MEACO–MIOC
CONGRESS 2023

29 NOV – 2 DEC 2023

Oman Convention and Exhibition Centre

The 17th International Congress of
The Middle East Africa Council of Ophthalmology

JOINTLY WITH

19th Muscat International Ophthalmology
Conference (MIOC) 2023

Premium IOL Implantation After LVC

Omid Kermani, MD
ARTEMIS Augenklinik Köln
GERMANY

Objective

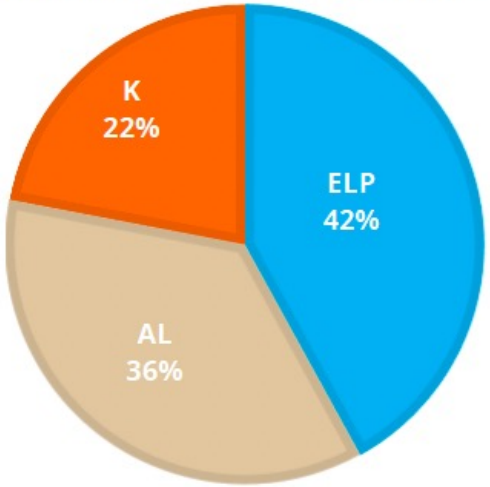
Patients after LVC are the most demanding because they have very high expectations with regard to the refractive result

Challenges

- Usually also expect presbyopia correction
- Come earlier than "normal" cataract patients
- Previous findings are often incomplete
- Common biometric formulas are not adapted to LVC eyes
- Higher order aberrations (HOA) are more pronounced
- Chronic post-LVC sicca syndrome is not uncommon
- The option to perform a touch-up on the cornea is limited

Effect Of Biometrical Parameters If Incorrect

Quellen für Rx-Vorhersagefehler[2]



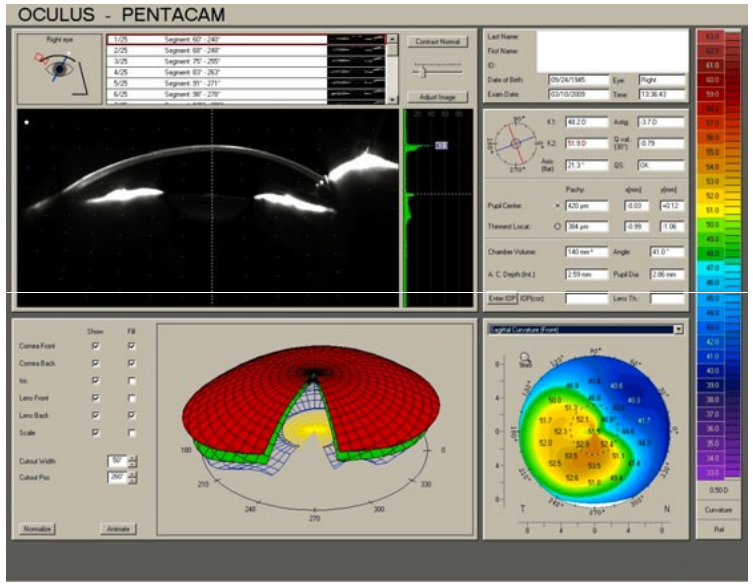
Abweichung von den Mittelwerten verschiedener Variablen und entsprechende Brechungsfehler [2]

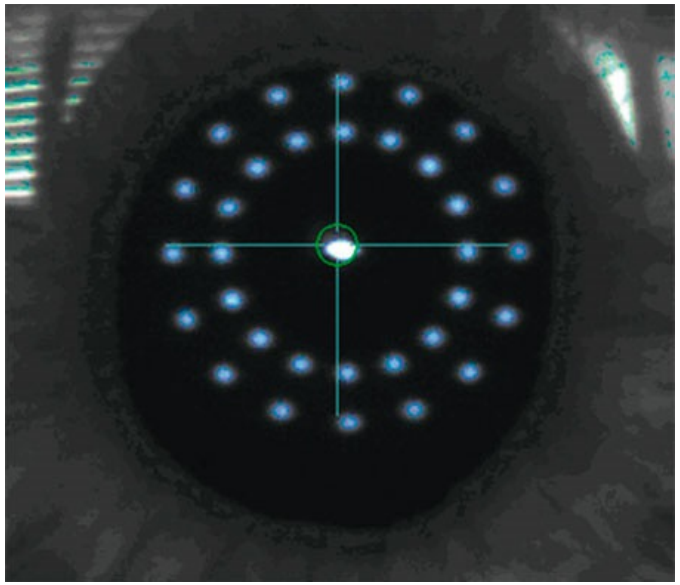
Variable	Error	Rx error
Corneal radius	1.0 mm	5.7 D
Axial length	1.0 mm	2.7 D
Postoperative ACD	1.0 mm	1.5 D
IOL power	1.0 D	0.67 D

