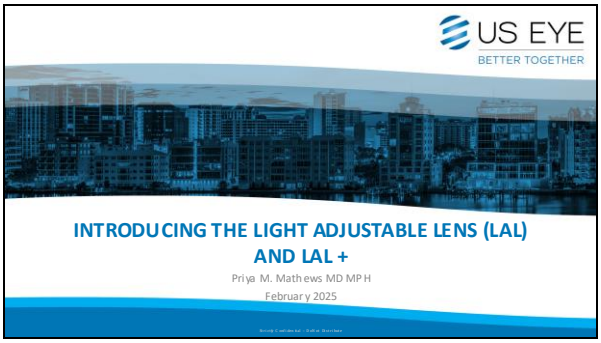


INTRODUCING THE LIGHT ADJUSTABLE LENS (LAL) AND LAL +

Priya M. Mathews MD MPH

February 2025

Disclosures

- Alcon (C,S)
- Johnson and Johnson (C,S)
- RxSight (C,S)
- OysterPoint (S)
- Dompe (S)
- SUN Pharmaceutical (S)
- Harrow (C)
- W.L. Gore (C)

The World's First Adjustable Intraocular Lens

High quality vision with no reduction in contrast or increased glare and halo (relative to a monofocal IOL)

Delivers LASIK Level-Level Refractive Outcomes

Patient driven binocular outcomes with 90% achieving 20/20 & J2[1]

Higher practice revenue and profits

Empowers a wide group of patients and doctors

Light Treatment After LAL Implantation

US EYE BETTER TOGETHER

ActivShield
Blocks UV light except during LDD treatment

Adjustment Beam
Light from the RxSight LDD is directed by the surgeon to the Light Adjustable lens

Photopolymerization
Macromers in the path of the light are photo-polymerized

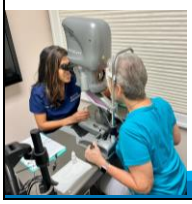
Diffusion and Power Change
Unpolymerized macromers move into the polymerized area, causing precise shape and power change

Lock-In Beam
The entire lens is exposed to light to polymerize all the remaining macromers

Final Result
The cornea is a precise change in the LAL power to match the patient's individual prescription

Light treatments are painless, non-invasive, and take approximately 90 seconds

US EYE BETTER TOGETHER



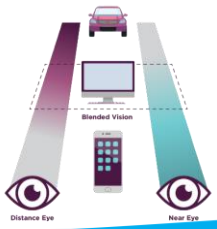
Initial Light Treatment
At least 17 days after surgery

Secondary Light Treatment
At least 3 days after initial light treatment

Additional Light Treatments
If required. At least 3 days after each prior light treatment

High Quality Customized Vision for Cataract Patients

US EYE BETTER TOGETHER



Accuracy: measure refraction post-op rather than predict pre-op

Quality: no loss of contrast or increased visual symptoms versus monofocal IOL

Customization: including optimization of blended vision between two eyes in ~80% of cases

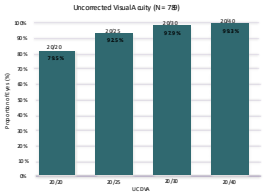
Refractive accuracy leads to visual excellence

US EYE BETTER TOGETHER

- Monocular uncorrected visual acuity of "distance" eyes was 20/20 or better in nearly 80% of subjects.
- **2x** the number of eyes with 20/20 vision or better w/o glasses

Using both eyes, ~90% able to see:

- 20/20 at distance
- read 5-point font using both eyes



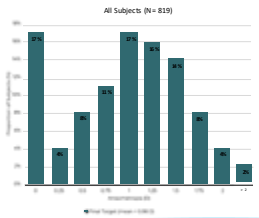
How are doctors customizing their patients' vision?

US EYE BETTER TOGETHER

Refractive Final Target	
Bilateral Emmetropia	16.7%
Blended Vision	**79.6%***
Bilateral Myopia**	3.7%

*Of those with blended vision, **65.3%** had anisometropia of 1.25 (D) or less

**Myopia is defined as -0.25 or more (D) in both eyes



Refractive Results

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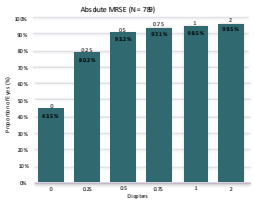
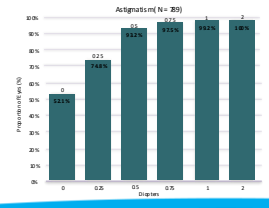
Absolute MRSE and astigmatism were within 0.50 D of emmetropia in **93.2%** of eyes targeted for emmetropia





Binocular Visual Outcomes

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	Uncorrected Binocular Distance Vision		Uncorrected Near Vision			
	20 20 or better	20/25 or better	J1+ or better	J1 or better	J2 or better	J3 or better
All (n=119)	**87%**	97%	50%	**79%**	92%	97%
Bilateral Emmetropia (n=37)	90%	97%	29%	55%	76%	88%
Blended Vision (n=82)	86%	97%	54%	84%	95%	99%
Bilateral Myopia (n=31)	80%	90%	63%	90%	97%	100%

Comparison Between Eyes With and Without History of Prior Refractive Surgery

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Outcome	No Prior Surgery (73%)	Prior Corneal Surgery (27%)
N	576	213
Median Monocular UCDVA	20/20	20/20
Mean Absolute MRSE	0.21 D	0.23 D
Mean Astigmatism	0.20 D	0.23 D
Median Monocular BCDVA	20/20	20/20

US EYE BETTER TOGETHER

INTRODUCING THE LAL+

What is LAL+

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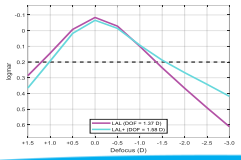
The LAL+ has an extended depth of focus built in providing patients with increased range of vision before light treatments. This was achieved by adding a small continuous increase in central lens power relative to the LAL

LAL

LAL+

This proprietary optical design further extends the depth of focus prior to any light treatments, while maintaining the same high-quality distance vision as the LAL



LAL+ Data – What's the advantage?

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Clinical Study Results of Patients Patients Bilaterally Implanted with LAL+

- Binocular uncorrected visual acuity
- After all treatments with the LDD

	Binocular Uncorrected Distance Vision		Binocular Uncorrected Near Vision			
	20/20 or better	20/25 or better	J1+ or better	J1 or better	J2 or better	J3 or better
Blended Vision (n=81)	**88%**	99%	84%	**93%**	96%	98%

SUMMARY

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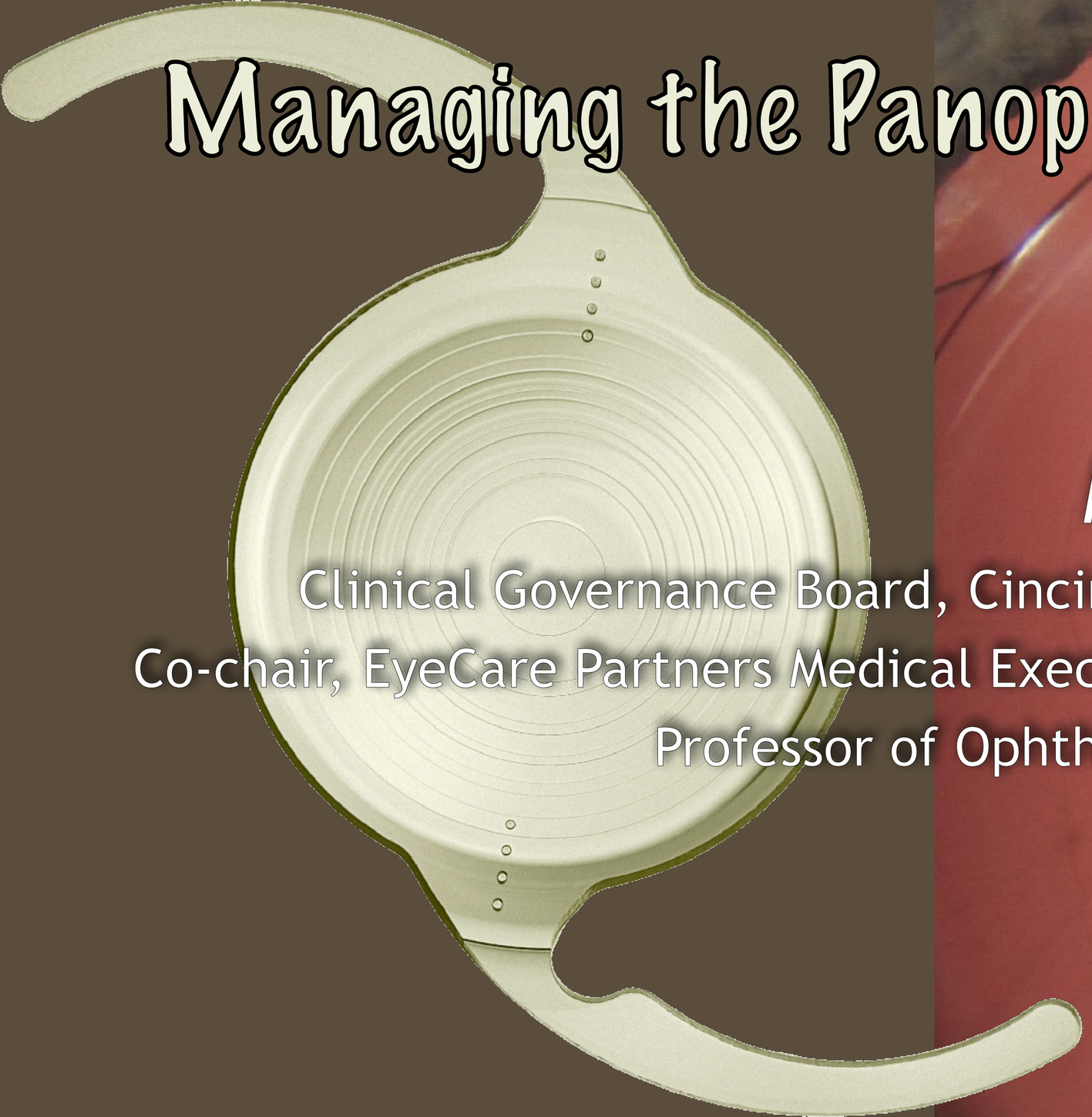
- The LAL has exponentially increased in popularity over the past 5 years
- Patients and Doctors appreciate the ability of delivering customized vision for every patient
  - Particular advantage in patients who less predictable refractive targets (i.e. previous corneal surgery, irregular astigmatism)
- Excellent distance and intermediate, reading can vary depending on the patient
  - It is so important to counsel patients appropriately prior to surgery !
  - For example- set realistic expectations for those who may not tolerate blended vision or patients with high astigmatism
- Outstanding quality of vision
- Low incidence of dysphotopsias
  - No increase in glare or halo versus monofocal
- Great performance in low light conditions
  - No reduction in contrast versus a monofocal lens

US EYE
BETTER TOGETHER

Thank You!!

priya.mathews@useye.com

Managing the Panoply of Premium IOLs



Michael E. Snyder, MD

Clinical Governance Board, Cincinnati Eye Institute/CVP Physicians

Co-chair, EyeCare Partners Medical Executive Board, Research Committee

Professor of Ophthalmology, University of Cincinnati

Disclosures

- Alcon: Research
- Beyonics: Consultant
- DORC: Consultant
- Gore: Consultant
- Haag-Streit: Consultant
- Humanoptics: Consultant, Royalties
- Johnson & Johnson Vision: Research
- Plexitome: Research
- VEO Ophthalmics: Board member, Royalties (TKP)

Why is “premium” adoption by docs incomplete, after over 20 years?

