Gonio

To be successful at glaucoma lasers, you must be proficient in gonioscopy

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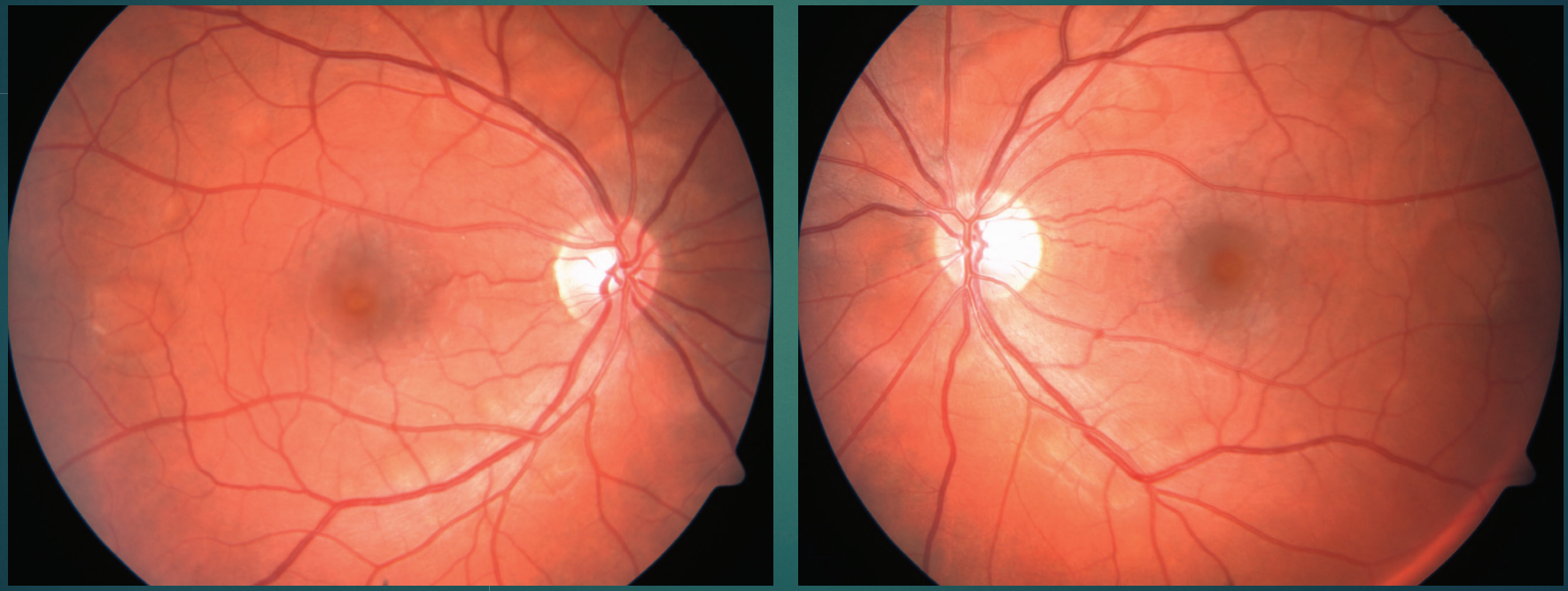
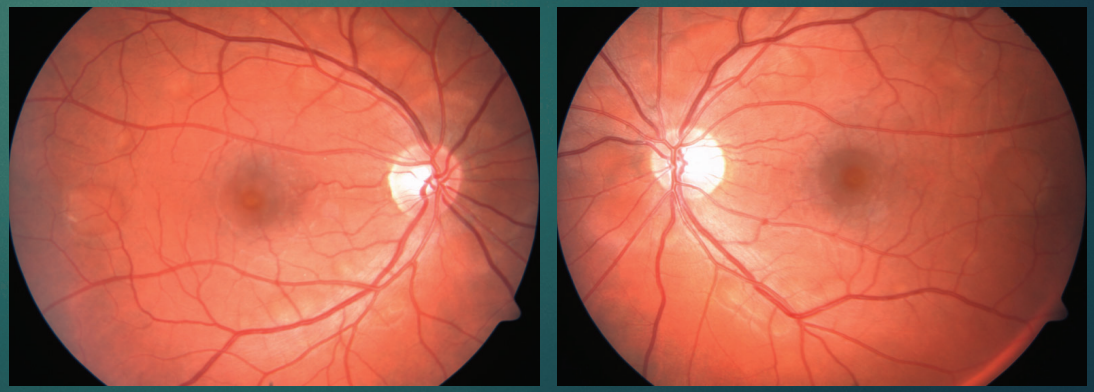
Financial Disclosures

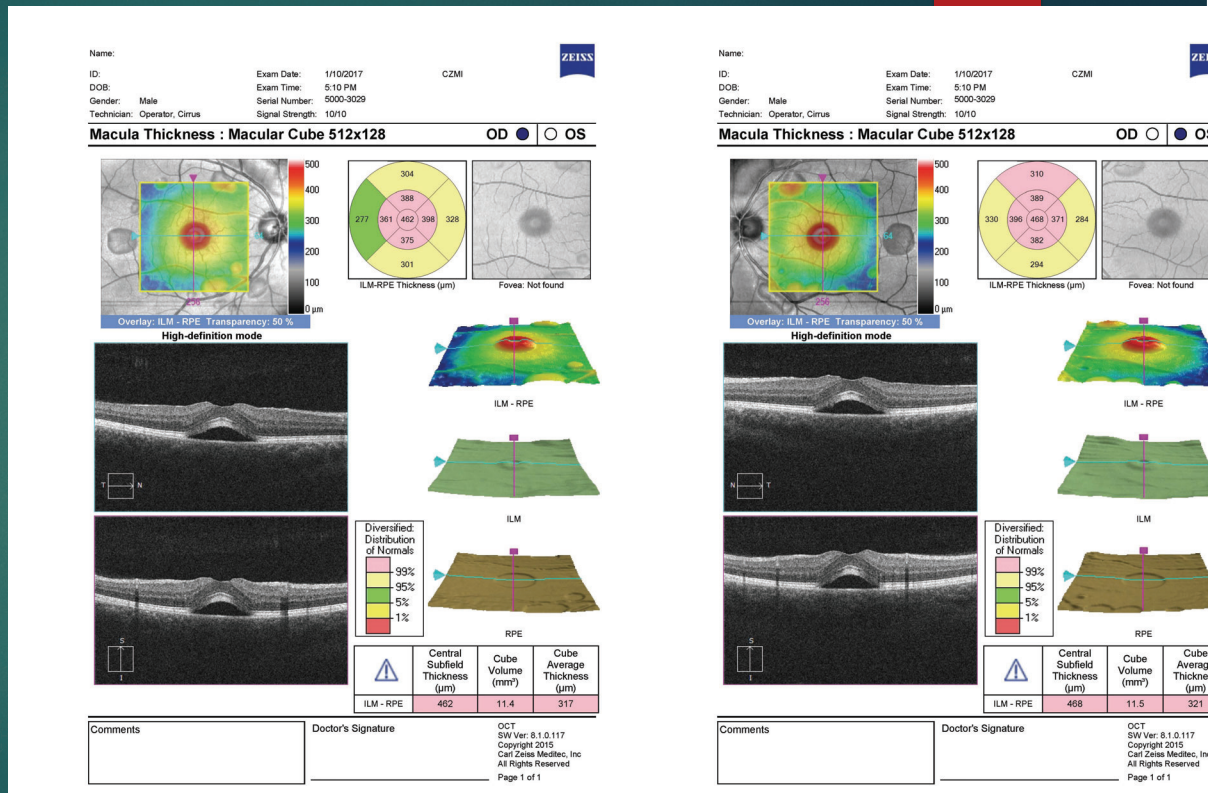
- None



- Your ability to identify an abnormal fundus is based on your experience observing and identifying a normal fundus
- Identifying the location of the problem is the first step in initiating treatment



- Imagine you only dilate a patient and perform a fundus exam when you think there is a problem



How is gonio any different?

