

# **Secondary IOL**

**Zaina Al-Mohtaseb, MD**  
**Whitsett Vision Group**  
**Director of Research**  
**Cataract, Refractive, & Cornea**  
**Clinical Associate Professor, Baylor College of Medicine**

# Financial Disclosure

- I have the following financial interests or relationships to disclose:
  - Alcon
  - Zeiss
  - Bausch + Lomb
  - Johnson & Johnson
  - Allergan
  - Visus
  - Vista
  - Ocular Therapeutix
  - Tarsus
  - Dompe
  - Kala
  - BVI
  - Trefoil
  - CorneaGen
  - Ocuphire

# IOI Fixation in Absence of Capsular Support

J Cataract Refract Surg. 2017 Mar;43(3):369-376. doi: 10.1016/j.jcrs.2016.12.024.

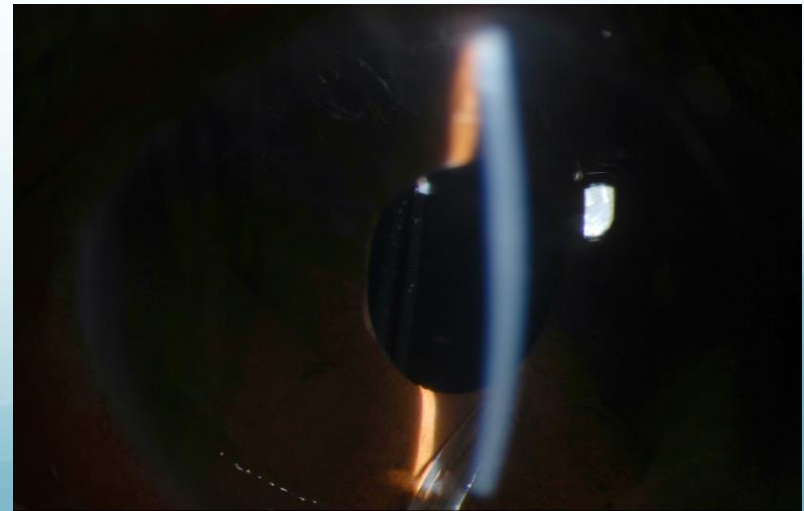
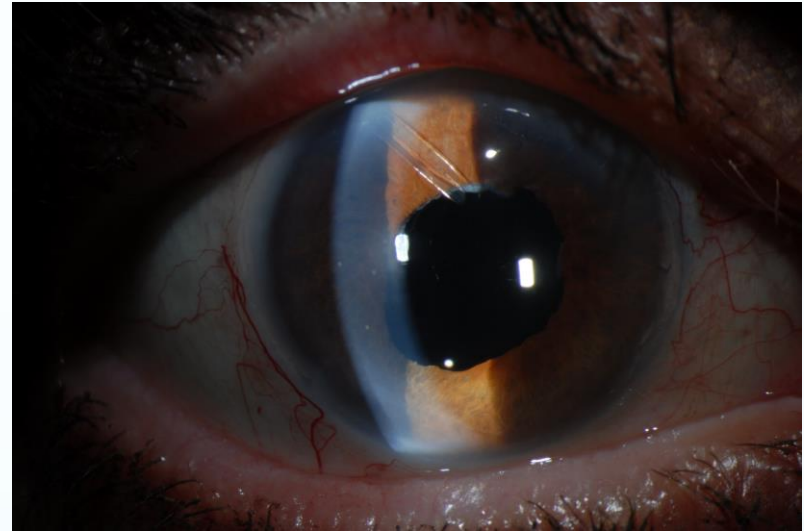
**Secondary intraocular lens implantation: Complication rates, visual acuity, and refractive outcomes.**

Brunin G<sup>1</sup>, Sajjad A<sup>1</sup>, Kim EJ<sup>1</sup>, Montes de Oca I<sup>1</sup>, Weikert MP<sup>1</sup>, Wang L<sup>1</sup>, Koch DD<sup>1</sup>, Al-Mohtaseb Z<sup>2</sup>.



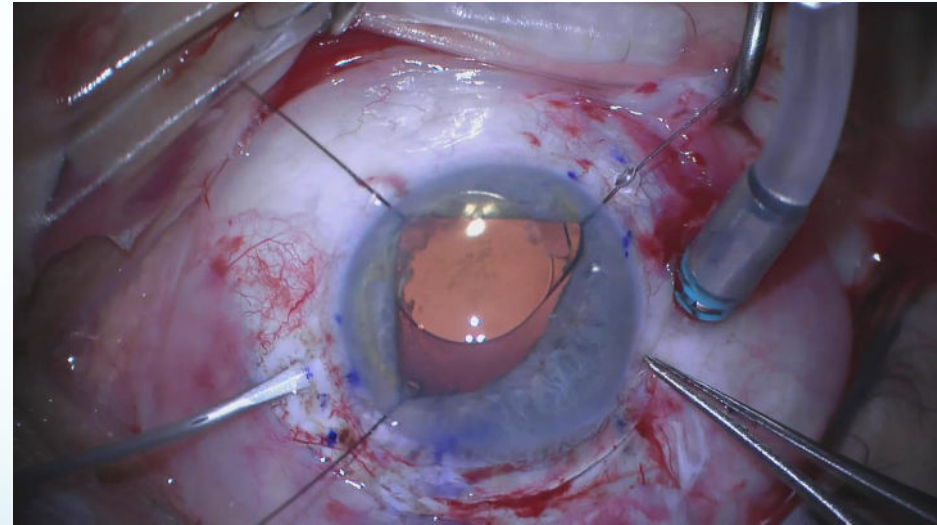
# Advantages to Scleral Fixation

- Most closely approximates anatomic position of crystalline lens
- Minimal corneal or angle trauma
- Good for patients with iris atrophy or abnormal angle anatomy
- Reduced risk of secondary glaucoma or pupillary block
- Little to no contact between iris and lens
  - Less risk of CME and UGH



# Disadvantages to Previous Scleral Fixation Techniques

- Technically more complex than iris sutured or ACIOL
- Longer operating time, require anterior vitrectomy
- Risk of lens tilt
- Blade penetration with uveal tissue at ciliary sulcus – bleeding
- Large incision, late dislocations
- Suture exposure
- Specially order CZ70BD and Gortex Suture



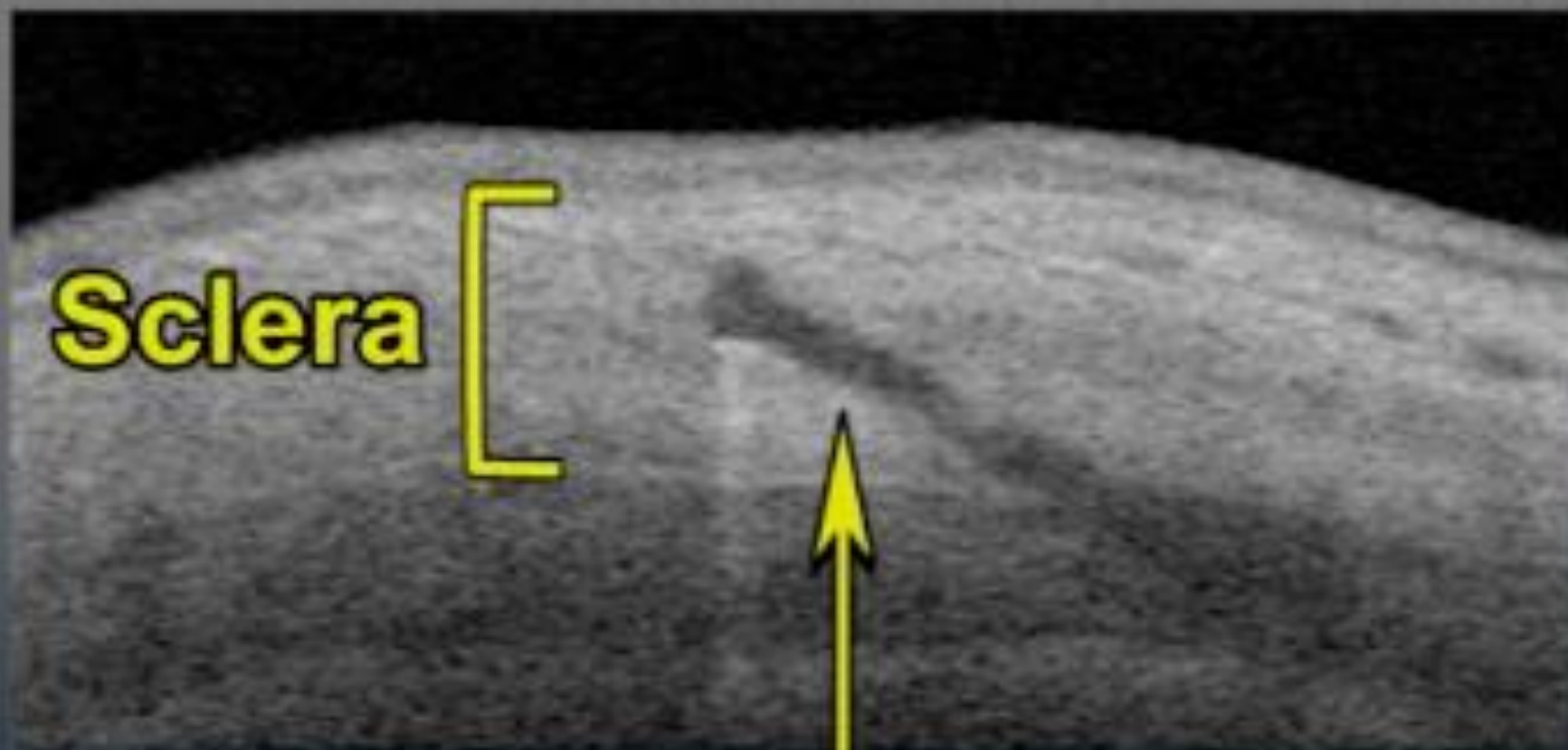
The background of the slide features two surgical needles, one positioned diagonally from the top left towards the center, and another positioned diagonally from the bottom right towards the center. The needles are set against a dark, textured background that resembles a close-up of a surgical instrument or a similar material.