- Inertia
- Fear of optical aberrations
- Discomfort talking about self pay services (varies by country/ province)
- Fear of the “unhappy patient”
  - Presbyopia is the #1 complication of cataract surgery
  - How about TORIC IOLs? (Approved in the US in 1998)

Premarket Approval (PMA)

New Search Back to Search Results

Note: this medical device has supplements. The device description/function or indication may have changed. Be sure to look at the supplements to get an up-to-date information on device changes. The labeling included below is the version at time of approval of the original PMA or panel track supplement and *may not represent the most recent labeling*.

Device	CRYSTALENS MODEL AT-45 ACCOMMODATING POSTERIOR CHAMBER INTRAOCULAR LENS (IOL)
Generic Name	Lens, intraocular, accommodative
Regulation Number	886.3600
Applicant	Bausch & Lomb, Inc. 50 Technology Drive Irvine, CA 92618
PMA Number	P030002
Date Received	01/24/2003
Decision Date	11/14/2003
Product Code	NAA


I feel very comfortable talking about money with patients


(Four Seasons, Silicone Valley at East Palo Alto)

I feel very comfortable talking about money with patients

(But I think about it as helping them choose what they think is best for them, without making them feel bad)

Whether you or your team talks about money is a matter of choice

I find a dialogue with me often clarifies misconceptions some folks have even after talking to a refractive counselor.

Current "Premium" IOL Landscape in the US:

Toric Plus Others

Johnson and Johnson Vision
- Tecnis Odyssey, Symfony, Synergy, Eyehance

Alcon
- Clareon Vivity & Panoptix

Bausch & Lomb
- Aphthera, Envista Aspire, Crystalens, Envista Envy

RxSight
- LAL, LAL+

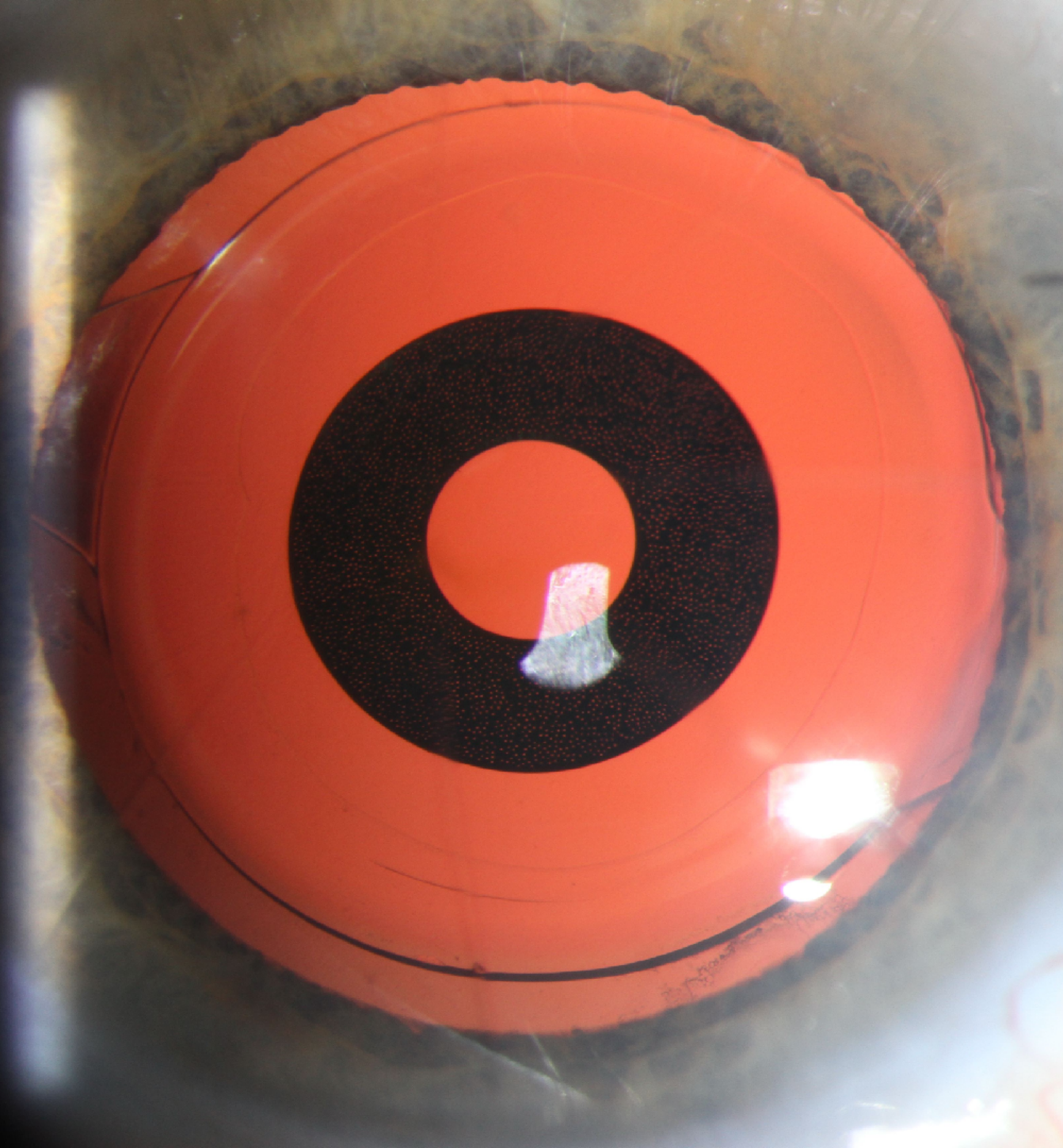
Rayner
- RayOne
- Sulcoflex Trifocal

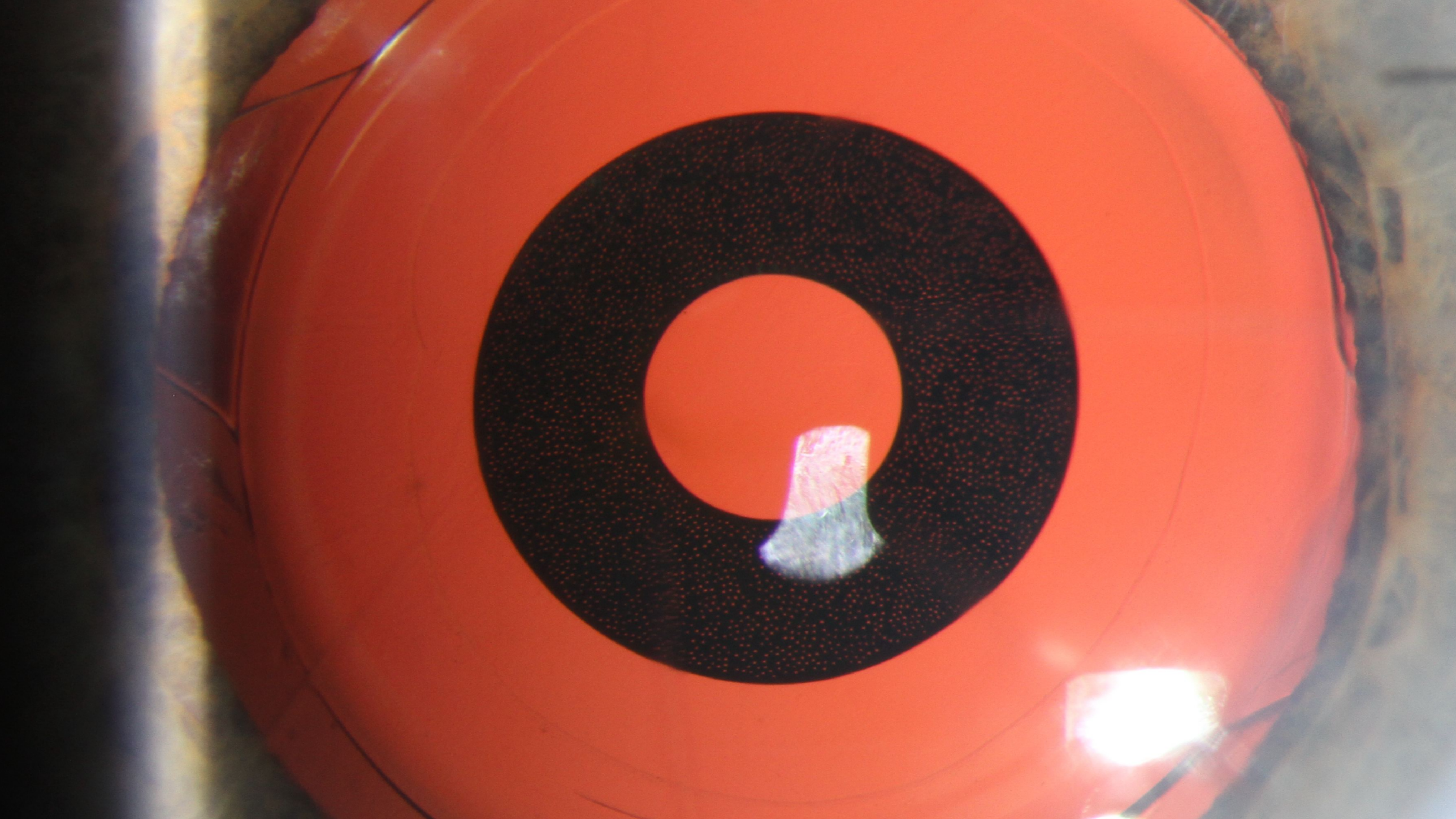
Pinhole Implants

Apthera IC-8 is now commercially available

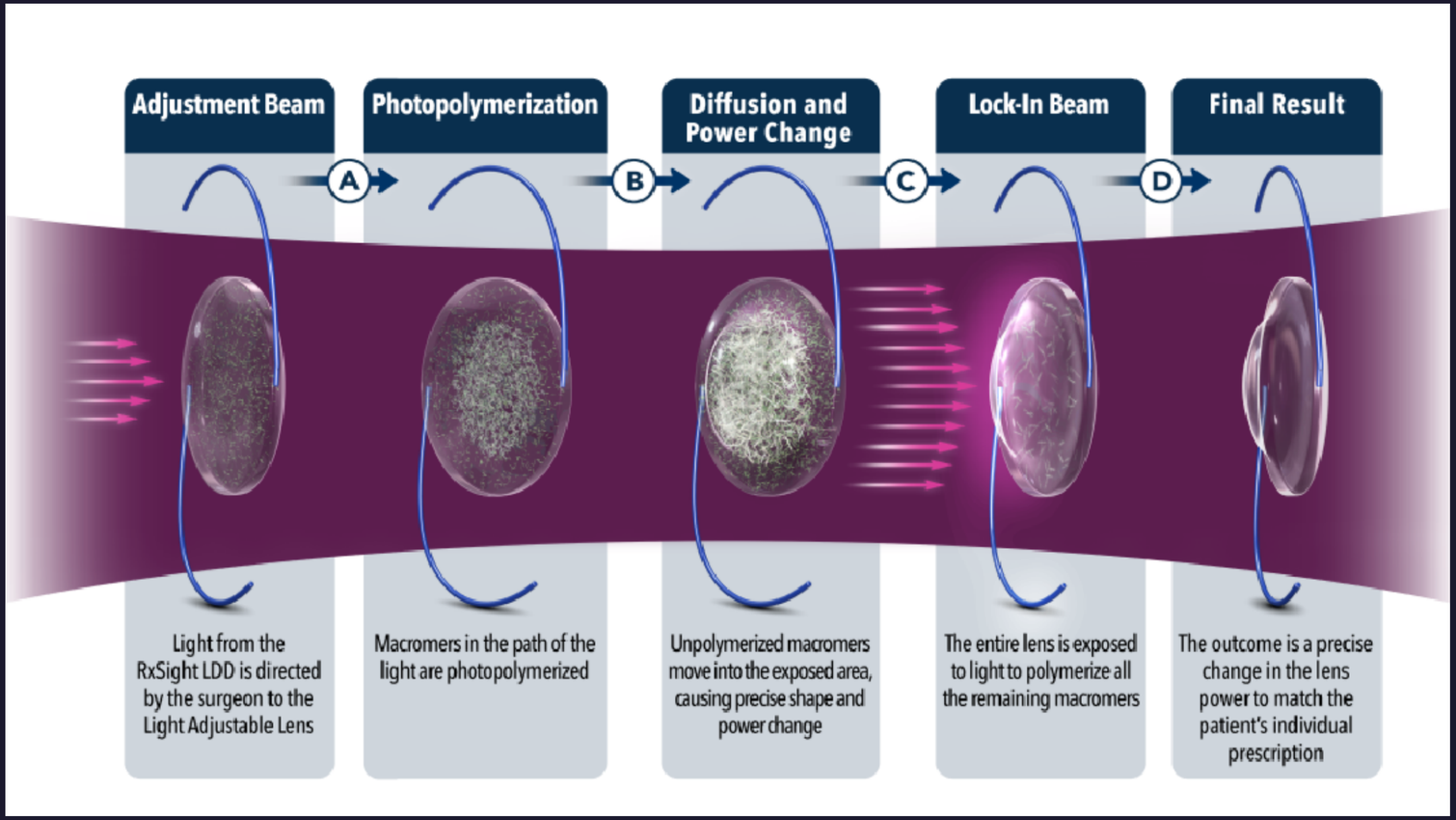
Especially nice for irregular corneas

- CL intolerant Keratoconus patient: “This is the best I have seen in 60 years!”





