MESA REDONDA
«Manejo Integral de la Presbicia»

Cirugía de la Presbicia con lentes intraoculares trifocales

Fernando Llovet, MD, PhD

Sociedad Oftalmológica de Madrid

Sociedad Oftalmológica de Madrid

NO interés financiero

0. Dos cuestiones + dos ideas

A quién implantar MIOL?

"La principal indicación es el paciente présbita"

Además en:

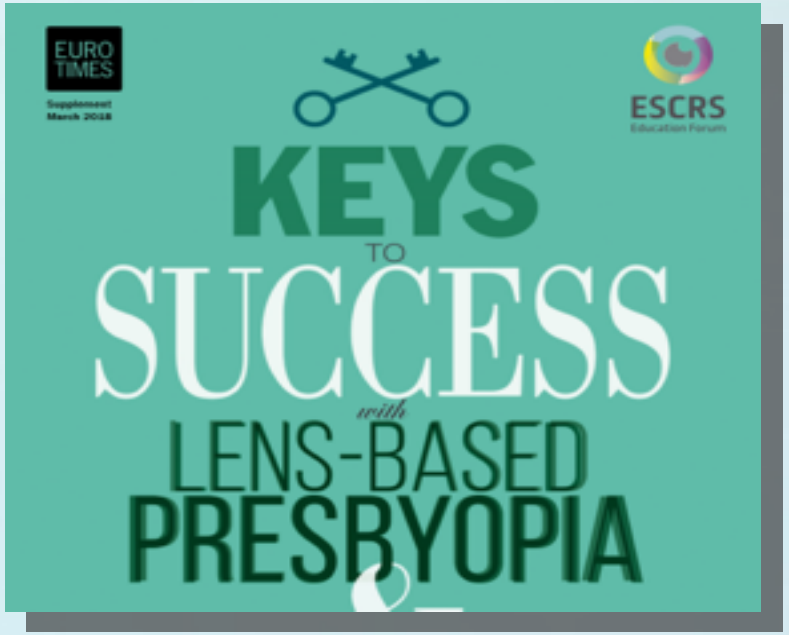
- Cirugía de catarata
- Recambio refractivo del cristalino (RLE) por:
  - Dysfunctional Lens Syndrome
  - Alta ametropía (especialmente hiperopia)

Cuándo implantar MIOL?

"Cuando sea posible obtener la emetropía"

"If you can deliver a perfectly emmetropic eye at the end of surgery, you have no problem implanting a MIOL"

(Robert M. Kershner, MD)



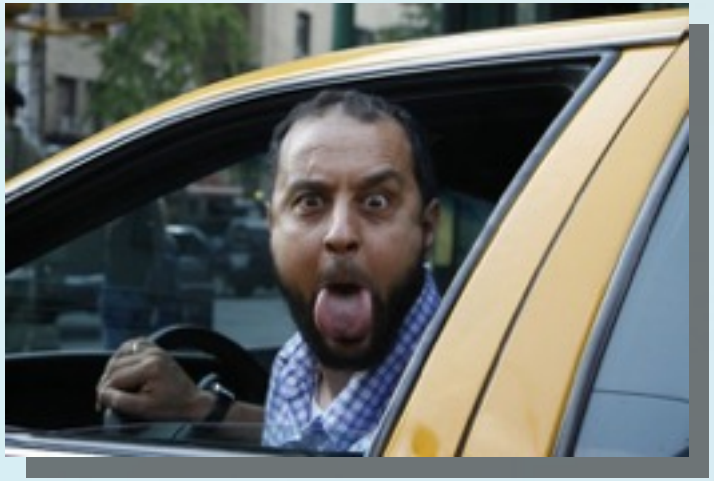
Es necesario, además de una cirugía perfecta, también:

- Seleccionar al **buen candidato**
- Disponer de **equipamiento** para el manejo postquirúrgico/retratamiento
- Estar preparado para manejar al paciente **insatisfecho**

1. Selección del paciente

1.1. Anamnesis

"El primer contacto establece relación médico-paciente… se obtienen importantes datos "



- Ocupación, aficiones: conductor, orfebre, cazador
- Personalidad, desórdenes mentales:
  - ✓ Alta demanda y expectativas
  - ✓ Problemas de adaptación, obsesivos
  - ✓ Medicaciones (dilatación pupilar)
- Problemas de salud: diabetes, ojo seco
- Edad avanzada?

1.2. Diagnóstico y pronóstico

Explicar: "Qué pasa, porqué pasa y qué se puede obtener"

- **Diagnóstico**:
  - Presbicia
  - Ametropía
  - Grado
- Características **específicas**: ojo seco, ambliopía
- **Pronóstico**:
  - Visiones cerca/intermedio/lejos
  - Independencia de gafas
  - Causas de insatisfación

1.3. Información y Consentimiento Informado

"Información exhaustiva oral y escrita"

- **Información**:
  - Explicación personalizada
  - Informe médico
- **Consentimiento Informado**: acorde Sociedades Científicas, personalizado
- Información **esecífica**:
  - "Visión multifocal"

1.4. Seguimiento

"Establecer un protocolo e informar del postoperatorio"

- Postoperatorio inmediato: inflamación, PIO...
- Evolución visual y refractiva:
  - Protocolo de seguimiento: 1 día, 1 semana, 1 mes, 3 meses
- Al final del proceso:
  - Resultados
  - Satisfacción
  - Causas de insatisfación
  - Informe médico

2. Evaluación preoperatoria

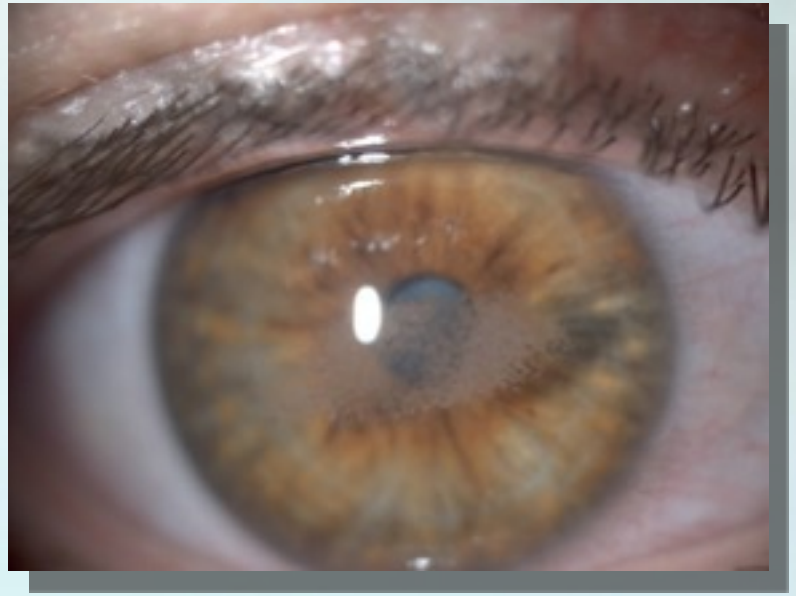
2.0. Exploración estandar

"Es cirugía refractiva y por tanto necesaria exploración estandar"

- Visual acuity (near, intermediate, distance)
- Refraction (near, intermediate, distance)
- IOP
- Biomicroscopy
- Ocular motility (Kappa angle, dominance)
- Pupillometry
- TBUT
- Pachimetry
- Corneal Topography
- Endothelial Count
- Fundus exploration (OCT)

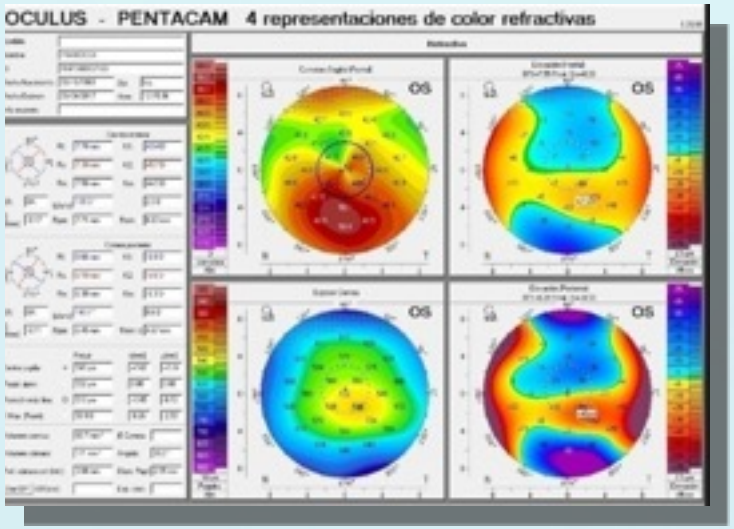
2.1. Superficie ocular

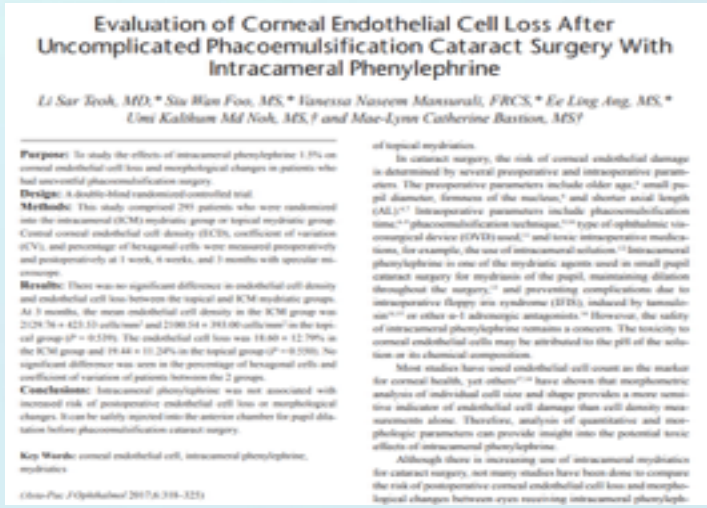
"Esencial estudiar la superficie"



Descartar:

- Distrofia Corneal Fuchs
- Ojo seco severo
- Cicatrices corneales, infiltrados
- Corneas non tratables con laser (KC)





Evaluation of Corneal Endothelial Cell Loss After Uncomplicated Phacoemulsification Cataract Surgery With Intracameral Phenylephrine

Li Sar Teoh, MD, Siu Wan Foo, MS,* Vanessa Naseem Mansurali, FRCS,* Ee Ling Ang, MS,* Umi Kalthum Md Nok, MS,† and Mae-Lynn Catherine Bastion, MS†*

Purpose: To study the effects of intracameral phenylephrine 1.5% on corneal endothelial cell loss and morphological changes in patients who had uneventful phacoemulsification surgery.

Design: A double-blind randomized controlled trial.

Methods: This study comprised 295 patients who were randomized into the intracameral (ICM) mydriatic group or topical mydriatic group. Central corneal endothelial cell density (ECD), coefficient of variation (CV), and percentage of hexagonal cells were measured preoperatively and postoperatively at 1 week, 6 weeks, and 3 months with specular microscope.

Results: There was no significant difference in endothelial cell density and endothelial cell loss between the topical and ICM mydriatic groups. At 3 months, the mean endothelial cell density in the ICM group was 2129.76 ± 423.33 cells/mm² and 2100.54 ± 393.00 cells/mm² in the topical group ($P = 0.539$). The endothelial cell loss was 18.60 ± 12.79% in the ICM group and 19.44 ± 11.24% in the topical group ($P = 0.550$). No significant difference was seen in the percentage of hexagonal cells and coefficient of variation of patients between the 2 groups.

Conclusions: Intracameral phenylephrine was not associated with increased risk of postoperative endothelial cell loss or morphological changes. It can be safely injected into the anterior chamber for pupil dilatation before phacoemulsification cataract surgery.

Key Words: corneal endothelial cell, intracameral phenylephrine, mydriatics

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of topical mydriatics.

In cataract surgery, the risk of corneal endothelial damage is determined by several preoperative and intraoperative parameters. The preoperative parameters include older age,[2] small pupil diameter, firmness of the nucleus,[3] and shorter axial length (AL).[4,5] Intraoperative parameters include phacoemulsification time,[6–8] phacoemulsification technique,[9,10] type of ophthalmic viscosurgical device (OVD) used,[11] and toxic intraoperative medications, for example, the use of intracameral solutions.[12] Intracameral phenylephrine is one of the mydriatic agents used in small pupil cataract surgery for mydriasis of the pupil, maintaining dilation throughout the surgery,[13] and preventing complications due to intraoperative floppy iris syndrome (IFIS), induced by tamsulosin[14,15] or other α-1 adrenergic antagonists.[16] However, the safety of intracameral phenylephrine remains a concern. The toxicity to corneal endothelial cells may be attributed to the pH of the solution or its chemical composition.

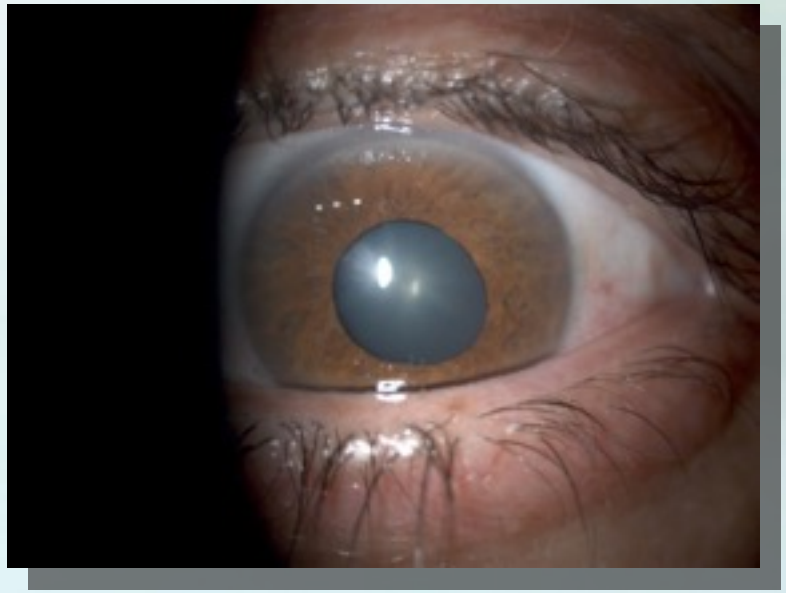
Most studies have used endothelial cell count as the marker for corneal health, yet others[17,18] have shown that morphometric analysis of individual cell size and shape provides a more sensitive indicator of endothelial cell damage than cell density measurements alone. Therefore, analysis of quantitative and morphologic parameters can provide insight into the potential toxic effects of intracameral phenylephrine.

