josip Juraj Strossmayer University of Osijek (Approval No. 2158-61-46-24-08, February 02, 2024) and from the Ethics Committee of Osijek University Hospital Centre (Approval No. RI-4642/2024, April 23, 2024).

Pre-operative Clinical Assessment

Patient age, gender, operated eye, and keratorefractometry values were recorded using the Nidek device (Japan,

2023) on the day of surgery and 1 month postoperatively. Best-corrected visual acuity (BCVA) was evaluated using Snellen charts at both time points. Optical biometry parameters, including axial length (AL) and anterior chamber depth (ACD), were measured with the IOLMaster 700 device (Zeiss, 2020).

Surgical Technique

All phacoemulsification surgeries were performed using the Centurion system (Alcon, 2019) by the same surgeon. All patients received a monofocal, hydrophobic acrylic, single-piece IOL from Johnson and Johnson, model AAB00 (Limerick, Ireland), with an optical diameter of 6 mm and a total length of 13 mm. During phacoemulsification, a 2.75 mm clear corneal incision was made, and a viscoelastic material was applied to the anterior chamber. A continuous curvilinear capsulorhexis of the desired size was then performed, followed by phacoemulsification and aspiration of the lens nucleus using an ultrasound probe inserted through the main incision. The remaining cortical material was removed from the capsular bag, and a foldable IOL was implanted.

Post-operative Evaluation

One month after surgery, each patient completed a questionnaire based on previously published studies⁽¹⁵⁾. The questionnaire contained five items assessing visual symptoms and overall satisfaction with post-operative vision.

The first question asked about the presence of unwanted visual phenomena such as flashes of light, arcs, halos, or partial circles, with response options “Yes” or “No.” If patients reported such symptoms, they were asked to rate their severity on a scale from 0 to 10, where 0 indicated no problem, and 10 represented debilitating symptoms.

The third question addressed the presence of a dark or gray shadow in the peripheral visual field, with “Yes” or “No” response options. If present, patients rated its severity using the same 0–10 scale.

The final question evaluated overall satisfaction with vision after surgery, rated on a 0–10 scale, where 0 indicated complete dissatisfaction, and 10 indicated complete satisfaction.

Statistical Analysis

Statistical analysis was performed to evaluate differences among study groups and to assess correlations between clinical parameters. Categorical data were presented as absolute and relative frequencies, and differences between categories were tested using Fisher’s exact test. The normality of distribution for numerical variables was assessed with the Shapiro–Wilk test. As most data were not normally distributed, results are expressed as medians with interquartile range (IQR) boundaries. Differences between pre-operative and post-operative values were analyzed using the Wilcox-

on signed-rank test, while differences among three or more independent groups were evaluated using the Kruskal–Wallis test with *post hoc* Conover comparisons. Correlations were assessed using Spearman's rank correlation coefficient (ρ).

In addition to *P*-values, effect sizes were reported to estimate the magnitude of differences: Cramér's *V* for associations between categorical variables, rank-biserial correlation (*r*) for Mann–Whitney tests, and Spearman's ρ for correlations. Odds ratios with 95% confidence intervals (CIs) were calculated for pairwise comparisons of dysphotopsia incidence, and Wilson 95% CIs were reported for proportions. All *P*-values were two-tailed, and statistical significance was set at $\alpha=0.05$.

Statistical analysis was performed using MedCalc® Statistical Software, version 22.018 (MedCalc Software Ltd., Ostend, Belgium; <https://www.medcalc.org>; 2024).

Results

Eighty patients were included in the study, and they were split into four groups according to the position of the IOL: Vertical in one group, horizontal in another (control group), superonasal in a third group (right eye's optic-haptic junction was at 135°, left eye at 45°), and inferonasal in a fourth (right eye's optic-haptic junction was at 45°, left eye at 135°). Twenty patients made up each group, making up 25% of the total patients.

Regarding gender distribution, there were 37 (46.3%) male patients and 43 (53.8%) female patients. The patients' median age was 76 years, with a minimum age of 45 and a maximum age of 97. Right eye surgery was performed on 41 (51.3%) patients.