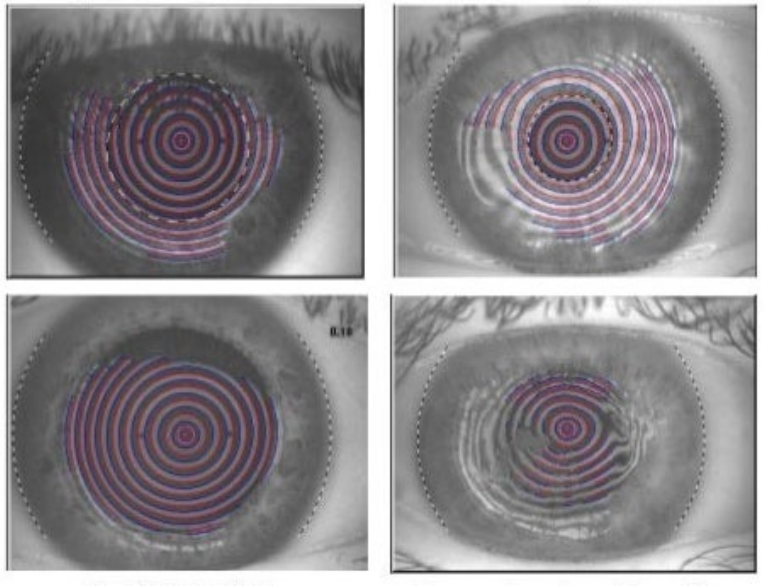
Rx error = refraction error; ACD = anterior chamber depth; IOL = intraocular lens.

2. Olsen T. Acta Ophthalmol. Scand. 2007;85:472–485

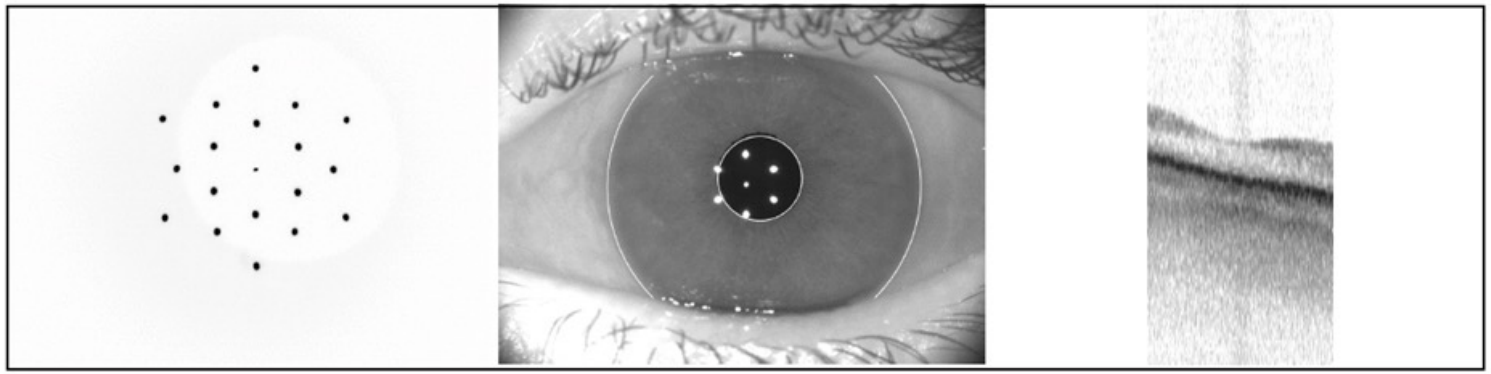
Keratometry Measuring Principles (selection)