Although there is increasing use of intracameral mydriatics for cataract surgery, not many studies have been done to compare the risk of postoperative corneal endothelial cell loss and morphological changes between eyes receiving intracameral phenyleph-

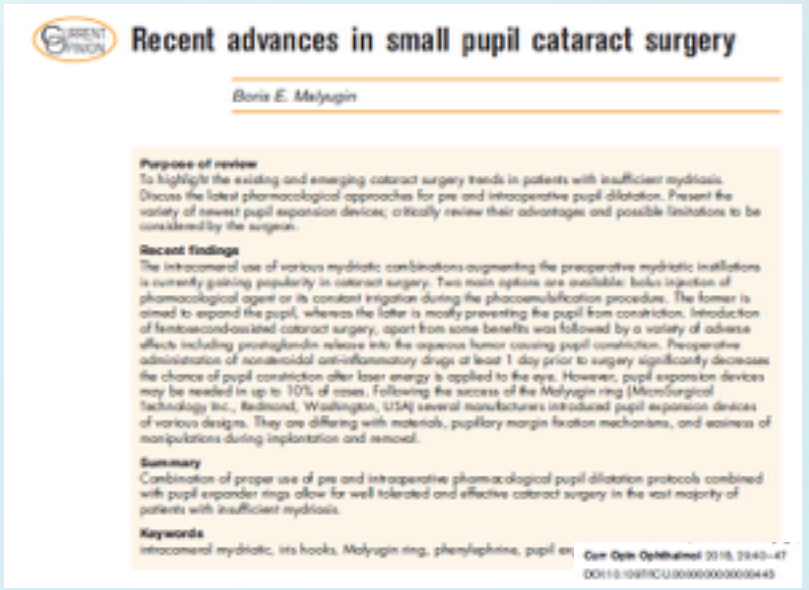
Topografía corneal y Recuento endotelial obligatorios!

2.2. Tamaño y dinámica pupilar

"Verdadera importancia tamaño y función"



- Necesaria una pupila pequeña cuando se lee y no muy grande por la noche, para poder conducir
- Evaluar la pupila antes de ditatar!



Recent advances in small pupil cataract surgery

Boris E. Malyugin

Purpose of review

To highlight the existing and emerging cataract surgery trends in patients with insufficient mydriasis. Discuss the latest pharmacological approaches for pre and intraoperative pupil dilatation. Present the variety of newest pupil expansion devices; critically review their advantages and possible limitations to be considered by the surgeon.

Recent findings

The intracameral use of various mydriatic combinations augmenting the preoperative mydriatic instillations is currently gaining popularity in cataract surgery. Two main options are available: bolus injection of pharmacological agent or its constant irrigation during the phacoemulsification procedure. The former is aimed to expand the pupil, whereas the latter is mostly preventing the pupil from constriction. Introduction of femtosecond-assisted cataract surgery, apart from some benefits was followed by a variety of adverse effects including prostaglandin release into the aqueous humor causing pupil constriction. Preoperative administration of nonsteroidal anti-inflammatory drugs at least 1 day prior to surgery significantly decreases the chance of pupil constriction after laser energy is applied to the eye. However, pupil expansion devices may be needed in up to 10% of cases. Following the success of the Malyugin ring (MicroSurgical Technology Inc., Redmond, Washington, USA) several manufacturers introduced pupil expansion devices of various designs. They are differing with materials, pupillary margin fixation mechanisms, and easiness of manipulations during implantation and removal.

Summary

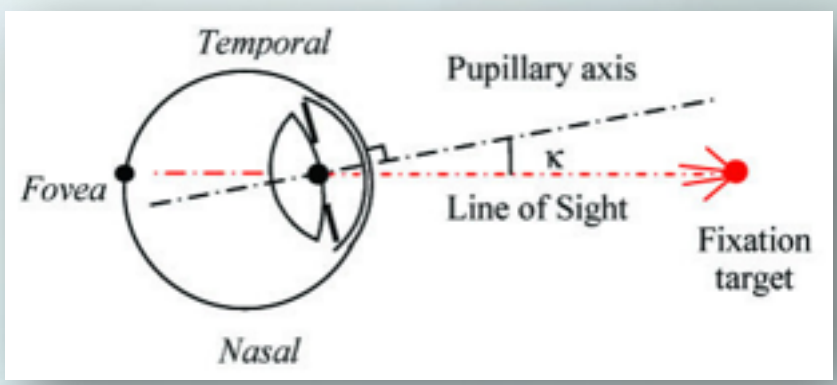
Combination of proper use of pre and intraoperative pharmacological pupil dilatation protocols combined with pupil expander rings allow for well tolerated and effective cataract surgery in the vast majority of patients with insufficient mydriasis.

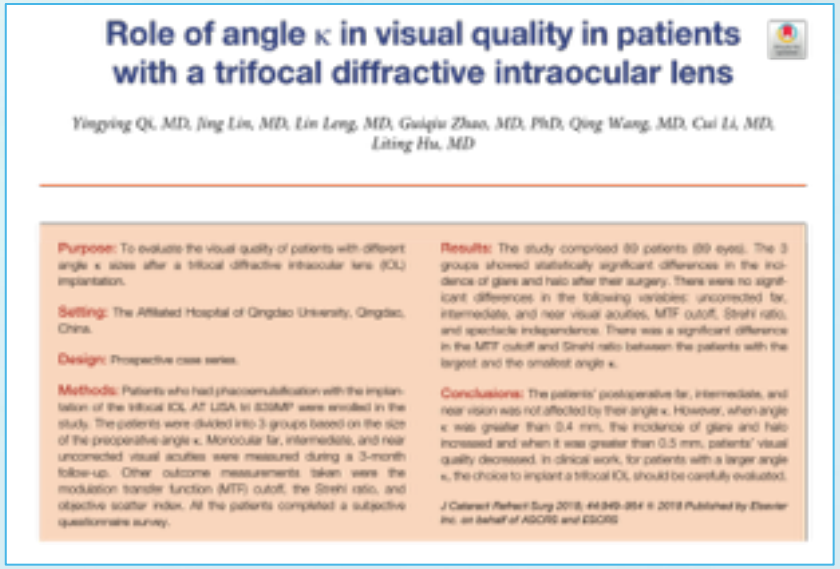
Keywords

intracameral mydriatic, iris hooks, Malyugin ring, phenylephrine, pupil ex

Curr Opin Ophthalmol 2018, 29:43–47
DOI:10.1097/ICU.0000000000000445

2.3. Angulo kappa





Role of angle κ in visual quality in patients with a trifocal diffractive intraocular lens

Yingying Qi, MD, Jing Lin, MD, Lin Leng, MD, Guiqiu Zhao, MD, PhD, Qing Wang, MD, Cui Li, MD, Liting Hu, MD

Purpose: To evaluate the visual quality of patients with different angle κ sizes after a trifocal diffractive intraocular lens (IOL) implantation.

Setting: The Affiliated Hospital of Qingdao University, Qingdao, China.

Design: Prospective case series.

Methods: Patients who had phacoemulsification with the implantation of the trifocal IOL AT LISA tri 839MP were enrolled in the study. The patients were divided into 3 groups based on the size of the preoperative angle κ. Monocular far, intermediate, and near uncorrected visual acuities were measured during a 3-month follow-up. Other outcome measurements taken were the modulation transfer function (MTF) cutoff, the Strehl ratio, and objective scatter index. All the patients completed a subjective questionnaire survey.

Results: The study comprised 89 patients (89 eyes). The 3 groups showed statistically significant differences in the incidence of glare and halo after their surgery. There were no significant differences in the following variables: uncorrected far, intermediate, and near visual acuities, MTF cutoff, Strehl ratio, and spectacle independence. There was a significant difference in the MTF cutoff and Strehl ratio between the patients with the largest and the smallest angle κ.

Conclusions: The patients' postoperative far, intermediate, and near vision was not affected by their angle κ. However, when angle κ was greater than 0.4 mm, the incidence of glare and halo increased and when it was greater than 0.5 mm, patients' visual quality decreased. In clinical work, for patients with a larger angle κ, the choice to implant a trifocal IOL should be carefully evaluated.

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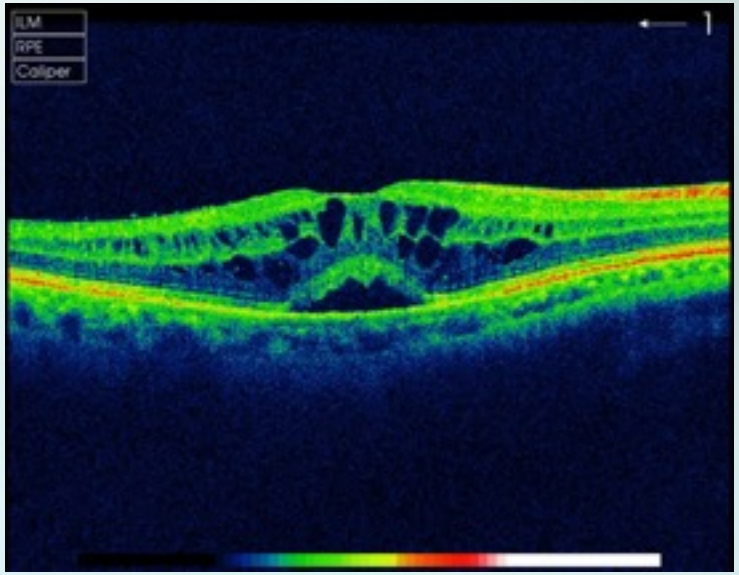
- Lentes difractivas toleran mejor un ángulo kappa mayor que las refractivas.
- Evaluar cuidadosamente antes de decidir el implante de una lente trifocal

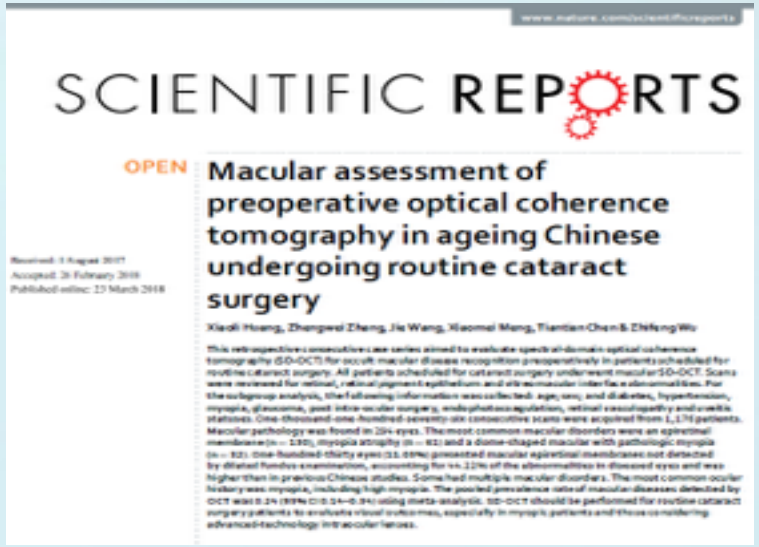
2.4. Fondo de ojo

"Obligatorio en cirugía intraocular"



Realizar de routina OCT macular

(y también explorar el fundus)


SCIENTIFIC REPORTS

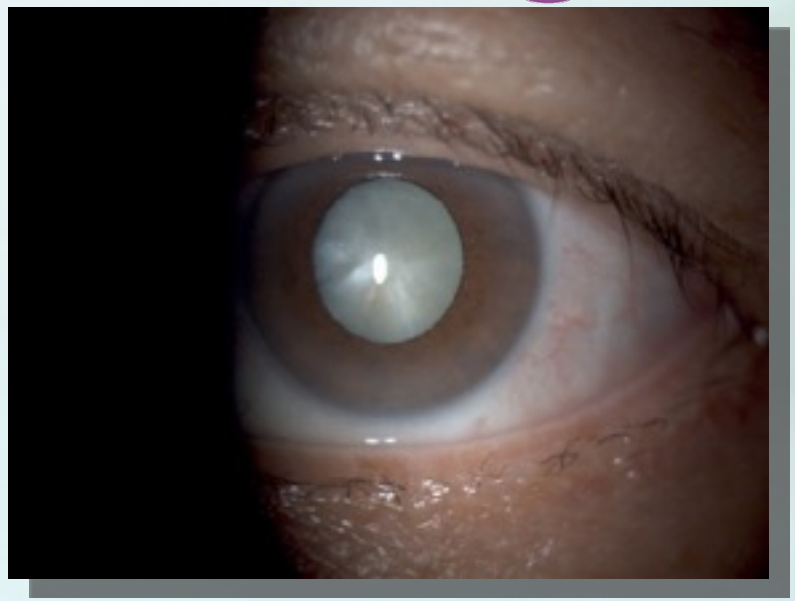
OPEN

Macular assessment of preoperative optical coherence tomography in ageing Chinese undergoing routine cataract surgery

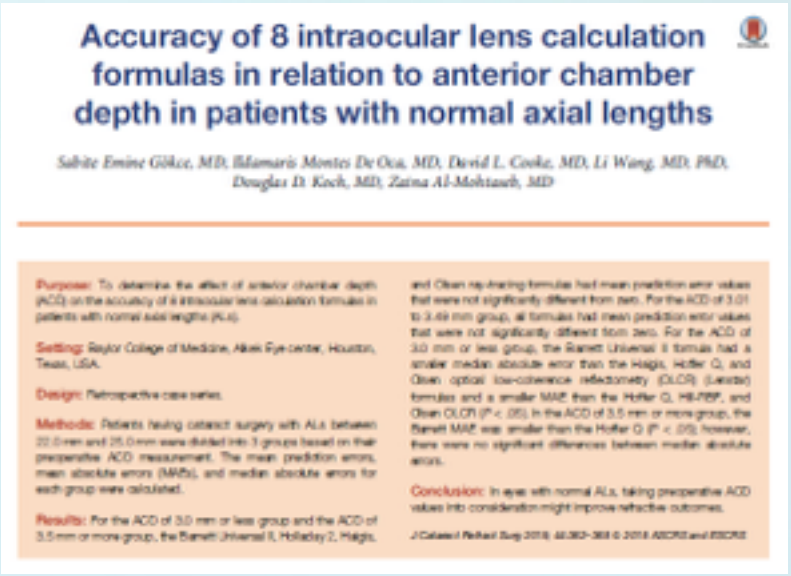
- MER: fácil pasar por alto y pueden progresar más rápido tras la cirugía.
- Patientes con moderada y estable patología macular?