- A strong fundamental background in gonioscopy is necessary in identifying and treating angle related pathology

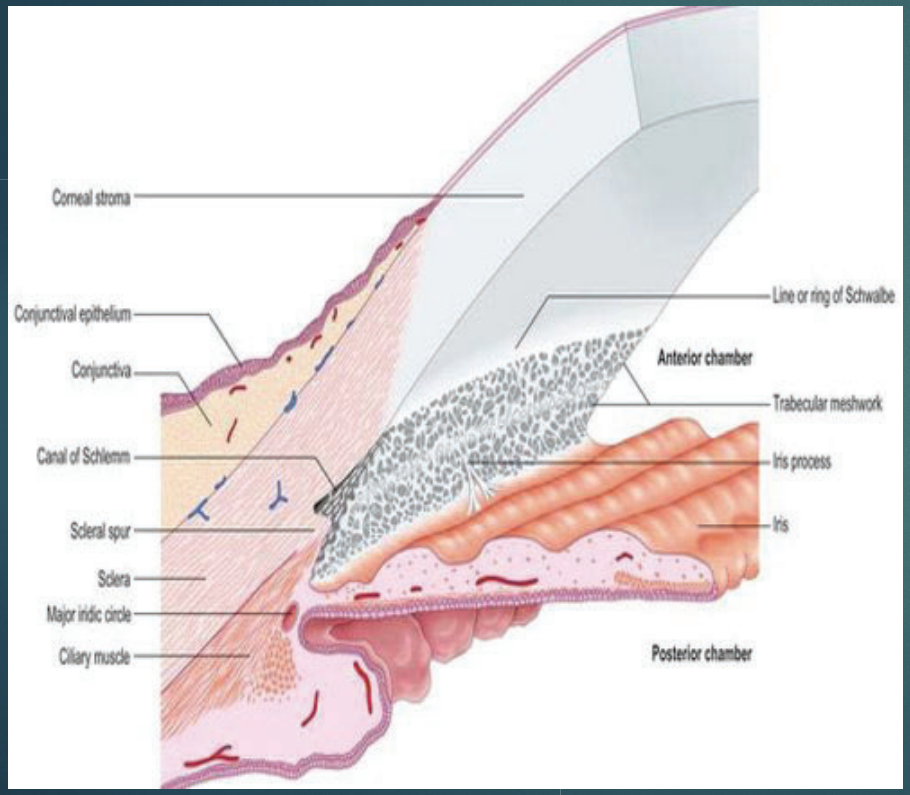
- Practice…Practice……Practice!!!

- Angle related pathology??

- GLAUCOMA!!!!
- But what else?
  - Trauma
  - Tumors
  - Inflammation
  - Ocular ischemia
  - Corneal Edema

- As more and more optometrists introduce lasers into their glaucoma treatment repertoire. Gonioscopy skills mu
  sharpen!!

The Basic Anatomy



Schwalbe's Line

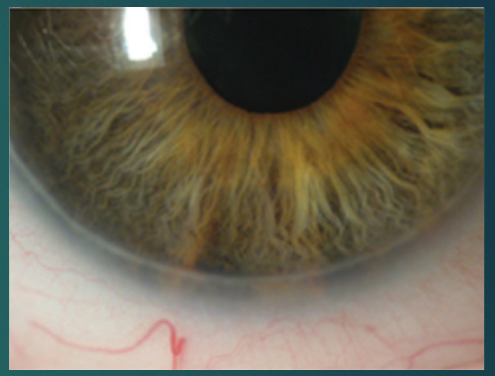
Trabecular Meshwork (Schlemm's Canal)

Scleral Spur

Ciliary Body

Schwalbe's Line

- Limit of corneal endothelium
- Physical ridge
  - Pigment collection there is called?
    - Sampeolesi's Line
  - Posterior Embryotoxin
- Important structure for orienting in gonioscopy

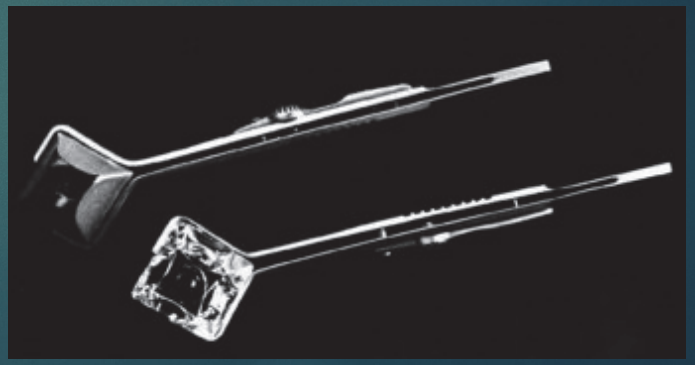


Trabecular Meshwork

- Triangle w apex at SL and base at SS
  - Fronts Schlemm's Canal
- 3-5 sheets of contractile cells
  - Can increase outflow resistance
    - => elevated IOP

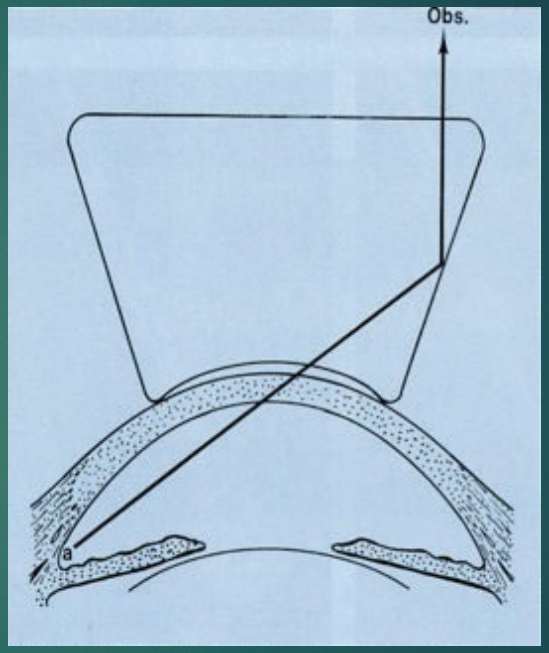
The Tools

- Direct:
  - Koeppe Lens
- InDirect:
  - Goldmann 3M, 4M
  - Sussman
  - Posner
  - Zeiss
- Anterior segment imaging