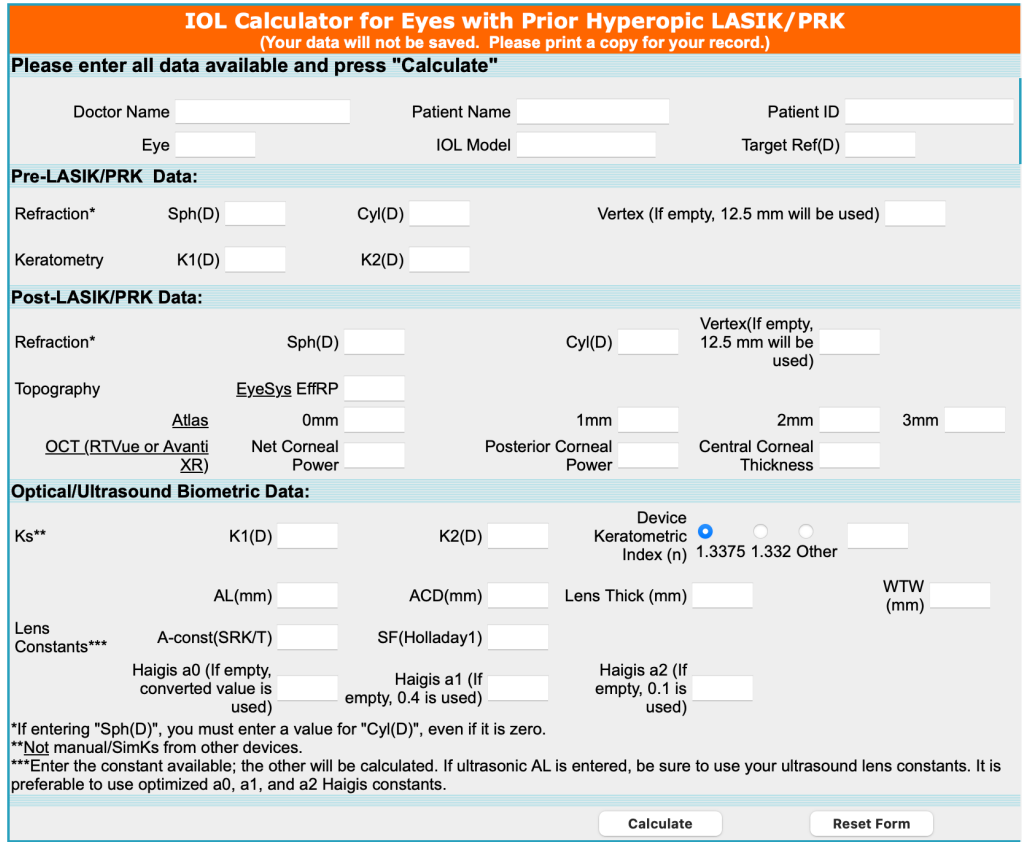




Alcon



ASCRS Post-LVC IOL Calculator



IOL Calculator for Eyes with Prior Hyperopic LASIK/PRK
(Your data will not be saved. Please print a copy for your record.)

Please enter all data available and press "Calculate"

Doctor Name | Patient Name | Patient ID
Eye | IOL Model | Target Ref(D)

Pre-LASIK/PRK Data:

Refraction* Sph(D) Cyl(D) Vertex (If empty, 12.5 mm will be used)
Keratometry K1(D) K2(D)

Post-LASIK/PRK Data:

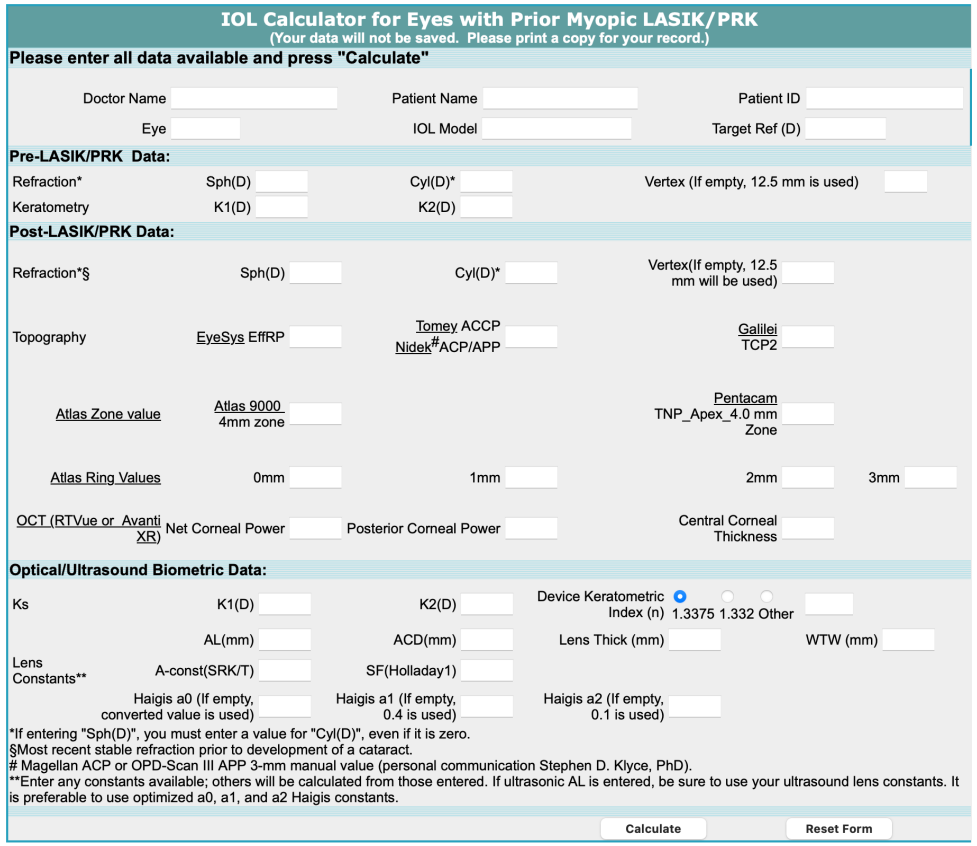
Refraction* Sph(D) Cyl(D) Vertex(If empty, 12.5 mm will be used)
Topography EyeSys EffRP
Atlas 0mm 1mm 2mm 3mm
OCT (RTVue or Avanti XR) Net Corneal Power Posterior Corneal Power Central Corneal Thickness