2.5. Biometría

" Especial atención al cálculo de la lente"



- Usar interferometría óptica
- (en caso necesario: biometría de inmersión)



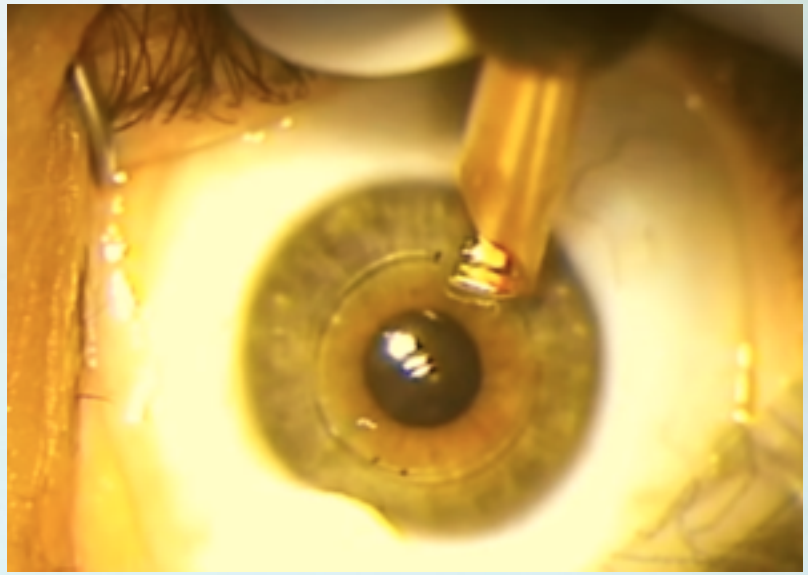
Accuracy of 8 intraocular lens calculation formulas in relation to anterior chamber depth in patients with normal axial lengths

Sabite Emine Gökce, MD, Iñamaris Montes De Oca, MD, David L. Cooke, MD, Li Wang, MD, PhD, Douglas D. Koch, MD, Zaina Al-Mohtaseb, MD

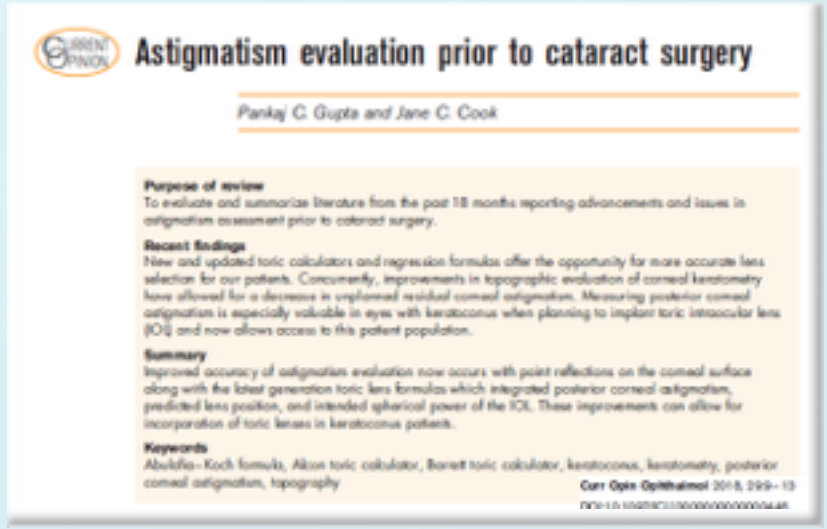
- Personalizar constantes (estudiar detalladamente los primeros casos)
- Recalcular la lente para el segundo
- Usar fórmulas de nueva generación (Haigis, Olsen, Barret, etc.) sin olvidar las antiguas (SRK-T, Hoffer-Q)

2.6. Astigmatismo

"Siempre planificar el manejo del astigmatismo"



- Qué hacer con el astigmatismo previo o en inducido
- SIA & TIA



Current Opinion

Astigmatism evaluation prior to cataract surgery

Pankaj C. Gupta and Jane C. Cook

Purpose of review
To evaluate and summarize literature from the past 18 months reporting advancements and issues in astigmatism assessment prior to cataract surgery.

Recent findings
New and updated toric calculators and regression formulas offer the opportunity for more accurate lens selection for our patients. Concurrently, improvements in topographic evaluation of corneal keratometry have allowed for a decrease in unplanned residual corneal astigmatism. Measuring posterior corneal astigmatism is especially valuable in eyes with keratoconus when planning to implant toric intraocular lens (IOL) and now allows access to this patient population.

Summary
Improved accuracy of astigmatism evaluation now occurs with point reflections on the corneal surface along with the latest generation toric lens formulas which integrated posterior corneal astigmatism, predicted lens position, and intended spherical power of the IOL. These improvements can allow for incorporation of toric lenses in keratoconus patients.

Keywords
Abulafia–Koch formula, Alcon toric calculator, Barrett toric calculator, keratoconus, keratometry, posterior corneal astigmatism, topography

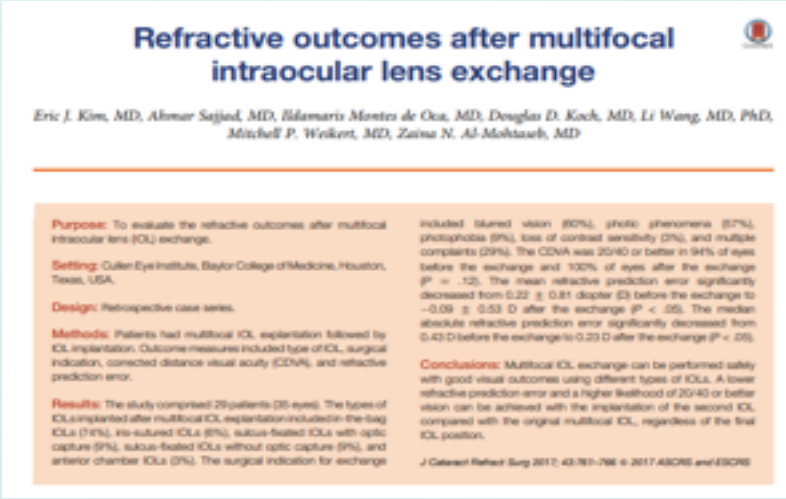
Curr Opin Ophthalmol 2015, 26:9–13

- Disponer de **<u>técnicas</u>** para manejo: AK, LRI, (manual o femtosecond), Lasik, PRK, toric lenses
- <u>Considerar el **astigmatismo corneal**</u> (anterior and posterior)
- <u>Considerar implantar **IOL tórica**</u>: >? D astigmatism

2.7. Defecto refractivo previo

"Además quiere quitarse las gafas de lejos"

- Mejor: <u>hipermétrope</u> con gafas progresivas
- Peor: miope que se retira las gafas para leer
  - ➢ Atención en ojos muy miopes
  - ➢ Especial cuidado en ambliopía o anisometropía



Refractive outcomes after multifocal intraocular lens exchange

Eric J. Kim, MD, Ahmar Sajjad, MD, Ildamaris Montes de Oca, MD, Douglas D. Koch, MD, Li Wang, MD, PhD, Mitchell P. Weikert, MD, Zaina N. Al-Mohtaseb, MD

Purpose: To evaluate the refractive outcomes after multifocal intraocular lens (IOL) exchange.

Setting: Cullen Eye Institute, Baylor College of Medicine, Houston, Texas, USA.

Design: Retrospective case series.

Methods: Patients had multifocal IOL explantation followed by IOL implantation. Outcome measures included type of IOL, surgical indication, corrected distance visual acuity (CDVA), and refractive prediction error.

Results: The study comprised 29 patients (35 eyes). The types of IOLs implanted after multifocal IOL explantation included in-the-bag IOLs (74%), iris-sutured IOLs (6%), sulcus-fixated IOLs with optic capture (9%), sulcus-fixated IOLs without optic capture (9%), and anterior chamber IOLs (3%). The surgical indication for exchange included blurred vision (80%), photic phenomena (57%), photophobia (9%), loss of contrast sensitivity (3%), and multiple complaints (29%). The CDVA was 20/40 or better in 94% of eyes before the exchange and 100% of eyes after the exchange ($P = .12$). The mean refractive prediction error significantly decreased from 0.22 ± 0.81 diopter (D) before the exchange to −0.09 ± 0.53 D after the exchange ($P < .05$). The median absolute refractive prediction error significantly decreased from 0.43 D before the exchange to 0.23 D after the exchange ($P < .05$).

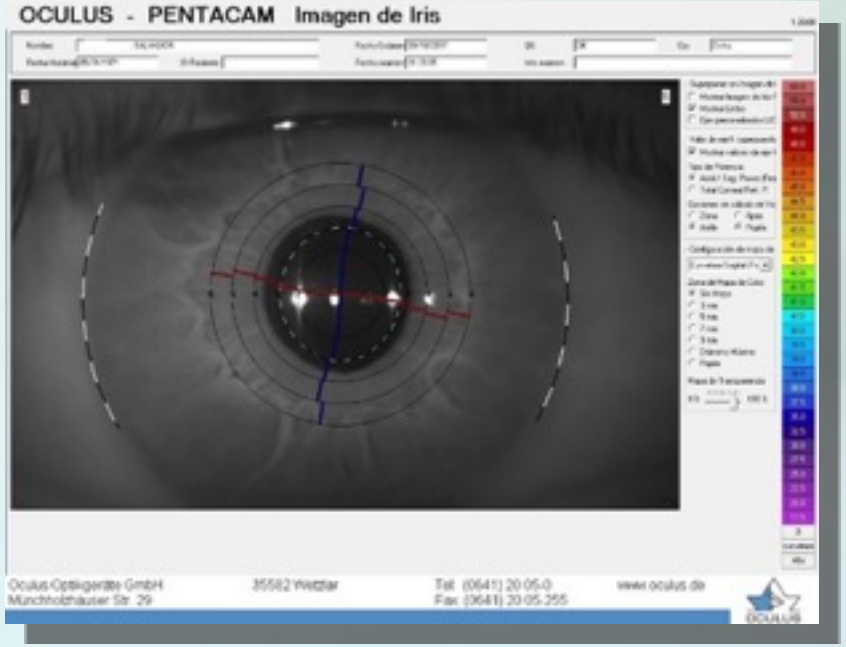
Conclusions: Multifocal IOL exchange can be performed safely with good visual outcomes using different types of IOLs. A lower refractive prediction error and a higher likelihood of 20/40 or better vision can be achieved with the implantation of the second IOL compared with the original multifocal IOL, regardless of the final IOL position.

J Cataract Refract Surg 2017; 43:781–786 © 2017 ASCRS and ESCRS

3. En la cirugía

3.1. Incisión

"Cuidado: NO inducir astigmatismo"



- Situar en el eje **correcto** (nuevos marcadores o en lámpara de hendidura)
- Tener en cuenta el **WTW**
- Cuando no hay astigmatismo, elegir incisiones **anastigmáticas** (escleral-limbal-temporal)
- **Considerar simultanear** LRI,AK, paired incisions

Clinical Ophthalmology

Dovepress

ORIGINAL RESEARCH

Surgically induced astigmatism after phacoemulsification by temporal clear corneal and superior clear corneal approach: a comparison

This article was published in the following Dove Press journal:
Clinical Ophthalmology

Archana Sunil Nikose
Dhrubojyoti Saha
Pradnya Mukesh Laddha
Mayuri Patil

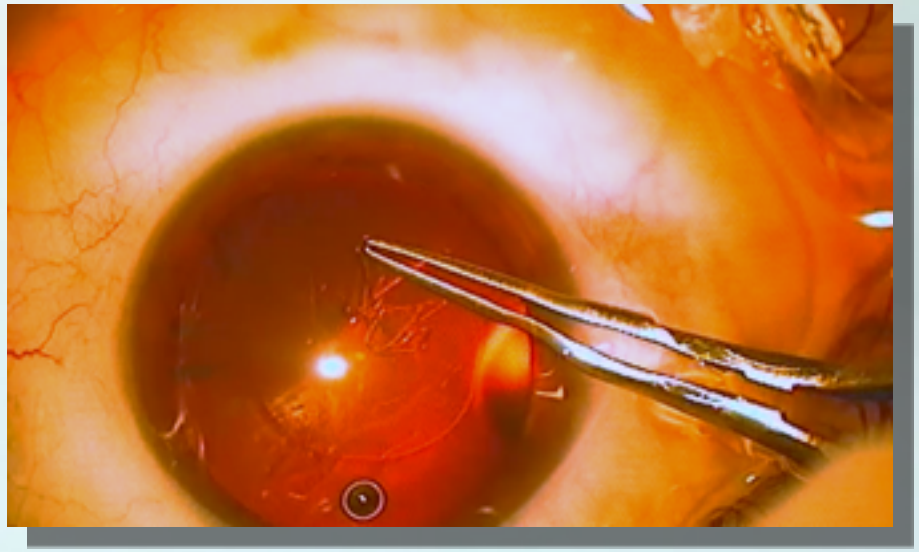
Department of Ophthalmology, N.K.P. Salve Institute and LMH, Nagpur, Maharashtra, India

Introduction: Cataract surgery has undergone various advances since it was evolved from ancient couching to the modern phacoemulsification cataract surgery. Surgically induced astigmatism (SIA) remains one of the most common complications. The introduction of sutureless clear corneal incision has gained increasing popularity worldwide because it offers several advantages over the traditional sutured limbal incision and scleral tunnel. A clear corneal incision has the benefit of being bloodless and having an easy approach, but SIA is still a concern.
Purpose: In this study, we evaluated the SIA in clear corneal incisions with temporal approach and superior approach phacoemulsification. Comparisons between the two incisions were done using keratometric readings of preoperative and postoperative refractive status.
Methodology: It was a hospital-based prospective interventional comparative randomized control trial of 261 patients conducted in a rural-based tertiary care center from September 2012

Clinical Ophthalmology 2018:12 65–70

3.2. Capsulorrexis (CCC)

"Debe cubrir el borde de la óptica"



- Además:
  - Centrada
  - Redonda
  - Tamaño adecuado (5,5 mm?)