The Procedure

- Topical anesthesia
  - Proparacaine or lido gel
- Position patient in slit lamp
- Apply lens to corneal surface
  - 3-M needs coupling gel



3M vs 4M

- 3 Mirror Pros
  - Longer detailed views of the angle
  - Helps when studying difficult angle landmarks
  - Beginners more comfortable
  - May be easier on non-cooperative patients (blinkers/ squeezers)
  - Same lens used when doing SLT
  - Fundus view

3M vs 4M

- 3 Mirror Cons
  - Takes longer
  - Requires coupling Gel
  - Lub Gel vs GonioVisc
  - Cannot do Indentation
  - Requires rotation to view entire angle

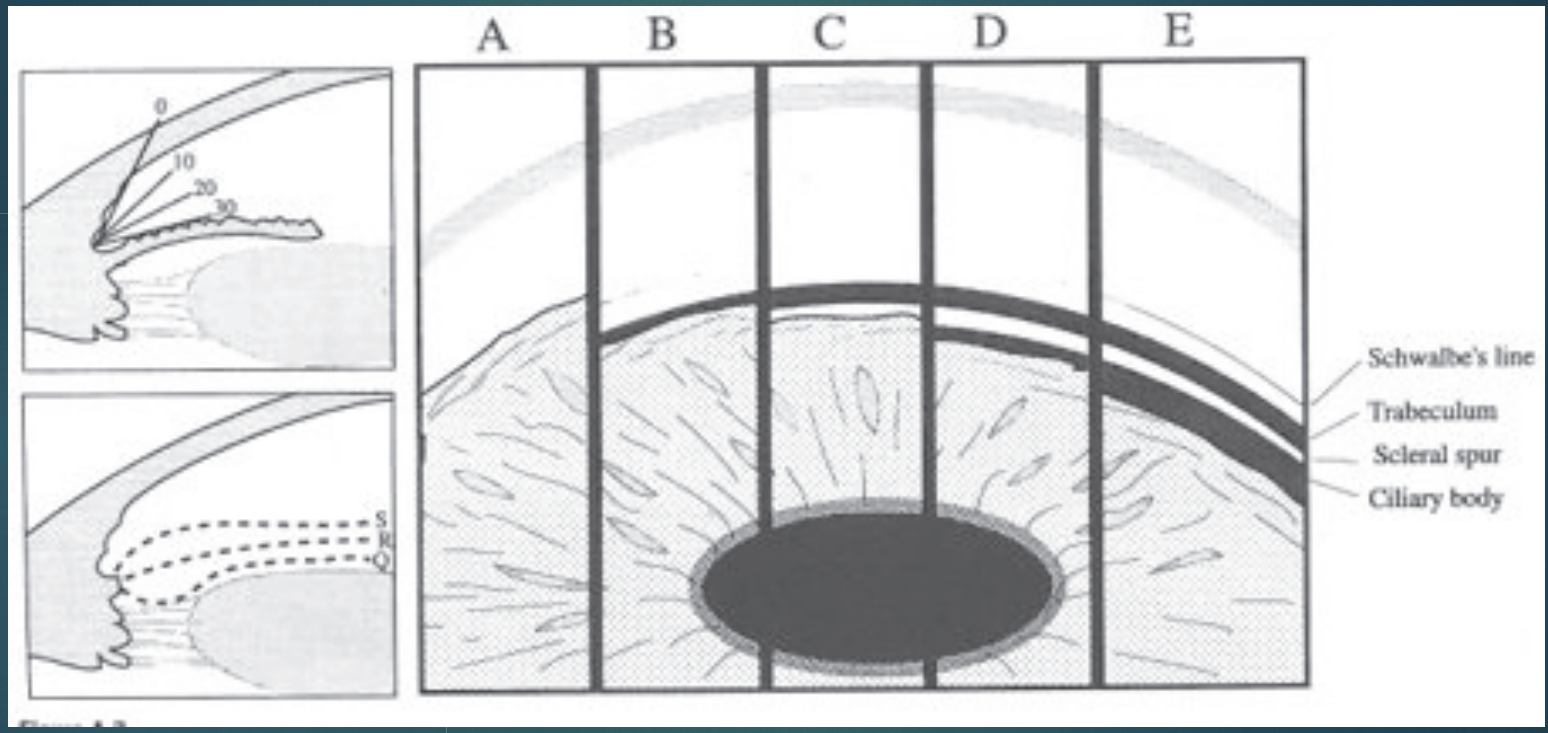
3M vs 4M

- 4 Mirror Pros
  - Done with topical proparacaine, following applanation tonometry
  - Can perform indentation gonioscopy in the case of chronic or acute angle closure
  - Central mirror can be used as a fundus lens

3M vs 4M

- 4 Mirror Pros
  - A slight learning curve
  - Air bubble can obscure view
  - Possible to push lens too hard against cornea
  - Folds in Descemet's are an indicator to back off