Optical/Ultrasound Biometric Data:

Ks** K1(D) K2(D) Device Keratometric Index (n) 1.3375 1.332 Other
AL(mm) ACD(mm) Lens Thick (mm) WTW (mm)
Lens Constants*** A-const(SRK/T) SF(Holladay1)
Haigis a0 (If empty, converted value is used) Haigis a1 (If empty, 0.4 is used) Haigis a2 (If empty, 0.1 is used)

*If entering "Sph(D)", you must enter a value for "Cyl(D)", even if it is zero.
**Not manual/SimKs from other devices.
***Enter the constant available; the other will be calculated. If ultrasonic AL is entered, be sure to use your ultrasound lens constants. It is preferable to use optimized a0, a1, and a2 Haigis constants.

Calculate Reset Form



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Doctor Name | Patient Name | Patient ID
Eye | IOL Model | Target Ref (D)

Pre-LASIK/PRK Data:

Refraction* Sph(D) Cyl(D)* Vertex (If empty, 12.5 mm is used)
Keratometry K1(D) K2(D)

Post-LASIK/PRK Data:

Refraction*§ Sph(D) Cyl(D)* Vertex(If empty, 12.5 mm will be used)
Topography EyeSys EffRP Tomey ACCP Nidek#ACP/APP Galilei TCP2
Atlas Zone value Atlas 9000 4mm zone Pentacam TNP_Apex_4.0 mm Zone
Atlas Ring Values 0mm 1mm 2mm 3mm
OCT (RTVue or Avanti XR) Net Corneal Power Posterior Corneal Power Central Corneal Thickness

Optical/Ultrasound Biometric Data:

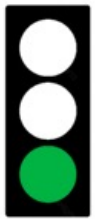
Ks K1(D) K2(D) Device Keratometric Index (n) 1.3375 1.332 Other
AL(mm) ACD(mm) Lens Thick (mm) WTW (mm)
Lens Constants** A-const(SRK/T) SF(Holladay1)
Haigis a0 (If empty, converted value is used) Haigis a1 (If empty, 0.4 is used) Haigis a2 (If empty, 0.1 is used)

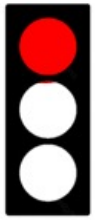
*If entering "Sph(D)", you must enter a value for "Cyl(D)", even if it is zero.
§Most recent stable refraction prior to development of a cataract.
Magellan ACP or OPD-Scan III APP 3-mm manual value (personal communication Stephen D. Klyce, PhD).
**Enter any constants available; others will be calculated from those entered. If ultrasonic AL is entered, be sure to use your ultrasound lens constants. It is preferable to use optimized a0, a1, and a2 Haigis constants.

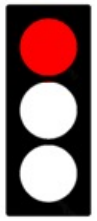
Calculate Reset Form

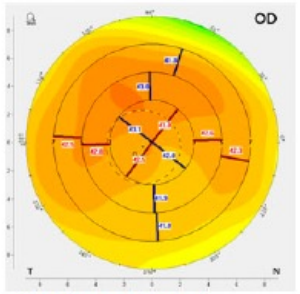
Übersicht Axial/Saggitalkarten für den Einsatz von Multifokallinsen und EDOF

Multifokal

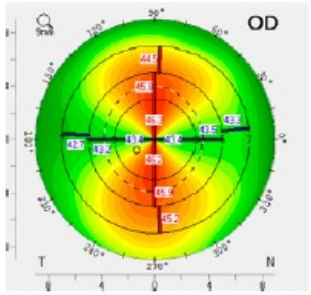




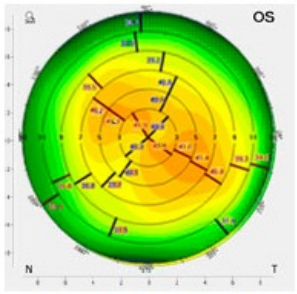




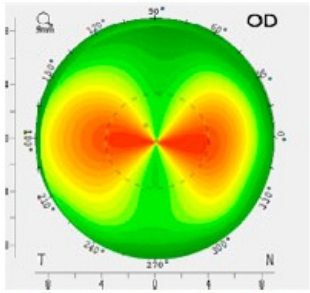
Geringer HH-Ast



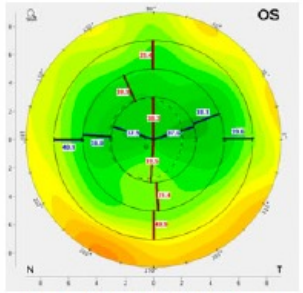
Regulärer symmetrischer Ast rectus / WTR