# **Transconjunctival Intrascleral IOL Fixation with Double-Needle Technique**

**Shin Yamane, M.D.**

**Yokohama city university medical center  
JAPAN**

The author has no financial interest



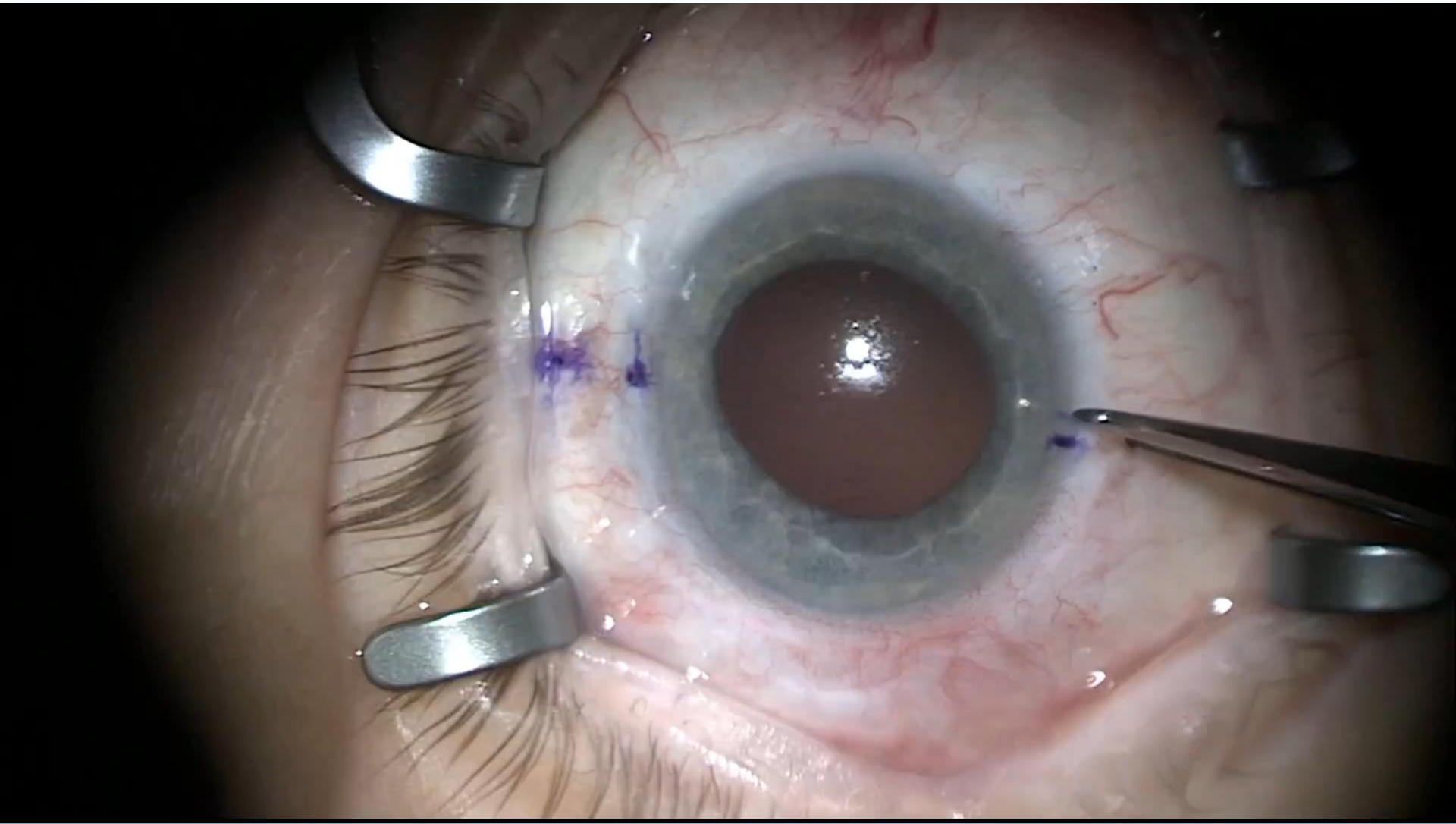
**Sclera**

**IOL haptic**

# **Yamane Double Needle Technique Pearls**



# Yamane Double Needle



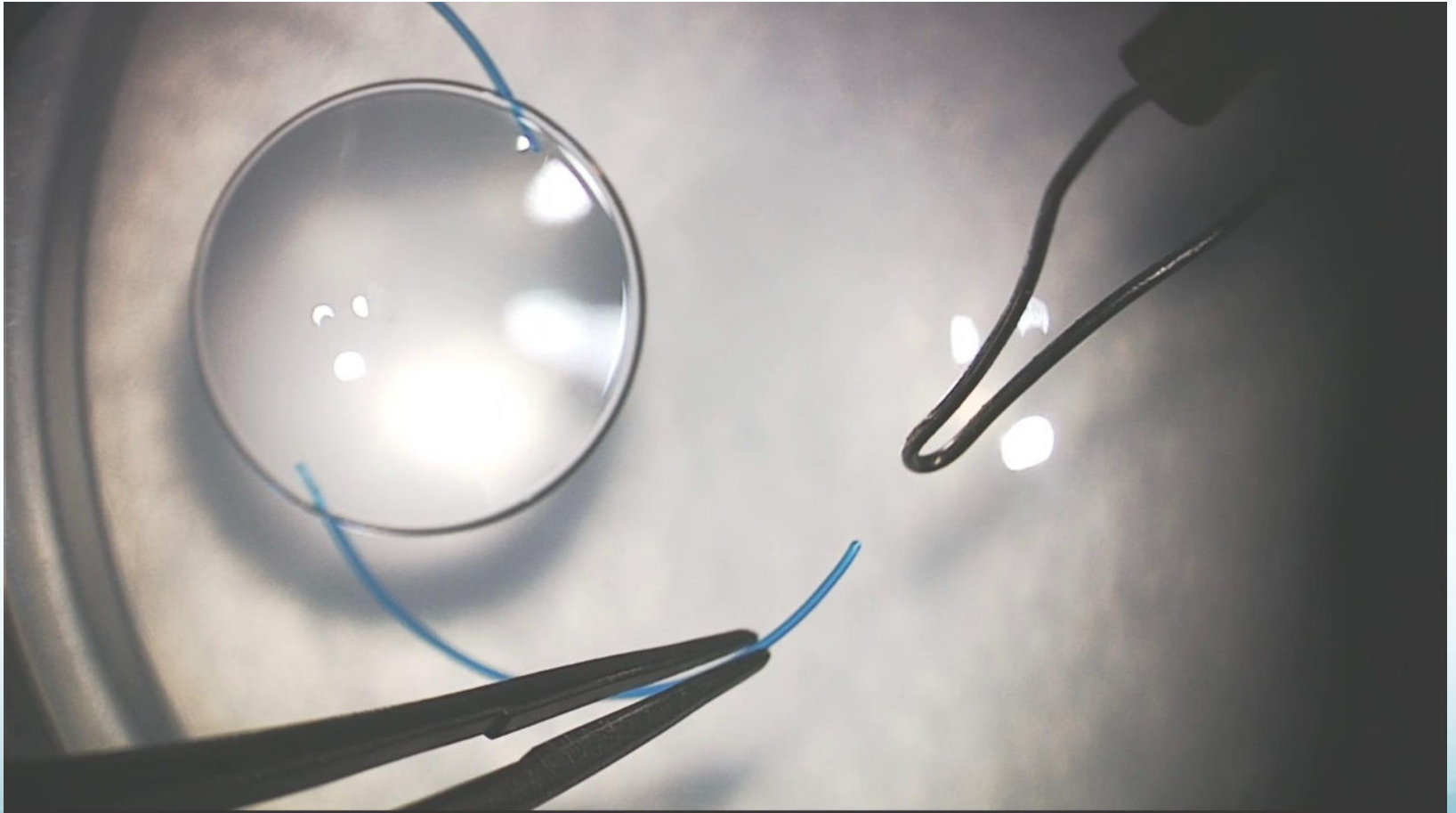
# Special Needle



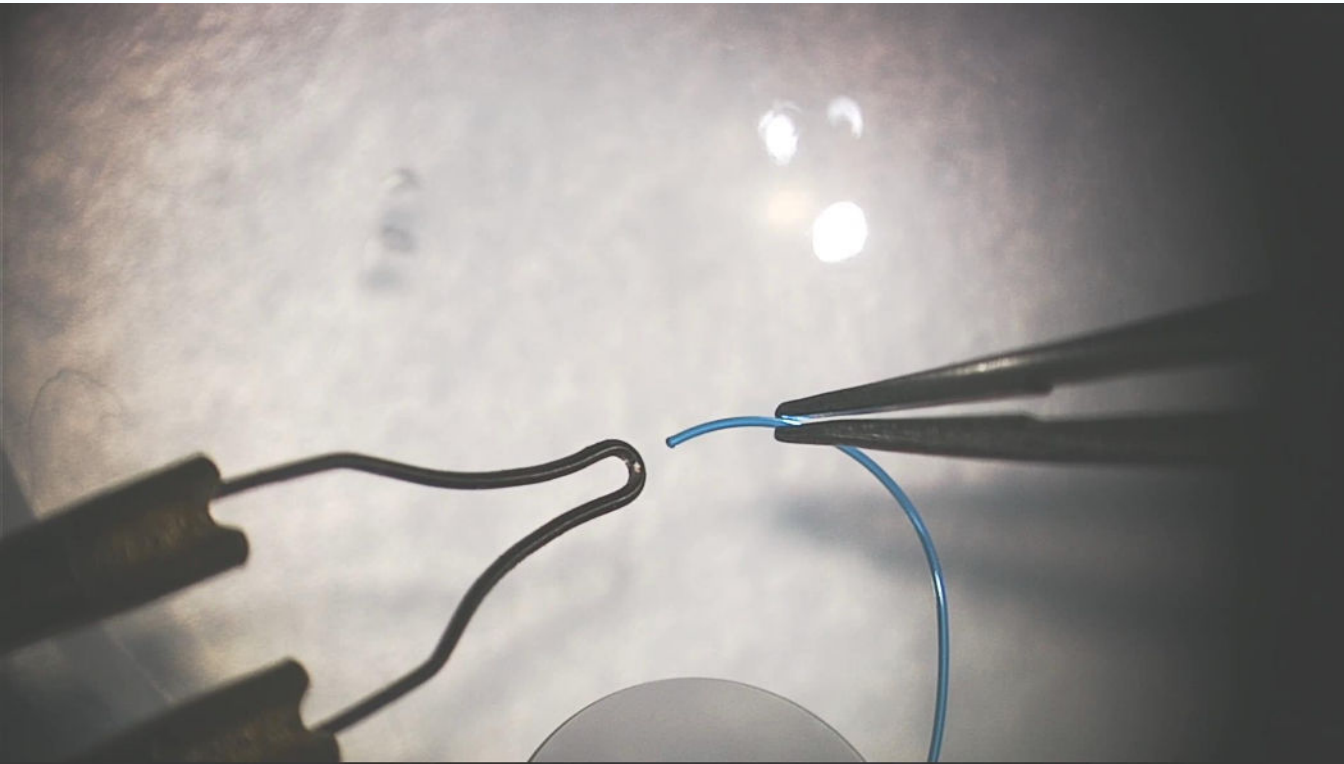
**TSK Ultra Thin Wall Hypodermic Needles, 30 gauge x 1/2"**

[https://www.delasco.com/pcat/1/Sharps/30\\_Gauge\\_Dispose/3012UTW/](https://www.delasco.com/pcat/1/Sharps/30_Gauge_Dispose/3012UTW/)