The Results


A
B
C
D
E
0
10
20
30
Schwalbe's line
Trabeculum
Scleral spur
Ciliary body

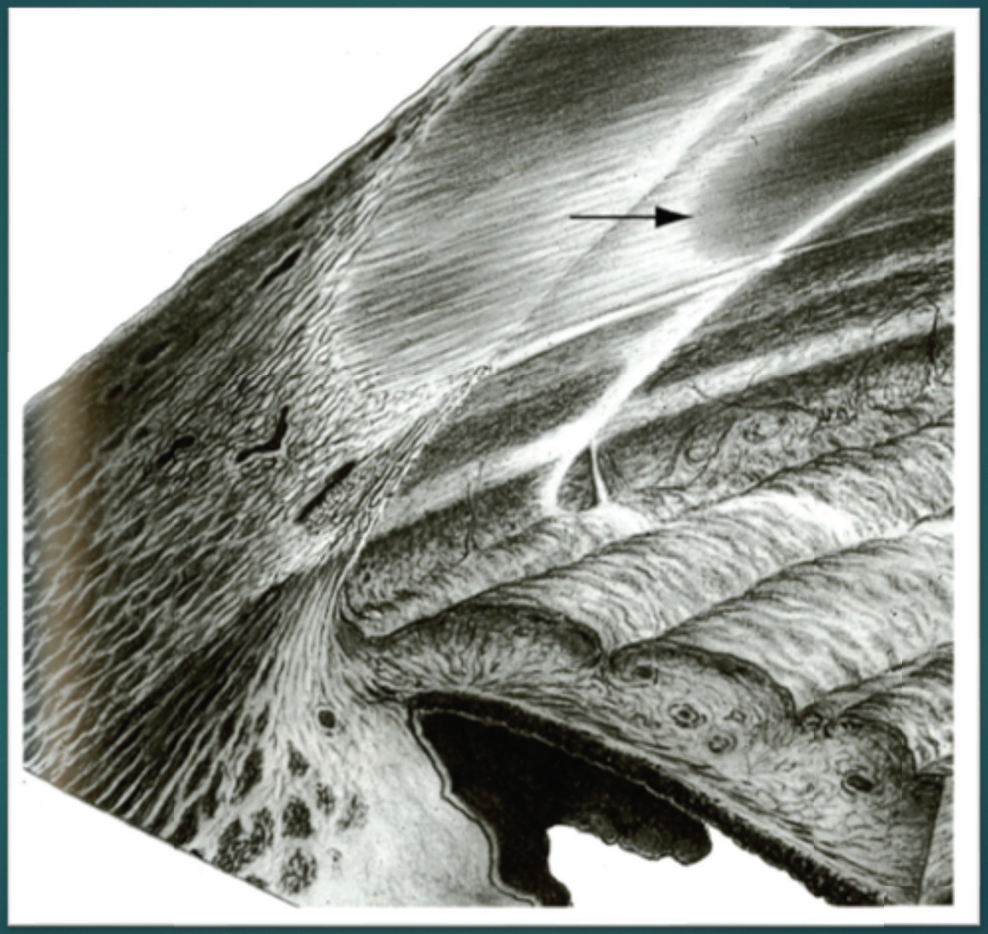
Documentation

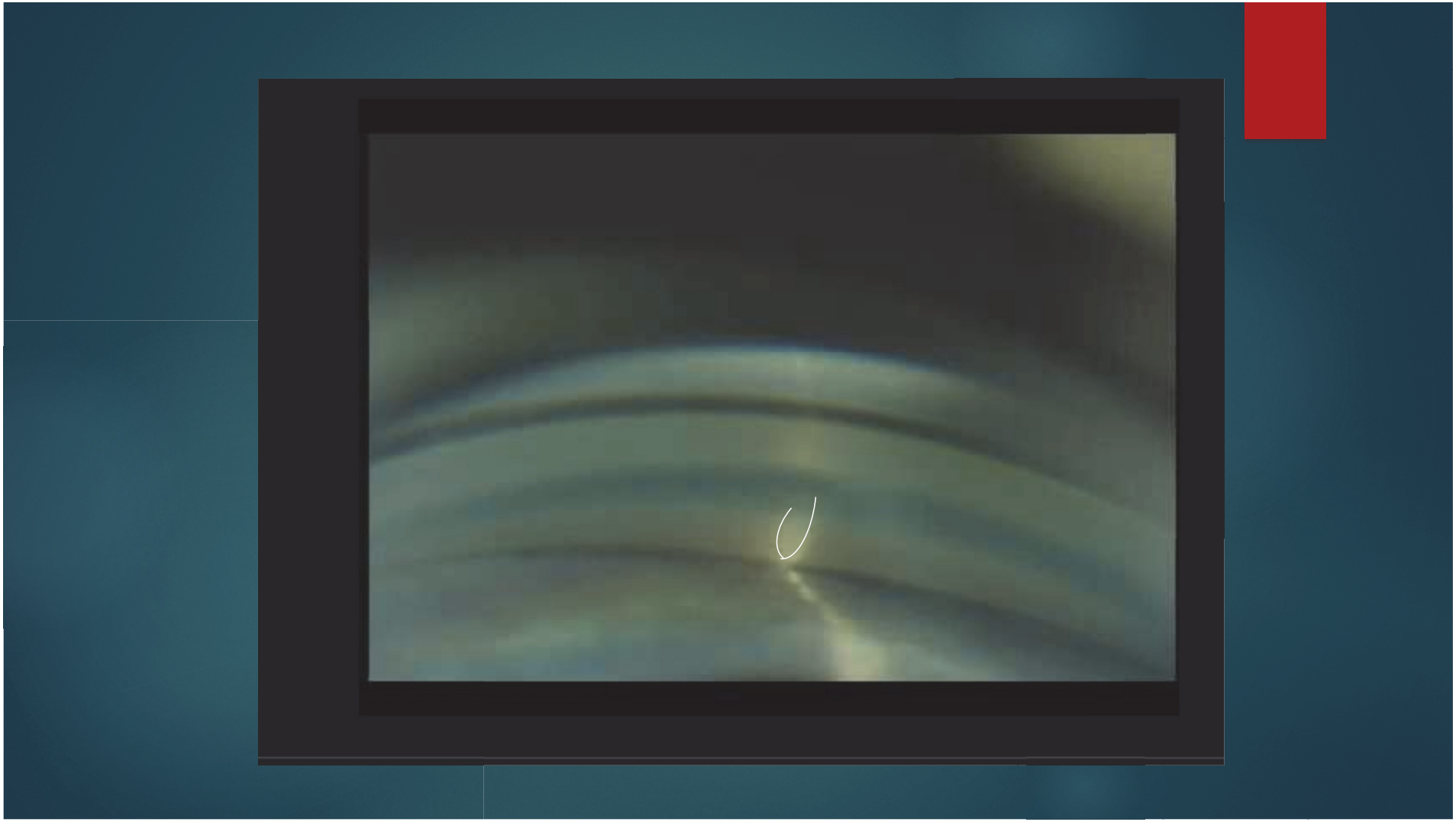
- Lens Used
- Deepest visible structure
- Iris approach (concave, flat, convex)
- Pigment
- +/- PAS
- +/- NVA

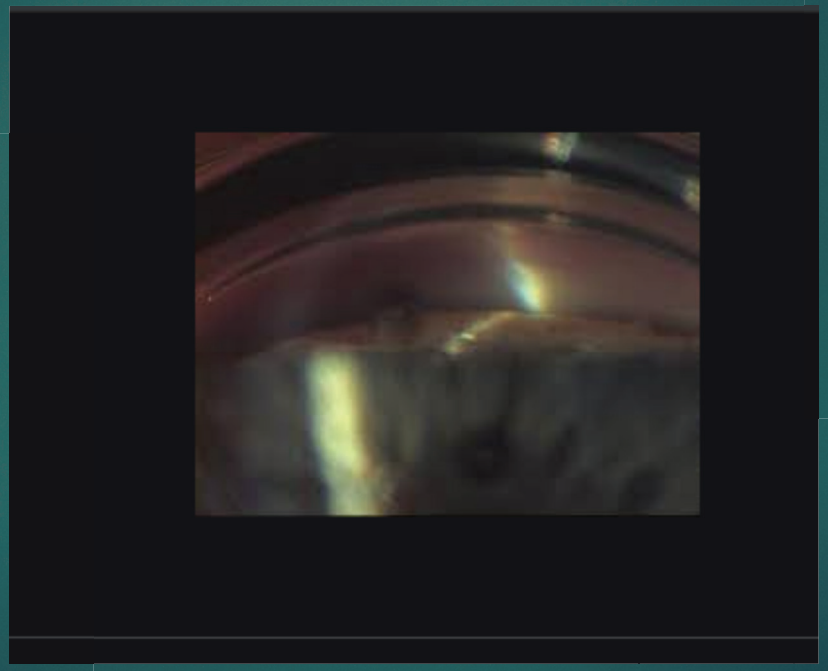
Simple right?