New device for creating a continuous curvilinear capsulorhexis

Matthew A. Powers, BA, Malik Y. Kahook, MD

PURPOSE: To describe the evolution of a new device to facilitate continuous curvilinear capsulorhexis (CCC) creation.

SETTING: Department of Ophthalmology, University of Colorado School of Medicine, Aurora, Colorado, USA.

DESIGN: Experimental study.

METHODS: Bench-side ex vivo testing of unique prototypes for guidance and assistance of CCC in bovine and human eyes was performed. Five designs were sequentially tested as follows: a flexible circular blade of nickel-titanium alloy (nitinol), a flexible nitinol guide wire, a flexible elastomeric suction device, a combination approach of a nitinol guide wire and flexible silicone ring, and a freestanding micropatterned silicone ring.

RESULTS: The first 3 designs were not amenable to insertion through a sub-2.4 mm corneal incision and failed to maintain adequate downward force to cut the capsule and/or prevent radial tears. The fourth design was successfully inserted through a 2.4 mm incision and maintained adequate downward pressure and contact to guide a manual CCC without radial tears. The final design was insertable through a 2.4 mm incision and exhibited self-adhesive characteristics after placement on the anterior capsule of an ophthalmic viscosurgical device–filled anterior chamber.

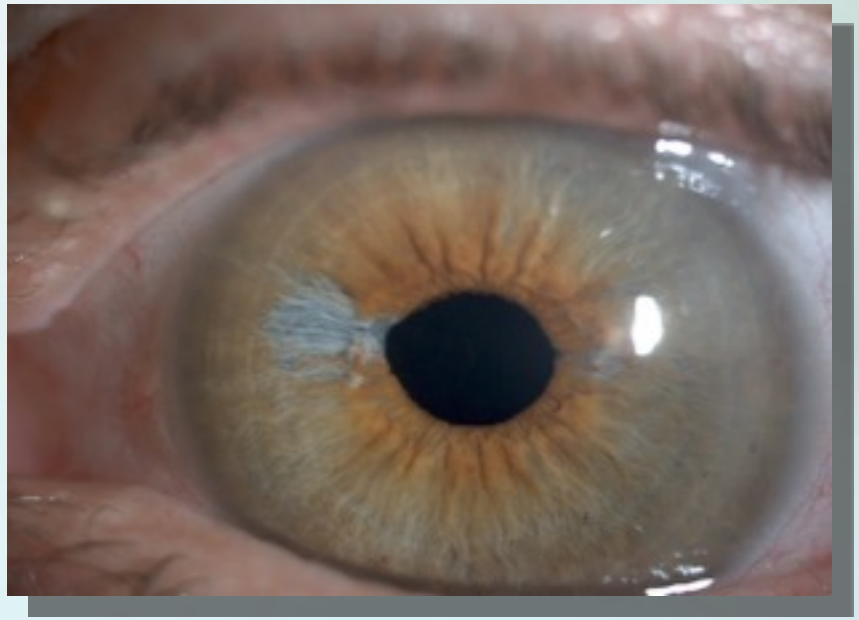
CONCLUSIONS: Given the steep learning curve of manual capsulorhexis and the high cost of capsulotomy-assistive devices, such as the femtosecond laser, an alternative approach for creating a CCC is desirable. Performance of a highly precise manual CCC through a small incision using a medical-grade silicone device with an adhesive micropatterned design is a viable and cost-effective option for use in cataract surgery across a wide range of user experience.

Financial Disclosure: All authors are named as the inventors in a patent filed by the University of Colorado covering the details in this report.

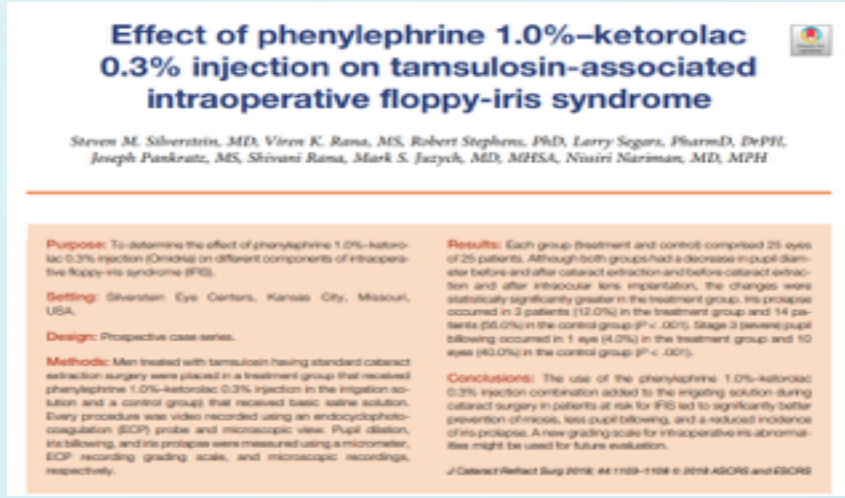
J Cataract Refract Surg 2014; 40:822–830

3.3. Iris

"Cuidad el iris"



ATENCIÓN al IFIS



Effect of phenylephrine 1.0%–ketorolac 0.3% injection on tamsulosin-associated intraoperative floppy-iris syndrome

Steven M. Silverstein, MD, Viren K. Rana, MS, Robert Stephens, PhD, Larry Segars, PharmD, DrPH, Joseph Pankratz, MS, Shivani Rana, Mark S. Juzych, MD, MHSA, Nisairi Nariman, MD, MPH

Purpose: To determine the effect of phenylephrine 1.0%–ketorolac 0.3% injection (Omidria) on different components of intraoperative floppy-iris syndrome (IFIS).

Setting: Silverstein Eye Centers, Kansas City, Missouri, USA.

Design: Prospective case series.

Methods: Men treated with tamsulosin having standard cataract extraction surgery were placed in a treatment group that received phenylephrine 1.0%–ketorolac 0.3% injection in the irrigation solution and a control group that received basic saline solution. Every procedure was video recorded using an endocyclophotocoagulation (ECP) probe and microscopic view. Pupil dilation, iris billowing, and iris prolapse were measured using a micrometer, ECP recording grading scale, and microscopic recordings, respectively.

Results: Each group (treatment and control) comprised 25 eyes of 25 patients. Although both groups had a decrease in pupil diameter before and after cataract extraction and before cataract extraction and after intraocular lens implantation, the changes were statistically significantly greater in the treatment group. Iris prolapse occurred in 3 patients (12.0%) in the treatment group and 14 patients (56.0%) in the control group ($P < .001$). Stage 3 (severe) pupil billowing occurred in 1 eye (4.0%) in the treatment group and 10 eyes (40.0%) in the control group ($P < .001$).

Conclusions: The use of the phenylephrine 1.0%–ketorolac 0.3% injection combination added to the irrigating solution during cataract surgery in patients at risk for IFIS led to significantly better prevention of miosis, less pupil billowing, and a reduced incidence of iris prolapse. A new grading scale for intraoperative iris abnormalities might be used for future evaluation.

J Cataract Refract Surg 2018; 44:1109–1108 © 2018 ASCRS and ESCRS

- No manipular en exceso la pupila. Usar ganchos de iris en pupilas estrechas.
- Respetar el iris durante la faco
- Evitar hernia de iris

3.4. Implante de IOL

"Implantar en el saco"

CLINICAL TRIAL REPORT

Comparison of incision size and intraocular lens performance after implantation with three preloaded systems and one manual delivery system

This article was published in the following Dove Press journal:
Clinical Ophthalmology

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Thierry Amzallag[2]
Lixin Wang[3]
Aldo A Martinez[4]

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Clinical Ophthalmology 2018:12 1495–1503

Purpose: To compare corneal incision size and intraocular lens (IOL) performance/behavior following implantation with the following delivery systems: system U (UltraSert®), system S (Hoya iSert® 250/251), system T (Tecnis® iTec), and a manual system (Monarch® III Delivery System).

Setting: Six study sites (four in Spain and two in France).

Design: Prospective, multicenter, parallel-group, randomized, subject-masked, postmarket clinical study.

Materials and methods: Subjects were enrolled based on predetermined inclusion/exclusion criteria. The effectiveness end points compared corneal incision size and enlargement after IOL implantation (day of surgery) among all delivery systems. Exploratory end points included mean enlargement of corneal incision size, rates of trapped trailing haptic, IOL adherence to the plunger tip, nozzle tip splitting, and mean surgically induced astigmatism (SIA) at postoperative visit.

Results: One hundred and nine subjects participated in the study. The mean corneal incision

→ Precaución en:

- Rotura/debilidad zonular
- Rotura/asimetría CCC
- Rotura de hápticos
- RCP / vitreorragia

4. Manejo postoperatorio

4.1. Evaluación postoperatoria

"Seguimiento según protocolo"

- Calendario de revisiones: 24 houras, 5–7 días, 1 mes, 3 meses y/o alta
- Estado ocular y posición de la MIOL
- Agudeza visual y resultado refractivo
  - UDVA mono & binocular
    CDVA mono & binocular
    UIVA mono & binocular
    UNVA mono & binocular
  - CDIVA mono & binocular / CDNVA mono & binocular
- Contrast Sensitivity
- Defocus curve
- Aberrometry

4.2. Satisfacción

➢ La satisfacción del paciente se obtiene mediante un **"Cuestionario de satisfacción"** propio de Clínica Baviera

Validation of the Spanish Catquest-9SF in patients with a monofocal or trifocal intraocular lens

Mats Lundström, MD, PhD, Fernando Llovet, MD, PhD, Andrea Llovet, MD, Mercedes Martínez del Pozo, MD, Blas Mompean, MD, José-Vicente González, OD, Konrad Pesudovs, PhD

PURPOSE: To validate the Spanish Catquest-9SF and study patient-reported visual function after implantation of a trifocal versus a monofocal intraocular lens (IOL).

SETTING: Clínica Baviera, Valencia and Madrid, Spain.

DESIGN: Prospective case series.

METHODS: The Catquest-9SF was translated from English to Spanish according to a standard procedure. The Spanish version was validated through Rasch analysis. Patients completed the Catquest-9SF before cataract surgery and 3 months after the surgery. The change in patient-reported visual function caused by surgery, the level of achieved visual function, and satisfaction with vision after surgery were assessed for bilaterally implanted trifocal IOLs versus monofocal IOLs.

RESULTS: The Spanish Catquest-9SF showed very good psychometric properties. Patient-reported achieved visual function was significantly better for those with a trifocal IOL than for those with a monofocal IOL ($P < .001$). This was also true when the groups were matched for age and ocular comorbidity ($P = .006$). In multivariate analyses of all cases and matched cases (the same age and no comorbidity), the reported visual function was significantly better with trifocal IOLs than with monofocal IOLs ($P = .001$ and $P = .008$, respectively). There was greater improvement after trifocal IOL implantation in the matched cases, although not significant ($P = .103$).

CONCLUSIONS: Results show the Spanish version of Catquest-9SF is a valid patient questionnaire with good psychometric properties. Patients with a trifocal IOL implanted bilaterally reported better visual function than those with a monofocal IOL implanted bilaterally. The change in visual function after surgery was also greater in patients with a trifocal IOL.

Financial Disclosure: None of the authors has a financial or proprietary interest in any material or method mentioned.

J Cataract Refract Surg 2016; 42:1791–1796 © 2016 ASCRS and ESCRS

Después de un periodo de **neuroadaptación**, es posible …

No complicaciones, buen resultado

Paciente contento

Problemas:

1.Decentramiento

2.Error refractivo residual

3.Disfotopsias

4.Visión borrosa

5.Ojo seco

6.OCP

Paciente descontento

Dissatisfaction after multifocal intraocular lens implantation

Maria A. Woodward, MD, J. Bradley Randleman, MD, R. Doyle Stulting, MD, PhD

PURPOSE: To analyze the reasons for patient dissatisfaction after phacoemulsification with multifocal intraocular lens (IOL) implantation and the outcomes after intervention.

SETTING: Emory Eye Center, Atlanta, Georgia, USA.

METHODS: This retrospective review comprised eyes of patients dissatisfied with visual outcomes after multifocal IOL implantation. Outcomes analyzed included type of visual complaint, treatment modality for each complaint, and degree of clinical improvement after intervention.

RESULTS: Thirty-two patients (43 eyes) reported unwanted visual symptoms after multifocal IOL implantation, including in 28 eyes (65%) with an AcrySof ReSTOR IOL and 15 (35%) with a ReZoom IOL. Thirty patients (41 eyes) reported blurred vision, 15 (18 eyes) reported photic phenomena, and 13 (16 eyes) reported both. Causes of blurred vision included ametropia (12 eyes, 29%), dry eye syndrome (6 eyes, 15%), posterior capsule opacification (PCO) (22 eyes, 54%), and unexplained etiology (1 eye, 2%). Causes of photic phenomena included IOL decentration (2 eyes, 12%), retained lens fragment (1 eye, 6%), PCO (12 eyes, 68%), dry-eye syndrome (1 eye, 2%), and unexplained etiology (2 eyes, 11%). Photic phenomena attributed to PCO also caused blurred vision. Thirty-five eyes (81%) had improvement with conservative treatment. Five eyes (12%) did not have improvement despite treatment combinations. Three eyes (7%) required IOL exchange.