# Low Temp Cautery



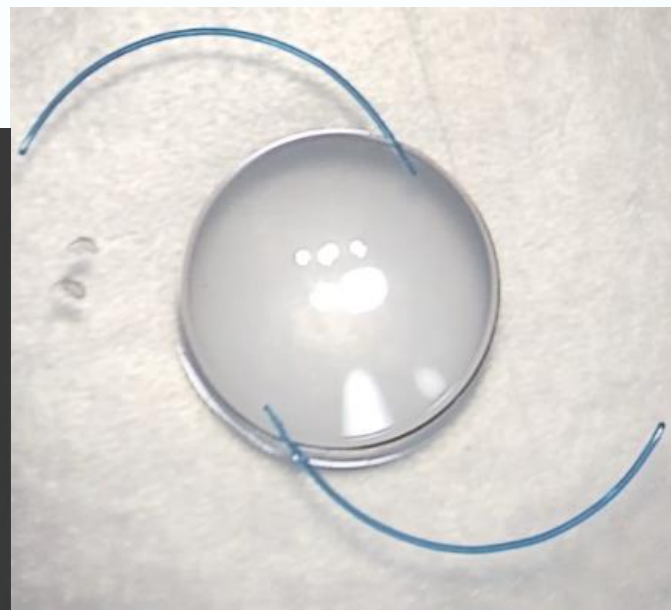
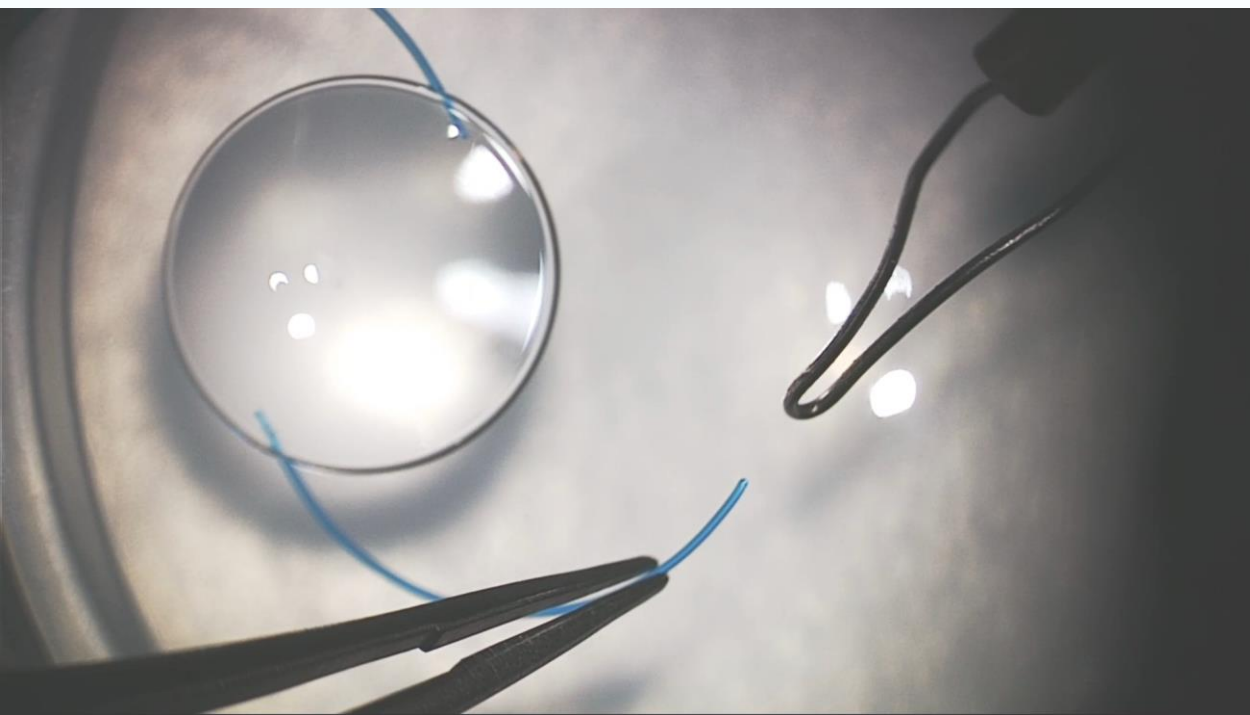
# Lens Options: Alcon MA60AC