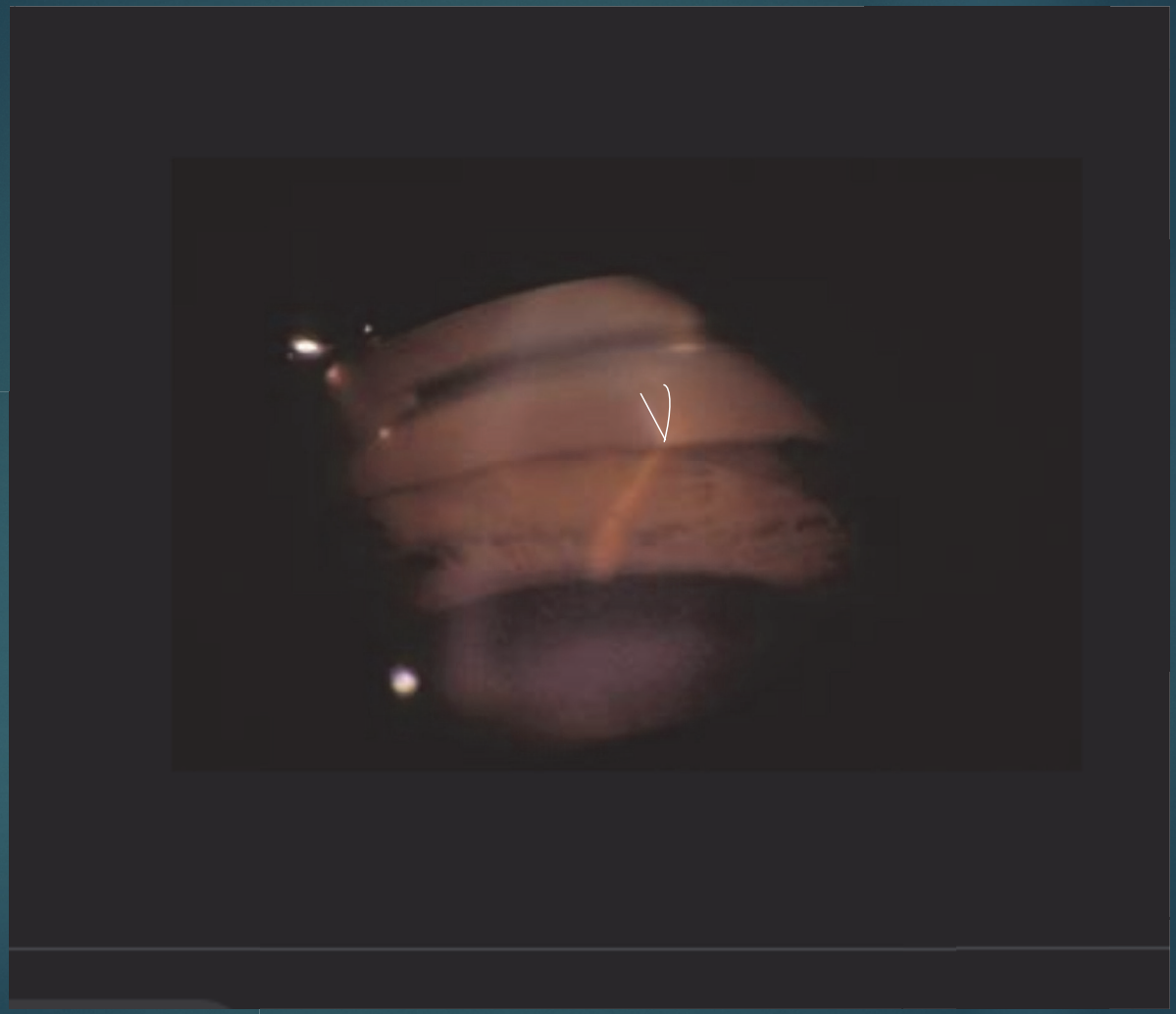
Technique

- Orient yourself with Schwalbe's line
- Corneal light wedge
  - Bright beam
  - Optic Section
  - Beam slightly off center
- Where is the best quadrant to start
  - Why?







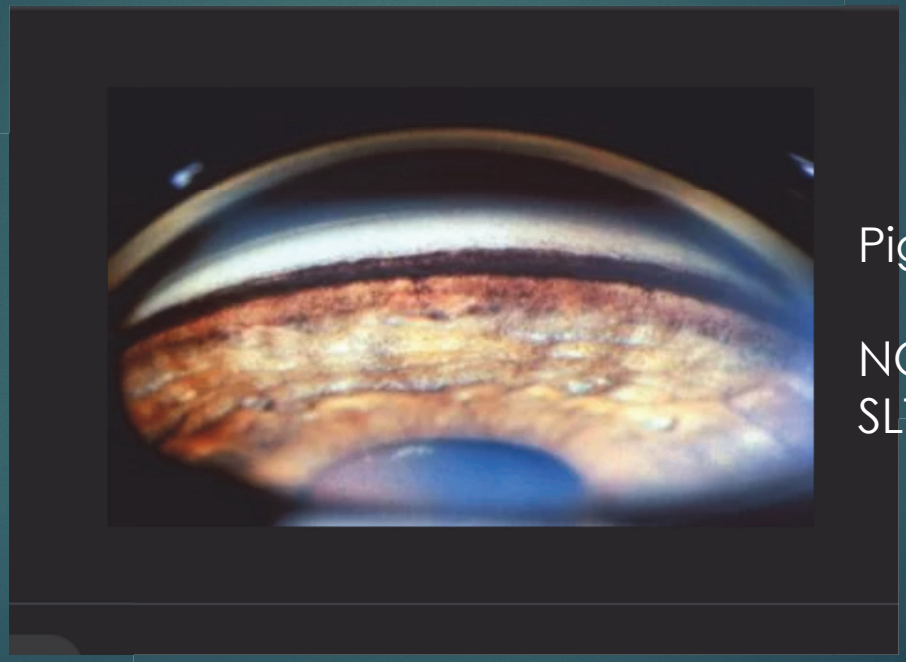


Technique

- Using the inferior angle as a reference point, examine all 4 quadrants
  - Inferior is typically the deepest
  - Last to close
  - Usually more pigment
  - Be aware of artificial constriction of the pupil for the light source

Technique

- Play close attention to the iris approach angle
  - Hyperopic eyes typically have steep insertion angels and a convex appearance
  - Pigmentary dispersion or pigmentary glaucoma have a posteriorly bowed appearance or concave appearance
- Grade the amount of pigment