Light Adjustable Lens



Customizable Vision

- **Postoperative Adjustments:** Vision can be fine-tuned after surgery to meet individual needs.
- **Personalized Results:** Patients can "test drive" their vision and have adjustments made for optimal clarity.

High Precision

- **Accurate Vision Correction:** Allows for adjustments in diopter strength post-surgery, ensuring precise correction of refractive errors.
- **Adaptable to Lifestyle:** Adjustments can be made to fit specific lifestyle needs (e.g., reading, computer use).

Slide Courtesy of Caroline Watson, MD

Light Adjustable Lens

Reduced Dependence on Glasses

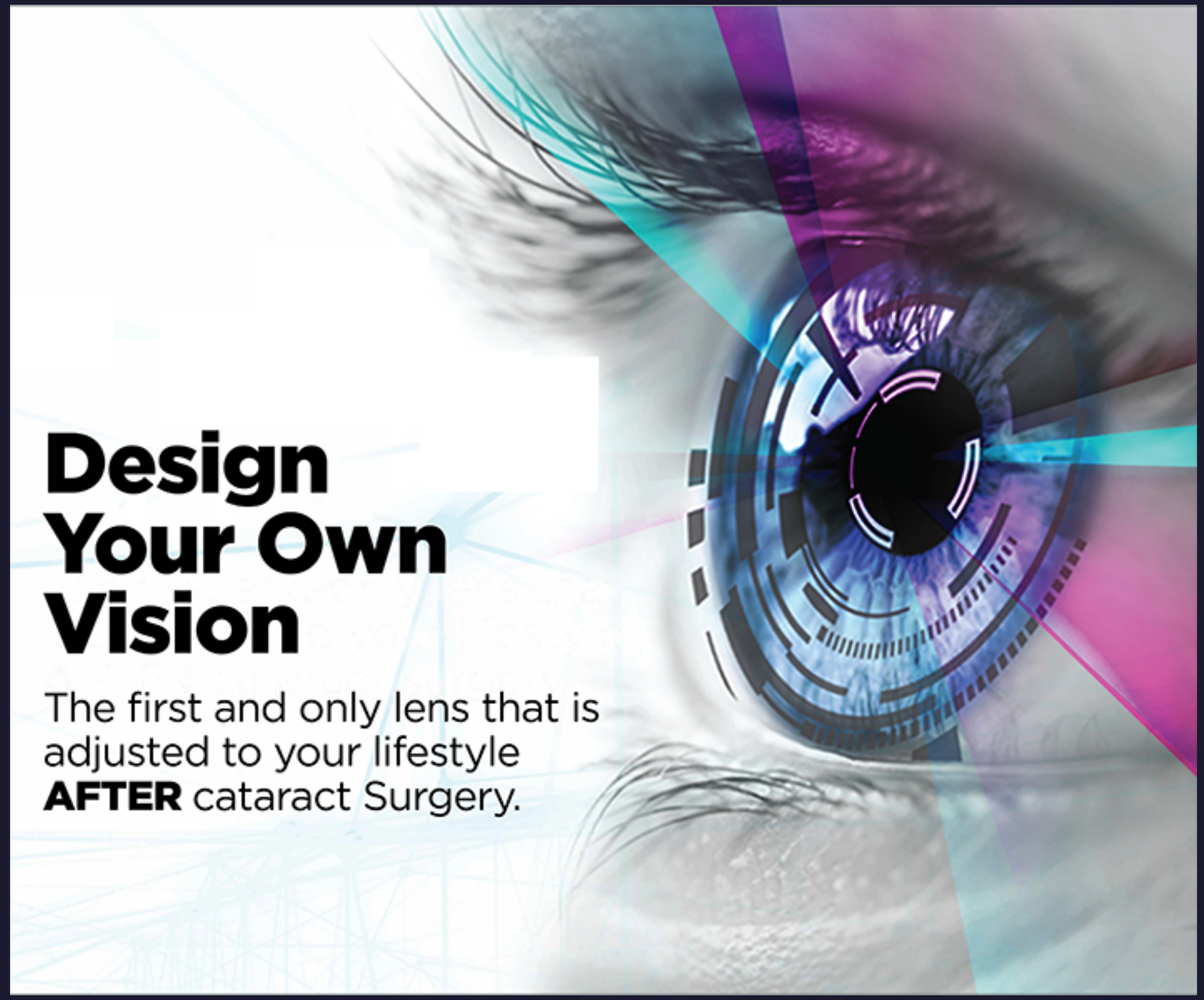
- **Enhanced Visual Outcomes:** Potentially reduces or eliminates the need for glasses or contact lenses for most activities.
- **Flexible Correction:** Accommodates changes in vision preferences, such as prioritizing near or distance vision.

Addressing Residual Refractive Error

- **Correcting Astigmatism:** Provides an opportunity to correct residual astigmatism postoperatively.

Minimizing Re-Treatments:

- Reduces the need for secondary procedures like LASIK or PRK.



Slide Courtesy of Caroline Watson, MD

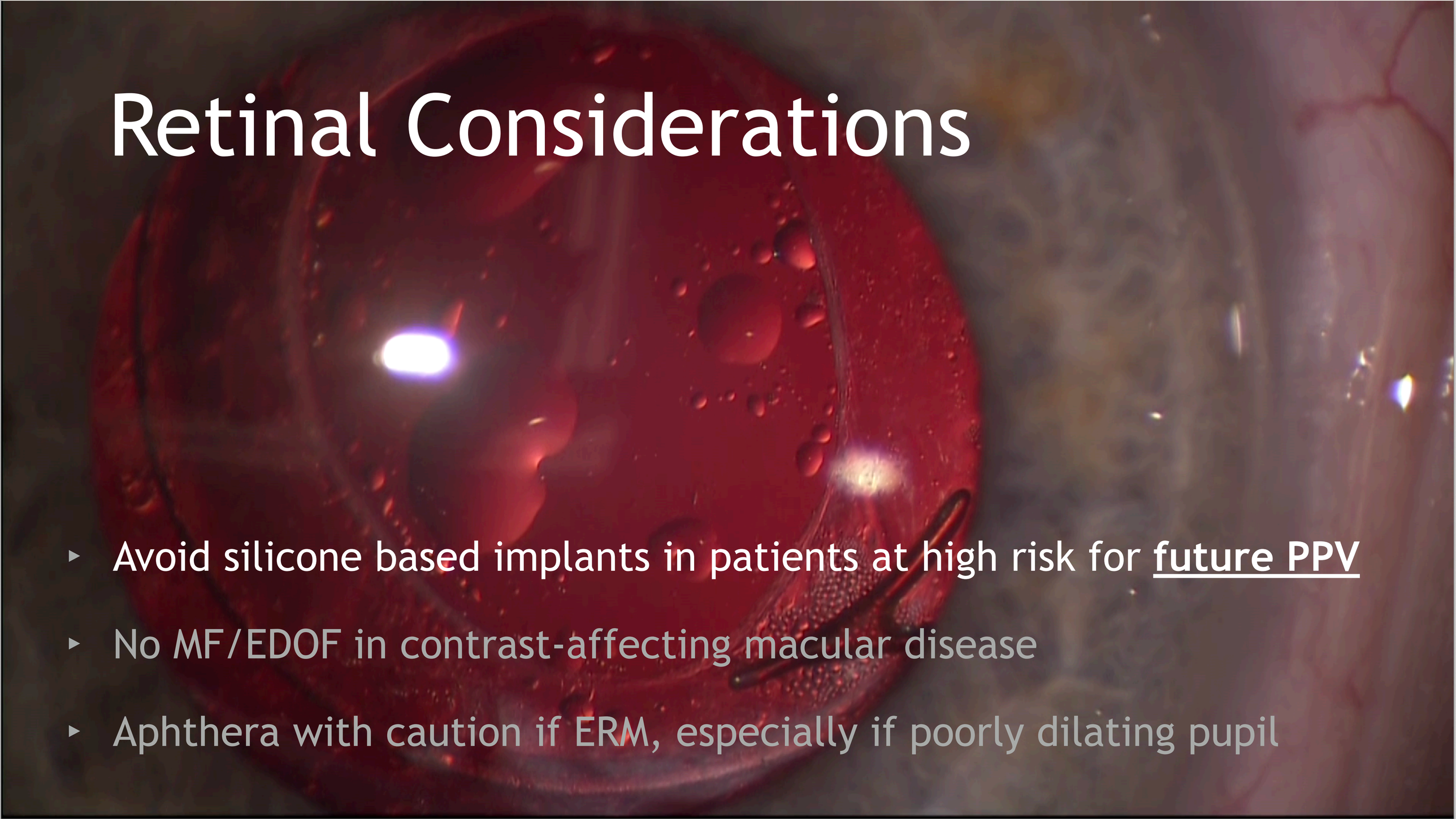
Crystalens - is there still a niche?

Crystalens - is there still a niche?