**PMMA (MONOFLEX TM\*)**



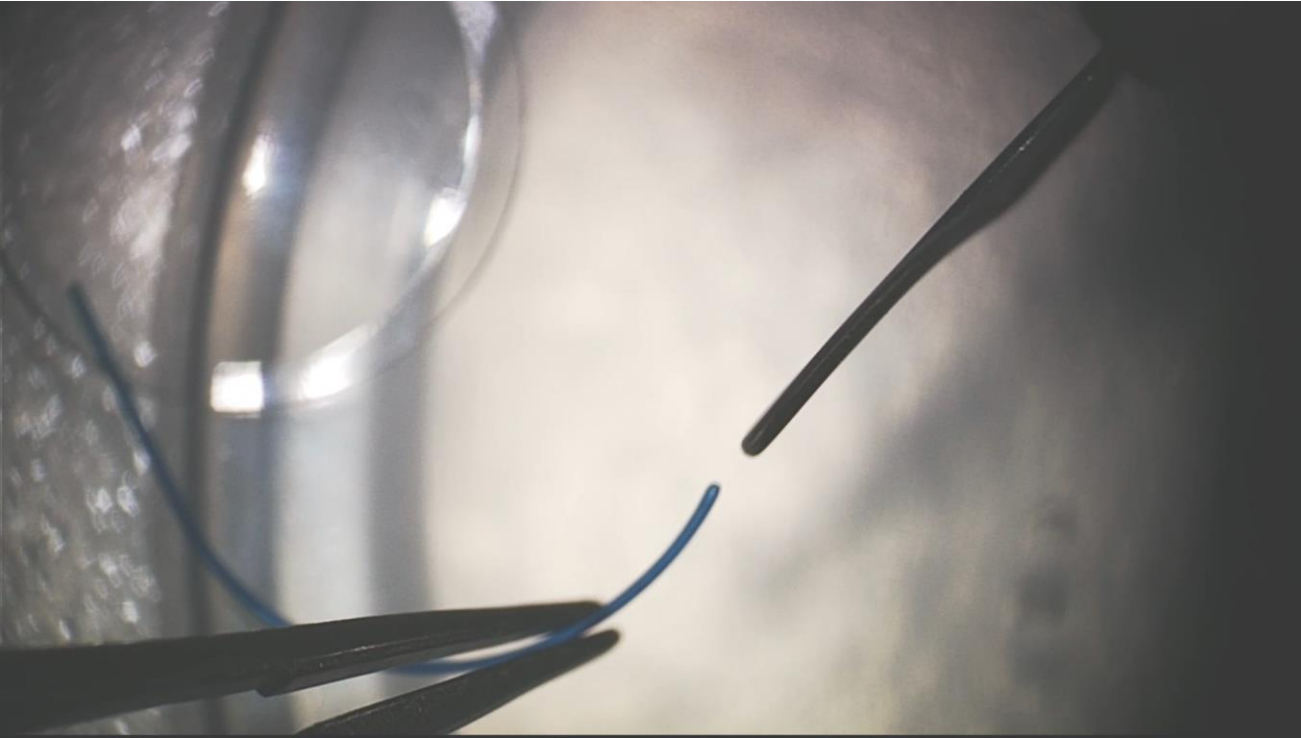
# Lens Options: Tecnis ZA9003



**PMMA monofilament**



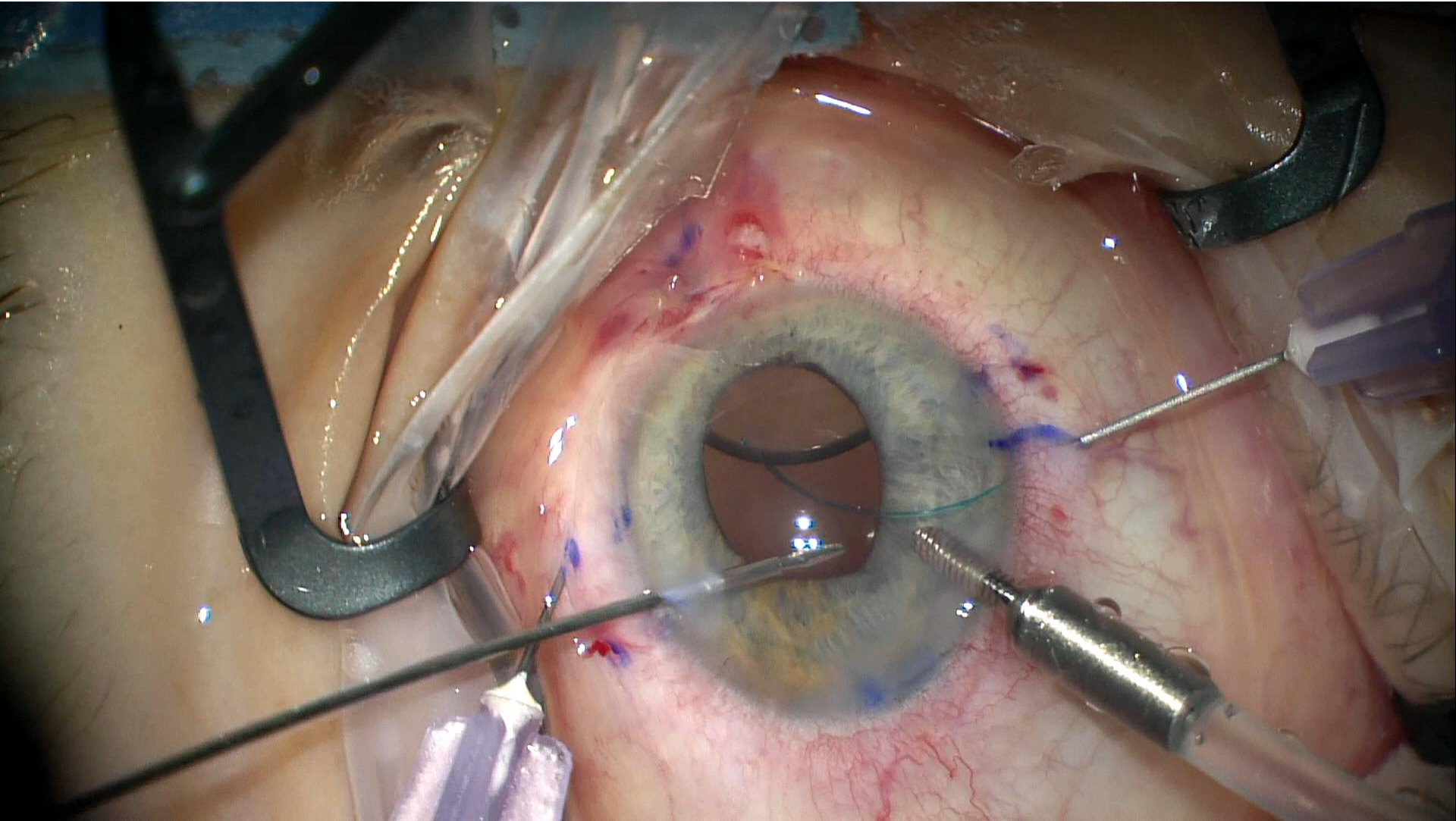
# Lens Options: Zeiss CT Lucia



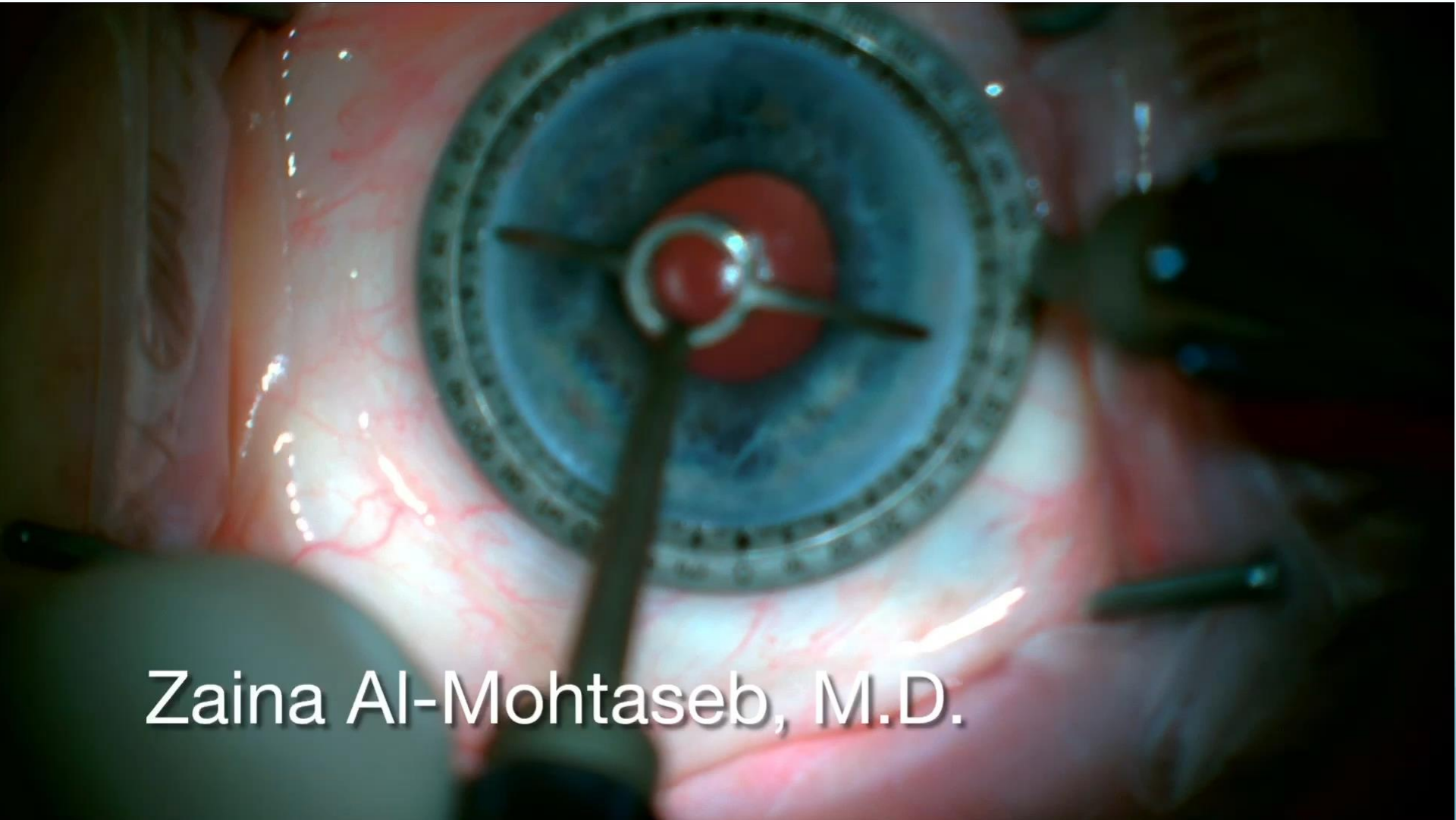
**PVDF (Polyvinylidene Fluoride)**



# Proximal Haptic – Para



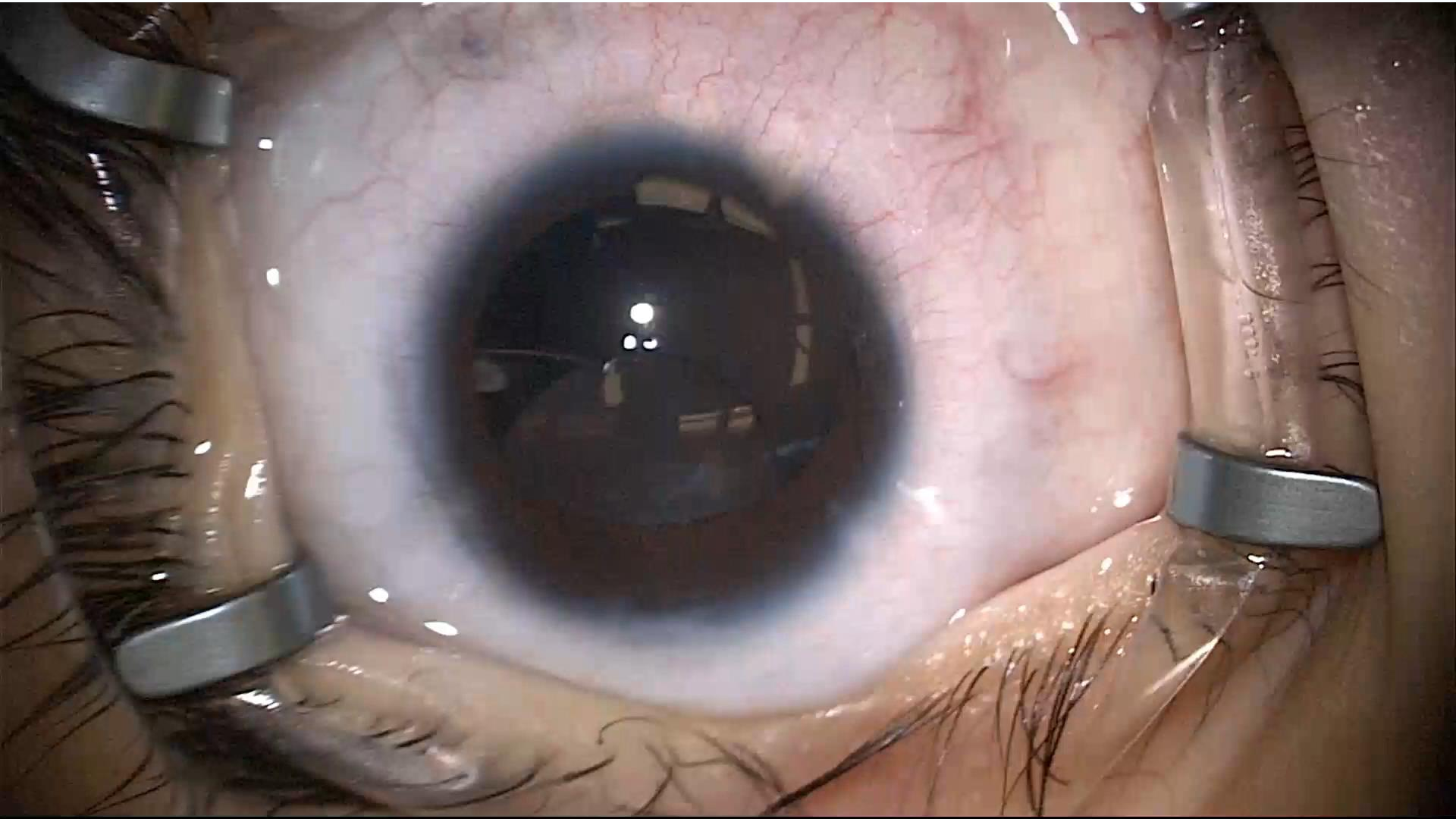
# Proximal Haptic – Wound



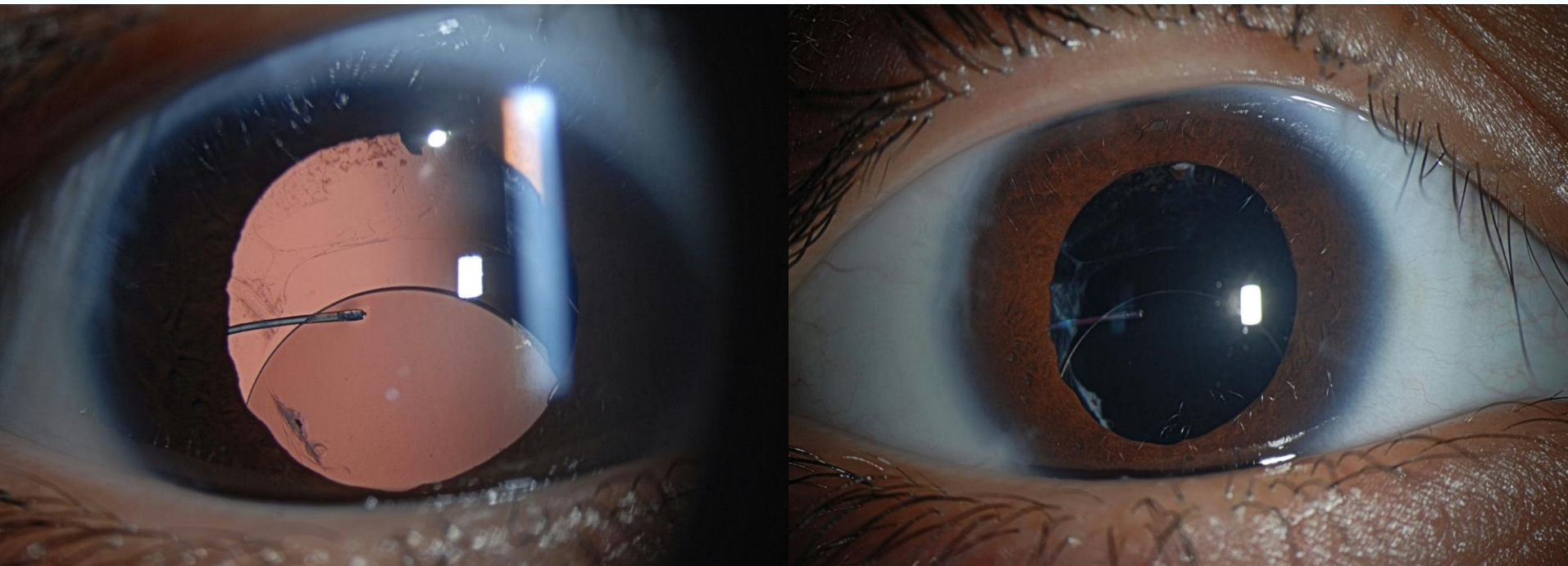
Zaina Al-Mohtaseb, M.D.