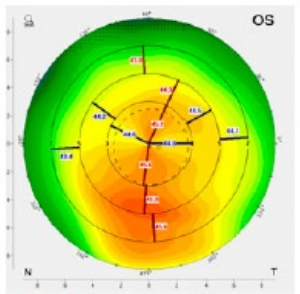
Regulärer symmetrischer Ast obliquus



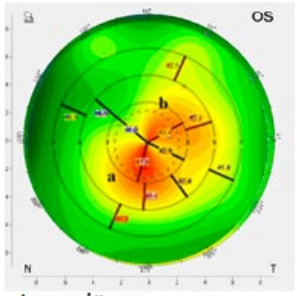
Regulärer symmetrischer Ast inversus / ATR



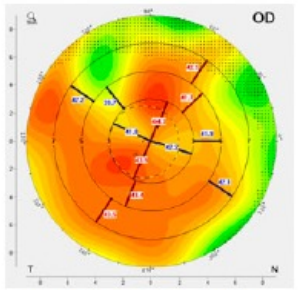
Post PRK/LASIK Myop (Bsp. RMS HOA 0.4µm)



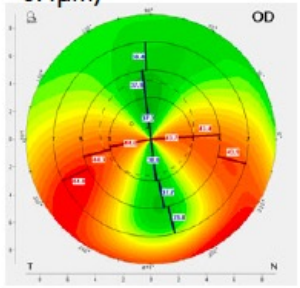
Regulärer asymmetrischer Ast (vertikales Koma < 1.5D)



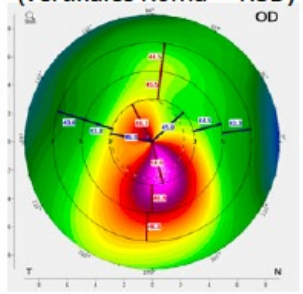
Irregulärer symmetrischer Ast obliquus (Diff <22°)



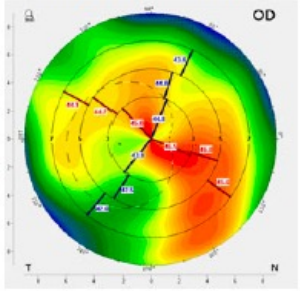
Irregularität durch z.B. Narbe peripher, kleine Pupille



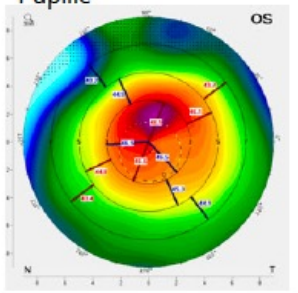
PMD – Pelluzide Marginale Degeneration



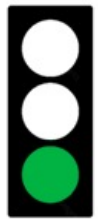
Ektasie / Keratokonus (Koma > 1.5 D)

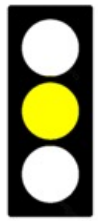


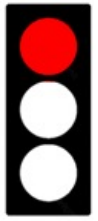
Irregulärer Asti z.B. nach Trauma (hohe Irregulariät)



Post hyperope LASIK (hohe negative Sph. Ab. Z40 !)