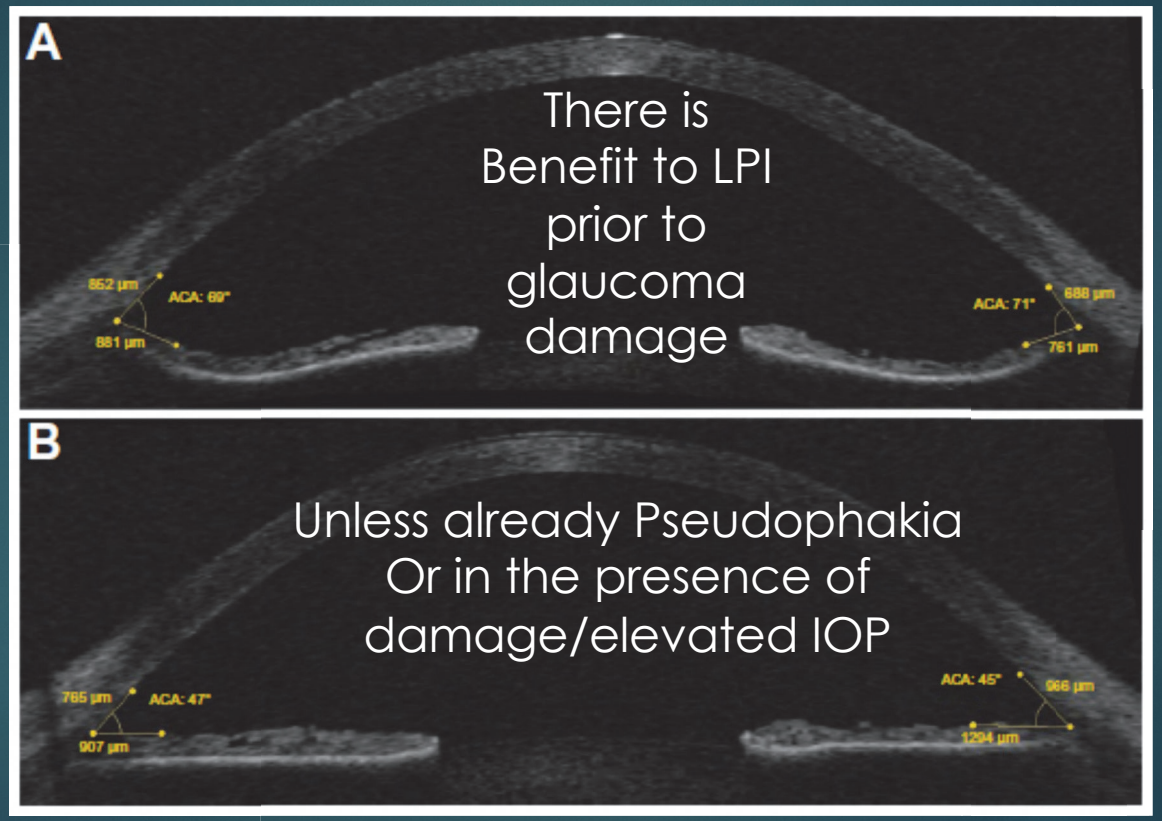
Pigmentary Glaucoma

NOT A GOOD
SLT CANDIDATE

Pigment Dispersion Syndrome

SLT Candidate?!?

What about LPI Candidate


A
There is
Benefit to LPI
prior to
glaucoma
damage
852 µm
ACA: 69°
881 µm
ACA: 71°
688 µm
761 µm
B
Unless already Pseudophakia
Or in the presence of
damage/elevated IOP
765 µm
ACA: 47°
907 µm
ACA: 45°
966 µm
1294 µm

Technique

- Compression is paramount in evaluating narrow angles when considering surgery/laser
  - Also helps confirm anatomical landmarks when grading difficult angles
  - The amount of compression is relative to the eye pressure
  - Can be used to evaluate patency of a previously placed LPI

Now I’m ready!

What the heck am I looking at?

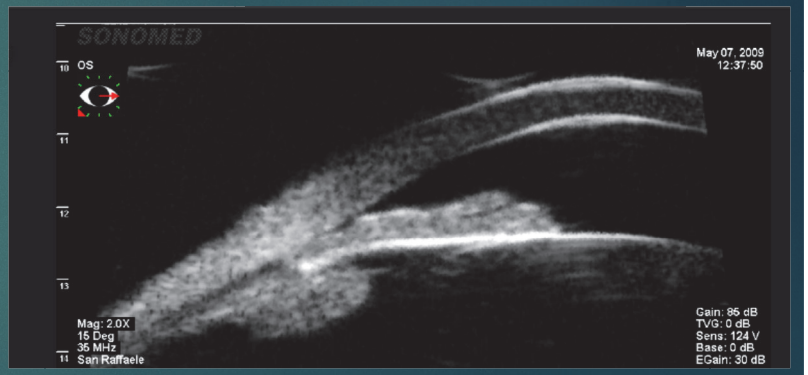
- Acute/Chronic Angle closure Glaucoma
  - Plateau Iris Syndrome?
- Trauma (recession vs cleft)
- Shallow chamber from previous surgery
- Malformation of the iridocorneal angle
  - (ICE syndromes, "Axenfeld Reigers", Peters anomaly)
- Uveitis

What the heck am I looking at?

- Anterior Chamber IOL
- Intraocular Foreign Body
  - Retained Lens Fragment
- Side effects from Medicine
  - Ciliary body swelling
- Neovascular Glaucoma
  - Proliferative Diabetic Retinopathy
  - Ocular Ischemic Syndrome
  - Central Retinal Vein Occlusion

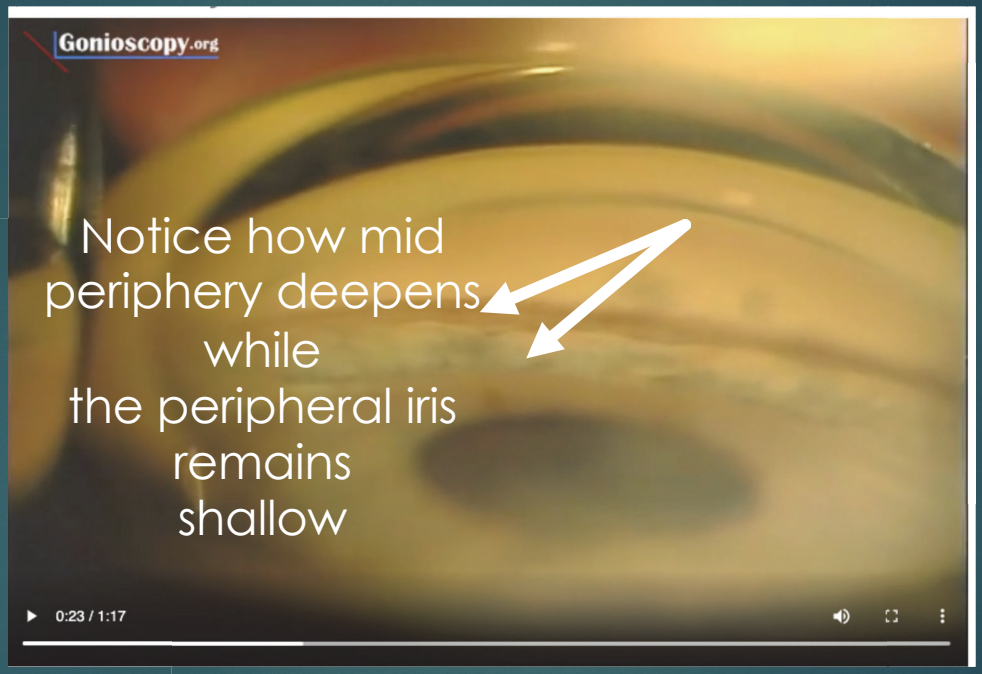
Plateau Iris Syndrome

- A form of primary angle closure glaucoma caused by large or anteriorly displaced ciliary body that leads to mechanical obstruction of the TM
- More common in younger patients
- Peripheral roll on compression gonio
  - Means the mid periphery iris deepens while the far periphery does not
- Narrow angle despite Patent LPI



Keep in mind this is anterior b scan
And not an OCT


Gonioscopy.org
0:14 / 1:17


Gonioscopy.org
Notice how mid periphery deepens while the peripheral iris remains shallow
0:23 / 1:17

Who needs an LPI?