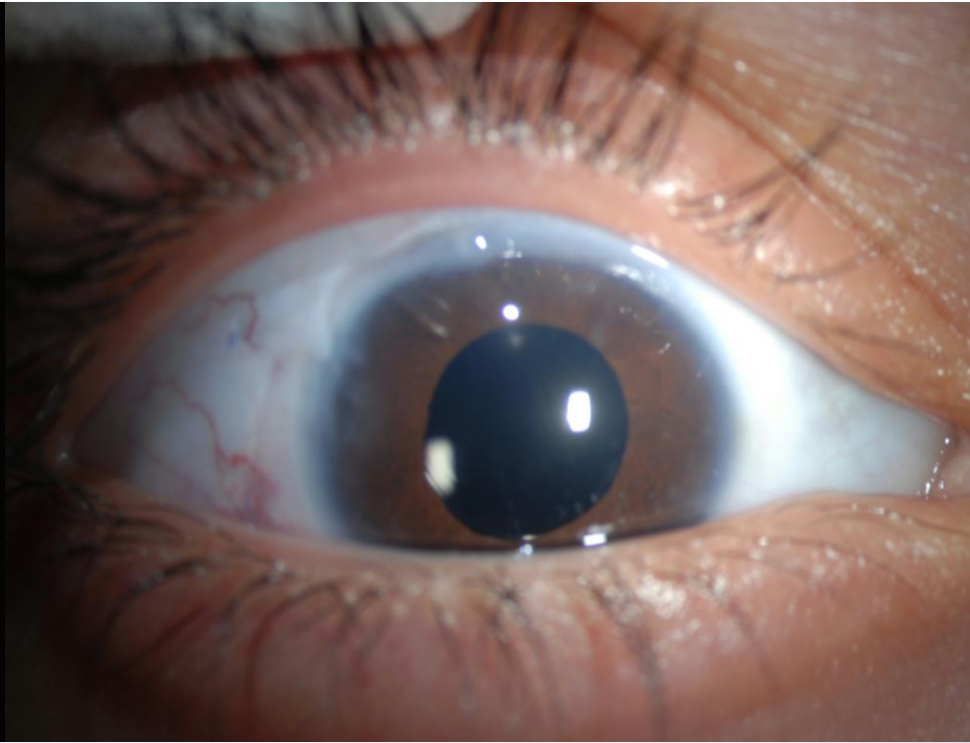
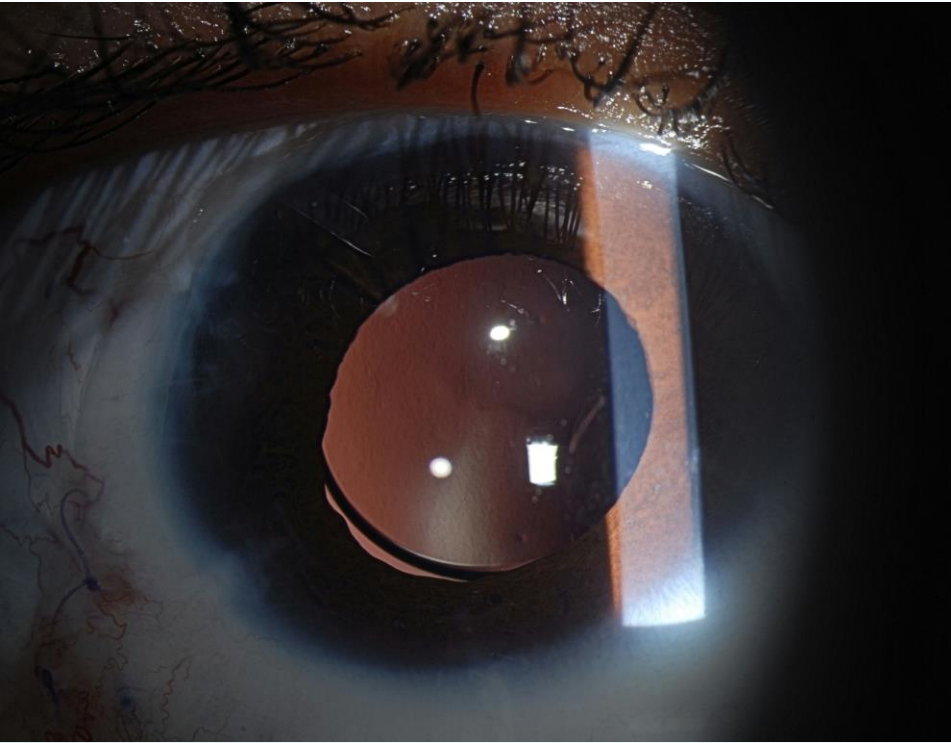
# Proximal Haptic – Loss