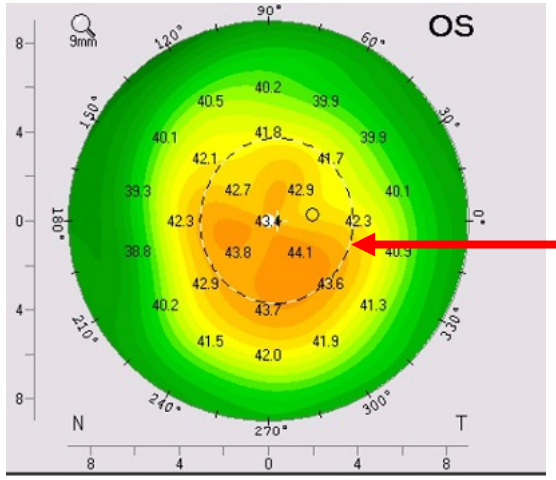


EDOF

Alcon

IOL Selection After LVC

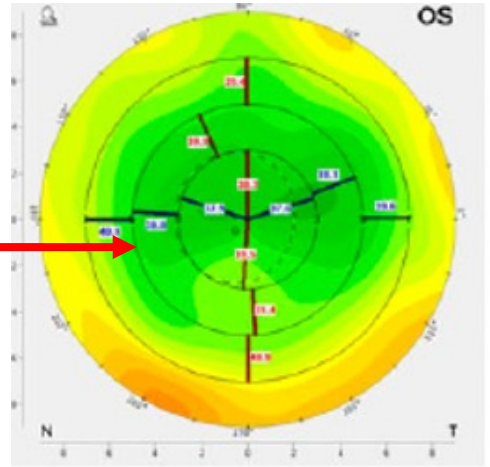
Previos Hyperopic LVC



Cornea shows

negative SA positive

Previous Myopic LVC

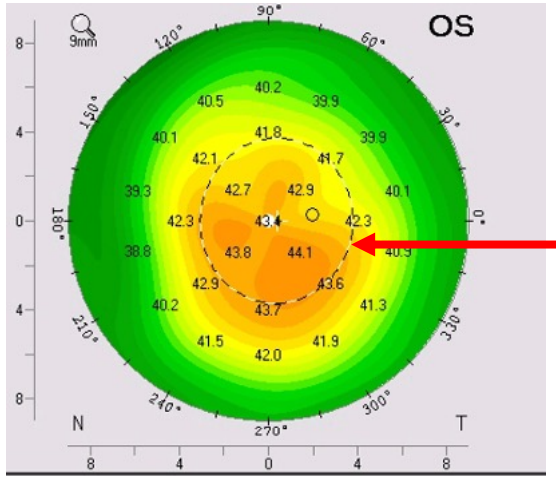


Conventional IOL with positive SA

Aspheric IOL with negative SA

Presbyopia Correcting IOL Selection After LVC

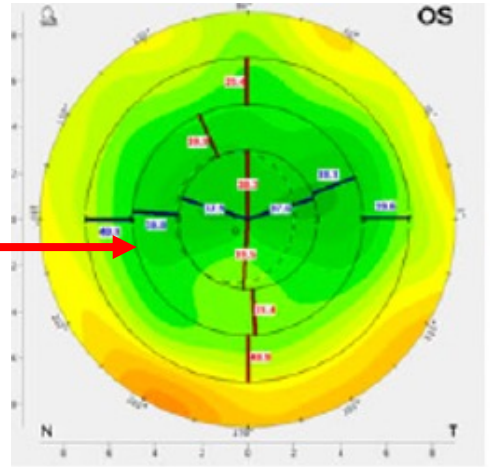
Previos Hyperopic LVC



Cornea shows

negative SA positive

Previous Myopic LVC

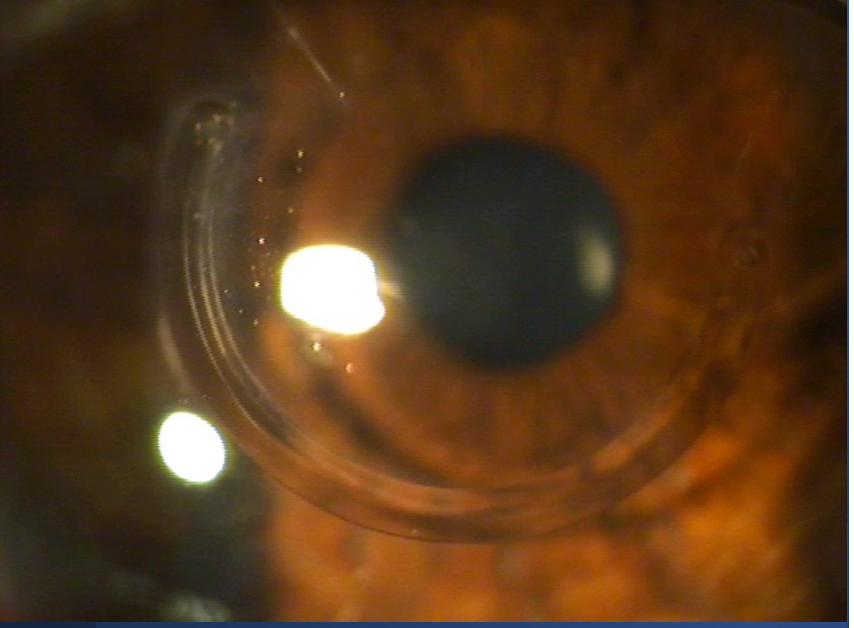


IOL with zero SA = Blended Monovision

Uses the corneal SA for depth of focus

Aspheric Multifocal/EDOF IOL with negative SA

HOA ≤ 0,4µm and stable tearfilm



Small-Aperture-IOL

In Eyes With Highly Aberrated Corneas

Dr. Kermani Vision®

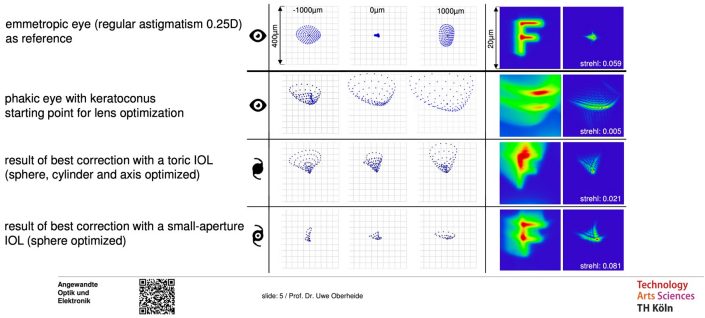
Raytracing-Simulationen von small-aperture und torischen IOLs in Keratokonusaugen