Significantly, the longest time for phacoemulsification aspiration time (AST) was observed in the superonasal position of IOL compared to the inferonasal and horizontal positions (Kruskal–Wallis test, $p=0.04$). However, no significant difference was observed compared to the vertical position. Fur-

thermore, compared to the superonasal and vertical placements of the IOL, the total amount of fluid required during the procedure was considerably lower in the inferonasal position (Kruskal–Wallis test, $p=0.03$). There was no significant difference compared to the horizontal position (Table 1).

Analysis revealed that the estimated fluid used during phacoemulsification was significantly higher among patients who developed positive dysphotopsia ($p=0.008$). Moreover, a weak but significant positive correlation was observed between the total amount of fluid used and the intensity of positive dysphotopsia ($\rho=0.25$, $p=0.025$). No significant associations were found between AST and either the presence or intensity of positive or negative dysphotopsia.

Significant improvements were observed after surgery compared to pre-operative values in BCVA (Wilcoxon test, $p<0.001$), ACD (Wilcoxon test, $p<0.001$), and AL (Wilcoxon test, $p=0.02$) across all patients. Among patients with a horizontal IOL position, there were significant increases in BCVA (Wilcoxon test, $p<0.001$) and AL (Wilcoxon test, $p=0.02$) postoperatively, while no significant difference was observed in ACD values. For those with an inferonasal IOL position, post-operative BCVA and ACD values showed significant improvements (Wilcoxon test, $p<0.001$), whereas there was no significant change in AL compared to pre-operative measures. Similar significant improvements were noted in patients with a superonasal IOL position, where both BCVA and ACD values were significantly higher after surgery (Wilcoxon test, $p<0.001$), with no significant change in AL. In patients with a vertical IOL position, all measured parameters BCVA, ACD, and AL, showed significant increases after surgery compared to pre-operative values (Table 2).

Positive dysphotopsia was present in 21 patients (26.3%), with no significant difference across IOL positions. Negative dysphotopsia was observed in 9 patients (11.3%), significantly more prevalent in patients with inferonasal and superonasal IOL positions (Fisher's exact test, $p=0.01$) (Table 3).

Table 1. Values of power of IOL, cumulative dissipated energy during procedure, aspiration time, and estimated fluid used during procedure in relation to the position of the IOL

	Median (interquartile range) by IOL position					<i>P</i>
	Horizontal	Inferonasal	Superonasal	Vertical	Total	
Lens power	23 (21–24.8)	22.5 (20–24.7)	23.5 (20.1–24.8)	24.0 (22–25.9)	23.0 (21–25)	0.29
Cumulative dissipated energy	9.05 (6.8–15.3)	7.85 (3.5–13.1)	4.82 (3.9–8.5)	11.3 (3.9–14.8)	7.3 (4.0–13.4)	0.12
Aspiration time	1.74 (1.3–2.3)	2.06 (1.0–2.5)	2.38 (2–3.5)	2.22 (1.6–3.1)	2.14 (1.4–2.9)	0.04 [†]
Estimated fluid used	40.5 (32–56.5)	33.5 (21.3–51.3)	51.5 (33.8–62.0)	51.5 (34.8–68)	45 (33–58)	0.03 [‡]

IOL: Intraocular lens. *Kruskal–Wallis test (*post hoc* Conover). [†]At the $p<0.05$ level, the longest time of aspiration of lens masses is significant in the case of superonasal intraocular lens position compared to horizontal and inferonasal. [‡]At the $p<0.05$ level, the smallest amount of liquid is significantly lower in the inferonasal position compared to the superonasal and vertical.