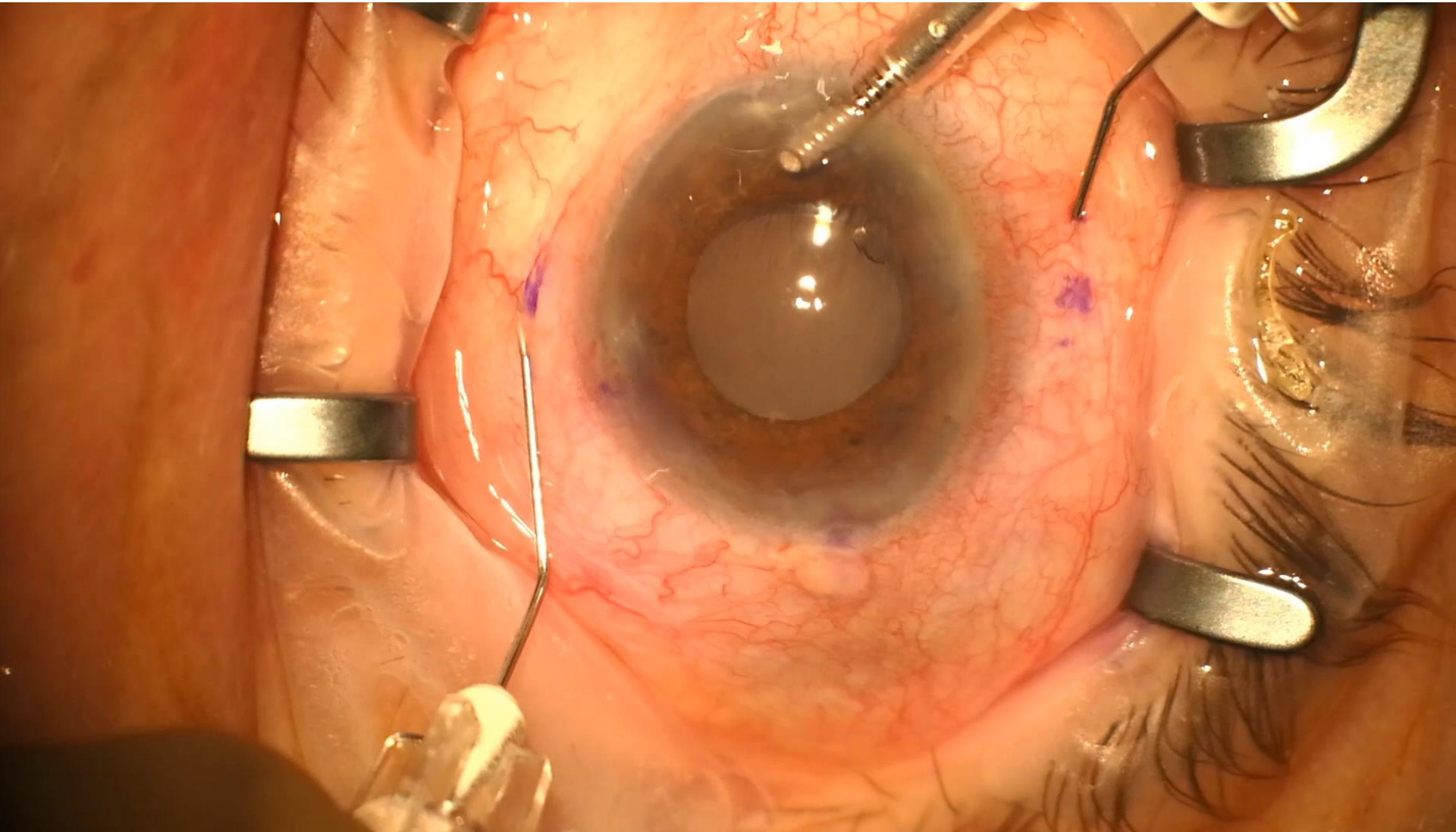
# Pre-op Photos



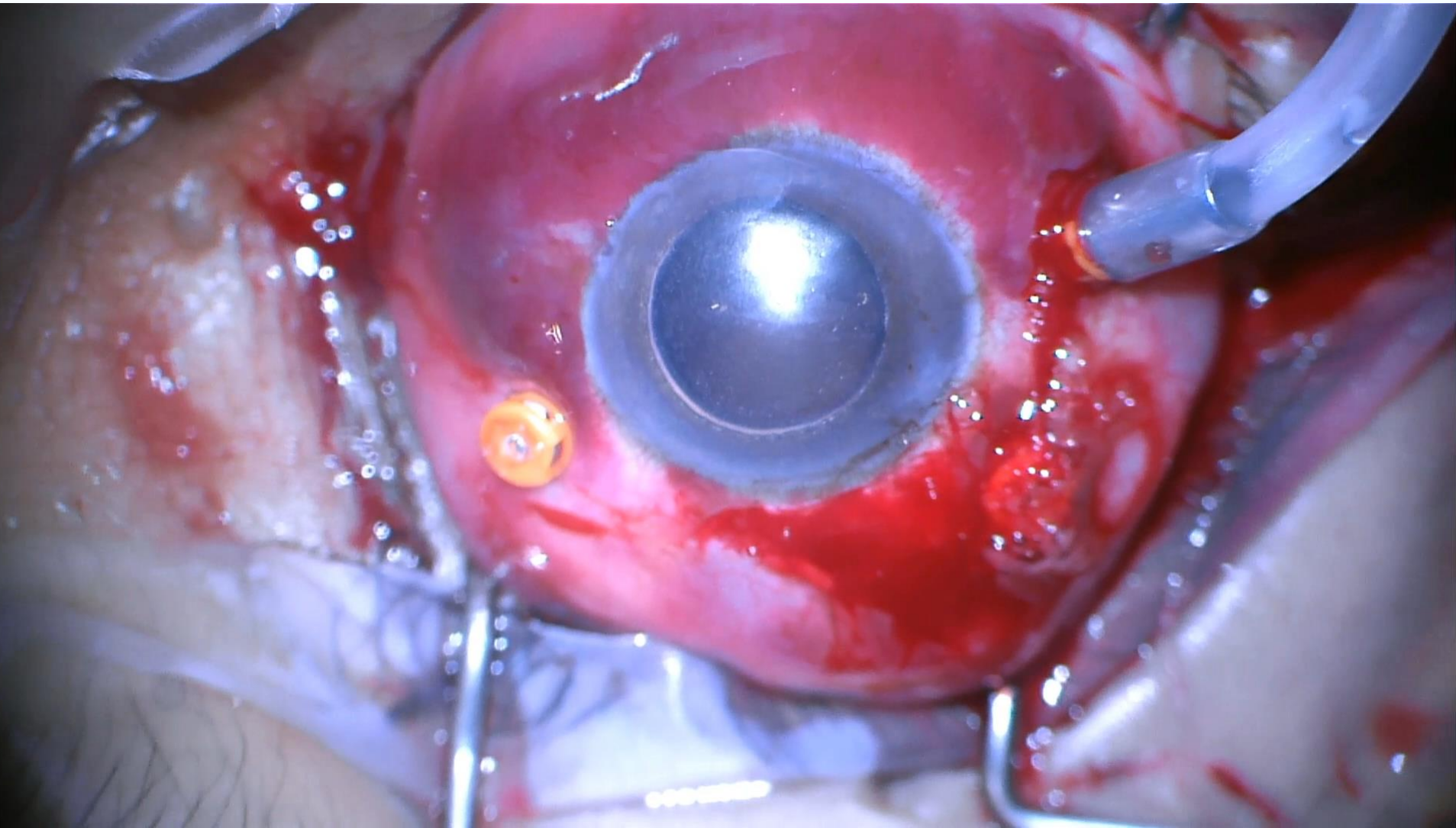
# Post-op Photos



# Centration of IOL

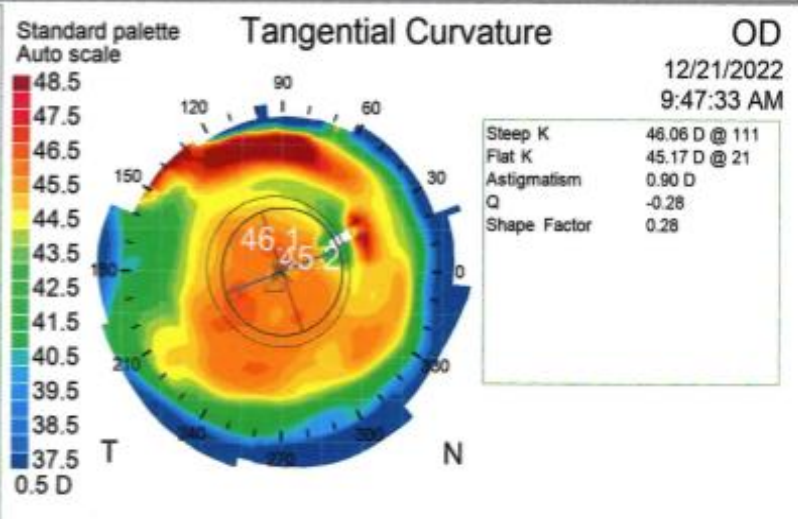
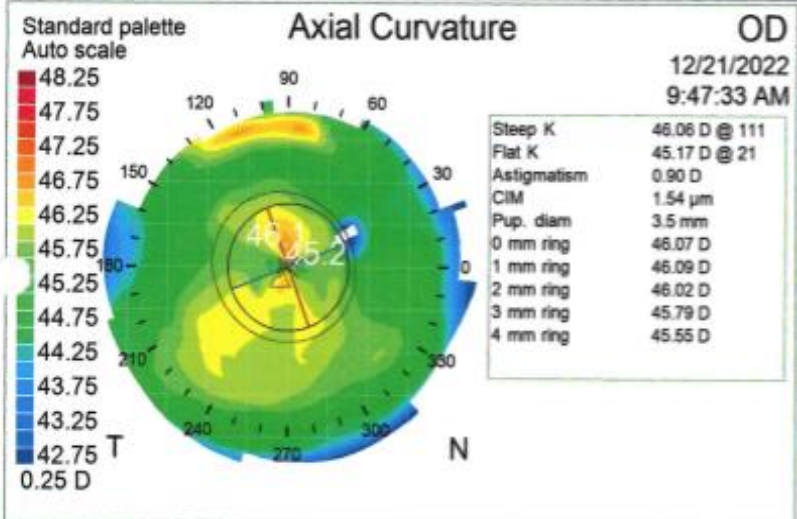


Combined with PPV (SF6)

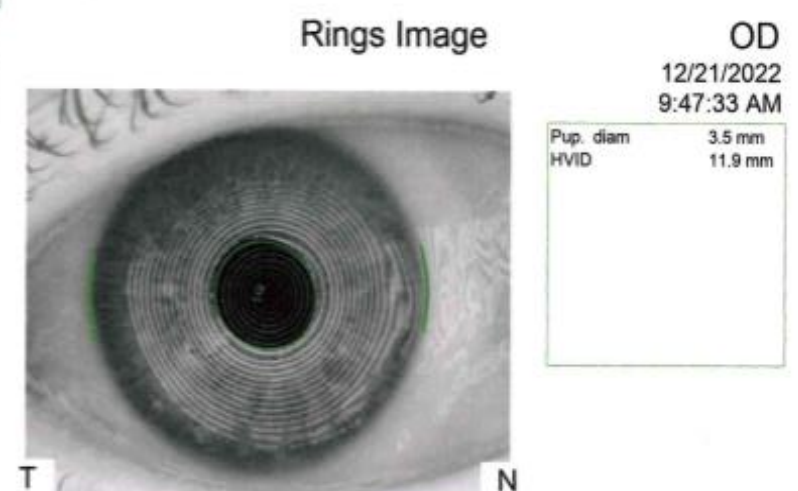
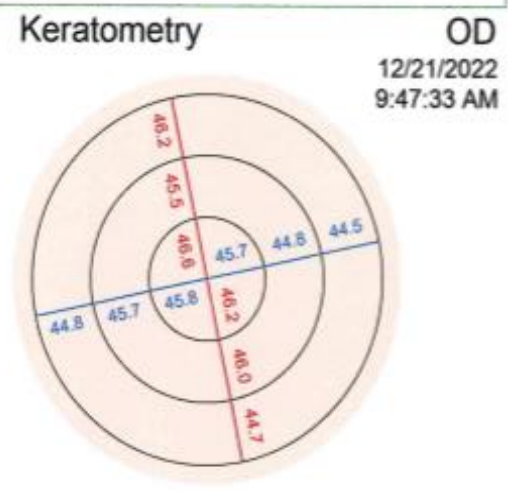


# 65 yold with Restor OU

Vacc	HM	20/40
VA w/ MRX	+10.25 sph 20/20	+0.25 +0.75 x 178 20/20
IOP (central, tonopen)	23	23
Pupils	no apd	No apd
C/S	White and quiet	White and quiet
Cornea	Clear	Clear
Anterior chamber	Vitreous Prolapse	Normal, quiet
Iris	WNL	WNL
Lens	Sunset IOL shifted inferiorly, large anterior capsular opening	Centered PC IOL, PC Intact
Vitreous	WNL	WNL
Fundus exam	WNL	WNL



- Sim Ks (3 mm)  
46.06 D (7.33 mm) @ 111  
45.17 D (7.47 mm) @ 21
- Total astigmatism 0.90 D
- Central (0-3 mm)  
46.55 D (7.25 mm) @ 102  
46.20 D (7.31 mm) @ 282  
45.70 D (7.39 mm) @ 12  
45.81 D (7.37 mm) @ 192
- Midperiphery (3-6 mm)  
45.52 D (7.41 mm) @ 102  
45.99 D (7.34 mm) @ 282  
44.84 D (7.53 mm) @ 12  
45.71 D (7.38 mm) @ 192
- Periphery (6-9 mm)  
46.20 D (7.31 mm) @ 102  
44.73 D (7.55 mm) @ 282  
44.46 D (7.59 mm) @ 12  
44.81 D (7.53 mm) @ 192



Date: 12/22/2022 Surgeon: ZAM, PCKG 1,2,4 Refraction: AL(Optical): 22.81 BCVA: UCVA: Std K1: 45.95 @16 Std K2: 46.50 @106 Astigm.: +0.55 @ 106 StdAvg K: 46.23	<b>RIGHT</b> Tech: Vertex: 12.00 Adj. AL: Hor W-t-W: 11.60 Phakic ACD: Phakic Lens Th.: Target SEQ Ref: -0.75 Tgt Add: n: 1.3375	<b>LEFT</b> Surgeon: Refraction: AL(Optical): BCVA: UCVA: Astigm.: Alternate K:	Date: 12/22/2022 Tech: Vertex: Adj. AL: Hor W-t-W: Phakic ACD: Phakic Lens Th.: Target SEQ Ref: Tgt Add: n:																								
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Eye Status: <b>Aphakic</b> New PC Lens: <b>in bag</b>	PreOp Pathology: <b>No</b> Prev. Rk... : <b>No</b> Keratoconus: <b>No</b> Scleral Buckle: <b>No</b> Silicone in Vitreous Cavity: <b>No</b>	Eye Status: <b>Phakic</b> New PC Lens: <b>in bag</b>	PreOp Pathology: <b>No</b> Prev. Rk... : <b>No</b> Keratoconus: <b>No</b> Scleral Buckle: <b>No</b> Silicone in Vitreous Cavity: <b>No</b>																								
Formula: <b>Holladay II</b>		Formula:																									
Rx Sight/Calhoun Vision 60005 MFG ACD(Opt): 5.20 <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th><u>IOL SEQ</u></th> <th><u>SEQ Ref.</u></th> </tr> </thead> <tbody> <tr><td>20.00</td><td>- 0.11</td></tr> <tr><td>20.50</td><td>- 0.45</td></tr> <tr><td>20.94</td><td>- 0.75</td></tr> <tr><td><b>21.00</b></td><td><b>- 0.79</b></td></tr> <tr><td>21.50</td><td>- 1.13</td></tr> </tbody> </table>	<u>IOL SEQ</u>	<u>SEQ Ref.</u>	20.00	- 0.11	20.50	- 0.45	20.94	- 0.75	<b>21.00</b>	<b>- 0.79</b>	21.50	- 1.13	J&J/AMO/Pharmacia/Allrg... DIUX MFG ACD(Opt): 5.72 <table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th><u>IOL SEQ</u></th> <th><u>SEQ Ref.</u></th> </tr> </thead> <tbody> <tr><td>21.50</td><td>- 0.36</td></tr> <tr><td><b>22.00</b></td><td><b>- 0.69</b></td></tr> <tr><td>22.10</td><td>- 0.75</td></tr> <tr><td>22.50</td><td>- 1.01</td></tr> <tr><td>23.00</td><td>- 1.35</td></tr> </tbody> </table>	<u>IOL SEQ</u>	<u>SEQ Ref.</u>	21.50	- 0.36	<b>22.00</b>	<b>- 0.69</b>	22.10	- 0.75	22.50	- 1.01	23.00	- 1.35		
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IOL Consultant Notes																											
(*) MFG Optical Lens constant generated by adding 0.2mm to UIS ACD																											
Surgeon/Technician Notes																											