CONCLUSIONS: Complaints of blurred vision and photic phenomena after multifocal IOL implantation were effectively managed with appropriate treatment. Few eyes (7%) required IOL exchange. Neodymium:YAG capsulotomy should be delayed until it has been determined that IOL exchange will not be necessary.

J Cataract Refract Surg 2009; 35:992–997 © 2009 ASCRS and ESCRS

5. Nuestros resultados con MIOL trifocales

ARCHIVOS DE LA SOCIEDAD ESPAÑOLA DE OFTALMOLOGÍA
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Artículo original

Resultados visuales, independencia de gafas e insatisfacción tras implante de una lente intraocular difractiva trifocal☆

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Lente intraocular
Multifocal
Trifocal
Satisfacción
Insatisfacción

RESUMEN

Objetivo: Evaluar los resultados visuales, la independencia de gafas y la satisfacción tras el implante de una lente intraocular trifocal.

Métodos: Estudio retrospectivo de 5.186 ojetos intervenidos de facoemulsificación con implante de la lente trifocal difractiva FineVision Micro F(r) (PhysIOL, Liège, Bélgica).

Resultados: La queratometría media preoperatoria fue 43,61 ± 1,55 D y el cilindro queratométrico medio −0,86 ± 0,46 D. A los 3 meses, cambiaron a 43,59 ± 1,56 y −0,71 ± 0,46 D respectivamente. La esfera media pasó de 2,09 ± 2,60 a 0,34 ± 0,38 D y el equivalente esférico medio de 1,64 ± 2,61 a −0,35 ± 0,36 D. Más del 80% alcanzaron una mejor agudeza visual corregida de lejos. La mayoría presentó un defecto residual final (predictibilidad) menor de 1 D (98,1%). El 16,3% precisó un ajuste refractivo, el 2,2% capsulotomía posterior y se recolocó la lente intraocular en 5 casos. Un porcentaje elevado sentía satisfecho en términos de visión e independencia de gafas en todas las distancias. Aunque un 2% refirió un empeoramiento en la visión nocturna, únicamente un 1% sentía poco satisfecho y 10 pacientes insatisfechos. Las causas fueron: visión borrosa (7 casos), necesidad de gafas (10), disfotopsias (7) y sequedad ocular (6).

Conclusiones: La implantación de esta lente permite obtener buenos resultados visuales en las 3 distancias así como un alto grado de independencia de gafas y de satisfacción.

Publicado por Elsevier España, S.L.U. en nombre de Sociedad Española de Oftalmología.

☆ Premio del Ilustre Colegio Oficial de Médicos de Zaragoza a la mejor Comunicación Libre del 91º Congreso de la Sociedad Española de Oftalmología que tuvo lugar los días 20 a 23 de septiembre en Zaragoza, España.

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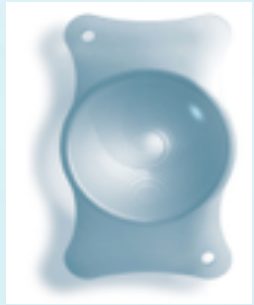

Visual Outcomes Following Bilateral Implantation of Two Diffractive Trifocal Intraocular Lenses in 10 084 Eyes

RAFAEL BILBAO-CALABUIG, ANDREA LLOVET-RAUSELL, JULIO ORTEGA-USOBIAGA, MERCEDES MARTÍNEZ-DEL-POZO, FERNANDO MAYORDOMO-CERDÁ, CELIA SEGURA-ALBENTOSA, JULIO BAVIERA, AND FERNANDO LLOVET-OSUNA

• PURPOSE: To investigate refractive and visual acuity outcomes, patient satisfaction, and spectacle independence at 3 months of 2 diffractive (non-toric) trifocal intraocular lenses (IOLs) in a large series of patients.

• DESIGN: Multicenter, retrospective, nonrandomized clinical study.

• METHODS: Patients underwent lens phacoemulsification and were implanted bilaterally with a diffractive trifocal IOL: FineVision Micro F (PhysIOL SA, Liège, Belgium) or AT Lisa tri 839MP (Carl Zeiss AG, Jena, Germany). Surgeries were performed between 2011 and 2015 with at least 3 months of follow-up. Visual and refractive performance, patient satisfaction, and spectacle independence were evaluated.

• RESULTS: A total of 10 084 trifocal IOLs were bilaterally implanted (5002 FineVision in 2901 patients and 4282 AT Lisa in 2141 patients). Three-month mean (± standard deviation) acuity: AT Lisa, binocular uncorrected distance visual acuity (UDVA), −0.01 logMAR ± 0.06; monocular distance corrected visual acuity (CDVA), 0.02 logMAR ± 0.06; binocular uncorrected near visual acuity (UNVA) at 40 cm, 0.05 logMAR ± 0.08; binocular uncorrected intermediate visual acuity (UIVA) at 80 cm, −0.05 logMAR ± 0.14; postoperative spherical equivalent, 0.26 D ± 0.47; cylinder −0.34 D ± 0.36; FineVision Micro F, binocular UDVA, 0.01 logMAR ± 0.05; monocular CDVA, 0.03 logMAR ± 0.06; binocular UNVA, 0.05 logMAR ± 0.08; binocular UIVA, −0.05 logMAR ± 0.12; spherical equivalent, 0.34 D ± 0.50; cylinder −0.39 D ± 0.40. The IOLs were equivalent in achieving spectacle independence; 98% were "satisfied" to "very satisfied" with their IOL performance.

• CONCLUSIONS: In this retrospective study with over 5000 patients, implantation of both trifocal IOL models provided good functional distance, intermediate, and near visual acuity, resulting in high levels of both spectacle independence and patient satisfaction. (Am J Ophthalmol 2017;179:53–66. © 2017 Elsevier Inc. All rights reserved.)

DIFFRACTIVE MULTIFOCAL INTRAOCULAR LENS (MIOL) designs have been used for more than 15 years.[1] Unlike conventional monofocal intraocular lenses (IOLs), which bend light to a single focus point on the retina, MIOLs are designed to help patients to see at varying distances using different points of focus. MIOLs used in clinical practice were either refractive initially, or later diffractive in their optical design. Refractive MIOLs incorporate a lens optic with different optical powers in different parts of the lens, whereas diffractive MIOLs use diffractive steps on the lens to distribute light rays into 2 or more principal foci. Irrespective of the design type, however, all MIOLs involve some form of optical compromise and a process of neuroadaptation for the patient.[2]

Most first-generation multifocal implants incorporated +4.0 diopters (D) addition at the lens plane to minimize the risk of diplopia resulting from the superimposition of simultaneous sharp and defocused images, while still enabling useful near vision. More recently, the introduction of lower near additions in the range of +2.5 D to +3.0 D, and mix-and-match strategies with different near additions, attempted to increase visual acuity at an intermediate distance.[3,4] This improvement in optic lens design, however, has not been sufficient to provide satisfactory intermediate vision for all patients implanted with these bifocal IOLs,[5] prompting manufacturers to develop a new concept—trifocal MIOLs—in an effort to improve quality of vision at all distances. The 3 foci generated by these lenses are obtained by combining 2 bifocal diffractive profiles in 1 surface of the IOL[6] or by using a trifocal diffractive profile combined with a bifocal diffractive optic.[7] Initial studies of trifocal lenses have validated the ability of the eye to use the intermediate focus regardless of lighting conditions and deliver good visual and refractive outcomes.[8–13] For instance, Jonker and associates reported an improvement in intermediate vision obtained with a trifocal lens compared to a reference bifocal implant.[10] Another study correlating optical bench performance with clinical defocus curves in

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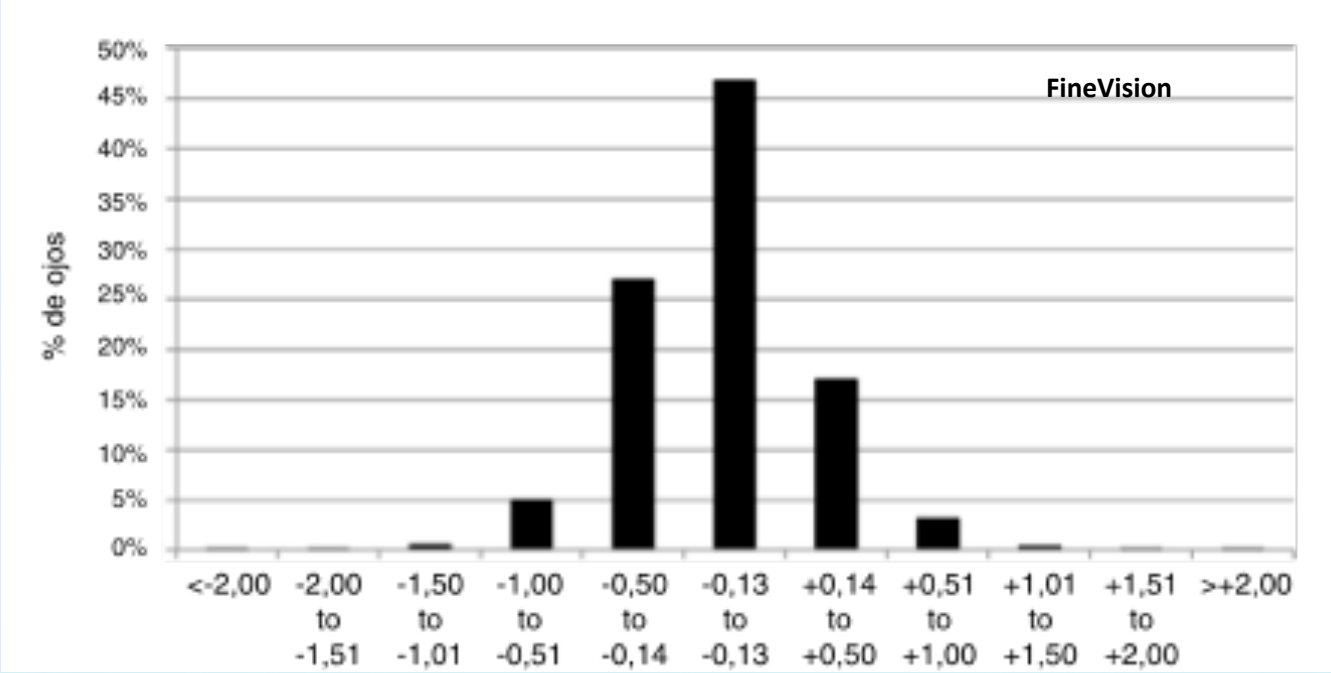
http://dx.doi.org/10.1016/j.ajo.2017.04.013

5.1. Datos clínicos (1)

Variable	RayOne	FineVision	LisaTri
Nº ojos	148	10.372	4.282
Nº pacientes	74	5.186	2.141
Edad (años)	56,84 ± 7,48	58 ± 7	57,74 ± 7,94
Potencia MIOL (D)	22,92 ± 3,94	23,2 ± 3,9	22.39 ± 4.33
Seguimiento (meses)	3	3,29 ± 0,41	3,18 ± 0,47

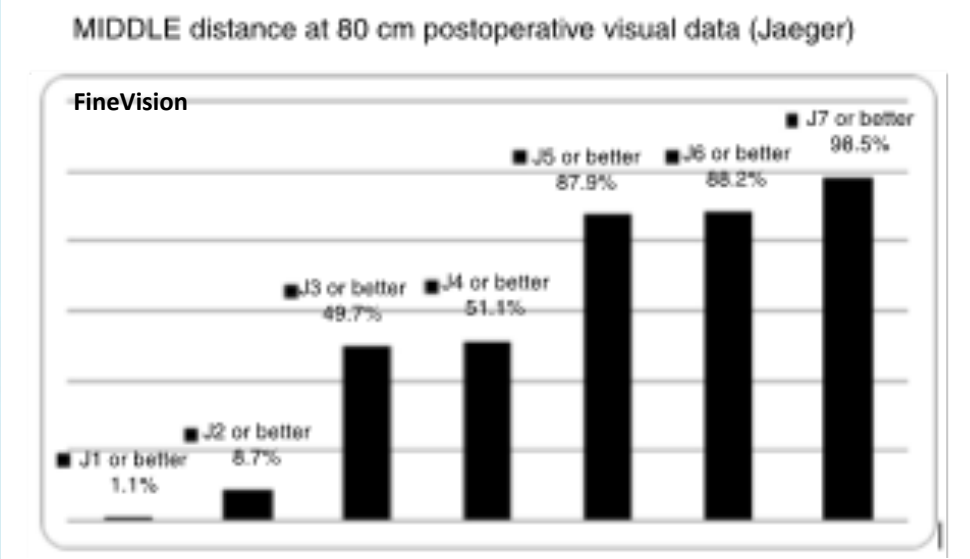
5.2. Resultados refractivos

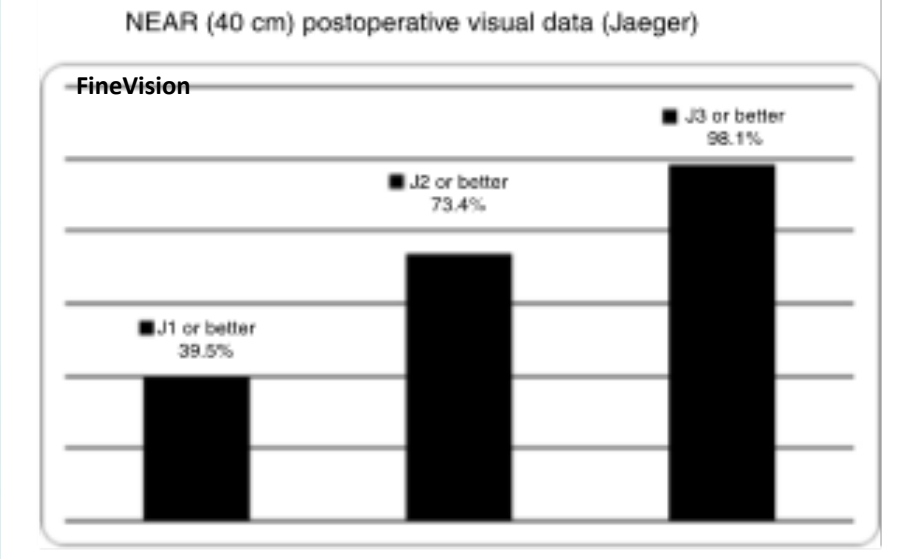
Variable	RayOne	FineVision	LisaTri
EE preop (D)	1,22 ± 2,52	1,64 ±2.62	1,43 ±2
EE postop (D)	-0.25 ± -0.62	-0,15 ± 0,36	0,26 ± 0,47