The overall clinical meaning of these findings is summarized as follows. Positive dysphotopsia occurred in 26.3% of patients (95% CI: 17.5–37.2%), while negative dysphotopsia was observed in 11.3% (95% CI: 5.7–20.8%). The association between IOL position and negative dysphotopsia showed a

Table 2. Values of BCVA, ACD and AL in all patients and in relation to the position of the IOL

	Median (interquartile range)		<i>p</i> *
	Before surgery	After surgery	
All patients			
BCVA	0.20 (0.10–0.40)	1.0 (0.90–1.0)	<0.001
ACD	3.33 (2.86–3.60)	3.41 (3.00–3.88)	<0.001
AL	23.0 (22.05–24)	23.2 (22.18–24.08)	0.02
Horizontal position			
BCVA	0.25 (0.09–0.50)	1.0 (0.73–1.0)	<0.001
ACD	3.37 (3.24–3.49)	3.43 (3.24–3.56)	0.07
AL	22.62 (22.05–23.51)	22.90 (22.25–23.85)	0.02
Inferonasal position			
BCVA	0.20 (0.10–0.35)	1.0 (0.90–1.0)	<0.001
ACD	3.05 (2.7–3.49)	3.15 (2.8–3.58)	<0.001
AL	23.0 (22.0–23.61)	23.0 (22.0–23.55)	0.21
Superonasal position			
BCVA	0.30 (0.20–0.45)	1.0 (0.80–1.0)	<0.001
ACD	2.87 (2.68–3.97)	3.33 (2.97–4.80)	<0.001
AL	22.64 (21.96–23.59)	22.85 (22.06–23.69)	0.21
Vertical position			
BCVA	0.20 (0.13–0.35)	1.0 (0.90–1.0)	<0.001
ACD	3.85 (3.25–4.41)	3.85 (3.25–4.50)	<0.001
AL	24.0 (22.73–25.0)	24.05 (22.8–25.0)	0.03

BCV: Best corrected visual acuity, ACD: Anterior chamber depth, AL: Axial length, IOL: Intraocular lens. *Wilcoxon test. Significant increases after surgery are shown in bold.

small-to-moderate effect size (Cramér's $V \approx 0.34$), with cases occurring almost exclusively in inferonasal and superonasal IOL positions. In contrast, the link between IOL position and positive dysphotopsia was weak (Cramér's $V \approx 0.16$). Patients with positive dysphotopsia had higher intraoperative fluid use (rank-biserial $r \approx 0.34$, $p = 0.008$), suggesting that greater fluid turbulence may contribute to post-operative light phenomena. However, the overall effect sizes were small, indicating that these differences, while statistically significant, are likely of limited clinical relevance.

There is no significant difference in the intensity of positive and negative dysphotopsia among patients where dysphotopsias are present, relative to the IOL position (Table 4).

Patient satisfaction with the surgery was rated with a median score of 10 (IQR 9–10), ranging from 5 to a maximum of 10. Spearman's correlation coefficient was applied to evaluate the association between satisfaction scores, patient age, and the severity of positive and negative dysphotopsia. It was observed that there is no significant correlation between the intensity of positive dysphotopsia and patient satisfaction scores. However, the intensity of negative dysphotopsia showed a significant negative correlation with satisfaction scores. In other words, higher satisfaction scores were associated with lower intensity of negative dysphotopsia ($\rho = -0.717$). Patient age did not show a significant relationship with satisfaction scores (Table 5).

Discussion

The results of this study provide insight into the influence of IOL position on the occurrence of dysphotopsia following ultrasonic cataract surgery with phacoemulsification. Based on the hypothesis that dysphotopsias are related to IOL position, we analyzed the incidence and intensity of positive and negative dysphotopsias in four patient groups and investigated their association with IOL orientation.

The overall incidence of dysphotopsia was relatively low, with 26.3% of patients reporting positive dysphotopsia and

Table 3. Distribution of patients according to the presence of positive and negative dysphotopsia in relation to IOLs position

	Number (%) of patients regarding the position of the IOL					<i>p</i> *
	Horizontal	Inferonasal	Superonasal	Vertical	Total	
Positive dysphotopsia						
Not present	16 (80)	16 (80)	14 (70)	13 (65)	59 (73.8)	0.63
Present	4 (20)	4 (20)	6 (30)	7 (35)	21 (26.3)	
Negative dysphotopsia						
Not present	20 (100)	16 (80)	15 (75)	20 (100)	71 (88.8)	0.01 †
Present	0	4 (20)	5 (25)	0	9 (11.3)	

*Fisher's exact test; Cramér's $V = 0.16$ for positive dysphotopsia and 0.34 for negative dysphotopsia (small-to-moderate effect size). 95% confidence intervals for incidence: positive dysphotopsia 17.5–37.2%, negative dysphotopsia 5.7–20.8%. IOL: Intraocular lens.