- A recent Chinese study tried to identify what the effect an LPI had on progressing to AACG in NAG suspects

THE LANCET

ARTICLES | VOLUME 393, ISSUE 10181, P1609-1618, APRIL 20, 2019

Laser peripheral iridotomy for the prevention of angle closure: a single-centre, randomised controlled trial

Prof Mingguang He, PhD • Yuzhen Jiang, PhD • Shengsong Huang, MD • Dolly S Chang, PhD • Beatriz Munoz, MS • Prof Tin Aung, PhD • et al. Show all authors • Show footnotes

Published: March 13, 2019 • DOI: https://doi.org/10.1016/S0140-6736(18)32607-2 • Check for updates

Who needs an LPI?

registry, number ISRCTN45213059.

Findings

Of 11 991 screened individuals, 889 individuals were randomly assigned from June 19, 2008 (889 treated and 889 untreated eyes). Incidence of the primary outcome was 4·19 per 1000 eye-years in treated eyes compared with 7·97 per 1000 eye-years in untreated eyes (hazard ratio 0·53; 95% CI 0·30–0·92; p=0·024). A primary outcome event occurred in 19 treated eyes and 36 untreated eyes with a statistically significant difference using pair-wise analysis (p=0·0041). No serious adverse events were observed during follow-up.

Interpretation

Incidence of angle-closure disease was very low among individuals classified as primary angle closure suspects identified through community-based screening. Laser peripheral iridotomy had a modest, albeit significant, prophylactic effect. In view of the low incidence rate of outcomes that have no immediate threat to vision, the benefit of prophylactic laser peripheral iridotomy is limited; therefore, widespread prophylactic laser peripheral iridotomy for primary angle-closure suspects is not recommended.

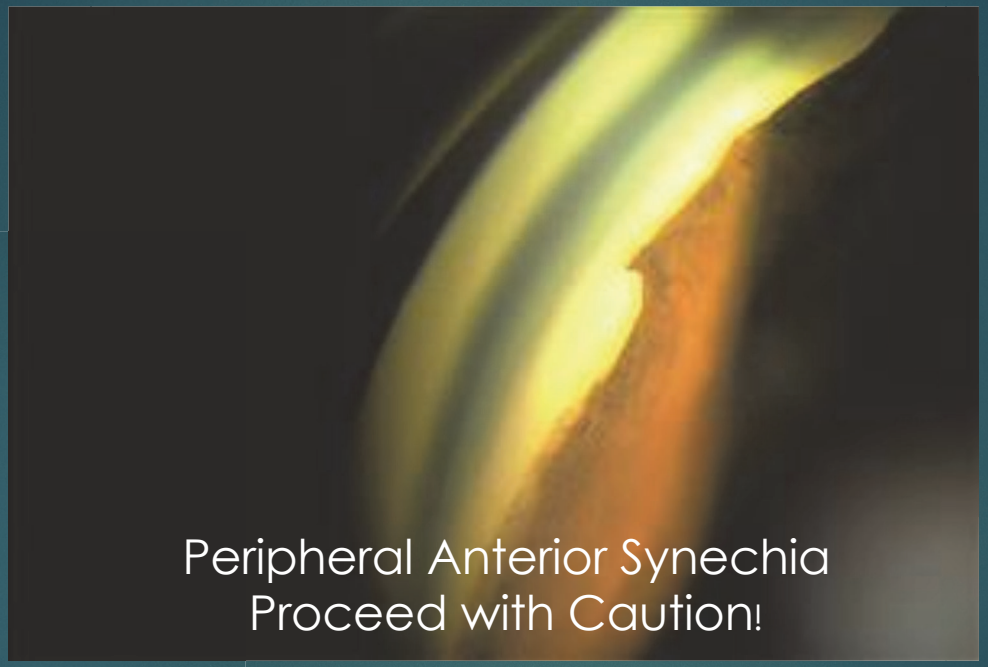
Funding

Fight for Sight, the Sun Yat-Sen University 5010 Project Fund, Moorfields Eye Charity, and the National Natural Science Foundation of China.

- Exclusion criteria?
- How does this affect your clinical practice
  - What else is a good treatment option in these patients?

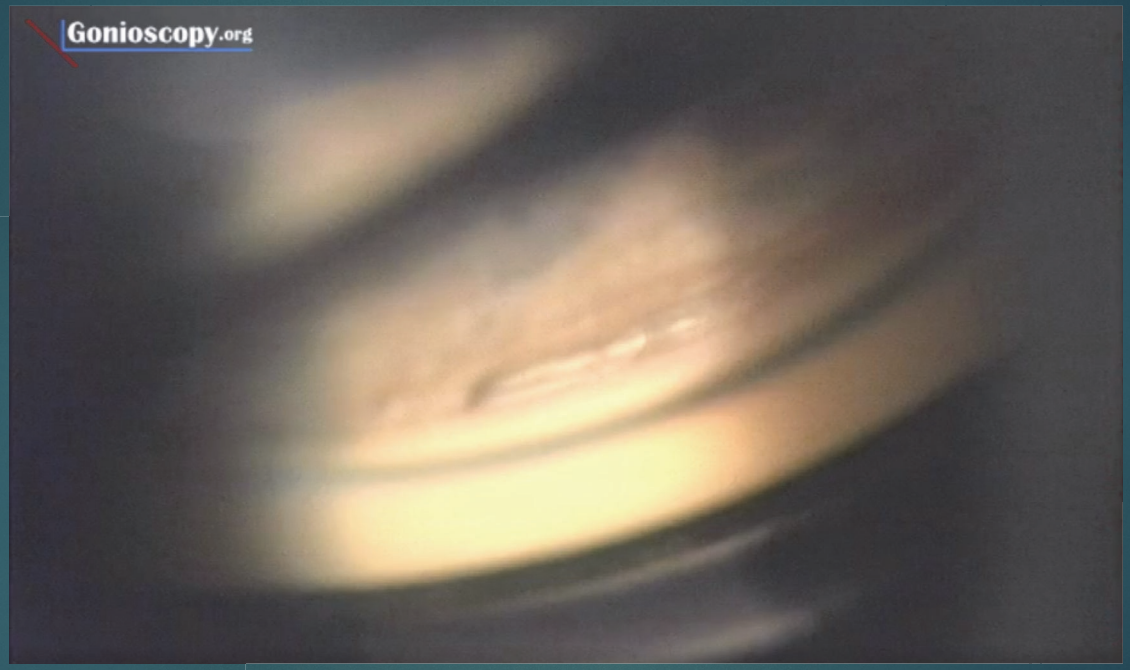

Not a good candidate for any glaucoma laser
*Angles with florid NVA respond very poorly
to non surgical treatment