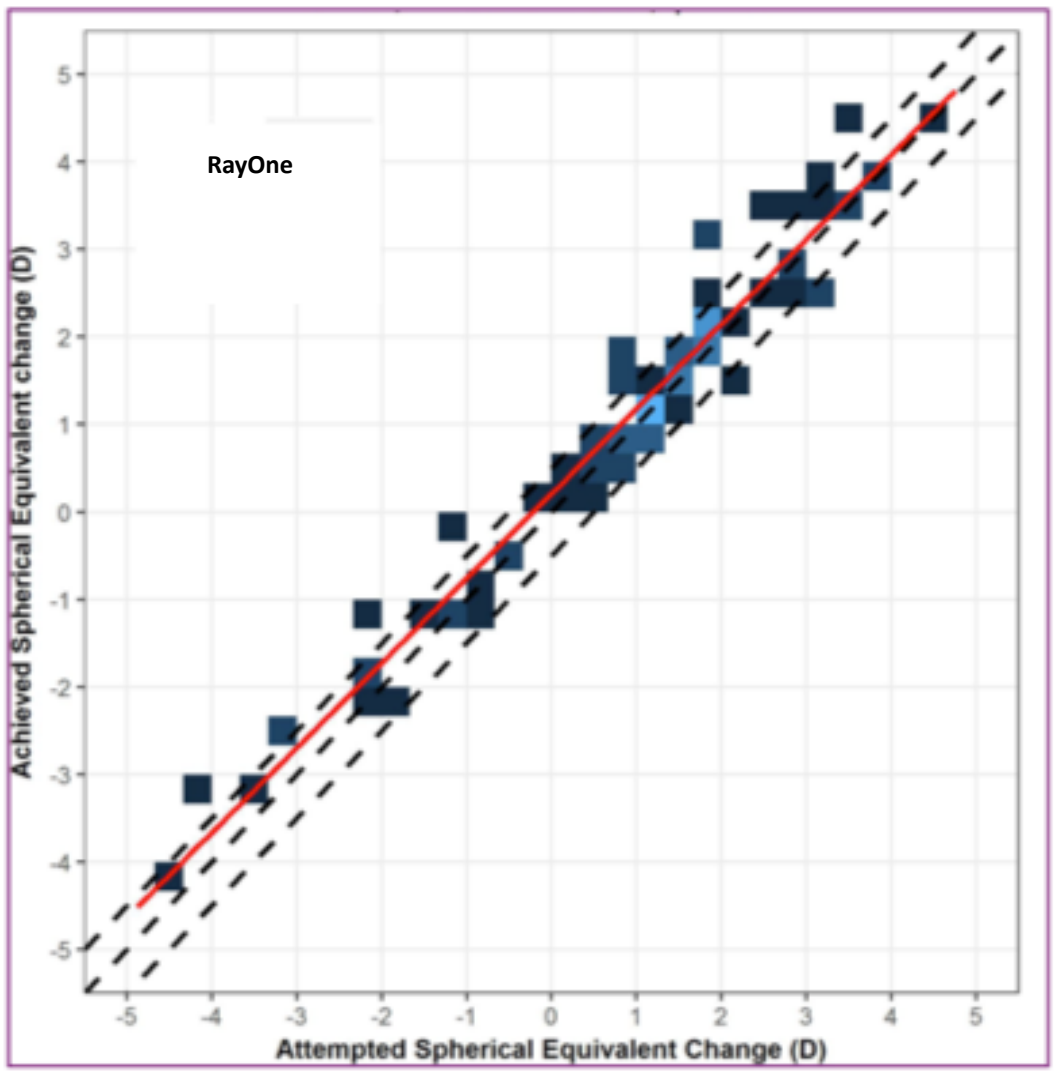
5.3. Resultados visuales postop

Variable (logMAR)	RayOne	FineVision	LisaTri
UNVA Binocular	**0,07** ± 0,06	**0,08** ± 0,11	**0,05** ± 0,08
UIVA Binocular	**0,21** ± 0,13	**0,22** ± 0,11	**0,15** ± 0,15
UDVA Binocular	**0,01** ± 0,03	**0,01** ± 0,05	**0,01** ± 0,06
CDVA Binocular	**0** ± 0,02	**0,01** ± 0,04	**0** ± 0,02



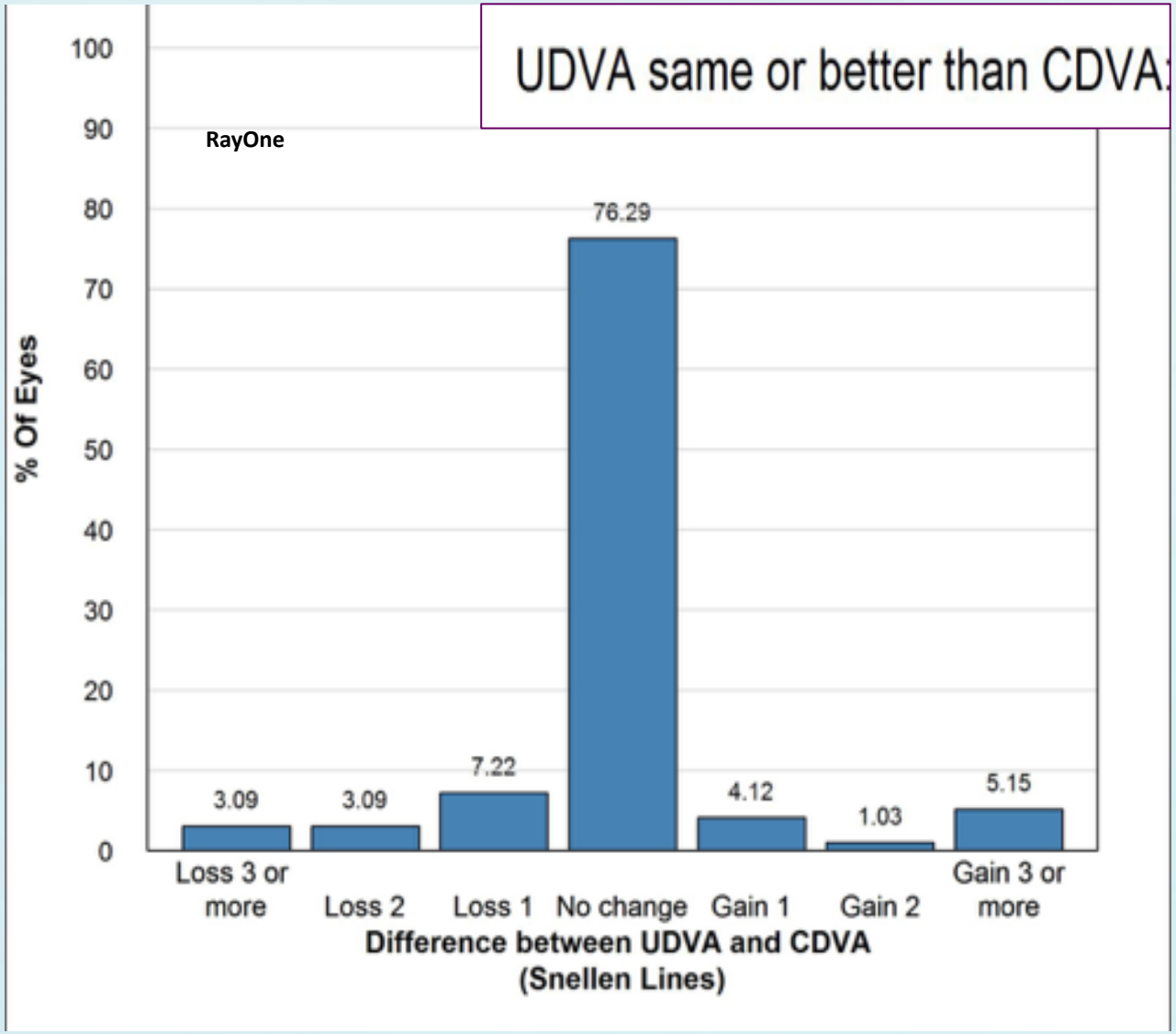


5.4. Predictibilidad



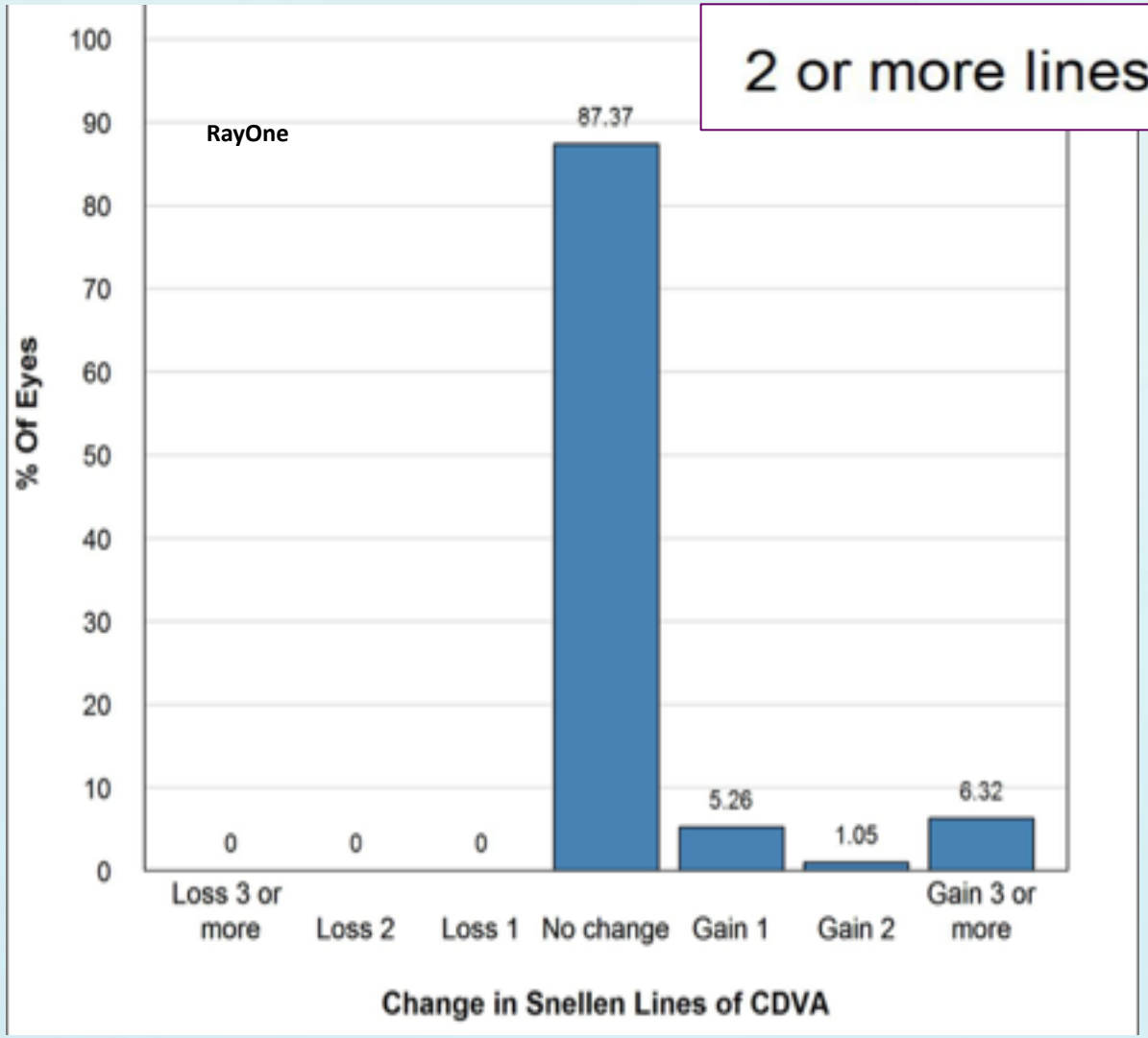
		RayOne	FineVision	LisaTri
±0.25	%	**71**	**71,9**	**71,1**
±0.50		85	90,9	90
±1.00		96	99,1	98,9