Table 4. Positive and negative dysphotopsia intensity values with respect to position IOLs

	Median (interquartile range) s regarding the position of the IOL				p*
	Horizontal	Inferonasal	Superonasal	Vertical	
Intensity of positive dysphotopsia	4.0 (3.25–4.0)	1 (0–3.5)	2 (1.75–4.50)	3 (1–7)	0.33
Intensity of negative dysphotopsia	-	4 (3.25–4)	3 (2–6)	-	0.20

*Kruskal–Wallis test. IOL: Intraocular lens.

Table 5. Evaluation of the relationship between satisfaction with the surgery and the intensity of positive and negative dysphotopsia, as well as the age of patients

	Spearman’s rank correlation coefficient (p)
	Assessment of satisfaction with the operation
Intensity of positive dysphotopsia	–0.295 (0.19)
Intensity of negative dysphotopsia	–0.717 (0.03)†
Age of the patient	–0.012 (0.92)

†Significant at $p < 0.05$.

11.3% experiencing negative dysphotopsia. Negative dysphotopsia was significantly more prevalent in the inferonasal and superonasal IOL positions, suggesting that lens orientation may influence the perception of dysphotopsia after surgery. However, no significant difference was observed in the incidence of positive dysphotopsia among the various IOL positions.

In this study, the incidence of negative dysphotopsia was 11.3%, which may be considered relatively low compared with the rates reported in the literature, where incidences commonly range between 15% and 20% in the early post-operative period. Several factors could account for the lower incidence observed in our sample.

First, patient selection may have influenced the results. The exclusion of individuals with pre-existing ocular conditions – such as irregular astigmatism, corneal disease, or prior ocular surgery – could have reduced the likelihood of post-operative visual disturbances. Second, the IOL model used – a monofocal hydrophobic acrylic single-piece IOL (AAB00, Johnson and Johnson) – is known for its favorable optical design and square-edge profile, which minimize internal reflections and edge-related light scatter, potentially lowering dysphotopsia occurrence.

Third, optical and surgical parameters, including consistent capsulorhexis size, centralized IOL positioning, and the experience of a single operating surgeon, likely contributed to uniform post-operative optical outcomes. Finally, the relatively short 1-month post-operative follow-up period may

also have contributed to the lower observed incidence, as neuroadaptation and capsular changes that can exacerbate ND may not yet be fully apparent during this time.

Post-operative analysis of ocular morphological parameters revealed significant improvements in AL, ACD, and BCVA across all groups. Specific changes depended on IOL orientation, as different positions were associated with improvements in certain parameters.

The longest AST for lens material was recorded in the superonasal IOL group, whereas the total amount of fluid used was significantly lower in the inferonasal group. These findings suggest that IOL orientation may influence technical aspects of surgery, potentially affecting the overall surgical experience.

Patient satisfaction was high, with a median score of 10, indicating a positive experience for most patients. Importantly, negative dysphotopsia showed a significant negative correlation with satisfaction, confirming that patients with less severe negative dysphotopsia tend to be more satisfied with surgical outcomes. Patient age did not significantly correlate with post-operative satisfaction, suggesting that age is not a major determinant of subjective surgical success.

Over the past decade, several studies have investigated the relationship between IOL orientation and dysphotopsia, contributing to a better understanding of this phenomenon.

Henderson *et al.* reported a 2.3-fold reduction in the incidence of negative dysphotopsia 1 day after cataract surgery when one of the two optic–haptic junctions of the IOL was placed inferotemporally compared to a vertically oriented control group. However, this difference was no longer statistically significant 1 month postoperatively (11).