In my practice, patients with:

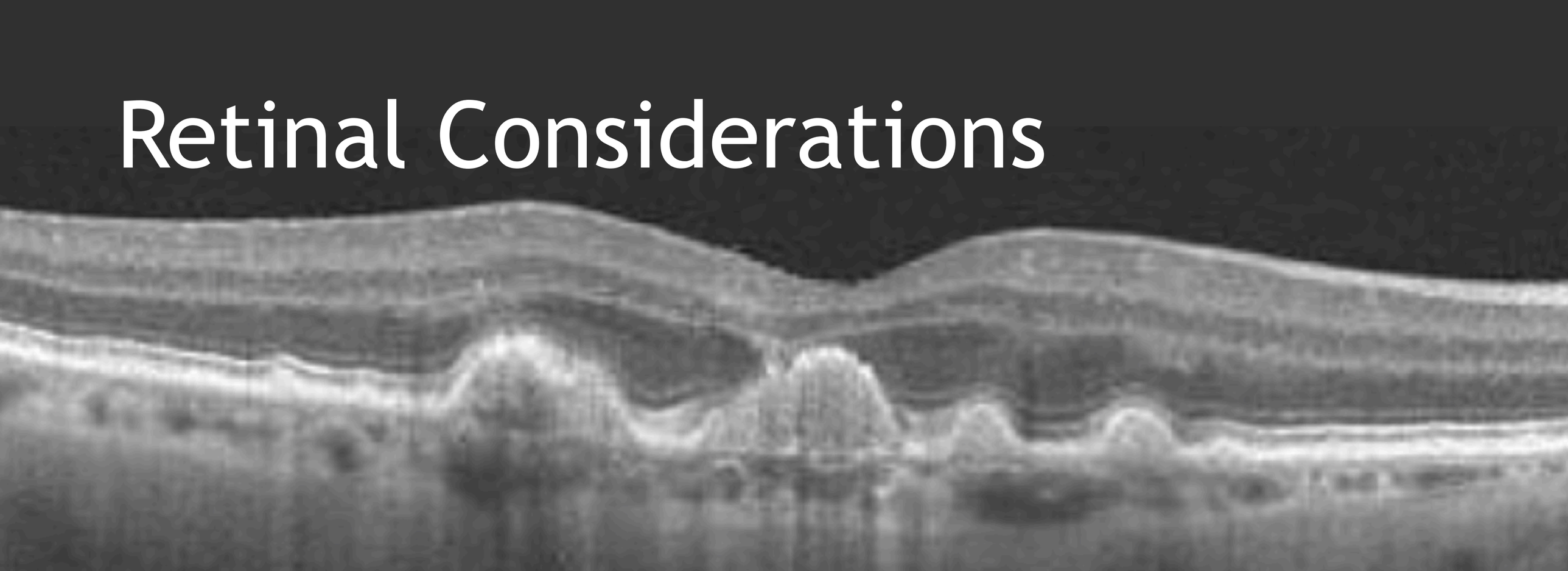
- Macular degeneration
- Normal zonules
- No likelihood of PPV
- & desire for some presbyopic correction…

Retinal Considerations



- Avoid silicone based implants in patients at high risk for **future PPV**
- No MF/EDOF in contrast-affecting macular disease
- Aphthera with caution if ERM, especially if poorly dilating pupil

Retinal Considerations



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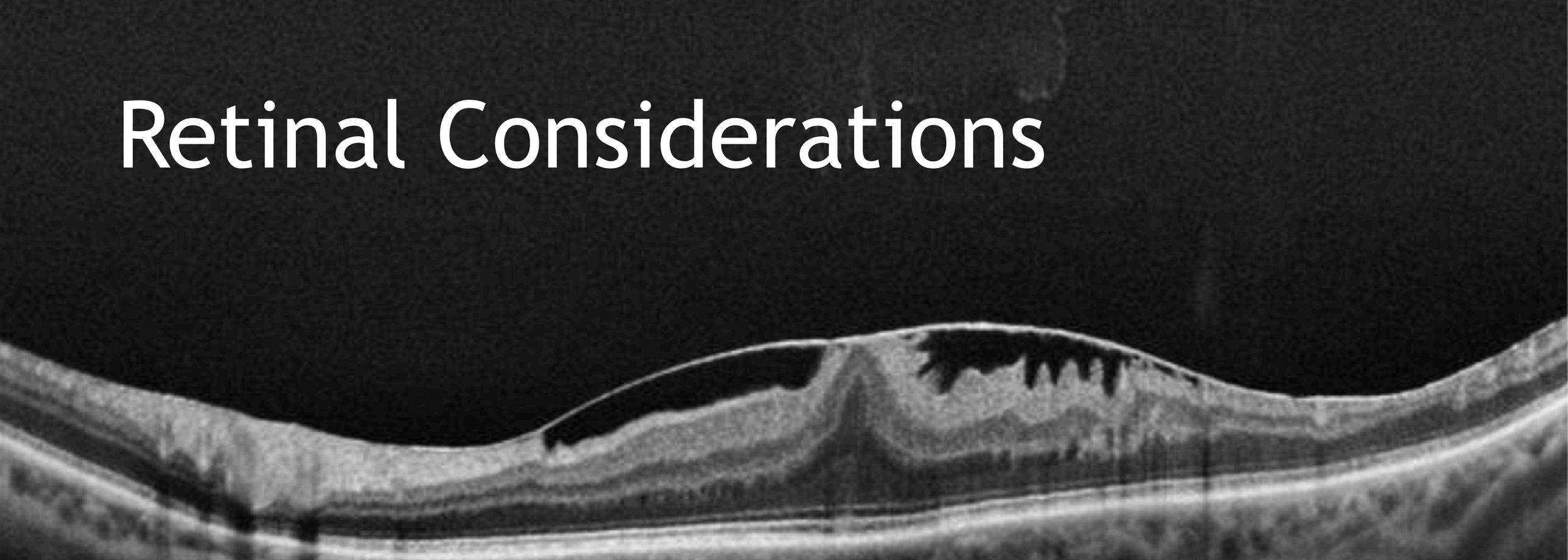
Retinal Considerations



- Avoid silicone based implants in patients at high risk for future PPV
- No MF/EDOF in contrast-affecting macular disease
- Aphthera with caution if **ERM**, especially if poorly dilating pupil

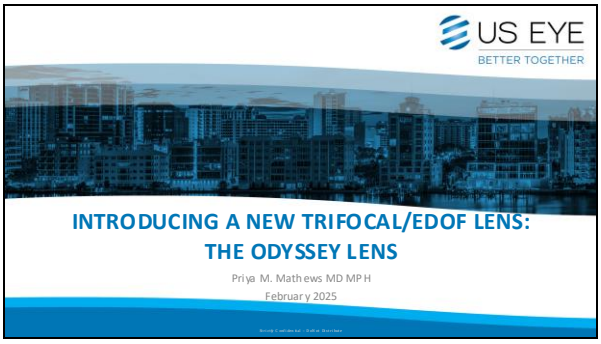
Stirring the Pot…

- Are Extended Depth of Focus (EDOF) IOLs Really a Different Category Than ‘Multifocal’ IOLs?
- Are ‘Enhance Monofocal’ IOLs Really a Different Category Than ‘Multifocal’ IOLs?

Stirring the Pot…

- My View?
  - Light is either focus at one focal point — or it isn’t…
  - There are several ways to manipulate light wavefronts with IOLs:
    - Spherocylindrical Refraction
      - “Basic” and Toric IOLs
      - Refractive MFIOLs
    - Diffraction
      - Diffractive MFIOLs
      - Pinhole IOLs
    - Addition or Subtraction of Spherical Aberration
    - Combinations Thereof…

Qs?



INTRODUCING A NEW TRIFOCAL/EDOF LENS: THE ODYSSEY LENS

Priya M. Mathews MD MPH

February 2025

Disclosures

- Alcon (C,S)
- Johnson and Johnson (C,S)
- RxSight (C,S)
- OysterPoint (S)
- Dompe (S)
- SUN Pharmaceutical (S)
- Harrow (C)
- W.L. Gore (C)

When implanting a presbyopia-correcting IOL…

1. Select the Right Patients
2. Set the Right Expectations
3. Minimize Post-Op Refractive Error

New Full Visual Range IOL
All-new diffractive profile

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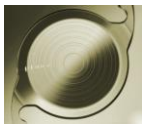
TECNIS Odyssey IOL



Design goals:

- **Optimized full range of vision**
- **Higher tolerance to residual refractive error**
- **Mitigate night vision symptoms**
- **High quality of vision**

Clinical Study Design

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- **Purpose:** To assess real world outcomes of the new full visual range[1] TECNIS Odyssey IOL.
- **Study Design:**
  - Retrospective study
  - **96** patients **bilaterally implanted** with the non-toric TECNIS Odyssey IOL, targeting emmetropia
  - 12 Sites with 19 participating surgeons in the US
  - Chart review of visual performance and symptoms at the 1-Month postop without post-op enhancements
  - Small magnitude corneal astigmatism was managed per surgeon discretion (50% of the cohort underwent limbal relaxing incisions or arcuate incisions) at the time of surgery

1. Data of File 20240004003

Binocular Distance VA

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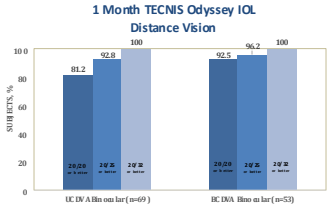
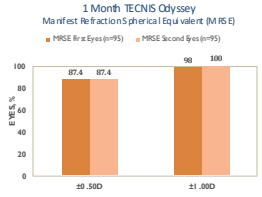
- Uncorrected Mean ±SD
  0.01 ±0.07 logMAR
  (20/20)
- Best Corrected Mean ±SD
  -0.03 ±0.07 logMAR
  (20/20)



Refractive Outcomes

- 95% Targeted within ±0.25 of emmetropia
- **87.4%** Eyes achieved MRSE within **±0.50 D of emmetropia**
- Mean MRSE
  - First eyes: -0.08 ±0.36 D
  - Second eyes: -0.04 ±0.34 D

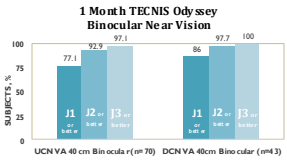


MRSE:N=95; 1 subject did not report MRSE at 1 Month

Binocular Near VA

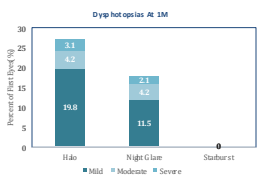
Uncorrected Near at ~40 cm
- **Mean VA = J1 (20/25)**
  0.01 ± 0.09 logMAR
- 92.9% J2 or better

Distance corrected Near at ~40 cm
- **Mean VA = J1 (20/25)**
  0.06 ± 0.08 logMAR
- 97.7% J2 or better



96.4% of TECNIS Odyssey subjects were not prescribed spectacles at any distance at the 1 Month visit*

Dysphotopsias



- **Low rates** of severe **dysphotopsia**
- Majority of symptoms were mild, if present

Conclusions from the 'Real-World' Study

In a **real-world** setting at **1 month** postoperative, the new EDOF/Trifocal 'Odyssey' IOL demonstrated:

- **Full range of vision**
- **Low night vision symptoms**
- **High percentage not prescribed glasses** at any distance

CASE STUDY

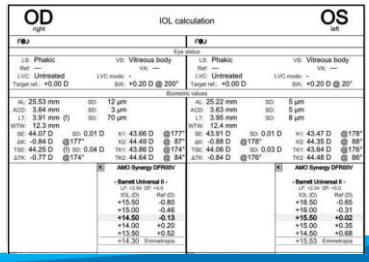
HISTORY

- 52-year-old female presenting for cataract surgery
  - "I have a difficult time seeing clearly, especially at work and night time"
  - Long time multifocal SCL wearer
  - On the computer and phone for work
  - Likes golfing and cycling on the weekends
- POH: none

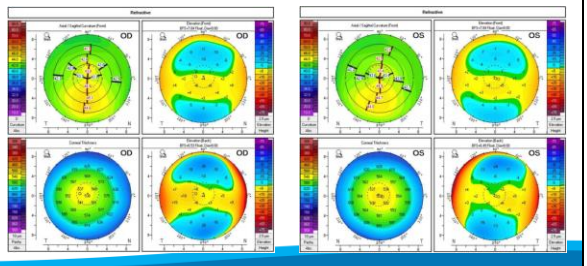
Vision:

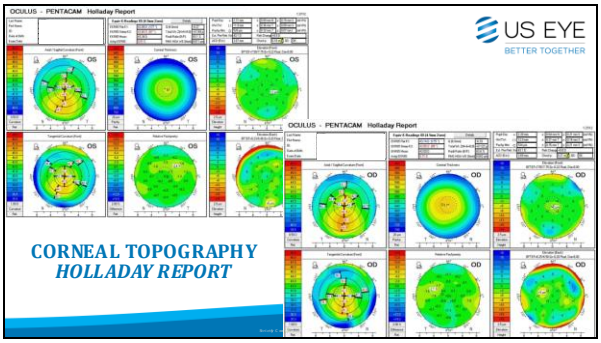
	OD	OS
MRx	-5.25 -0.25 x 150 → 20/25	-4.75 -0.25 x 175 → 20/25
BAT	20/70	20/70

	OD	OS
Lids/Conj/Sclera	1+ MGD, trace blepharitis	1+ MGD, trace blepharitis
Cornea	2+ central PEEs 1 mm circular anterior stromal scar at 6oclock (peripheral)	2+ central PEEs
Iris	wnl	wnl
Lens	2+ Cortical, 2+ NS	2+ Cortical, 1+ NS
Fundus exam	wnl	wnl



CORNEAL TOPOGRAPHY





OCT MACULA

US EYE
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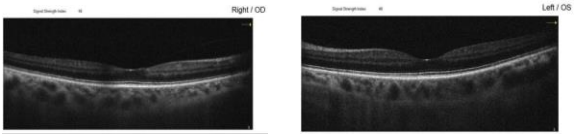

TREATMENT PLAN

US EYE
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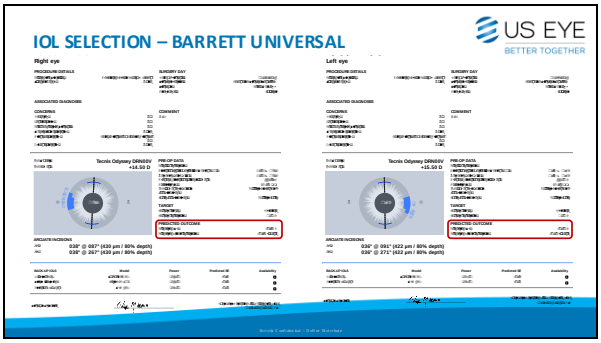
- Patient desires spectacle independence as much as possible, but is OK with wearing cheaters if needed
- Does not want to sacrifice distance

Surgical plan?