U. Oberheide[1], A. Grafov[1], H. Weigand[1], G. Gerten[2], O. Kermani[2]
[1] Institut für Angewandte Optik und Elektronik, TH Köln
[2] Augenklinik am Neumarkt, Köln

Technology
Arts Sciences
TH Köln

Results of simulations I - focus and point spread function

Simulation of photopic conditions (2.5mm pupil, 550nm wavelength):
through focus spot pattern / simulated optotype (F) / point spread function (PSF)



small-aperture IOL

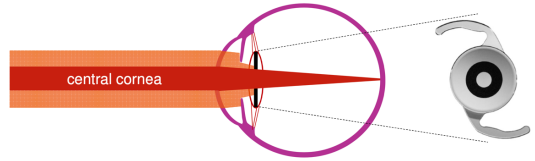
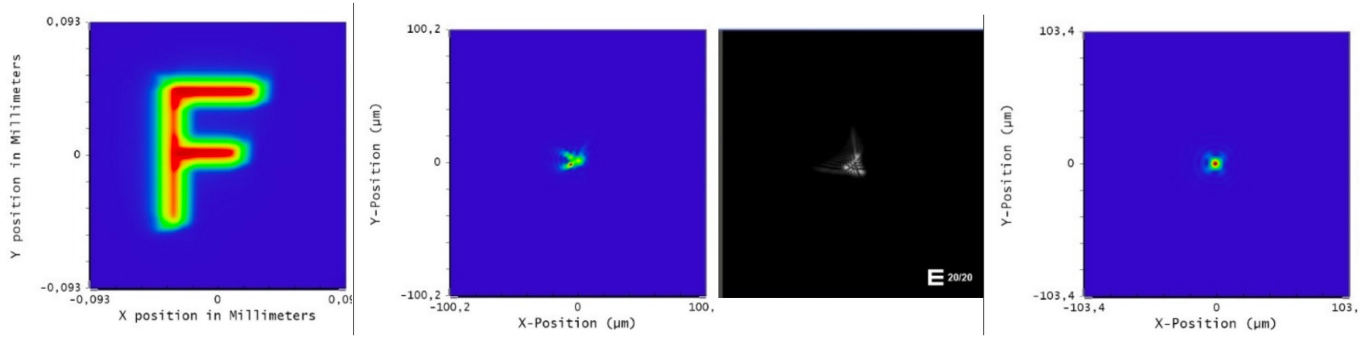


Image: IC-8 ™, Acufocus Inc., USA

Effect of limitating optical system to central corneal region

- extending the depth of field (intended use for presbyopia correction)
- Reducing the effect of peripheral corneal aberrations (e.g. from asymmetric cornea)



simulation of optimized toric IOL (optotype and PSF)

measured PSF after toric IOL implantation

PSF simulation of optimized sma aperture IOL

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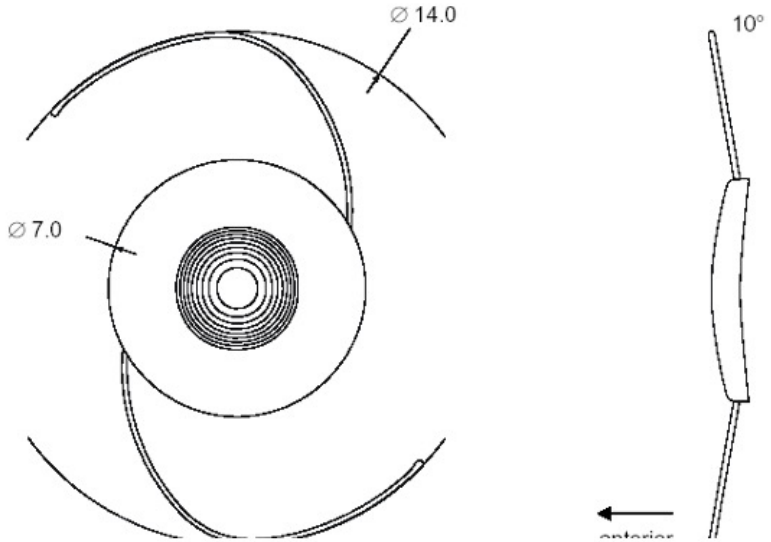
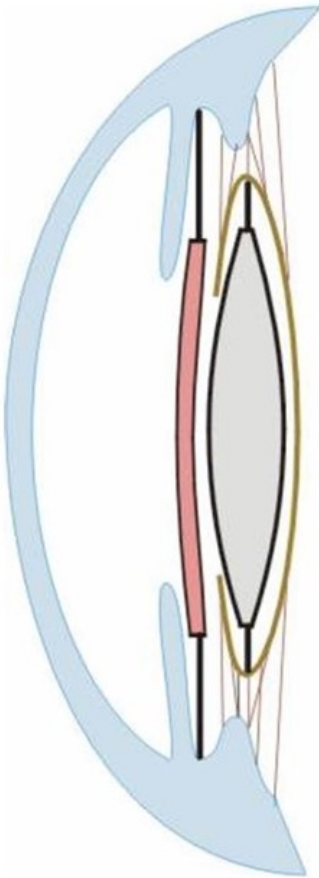
Muscat - Oman