Similarly, Manasseh *et al.* (6) conducted a randomized controlled study that demonstrated a reduction in the incidence of pseudophakic negative dysphotopsia from 16% to 8% when the optic–haptic junction was positioned horizontally.

Furthermore, Pamulapati *et al.* (15) performed a randomized controlled trial involving 163 patients implanted with bilateral Tecnis monofocal IOLs (ZCB00, Johnson and Johnson Vision). Participants were randomized to four IOL orientations (vertical, horizontal, superonasal, and inferonasal). Their findings showed that the horizontal group had the most favorable results 4–6 weeks after surgery, while the

superonasal group showed the lowest outcomes at both 1 week and 4–6 weeks postoperatively. No significant differences were observed in the frequency or intensity of positive dysphotopsia.

Taken together, these studies reinforce the importance of considering IOL orientation in the context of dysphotopsia. Their findings support and complement the results of our study, emphasizing the multifactorial nature of dysphotopsia and providing valuable guidance for future research and clinical practice aimed at optimizing patient outcomes following cataract surgery.

This study has several limitations. A formal power analysis was not conducted before data collection because of the exploratory nature of the study and limited patient availability. Consequently, with 20 patients per group, the statistical power was sufficient to detect only large differences between groups, while smaller or moderate effects may have gone undetected.

All surgeries were performed by a single experienced surgeon using the same technique and IOL model, which ensured procedural consistency but may limit the generalizability of the findings to other surgeons or IOL designs.

The follow-up period was limited to 1 month after surgery, which may not fully capture late-onset or transient dysphotopsia symptoms that can resolve or develop over a longer period.

Additionally, only monofocal hydrophobic acrylic lenses of a single model (AAB00, Johnson and Johnson) were used; therefore, the findings may not apply to other lens materials or optical designs.

Finally, the study did not include an analysis of other potential factors that might influence dysphotopsia, such as pupil size, capsulorhexis diameter, or individual anatomic differences, which could be addressed in future research.

Conclusion

Based on the conducted study and its findings, the following conclusions can be drawn.

Negative dysphotopsia is significantly more prevalent in inferonasal and superonasal IOL positions. However, there is no significant difference in the incidence of positive dysphotopsia across different IOL positions. AST and the volume of fluid used vary depending on IOL orientation: the superonasal position is associated with the longest AST for lens material, while the inferonasal position is associated with a significantly smaller volume of fluid used.

After surgery, all patients showed significant improvements in BCVA, as well as increases in ACD and AL. The presence of dysphotopsias was not correlated with the intensity of either positive or negative dysphotopsia. Moreover, the severity of dysphotopsias did not significantly differ according to IOL orientation.

Patient satisfaction after surgery was high, with a median score of 10. Satisfaction was not significantly correlated with the intensity of positive dysphotopsia. However, the intensity of negative dysphotopsia showed a significant negative correlation with satisfaction, indicating that greater satisfaction corresponds to lower intensity of negative dysphotopsia. Patient age was not significantly associated with post-operative satisfaction.

Disclosures

The Original Article has been published in the repository as a master's thesis.

Galić P. Utjecaj pozicije intraokularne monofokalne leće kod ultrazvučne operacije mrežne fakoemulzifikacijom na pojavnost disfoptopsija [Master's thesis]. Osijek: Josip Juraj Strossmayer University of Osijek, Faculty of Medicine Osijek; 2024 [cited 2025 March 07] Available at: <https://urn.nsk.hr/urn:nbn:hr:152:115732>

Ethics Committee Approval: This study was approved by the Faculty of Medicine Osijek at Josip Juraj Strossmayer University of Osijek Ethics Committee (Date: 02.02.2024, Number: 2158-61-46-24-08) and the Ethics Committee of Osijek University Hospital Centre. (Date: 23.04.2024, Number: R1-4642/2024) and conducted in accordance with the tenets of the Declaration of Helsinki.

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