Odyssey IOL OU

IOL SELECTION – BARRETT UNIVERSAL



POSTOP RESULTS

- OD: 20/15+1 distance, J1+ near
- OS: 20/15+1 distance, J1 near
- OU: 20/15+1 distance, J1+ near

Patient was thrilled! She reported complete spectacle independence.

CONCLUSION/SUMMARY

- The Odyssey IOL delivers high-quality vision, while preserving contrast sensitivity, at all focal points
  - Patients are thrilled with their distance vision from the beginning
  - "Underpromise and overdeliver" – I tell every patient that they may need reading glasses
  - Minimal complaints regarding dysphotopsias so far
- Pearls
  - Aim closest to plano (or if deciding between two IOLs- select first minus)
  - Reading gets better with time


US EYE
BETTER TOGETHER
Thank You!!
priya.mathews@useye.com

UPDATE ON SECONDARY INTRAOCULAR LENSES

Matthew Cunningham, MD, FASRS
Florida Retina Institute/RCA
New Orleans Academy of Ophthalmology
February 2025

1

DISCLOSURES

- Consultant: Alimera, Allergen, Alcon, Genentech, Ocuphire Pharm, Ocular Therapeutics, ANI Pharmaceuticals
- Investigator: Alimera, Genentech, Inc., Jaeb Center for Health Research, Regeneron, Novartis, Ocuphire Pharm, Parexel, Ocular Therapeutics
- Speaker: Genentech, Inc., Apellis, Astellas, Regeneron
- **None relevant to this talk**

2

CASE

3

72 YEAR OLD MAN WITH HISTORY OF RD REPAIR AND CATARACT SURGERY >20 YEARS AGO PRESENTS WITH SUDDEN PAINLESS LOSS OF VISION.

"I SEE A NEW FLOATER"

4

EXAM

VA CF

SLIT LAMP EXAM: ANTERIOR CHAMBER QUIET

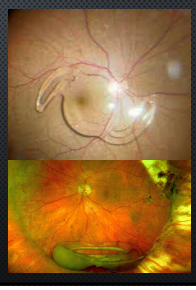
5

DISLOCATED IOL

6

IOL DISLOCATION

- Can present as:
  - Pseudophacodonesis
  - Simple lens decentration within an intact capsular bag or in sulcus
  - Partial lens subluxation out of the capsular bag
  - Complete dislocation of the lens within or outside of the bag into the anterior or posterior chamber.
    - PC defect or tear, the IOL may slide out of the bag (out-of-the-bag dislocation)
    - Defect in stability of the capsular bag support (in-the-bag dislocation)



7

ETIOLOGY

- After CEIOL, late dislocation of the lens typically occurs due to progressive zonular insufficiency and contraction of the anterior capsule.
- Progressive zonular weakness has been associated with:
  - Previous vitreoretinal surgery
  - Uveitis
  - Trauma
  - High myopia
  - Aging
  - Atopic dermatitis (e.g. repeated eye rubbing)
  - Connective tissue disorders (ED, Marfans)

8

SECONDARY INTRAOCULAR LENS PLACEMENT

- Significant debate in the literature with regard to what is best:
  - Anterior chamber lens
  - Sulcus lens with adequate capsular support
  - Sutured posterior chamber lens
    - Scleral fixated
    - Iris fixated

ASRS PAT survey

9

BEST EVIDENCE FOR MANAGEMENT (*OPHTHALMOLOGY 2020*)


Ophthalmic Technology Assessment

Intraocular Lens Implantation in the Absence of Zonular Support: An Outcomes and Safety Update

A Report by the American Academy of Ophthalmology

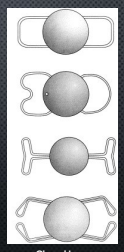
Conclusion:

The evidence shows no superiority of any lens type or fixation technique. The various techniques seem to have equivalent visual acuity outcomes and safety profiles. Large prospective studies are needed to confirm the long-term complication profiles of these various IOL implantation techniques.

10

ANTERIOR CHAMBER INTRAOCULAR LENS

- PREVIOUS REPUTATION WAS BAD WITH CLOSED LOOP LENSES
  - PUPILLARY BLOCK
  - CORNEAL DECOMPENSATION
  - IOL CHAFFING


Closed Loop

11

ANTERIOR CHAMBER INTRAOCULAR LENS

- NEWER ACIOLS ARE VAULTED APPROPRIATELY AND HAVE GOOD STUDIES WITH LONG TERM TRACK RECORDS
- DISADVANTAGES:
  - LARGE WOUND SIZE
  - ACIOL MIGRATION
  - HAPTIC EROSION


Open Loop

12

IF DRUG DELIVERY IS PLANNED DON'T USE ACIOLS

13

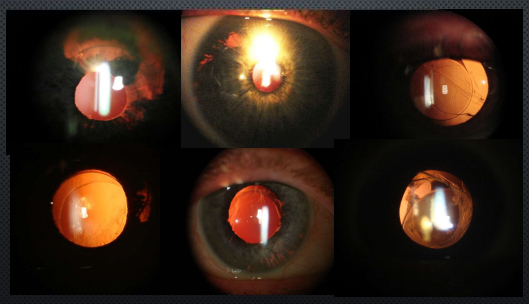
PATIENT SELECTION AND TIPS FOR ACIOL PLACEMENT

- Optimal patient
  - No glaucoma or corneal pathology
  - No ACD issues
- Tips
  - Miochol for pupillary constriction
  - Tunnel integrity is key
  - Sheets glide can be helpful
  - Rotate lens 2-3 clock hours from wound site
  - PI should be in covered by lids
  - Valved Trocars

14

15

WHAT DO THESE EYES HAVE IN COMMON?



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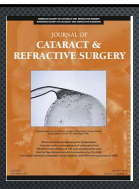

SPECIAL REPORT

Complications of sulcus placement of single-piece acrylic intraocular lenses

Recommendations for backup IOL implantation following posterior capsule rupture

David F. Chang, MD, Samuel Masket, MD, Kevin M. Miller, MD, Rosa Braga-Mele, MD, Brian C. Little, MD, Nick Mamalis, MD, Thomas A. Oetting, MD, Mark Packer, MD, for the ASCRS Cataract Clinical Committee

- MOST COMMON COMPLICATIONS IDENTIFIED:
  - PIGMENT DISPERSION
  - IOL EDGE SYNDROME
  - RECURRENT HYPHEMA/VITREOUS HEME
  - CME
  - IOP GREATER THAN 22

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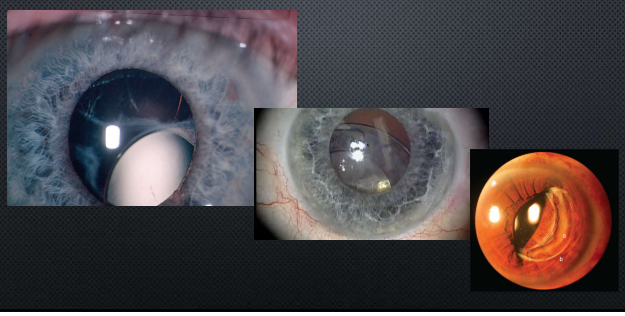
IN THE BAG LENS DISLOCATION



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SCLERAL SUTURED POSTERIOR CHAMBER LENS

- Expanded indications more recently
  - Aphakic contact lens intolerance
  - Posterior lamellar endothelial keratoplasty and penetrating keratoplasty
  - Iris or ACIOL lenses which lead to pigmentary glaucoma
  - Anticipated glaucoma valve implantation
  - Larger optic can prevent migration of vitreous steroid delivery systems

Snowflake degeneration

19

SCLERAL SUTURED IOLS

- Variety of potential complications with scleral sutured lenses including:
  - Knot erosion
  - Broken fixation suture (up to 50% in 4 years of follow-up)
  - Vitreous hemorrhage
  - Retinal detachment
  - Angle closure glaucoma

20

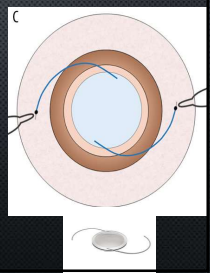
VARIETY OF NEWER TECHNIQUES

- Glue or scleral embedded haptic
- Akreos lens with Gore-Tex suture
- Bulb technique (Yamane)

21

YAMANE TECHNIQUE (FLANGED IOL FIXATION WITH DOUBLE NEEDLE TECHNIQUE)

- The needles/trocars must be inserted exactly 180º apart and 2.5 mm posterior to the limbus
- The CT Lucia 602 (Carl Zeiss Meditec) is the ideal three-piece lens to use for the Yamane technique because its haptics resist kinking and breakage.
- If using needles instead of trocars, use the TSK thin-walled special 30-gauge needles
- Infusion cannula is vital to maintaining IOP and ensuring that both sclerotomy passes are similar in length and location.



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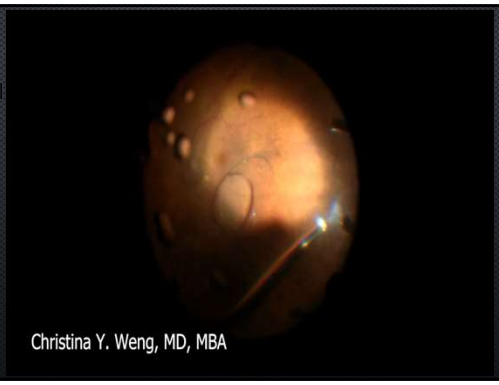

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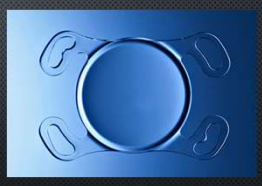
GORE-TEX SUTURED AKREOS IOL

- Bausch & Lomb AO60 IOL
  - First reported in 2014
  - Straightforward technique and provides stable 4-point fixation and minimizes tilt with excellent centration.
  - Ideal for aphakic patients with shallow AC or corneal pathology.
  - 23 or 25ga sclerotomies can also be used to perform simultaneous vitrectomy.
  - Sutured in place with Goretex 5-0 ePTFE 8K10 CV-8 suture (7-0 equivalent).