Supplemental Multifocal Sulcus IOL

Primary target: Secondary MF IOL Implantation in Pseudophakic Monofocality

- **PCL + Add-On Sulcus IOL**
  - Haptic diameter >13.0mm
  - Optic diameter ≥ 6.0mm
  - Angulation of haptics ≥ 10^0
  - Hydrophylic material





ARTICLE

Dual intraocular lens implantation: Monofocal lens in the bag and additional diffractive multifocal lens in the sulcus

Georg Gerten, MD, Omid Kermani, MD, Karl Schmiedt, MD, Elham Farvili, MD, Andreas Foerster, MD, Uwe Oberheide, PhD

PURPOSE: To evaluate a new diffractive multifocal intraocular lens (IOL) as an additional (add-on) IOL for sulcus-based implantation.

SETTING: Augenklinik am Neumarkt, Köln, Germany.

METHODS: In this prospective study, cataract patients had phacoemulsification and IOL implantation. After phacoemulsification, an aspheric silicone monofocal IOL (MS 612 ASP-Y) with a power range of +4.00 to +27.00 diopters [D]) was implanted in the capsular bag. This was followed by sulcus placement of an add-on multifocal IOL (MS 714 PB) with a +3.50 D diffractive element for near but zero refractive power for distance.

RESULTS: The study included 56 eyes of 30 patients. Three months postoperatively, the mean monocular uncorrected distance visual acuity was 0.10 logMAR ± 0.11 (SD) (median 1.00 decimal; 20/20 Snellen), with a remaining mean postoperative spherical equivalent of 0.01 ± 0.51 D. The mean uncorrected intermediate visual acuity was 0.20 ± 0.15 logMAR (median 0.63 decimal; 20/30 Snellen) with a luminance of 500 lux at 1 m. The mean uncorrected near visual acuity (Early Treatment Diabetic Retinopathy chart) was 0.16 ± 0.13 logMAR (median 0.80 decimal; Jaeger 2). No major complications (eg, iris chafing, iris capture, lens epithelial cell ingrowth, glaucoma) were associated with the add-on IOL in the sulcus.

CONCLUSIONS: Combined implantation of an add-on diffractive sulcus IOL and a monofocal capsular bag IOL was safe and effective in improving far and near visual acuity in cataract surgery. Preliminary visual acuity results were similar to those in eyes with a single 1-piece diffractive multifocal IOL.

J Cataract Refract Surg 2009; 35:2136–2143 © 2009 ASCRS and ESCRS

METHODS: In this prospective study, cataract patients had phacoemulsification and IOL implantation. After phacoemulsification, an aspheric silicone monofocal IOL (MS 612 ASP-Y) with a power range of +4.00 to +27.00 diopters [D]) was implanted in the capsular bag. This was followed by sulcus placement of an add-on multifocal IOL (MS 714 PB) with a +3.50 D diffractive element for near but zero refractive power for distance.

RESULTS: The study included 56 eyes of 30 patients. Three months postoperatively, the mean

first generation of bifocal IOLs relied on the refractive principle, their performance was very dependent on pupil size and, compared with monofocal IOLs, they had potential adverse optical effects, such as loss of contrast sensitivity and compromised visual acuity

IOL and its replacement by a monofocal IOL is a possible, although not desirable, solution. The concept of an additional functional diffractive optic is an alternative for uneventful reversibility of this complex refractive surgical procedure.

0886-3350/09/$—see front matter
doi:10.1016/j.jcrs.2009.07.014

Contemporary Supplemental Refractive Sulcus IOL

Reversible MF Solution Or Alternative To Laser Touch-Up

Presently not available in the USA

- AddOn®
- 1stQ Germany

- Reverso®
- Cristalens France

- Sulcoflex®
- Rayner UK

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Thank You

"There are no incurable diseases - only a lack of will and knowledge. "

Ibn Sina (Avicenna)
Persian physician
980 -1037 AD.

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