5.5. Eficacia



	RayOne	FineVision	LisaTri
%	76,3	61,2	62

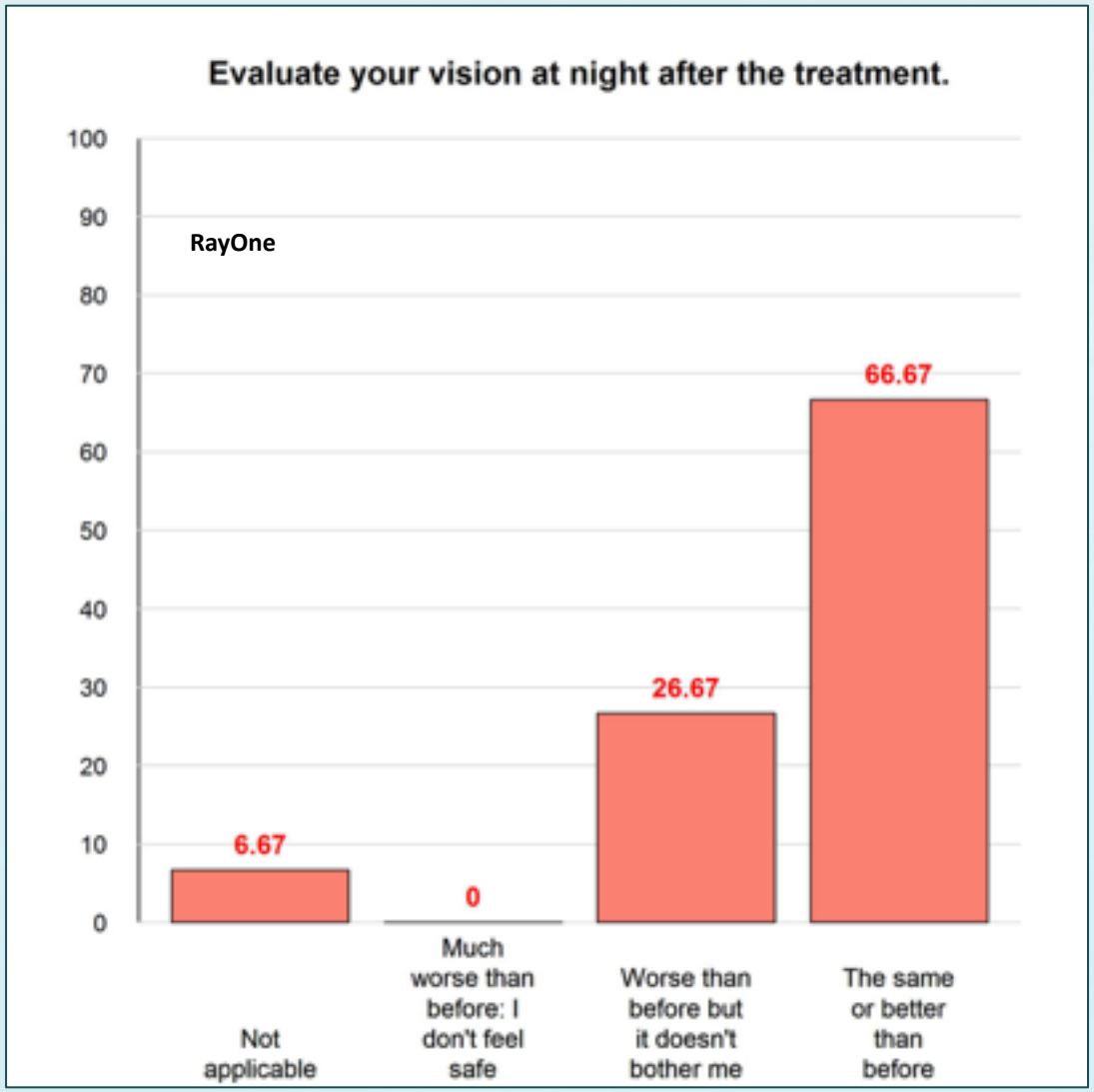
5.6. Seguridad



	RayOne	FineVision	LisaTri
%	0	0,3	0,3

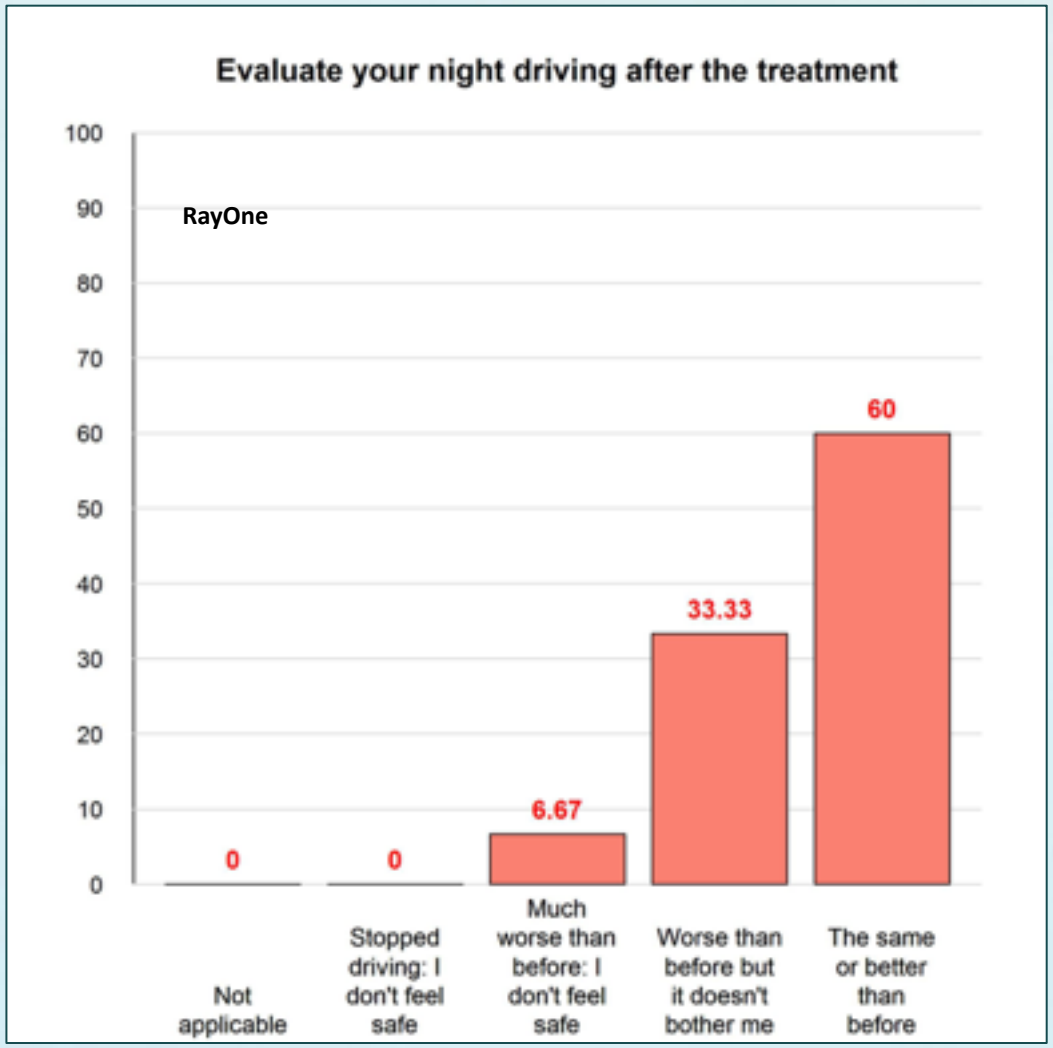
5.7. Satisfacción

5.7.1. Satisfacción (visión nocturna igual o mejor)



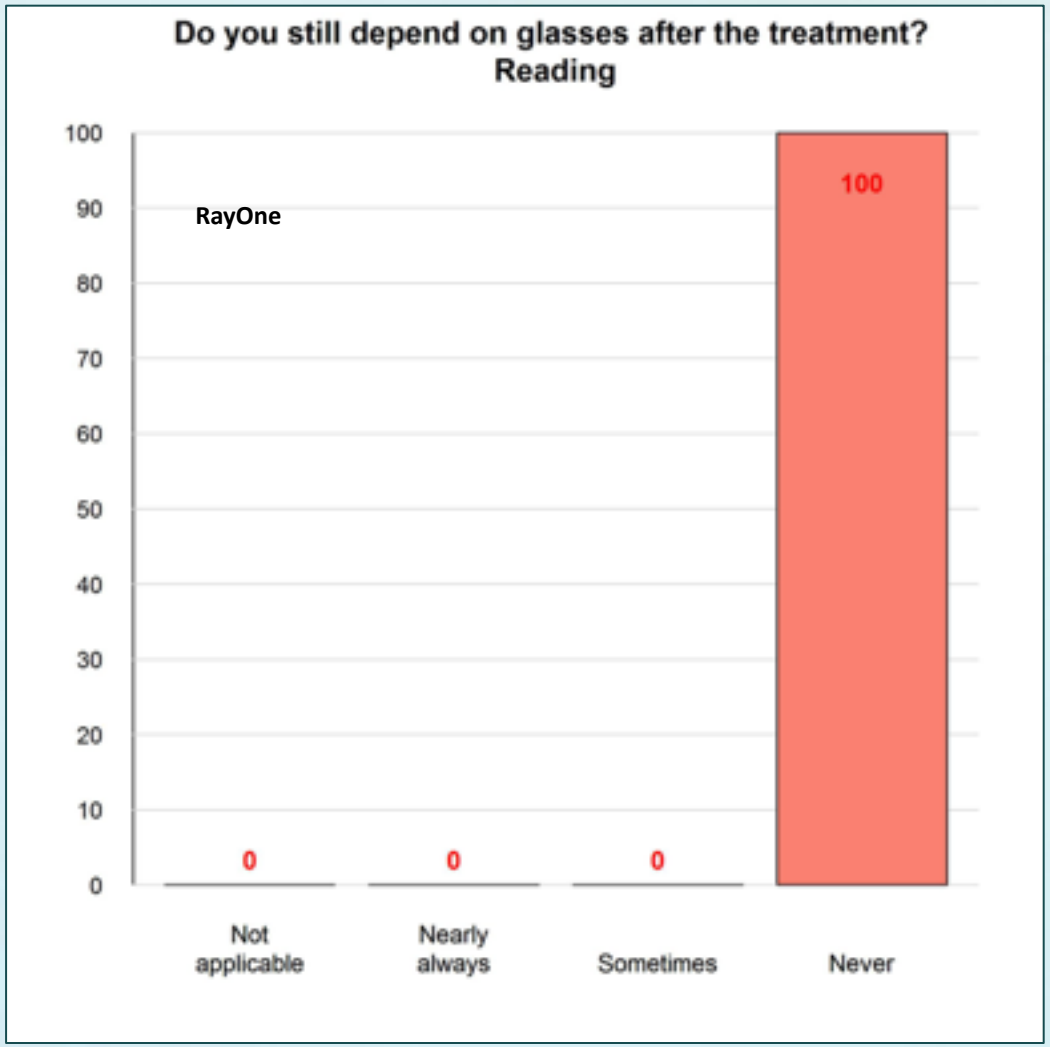
	RayOne	FineVision	LisaTri
%	66,7	66,5	72,8

5.7.2. Satisfacción (inseguridad conducción nocturna)



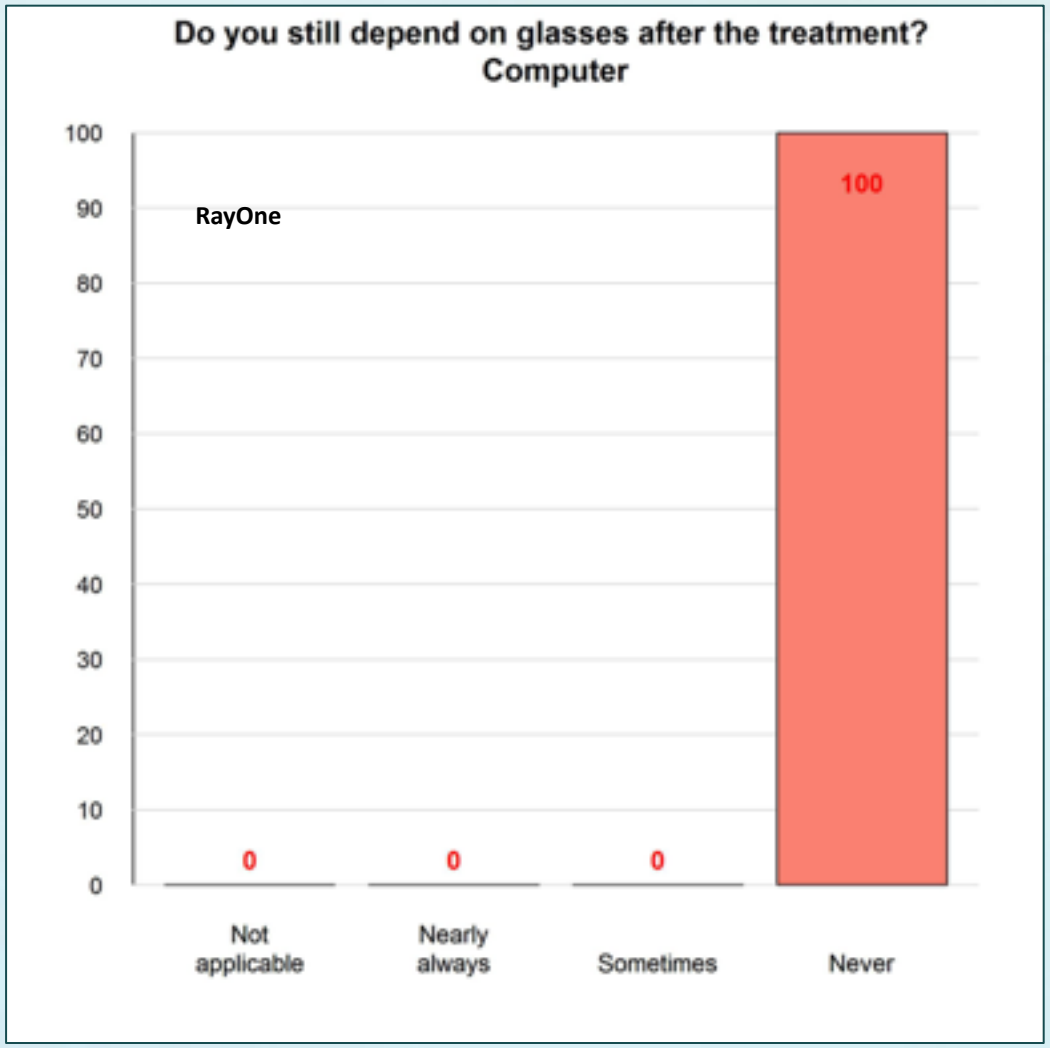
	RayOne	FineVision	LisaTri
%	6,7	8,7	7,90