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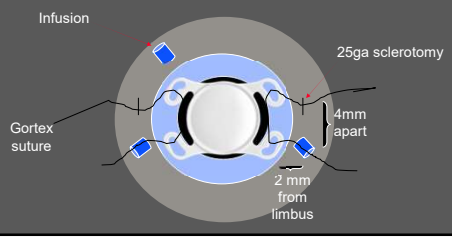
IOL ORIENTATION

- TROCARS CAN BE PLACED SUPERIORLY FOR VITRECTOMY WITH INFEROTEMPORAL INFUSION USING TROCAR SITES FOR HAPTIC SUTURES



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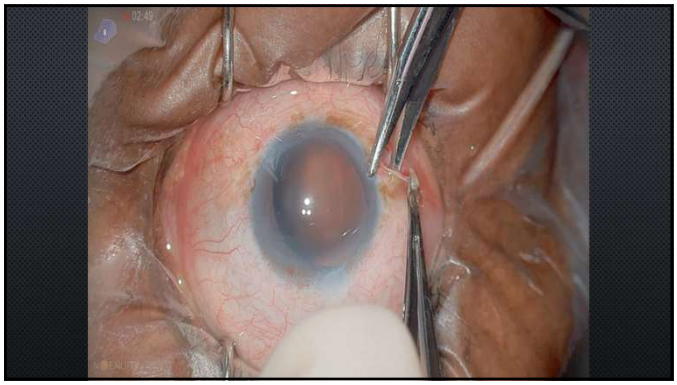

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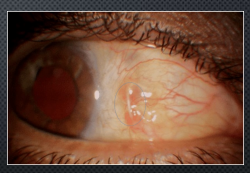
POTENTIAL COMPLICATIONS OF GORE-TEX SUTURED IOL

- POST-OPERATIVE CME HAS BEEN REPORTED IN 19% OF 37 EYES STUDIED[2] AND 38% OF 53 EYES[1]
- ONE STUDY[3] REPORTED EXPOSURE OF GORTEX SUTURE IN 40%
- OPACIFICATION OF THIS HYDROPHILIC IOL HAS BEEN NOTED AS WELL[4]



1. Shah YS, et al. Clinical Outcomes of Secondary Scleral-Sutured Foldable Hydrophilic Acrylic Intraocular Lens Placement by Trainees: A Single-Site Analysis. Clin Ophthalmol. 2021 Feb 24;15:783-790.
2. Leuzinger-Dias M, et al. Scleral Fixation of Akreos AO60 Intraocular Lens Using Gore-Tex Suture. J Ophthalmol. 2021 Dec 20;2021:9349323.
3. Junqueira NB, et al. Scleral fixation using a hydrophilic four-haptic lens and polytetrafluoroethylene suture. Sci Rep. 2021 Aug 4;11(1):15793.
4. Kaiserr A, et al. Opacification of scleral-sutured akreos ao60 intraocular lens after vitrectomy with gas tamponade: case series. Retin Cases Brief Rep. 2020 Spring;14(2):174-177.
•5. Junqueira. August 2021 Scientific Reports 11(1):15793

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THANKS FOR YOUR ATTENTION

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What to do with the Unhappy (Premium) IOL Patient

Michael E. Snyder, MD
Clinical Governance Board, Cincinnati Eye Institute/CVP Physicians
Co-chair, EyeCare Partners Medical Executive Board, Research Committee
Professor of Ophthalmology, University of Cincinnati

Disclosures

- DORC: Consultant
- Gore: Consultant
- Haag-Streit: Consultant
- Humanoptics: Consultant, Royalties
- Johnson and Johnson Vision: Research
- Plexitome: Research
- VEO Ophthalmics: Board member, Royalties (TKP)

"What should I do with the unhappy (Premium) IOL Patient?"

Where to Start?

How are they Unhappy?

The Dreaded "Patient History…"

How are they Unhappy?

- What are the (more common) symptoms?
  - Blur?
  - Halo?
  - Glare?
  - Shadow, Double or Multiple Images?
  - Reflections?
  - Positive Dysphotopsia?
  - Negative Dysphotopsia?
  - Aniseikonia?
  - Dyschromatopsia?

How are they Unhappy?

- Are the symptoms uniocular or binocular?
- Are the symptoms constant or variable?
  - Is there a diurnal fluctuation?
- Are they stable or progressive?
- At what distance do the symptoms occur?
- WAS THE VISION EVER GOOD SINCE SURGERY?

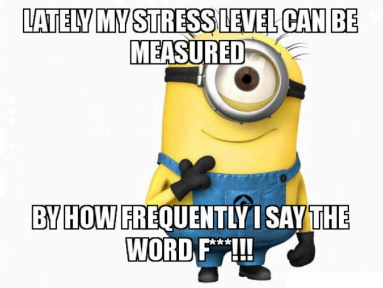
How are they Unhappy?

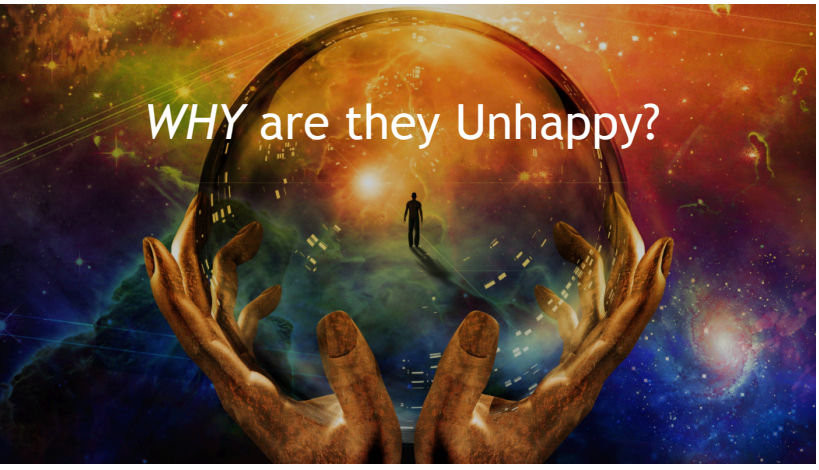
- If there are a litany of complaints (common), what are the top 3?
  - Need cone-in…

Where are They Unhappy?

- Do both eyes have the same anatomy?

What is the MAGNITUDE of their unhappiness?





Blur

- Ametropia (DKR)
- Tear Film
- MDF
- Irregular Astigmatism
- PCO
- IOL Malposition/Tilt
- Macular Diseases
- Optic Nerve Disease
- “My Husband Sees Farther than I do!” (He is a fighter pilot, 20/10)

Dimness

- Is the patient taking a miotic?
- Do they have a pinhole IOL?
- Is there an RAPD?
- Macular disease?

Brightness

- Is the patient taking a mydriatic?
- Do they have a pinhole IOL?
- Is there an APD?
- Macular disease?

Halos…

- Ametropia?
- Resting Photopic/Scotopic Pupil Size? Shape?
- Is there a PI?
- What type of IOL? MFIOL? Pinhole?

Aniseikonia

- Anisometropia?
- ERM
- Hx PPV/MP?
- Hx CME

Dyschromatopsia

Dyschromatopsia

Too yellow?

(Xanthopsia)

Dyschromatopsia

Too Blue?

(Cyanopsia)

Dyschromatopsia

Too Red?

(Erythropsia)

Dyschromatopsia

Too Washed Out?

Dyschromatopsia

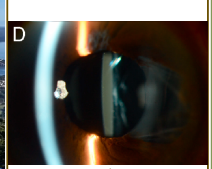
Too Saturated?

Dyschromatopsia

- Uniocular or binocular? What is the difference between the two eyes?
- Does the IOL have a chromophore?
- Does the fellow eye have a chromophore? (Either in IOL or urochromes in lens)
- Macular or ONH disease/red desaturation?
- Color testing (with HRR plates)
- Look at the medication list!

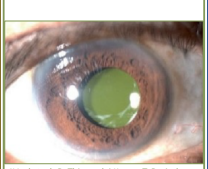
Intraocular Lens Discoloration

Brown IOL
(Presumptive degenerative process)



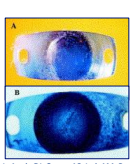
[1]Wong MHY, Su DH, Chee SP. Brown discoloration of acrylic hydrophobic intraocular lens. Can J Ophthalmol. 2016 Aug;51(4):277-281.

Green IOL
(Presumptive degenerative process)



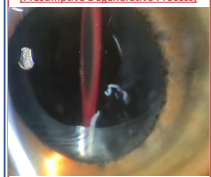
[2]Venkatesh R, Thirumalai Kumar T, Ravindran RD. Greenish discoloration of silicone intraocular lens. Indian J Ophthalmol. 2008 Mar-Apr;56(2):170-1.

Blue IOL – Iatrogenic
(Trypan blue use during surgery)



[3]Werner L, Apple DJ, Crema AS, Izak AM, Pandey SK, Trivedi RH, Ma L. Permanent blue discoloration of a hydrogel intraocular lens by intraoperative trypan blue. J Cataract Refract Surg. 2002 Jul;28(7):1279-86.

Red IOL
(Presumptive Degenerative Process)



Ladki M, Snyder A, Hamilton M, Basden B, Snyder M Red Alert: A new presentation of IOL Discoloration ASCRS Poster 2024

Summary of reported intentional and non-intentional coloration and discoloration of IOLs (Malik Ladki, Alana Snyder, et. al)

Color	Origin of (dis)coloration	IOL type	Putative effect (if intentional)	Known symptoms
Brown[1] (Non-intentional)	Presumed degenerative changes	Acrylic hydrophobic aspheric lens- Abbott Medical Optics		Decreased color contrast sensitivity
Blue[3] (Non-intentional)	Absorption of trypan blue dye	Acqua® (Mediphacos)- hydrophilic acrylic lens		Cyanopsia
Green[2] (Non-intentional)	Presumed degenerative changes	Silicone IOL (Allergan SI-40NB)		None
Yellow[4] (Intentional)	Intentional "blue blocker"	1)Alcon Laboratories "Natural" chromophore- AcrySof SN60AT 2)Hoya- PY-60AD 3)Zeiss- CT LUCIA 621PY® 4)HumanOptics: ASPIRA-aAY	Mimic the natural color of the human crystalline lens, attenuate blue-light radiation and shorter wavelength optical radiation.	Xanthopsia (uncommon)
Orange[5,6] (Intentional)	Blue light–filtering IOL covalently bound to orange chromophore	PC 440Y (Ophtec) – not currently in production	Mimic protective properties of a middle-aged human lens	Decreased color discrimination (uncommo
Yellow hue/Blue-appearing[7,8,9,10] (Intentional)	Violet light-filtering chromophore	Johnson and Johnson Optiblue®	"Full transmission of healthy blue light": Improved scotopic and melanopsin sensitivity	None
Champagne[11] (Intentional)	"Active shield" UV blocker	RXSight Light adjustable lens	Prevent premature refractive "lock in"	None
Red (Non-intentional)	Presumed degenerative changes	Silicone plate (Staar)		None

Work-Up:

- Refraction/Autorefraction (DKR)
- Exam!
  - Make sure to see them first before dilation!
- Cross-Cover Testing

Work-Up: Adjunctive Testing

- Topography (Placido disc-based)
- OCT Macula
- OCT ONH
- OCT Cornea or Lens (Tilt?)
- UBM
- FANG
- VF
- Color testing

Cases

Case: "I can't see my chart!"

- 60-ish y.o. anesthesiologist with nuclear cataract
- Undergoes sequential Phaco, ReStor MFIOL OU (Nov, Dec)
- Everything is blurry and I can't see my charts in the OR, even with glasses
- Exam is notable for (persistent) reduced tear film and 2-3+ PEK OU
- 4 months post-op, 2-page, type-written letter…

Case: "Now I can see my chart!"

- Ends up 20/20, J1+ OU and thrilled.
- Sends us a Holiday card and a tray of pastries at year-end.

Case: "I can't see my food!"

- 28 y.o.woman with bilateral PSC cataract
- Cancels MFIOL weekend before surgery
- Happy after first monofocal IOL eye
- FURIOUS after second eye

Case: Positive Dysphotopsia

- After cataract surgery with a 4.0D hydrophilic acrylic IOL, the patient has intolerable halos, glare and reflections.
- His resting pupil size is 7mm.
- He does not like the dimness he gets with pilocarpine drops.
- Now has an intolerable PSC cataract in the other eye.
- What to do for that eye?
- What to do for the first eye?