## PROCEDURES

Exchange of intraocular lens (66986)

## Right eye

### PROCEDURE DETAILS

Procedure Subtype:

N/A

Special Needs:

None

### SURGERY DAY

Date of surgery:

12/27/2022

Surgical Facility:

Park Ten Surgical Center

Surgeon:

Zaina Al-Mohtaseb

Anesthesia:

Topical

### ASSOCIATED DIAGNOSES

#### CONCERNS

Diabetes:

No

Keratoconus:

No

Prior Refractive Surgery:

None

Medication concerns:

None

Allergy concerns:

None

Other concerns:

None

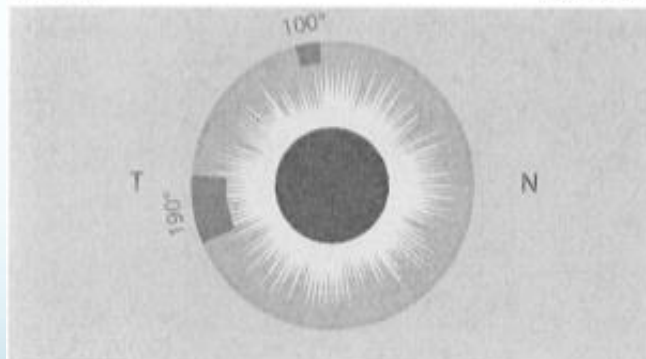
#### COMMENT

N/A

IOL Model:

**RxSight LAL**  
**+21.00 D**

IOL Power:



#### ARCUATE INCISIONS

#1:

None

#2:

None

#### PRE-OP DATA

Pre-op refraction:

+13.25 + 1.12 x 024°

Anterior keratometry (IOLMaster 700):

0.55 @ 106°

Posterior keratometry (IOLMaster 700):

0.42 @ 000°

ZEISS TK (IOLMaster 700):

0.35 @ 125°

Net astigmatism (D):

0.41 @ 145°

Average anterior corneal power:

46.22 D

Axial length:

22.81 mm

IOL power estimation

Barrett Universal II

formula used:

Toric formula used:

Barrett Toric

#### TARGET

Target range:

Distance

Target refraction:

-0.75 D

#### PREDICTED OUTCOME

Predicted SE:

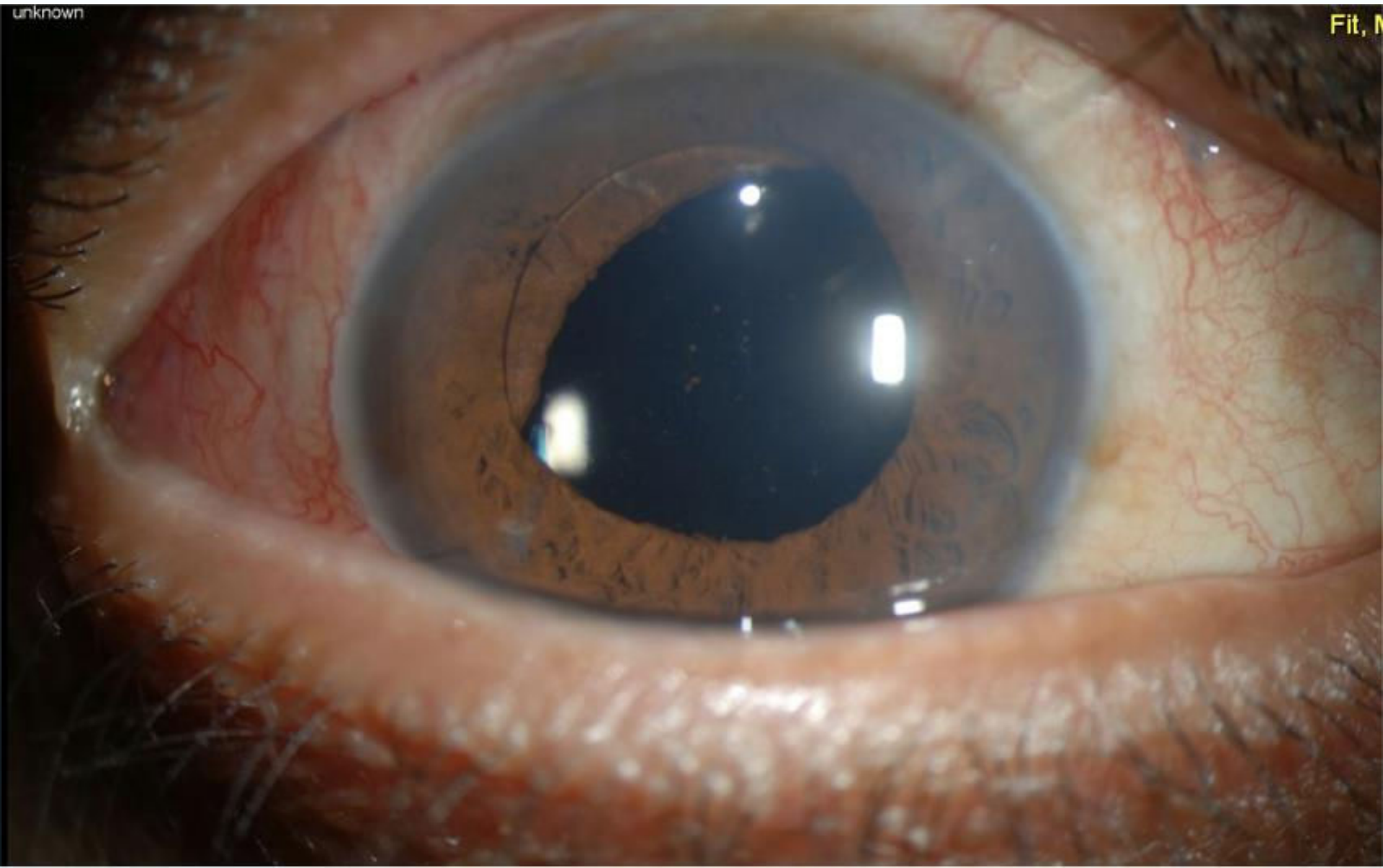
-0.74 D

Predicted final refraction:

-0.95 + 0.42 x 145°

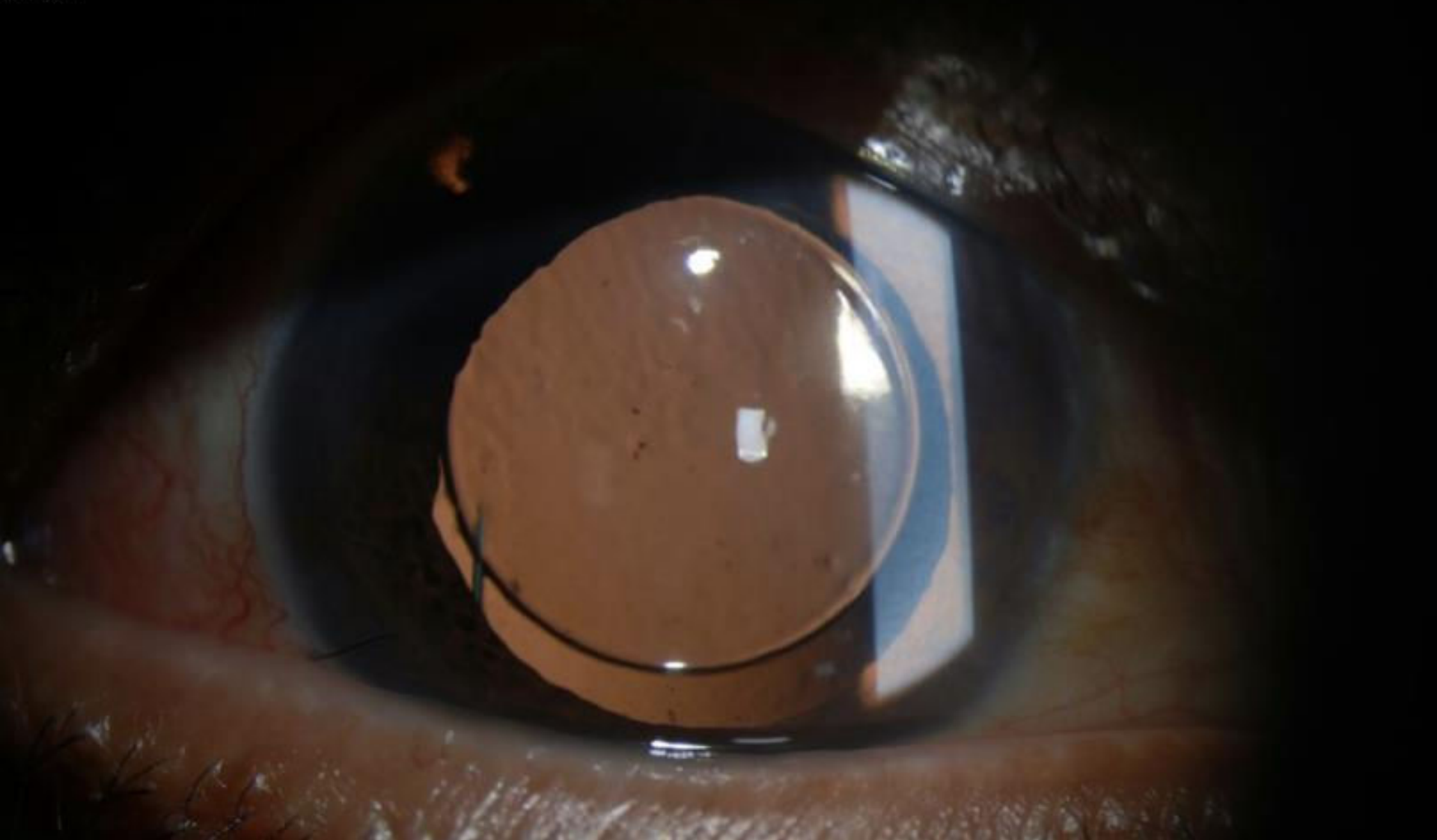
# LAL Yamane Exchange

# Iris Capture



# Iris Capture

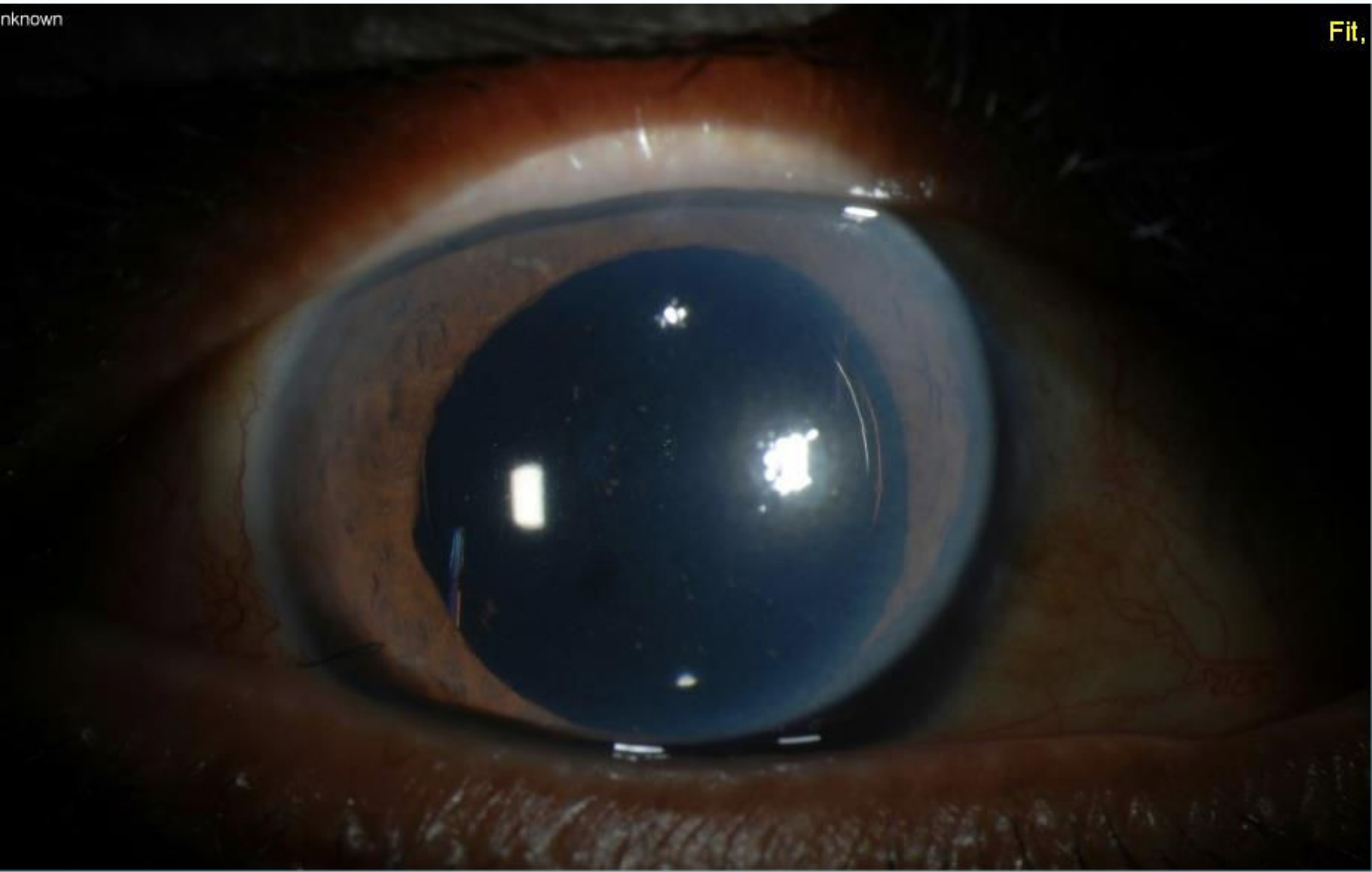
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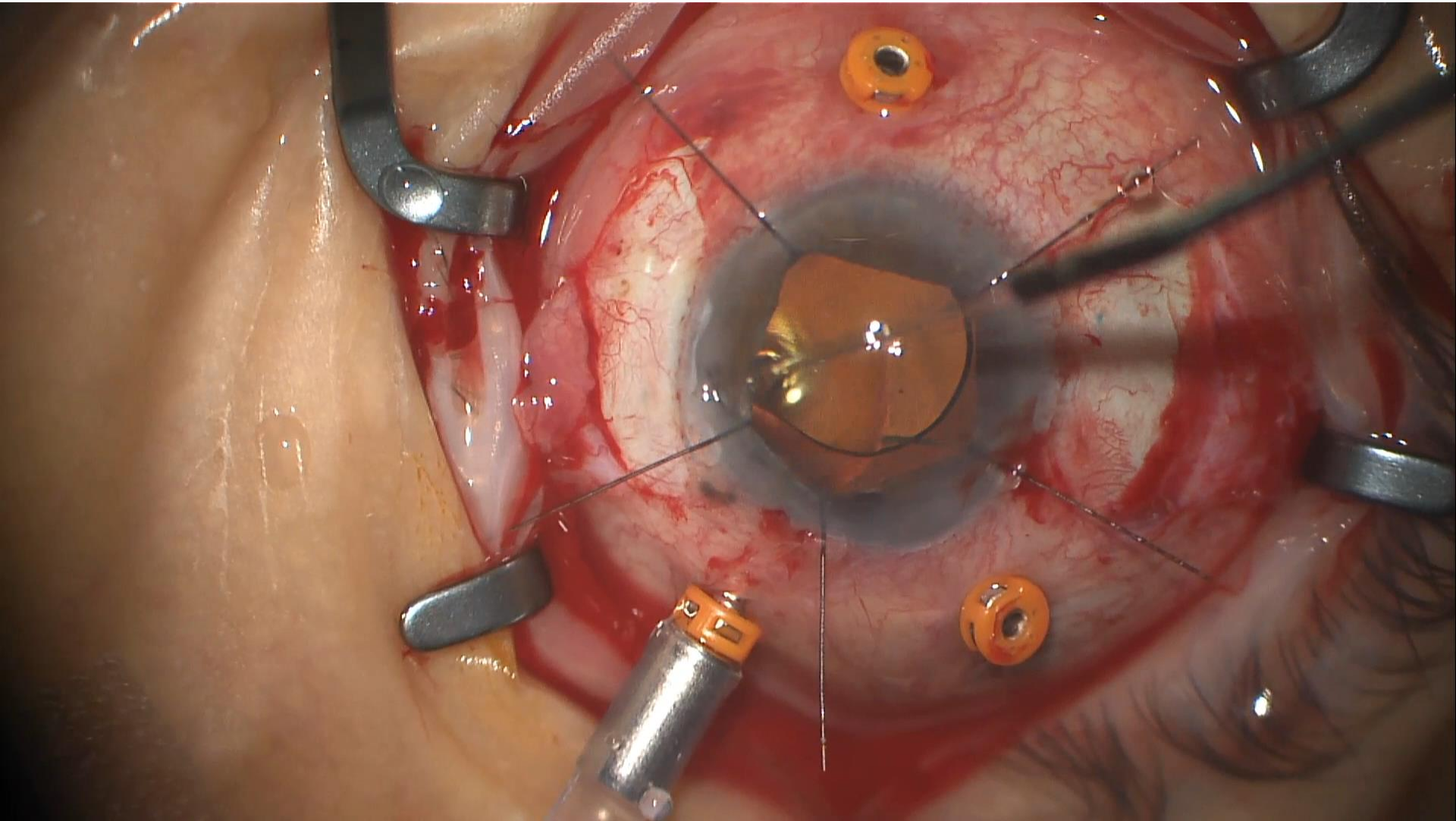
# Iris Capture

unknown

Fit,



# Double Needle Exchange



## Accuracy of Intraocular Lens Calculation Formulas for Flanged Intrascleral Intraocular Lens Fixation with Double-Needle Technique

Jake McMillin <sup>1</sup>, Li Wang, Margaret Y Wang, Zaina Al-Mohtaseb, Sumitra Khandelwal, Mitchell Weikert, M Bowes Hamill

Affiliations + expand

PMID: 33315743 DOI: 10.1097/j.jcrs.0000000000000540

### Abstract

**Purpose:** To evaluate the refractive prediction error of intraocular lens calculation formulas in eyes that have undergone the Yamane technique for scleral fixation of intraocular lenses (IOL).

**Setting:** Alkek Eye Center, Cullen Eye Institute, Baylor College of Medicine, Houston, TX DESIGN:: Retrospective case series from electronic chart review.

**Methods:** Patients who had undergone scleral fixation of secondary IOLs were selected. The IOL refractive prediction errors (RPE) for 4 IOL prediction formulas - Barrett Universal II, Holladay 1, Hoffer-Q, and SRK/T - were obtained by subtracting the predicted spherical equivalent from post-operative spherical equivalent. The arithmetic mean RPE, mean absolute error (MAE), and percentages of eyes with prediction error of  $\leq 0.5$  D and  $\leq 1.0$  D were calculated and compared.

**Results:** 40 eyes of the 40 patients met inclusion criteria. All formulas produced hyperopic mean arithmetic RPE. MAE values were 0.73 D for Holladay 1, 0.76 D for Barrett, 0.80 D for SRK/T, and 0.86 D for Hoffer Q. The percentage of eyes with prediction error of  $\leq 0.5$  D and  $\leq 1.0$  D with these formulas were: 45% (18 eyes) and 75% (30 eyes) for Holladay 1, 38.5% (15 eyes) and 77% (30 eyes) for Barrett, 32.5% (13 eyes) and 67.5% (27 eyes) for SRK/T, and 27.5% (11 eyes) and 62.5% (25 eyes) with Hoffer-Q. There were no significant differences in prediction errors between the 4 formulas.

**Conclusion:** Refractive outcomes of the Yamane technique are less predictable than standard cataract surgery. Arithmetic RPE is hyperopic to predicted for all formulas tested.

# Advantages of Yamane Technique

- **Small wound** (less risk of iris prolapse, astigmatism from sutures, faster recovery)
- **30 gauge needle** instead of blade through uveal tissue in ciliary sulcus –less risk of post op hypotony, suprachoroidal and intraoperative hemorrhage
- Can use **3-piece lens** already implanted or lens off the shelf
- Shorter operating time; quick learning curve
- Closely approximates anatomic position of crystalline lens
- Minimal corneal or angle trauma, good for patients with iris atrophy or abnormal angle anatomy
- Reduced risk of secondary glaucoma or pupillary block
- **No issue of suture exposure**
- Little to no contact between iris and lens
- Can be **combined with retina/glaucoma/corneal surgeries**



# Pearls for Yamane Technique

- Special large lumen 30 G needle
- Place needle on non-luer locked TB syringe filled with BSS (not too tight)
- Test the haptics in the needles prior to lens insertion
- **AC maintainer can be helpful especially in vitrectomized eyes**
- Mark the conjunctiva at 1:00 & 7:00 (exactly 180 degrees apart) 2.5mm posterior to the limbus
- Stabilize the globe using a 0.12 near area of needle insertion
- Insert needle a bevel and a half (2mm) in sclera prior to turning centrally
- Bend 25 gauge max grip forceps
- Use low-temp cautery to create flanged haptic
- **Can use any 3 piece lens (ZA9003, MA60AC, CT Lucia, or LAL) but haptics angle & ends differ**
- **Grab proximal haptic parallel instead of perpendicular whether from para or wound**

Thank you!

[zaina1225@gmail.com](mailto:zaina1225@gmail.com)