5.7.3. Satisfacción (independencia gafas lectura)



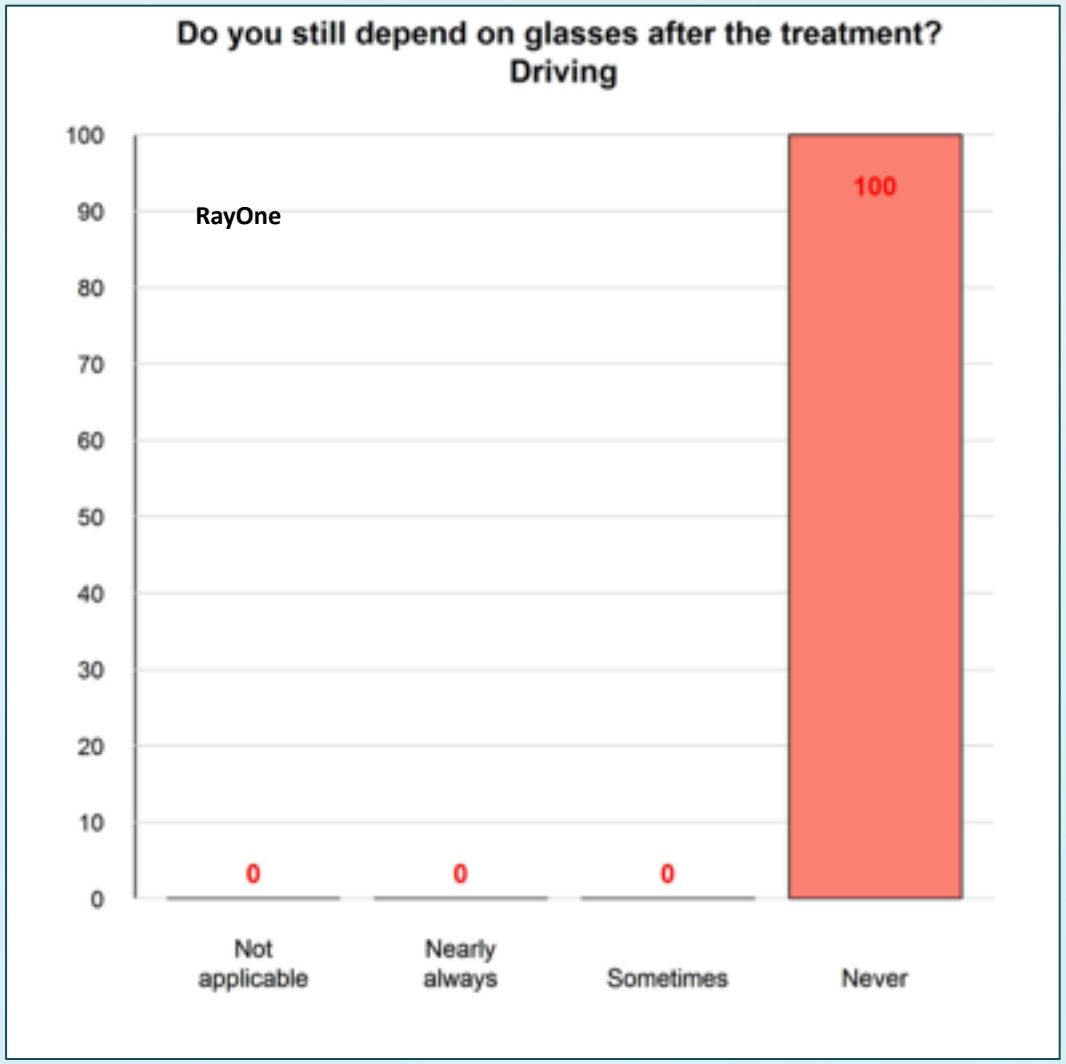
	RayOne	FineVision	LisaTri
%	100	98.3	98.5

5.7.4. Satisfacción (independencia gafas ordenador)

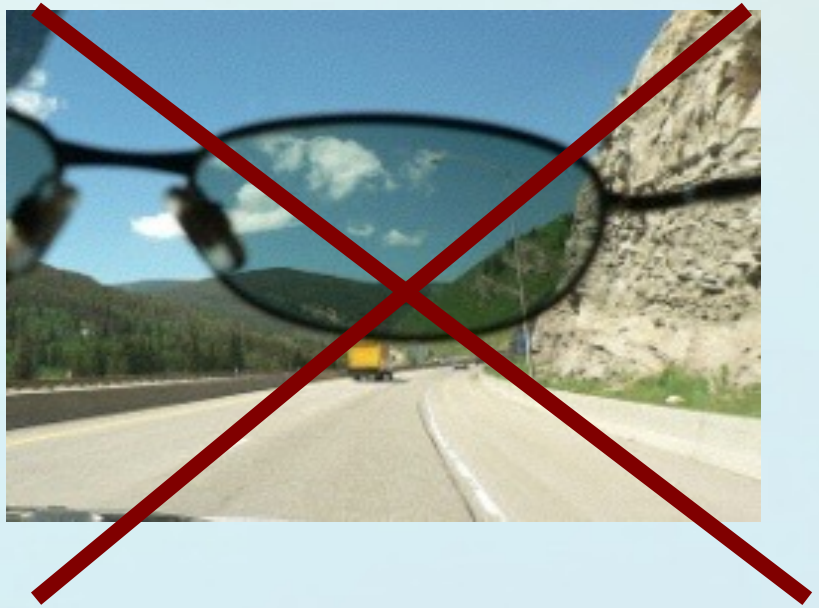


	RayOne	FineVision	LisaTri
%	100	98	98.3

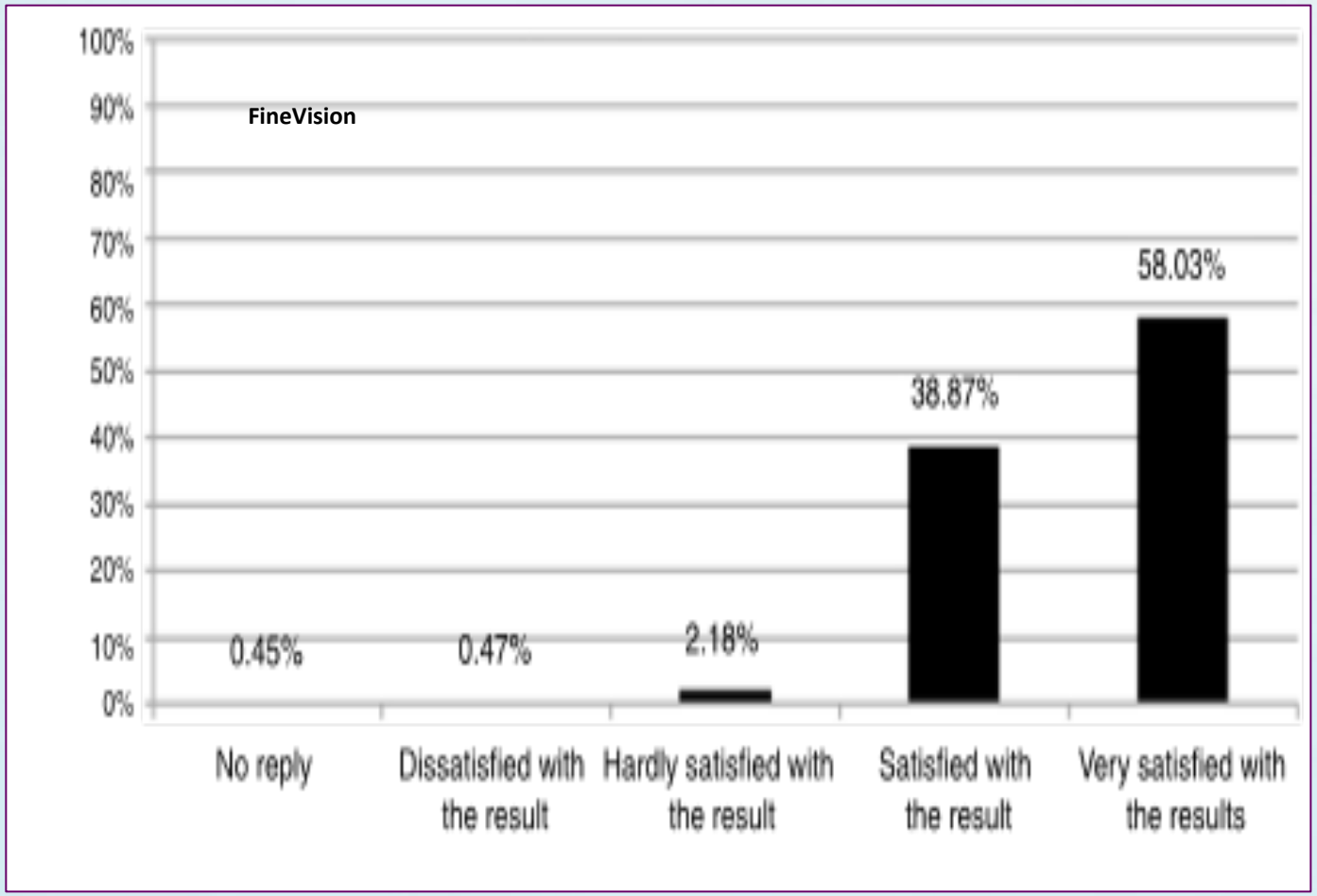
5.7.5. Satisfacción (independencia gafas conducir)



	RayOne	FineVision	LisaTri
%	100	94,5	92.5

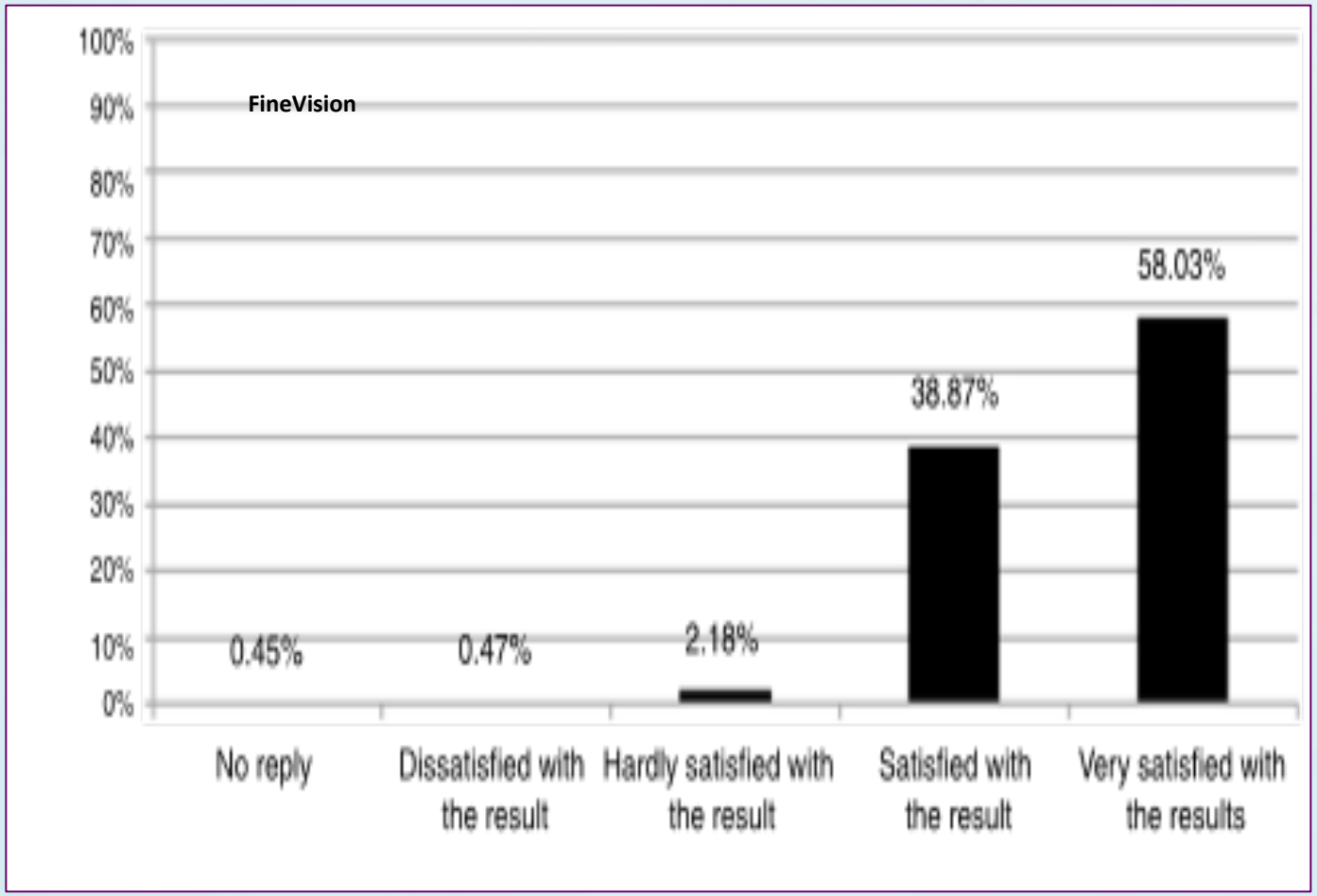


5.7.6. Satisfacción (satisfechos y muy satisfechos)



	RayOne	FineVision	LisaTri
%	100	97	98

5.7.7. Satisfacción (insatisfacción)



	RayOne	FineVision	LisaTri
%	0	0,47	0

5.7.8. Satisfacción (casos de insatisfacción)

FineVision: 5.186 pacientes

Causas	*Nº Casos*
Visión borrosa	7
Gafas v. cerca	6
Gafas v. cerca/intermedia	2
Gafas v. intermedia	14
Gafas v. lejos	10
Disfotopsias	7
Ojo seco	4

7. Conclusiones

Las lentes intraoculares trifocales estudiadas presentan buenos resultados visuales en las tres distancias evaluadas, con un elevado porcentaje de independencia de gafas y un alto grado de satisfacción.

¡Muchas gracias!

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