Case: Positive Dysphotopsia

- CUDE for special order, custom made:
  - 1) ultra low power IOL made from
  - 2) hydrophilic acrylic (less shiny), in
  - 3) 7.0mm optic diameter.
- IOL Exchange with PCCC and CTR Placement.
- Ultimately, Phaco/CTR/IOL with CUDE implant in fellow eye.

Case: Positive Dysphotopsia

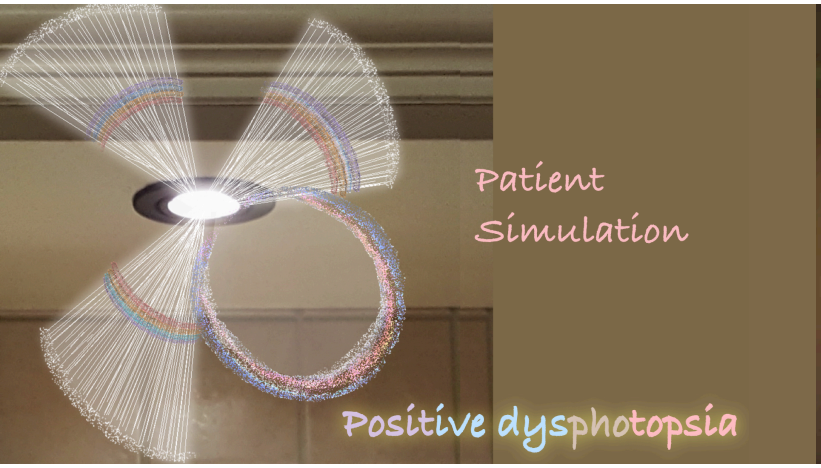
- Happy x Many Years
- Then Develops Pseudophakodonesis…
- …Told he needs PPV and Yamane fixation…
- Now what?
- Observing, now x 3 years with no change.
- And when he does need surgery — Loop sutures around CTR!

Case

- 59 year-old man
  - Mx: BSCVA = 20/20…

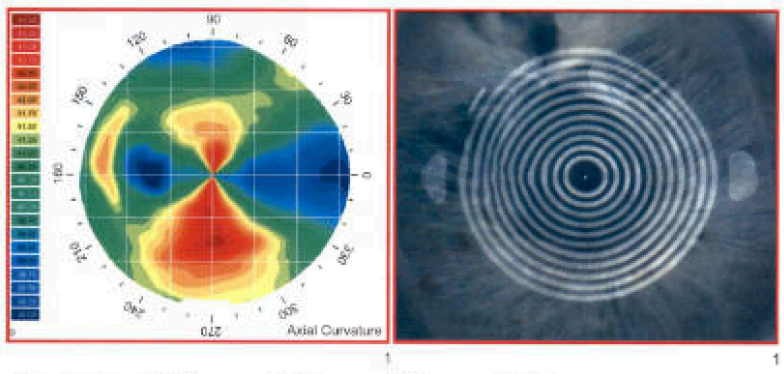
Case

- 59 year-old man
  - Phaco/IOL (wrong IOL power)
  - IOLX (Iris damage with photic symptoms)
  - IOLX for Morcher 10mm BDI, 3.5mm optic, large CRI/AK (Positive dysphotopsias)

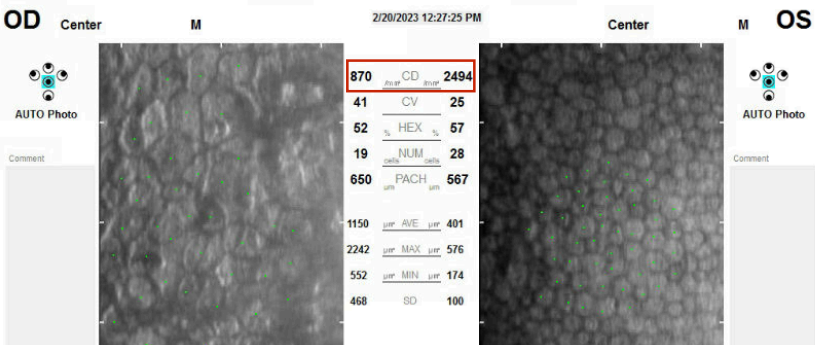


Case 1 Topo

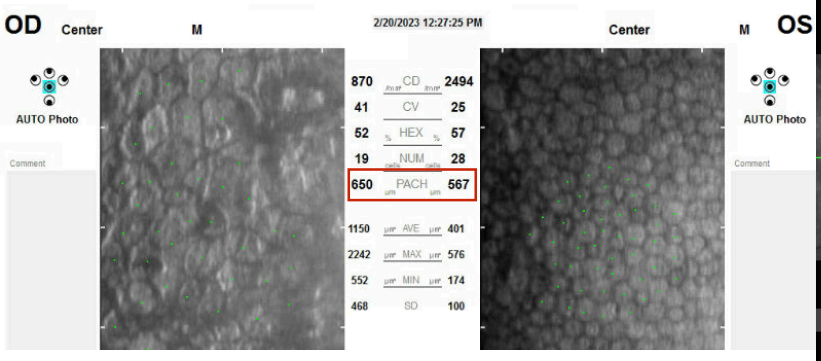
OD
right eye



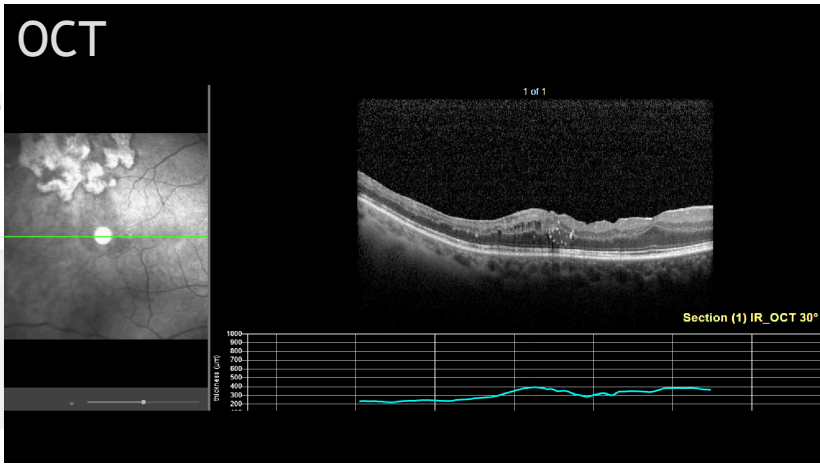
Case 1 ECC

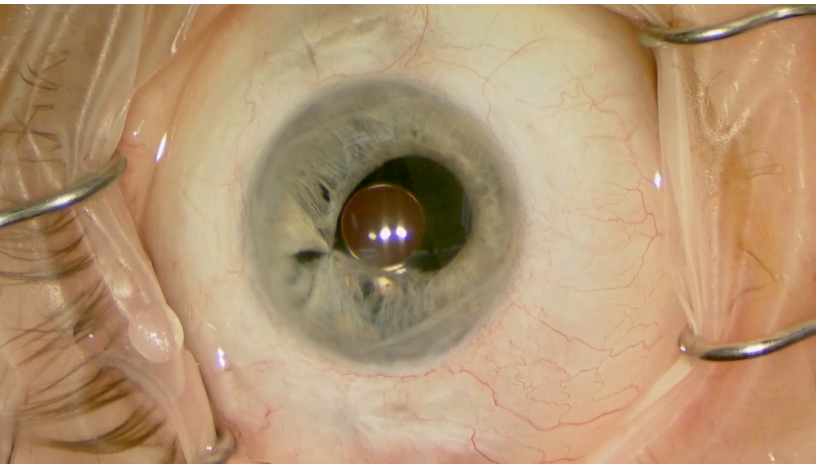


Case 1 ECC



OCT

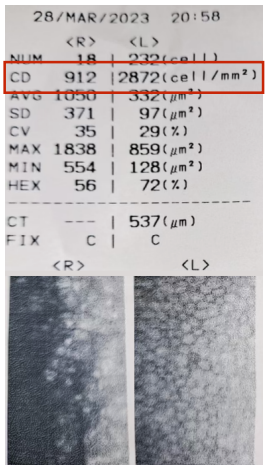




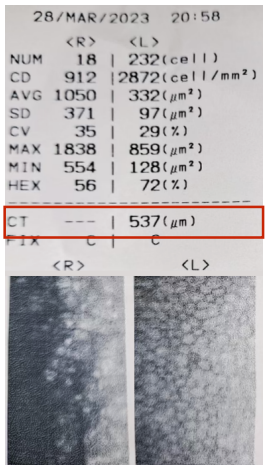
Case 1

- Post-op:
  - Hypotony
  - Ate a bad dinner POD #4, emesis, SCH
  - Eventual selective suture lysis
  - Photic symptoms gone, except very bright in the sun

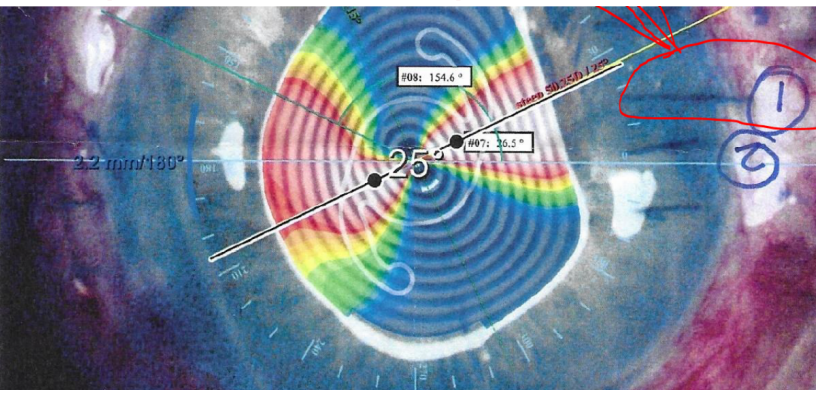
Post -Op ECC



Post -Op ECC



Topo 1 Week Post-Op



Result?

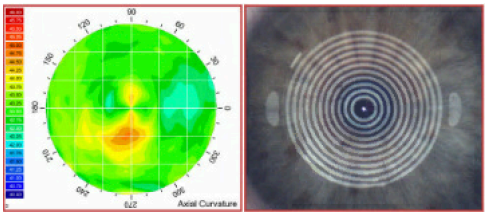
- “Rainbow colored reflections and light streaks are gone.”
- Functions well on partly cloudy days, but still needs sunglasses or a small (3mm) aperture contact lens for bright days (if no sunglasses)

A Case of Lavender:

- 78 year old lady referred from 2 hours away for possible IOLX
- 6M s/p phaco/pinhole IOL OS. (Told she had a "kidney shaped cornea")
- The day of surgery saw a lavender tint to her vision, that has diminished (but not disappeared) over the past few weeks.
- Glare/halos with Night Driving
- Lavender floaters that move, especially with glasses on or in bright areas.
- Eye is pulling/straining when her glasses are off.
- Vision clarity has improved since surgery but is very bothered by the odd coloring of her vision.
- Takes Brim 0/2 for nighttime glare with some help done OS.

A Case of Lavender:

- Exam:
  - Vcc: OD: 20/20, OS: 20/15
  - OD moderate nuclear cataract; OS: In the bag PH-IOL, 2+ PCO
  - Topo OS:



A Case of Lavender:

- Discussion:
  - Unsure of lavender spots she sometimes fleetingly notices, though *not a red flag for pathology* (and she is not worried about it).
  - Reduced clarity is PCO related. OK for YAG capsulotomy (outside of mask) prn.
  - YAG will make IOL exchange more challenging, but she is OK with this.
  - Halos at night are likely pinhole related. She can tolerate this fine with the brimonidine.
  - Cooler colors OS ("fluorescent" OS compared to "incandescent" OD) is actually from urochrome pigments artifactually yellowing the colors OD. Reassured.
  - She thinks she can “stay” happy with IOL OS

Case: Irate MFIOL IOL(???)

- Competitor did bilateral phaco/MFIOL.
- 20/20, J1+
- Pt was so unhappy that competitor refunded $$ in exchange for a liability waiver, gag order, and 200-yard voluntary restraining order.
- Pt’s problem was floaters.

CASE: Was good, now bad…

Pt Underwent Phaco/LAL OU

- POM1: UCDVA: 20/20-2 OU, UCIVAL: 20-30-2 OU,UCNVA: J2+ OU
- Week 3 Mx: OD: -1.25 + 1.00 x 173; OS: -1.75 + 1.25 x 005
- LAL Treatment OU x 2

- Final result: UCDVA: 20/15 OU! UCNVA: J1+ OU!

Don't celebrate too soon…

Excerpts from letter POM5:

"Unfortunately the weather has been affecting my eyes…"

Don't celebrate too soon…

Excerpts from letter POM5:

"Unfortunately the weather has been affecting my eyes…"

"I paid over $12K for these lenses and I do not want seasonal issues."

Don't celebrate too soon…

Excerpts from letter POM5:

"Unfortunately the weather has been affecting my eyes…"

"I paid over $12K for these lenses and I do not want seasonal issues."

"I have several friends who paid a lot less for the traditional lenses and have none of my issues."

Don't celebrate too soon…

You please some of the people all of the time…

…you can please most of the people most of the time…

…but you can't please all of the people all of the time!

Don't celebrate too soon…

You please some of the people all of the time…

…you can please most of the people most of the time…

…but you can't please all of the people all of the time!

And some people you just cannot please!

What Else is Going on in Patient's Life?

- Time of Undue Stress or Hardship?
- Can Patient not "Adapt?"
- Is There no Obvious Cause or no Treatment?
- Do Not Forget to Offer Getting them Plugged in with Counseling.

Overriding Principles

Overriding Principles

- Careful History
- Careful Exam
- Setting realistic expectations pre-op is easier than post-op.
- Patients have short memories.
- There is no perfect IOL — not all problems can be fixed.
- Fixing one problem may create another.
- Not all fixes work.
- Not all patients want the 'problem' to be fixed.
- Some patients will ask for more than you can achieve
- "Which option may make you *least unhappy*?"
- Sometime YOU need to be the adult in the room and say "no."
- …But you can still suggest options to help them cope.

Qs?

Vitrectomy for Vitreous Opacities

Matthew Cunningham, MD, FASRS
Florida Retina Institute
New Orleans Academy of Ophthalmology
February 2025

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Disclosures

- Consultant: Alimera, Allergen, Alcon, Genentech, Ocuphire Pharm, Ocular Therapeutics, ANI Pharmaceuticals
- Investigator: Alimera, Genentech, Inc., Jaeb Center for Health Research, Regeneron, Novartis, Ocuphire Pharm, Parexel, Ocular Therapeutics
- Speaker: Genentech, Inc., Apellis, Astellas, Regeneron

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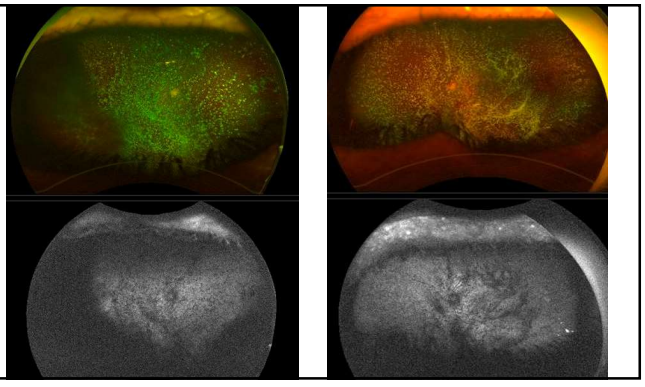

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Question

- Is pars plana vitrectomy an effective and safe way to address visually significant vitreous opacities?

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Why not vitrectomy for vitreous opacities?

Why pars plana vitrectomy has come of age for vitreous opacities in selected patients.


Jaya B. Kumar, MD


Matthew A. Cunningham, MD

By Jaya B. Kumar, MD, and Matthew A. Cunningham, MD

Take-home Points

- With improved safety profiles for small-gauge vitrectomy and excellent patient outcomes, it's time to accept and expand the scope of vitreoretinal surgery to include pars plana vitrectomy for vitreous opacities.
- When assessing a patient with symptomatic VOs, pay particular attention to the lenticular status, presence of a Weiss ring, absence of vitreous cell and peripheral retinal findings.
- During the clinical evaluation, make sure to rule out mimickers such as ocular amyloidosis, lymphoma and uveitic conditions, such as birdshot chorioretinopathy.
- Make sure to review the risks of PPV with patients. These risks include retinal tears, hypotony, vitreous hemorrhage, macular edema and retinal detachment.
- By ensuring our patients have been symptomatic for more than six months, are pseudophakic and have had a Weiss ring present on exam, we've had no significant adverse events associated with PPV for symptomatic VO.

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Background

- Vitrectomy was originated in the late 1960s by Robert Machemer
- "Father of modern retinal surgery"
- The original purpose was to remove clouded vitreous humor

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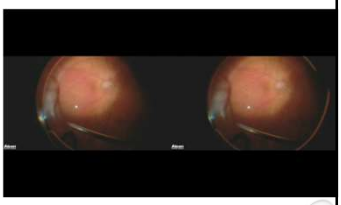
Vitrectomy surgery

- Historically recommended to treat conditions related to:
  - Diabetic retinopathy
  - Some forms of retinal detachments
  - Macular hole
  - Macular pucker
  - Endophthalmitis
  - Complicated cataract surgeries
  - Severe eye injuries



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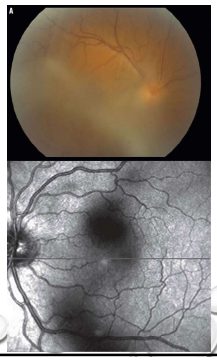
PPV for Vitreous floaters

- Vitreous floaters can be visually significant and impair patient's quality of life by interfering with daily activities.
  - options include: observation, YAG laser vitreolysis, and PPV.
  - The ASRS ReST committee recommended additional investigation for YAG laser vitreolysis
- Vitrectomy surgery has increasingly been used to remove visually significant vitreous opacities/floaters



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Previous studies….

- Sebag et al. (2014) - a posterior vitreous detachment was not present in all patients preoperatively, and a PVD was not induced during surgery; 4 out of the 195 cases (2.1%) developed recurrent floaters after developing a PVD
- De Nie et al reviewed 110 vitrectomies for vitreous floaters over 12 years; they found a high postoperative retinal detachment rate of 11%, with >50% undergoing a 20 gauge PPV.
- In several past studies, <50% of included eyes were pseudophakic.

Sebag, Jerry, et al. "Vitrectomy for floaters: prospective efficacy analyses and retrospective safety profile." Retina 34.6 (2014): 1062-1068.
De nie KF, Crama N, Tilanus MA, et al. Pars plana vitrectomy for disturbing primary vitreous floaters: clinical outcome and patient satisfaction. Graefes Arch Clin Exp Ophthalmol. 2013;251(5):1373-1382.

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Our general criteria

- All surgeons followed a strict criterion to sign up patients for surgery:
  - the duration of symptoms must have been >6 months
  - the presence of pseudophakic status
  - Presence of a Weiss ring on examination

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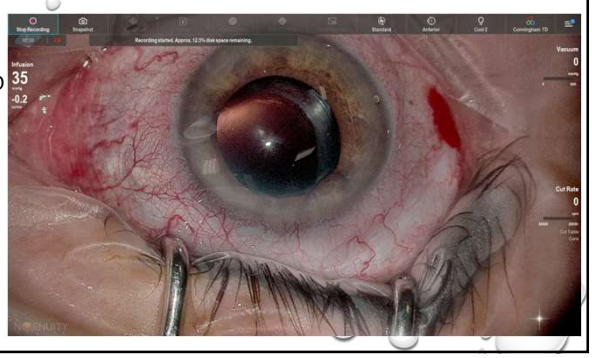
Video



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Purpose

- This study evaluated our experience at a retina-only private practice with small-gauge pars plana vitrectomy (PPV) for visually significant vitreous floaters.
- We reviewed the surgical outcomes, complications rates, and percentage of second-eye surgery for the same indication

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Methods

- Retrospective, interventional case series of consecutive patients undergoing ppv for significant vitreous floaters, from September 2014 to December 2018 at a vitreoretinal surgery practice.
- The preoperative visual acuity, complication rates, and visual outcome following surgery were evaluated in 104 eyes (81 patients).
- Inclusion criteria included significant visual disturbance due to vitreous floaters for >6 months, pseudophakia, and the presence of a posterior vitreous detachment (PVD) confirmed on exam.
- Exclusion criteria included history of venous or arterial occlusive disease, advanced glaucoma or age-related macular degeneration, previous retinal detachment, endophthalmitis, or uveitis.

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Demographics and pre- and postoperative data

	N	%
Eyes	104	
Right	51	49.0
Left	53	50.9
Patients	81	
Male	36	44.4
Female	45	55.6
Age, years		
Mean ± SD	69 ± 6.5	
Range	53-82	
Pseudophakic Prior to PPV	104	100
Preoperative BCVA (Mean ± SD logMAR)	0.16 ± 0.17	
Postoperative BCVA (Mean ± SD logMAR)	0.12 ± 0.15	

Abbreviations: BCVA, best-corrected visual acuity; PPV, pars plana vitrectomy

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Results

- A total of 104 eyes in 81 patients were included in the study; 35 patients underwent surgery in both eyes (43.2%)
- All eyes were pseudophakic at the time of PPV.
- Two eyes had previous retinal tears that were treated with laser barricade in clinic.
- All eyes included in the study underwent a single 23 or 25 gauge PPV.

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Postoperative complications

	N	%
Retinal Detachment	0	0
Vitreous Hemorrhage	1	0.9
Retinal Tear	0	0
Endophthalmitis	0	0
Transient Ocular hypertension (within post-op period)	36	34.6
Ocular hypertension (at last follow-up)	5	4.8

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Results

- Of the 36 eyes that developed ocular hypertension, the mean IOP was 26.5mmHg (22-46) within the 3 month post-op period
  - Five eyes (4.8%) required longer term use of one glaucoma drop, and were still on the single drop at their last follow up visit.

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Results

- Prior to ppv, The mean preoperative VA was 0.16 ± 0.17 logMAR units (~20/29 SE) and improved to 0.12 ± 0.15 logMAR units (~20/26 SE, Wilcoxon test, p=0.0083), at the last known follow-up after PPV *(average of 473 days following surgery, range of 95-1300 days).*

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Conclusion

- VA following PPV for vitreous floaters significantly improved yielding high patient satisfaction.
- Nearly half patients (43.2%) underwent PPV in the other eye.
- Small gauge PPV in the carefully selected patient is an effective and safe procedure to eliminate symptoms.

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Limitations

- This was a retrospective study
  - Unfortunately, there have been no randomized controlled trials on vitrectomy for vitreous floaters, only retrospective case reports and retrospective cohort studies
- Refractions were not routinely performed, which limit the best corrected preoperative and postoperative VA reported in this study.
- Finally, we did not perform a questionnaire quantifying patients' preoperative dissatisfaction with floaters on quality of life; nor did we perform a questionnaire quantifying satisfaction postoperatively.
- Per our chart review of the patient history and subjective changes, nearly all patients reported subjective improvement in vision and overall satisfaction with the surgical outcome. As a result, nearly half (43.2%) of patients elected to undergo PPV for visually significant floaters in the other eye

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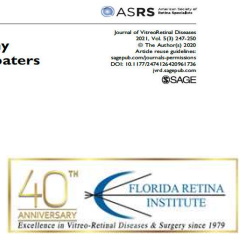
JVRD 2021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Thanks for your attention….

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