Angle recession
Diminished outflow, not a good candidate for SLT



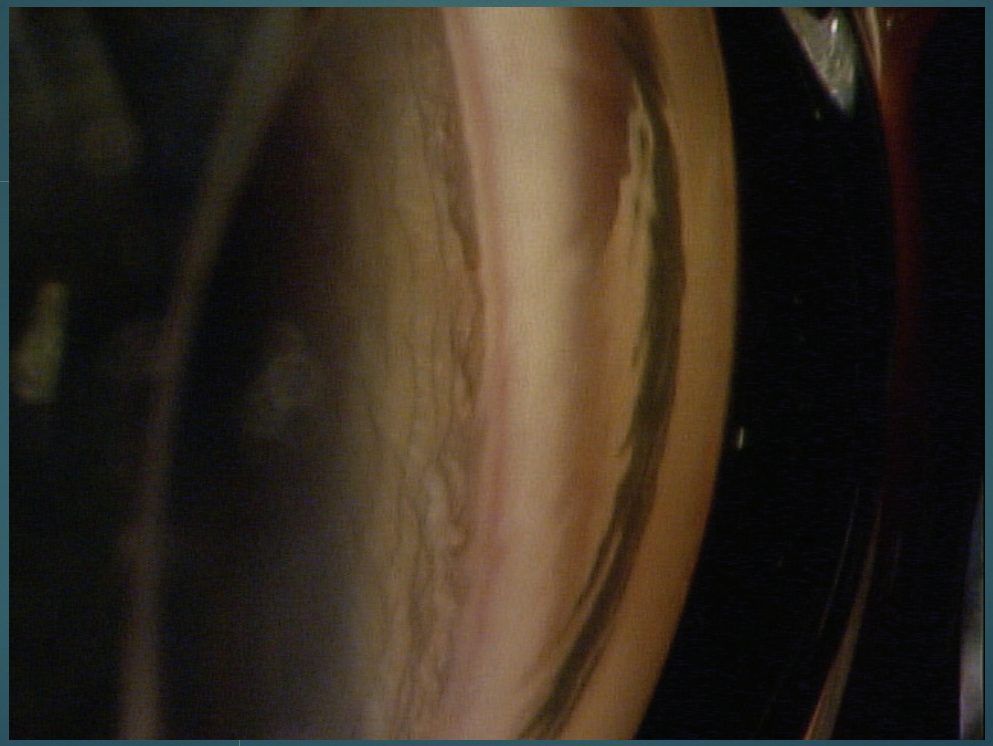
Peripheral Anterior Synechia
Proceed with Caution!

SLT – okay
ALT – not okay
LPI – okay in emergencies, but often fail



Cyclodialysis cleft

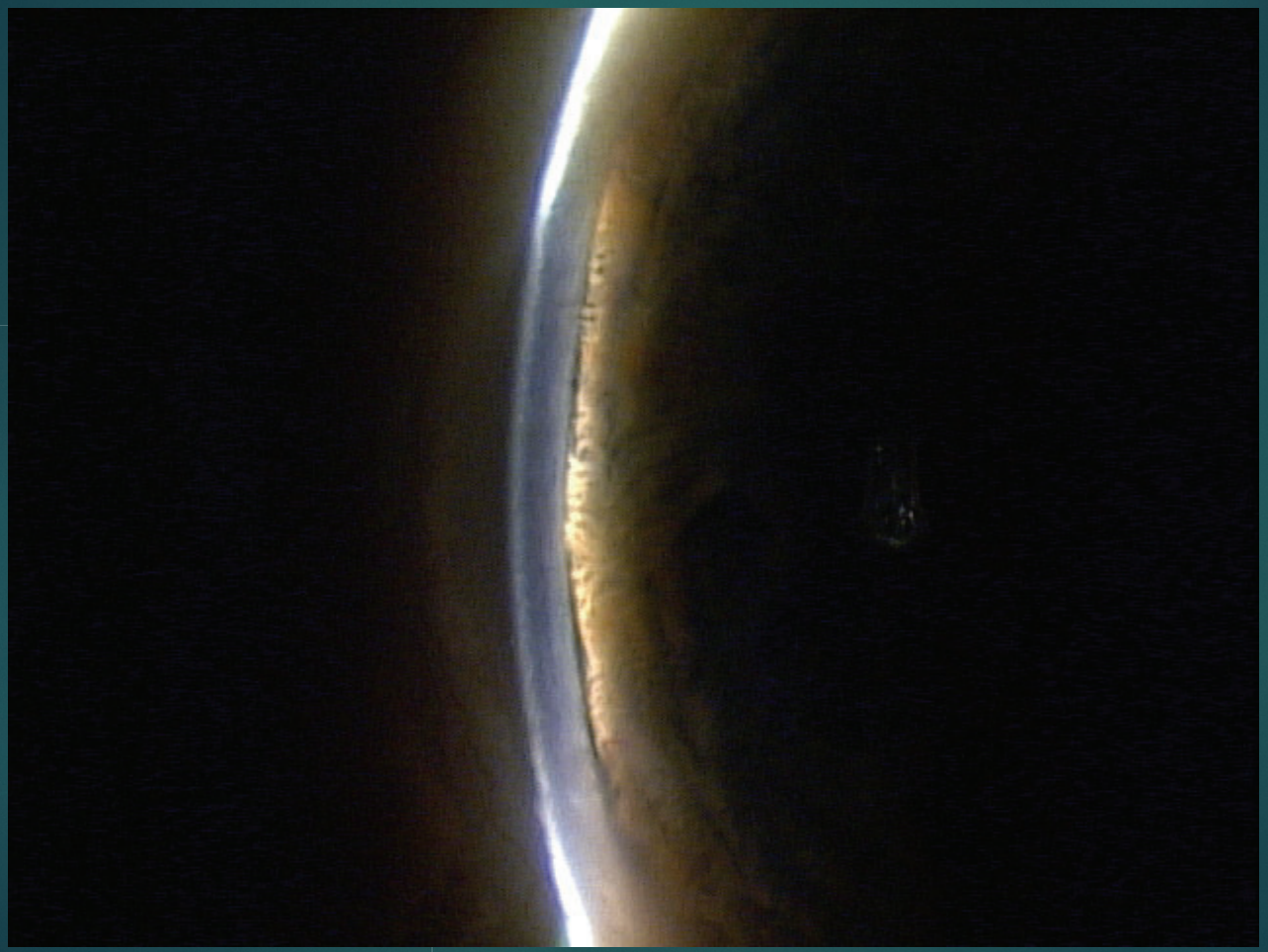

Scattered low grade PAS from previous ALT
Good candidate for SLT!



Blood in Schlemm's Canal

NOT A GOOD SLT CANDIDATE

- 25 yoF presents with 1 week blurry vision
- Sc VA 20/400 OU
- BcVa 20/30 (Mrx -3.00 OU)
- ROS: Positive for Migraines



Trokeni XR (Topiramate)

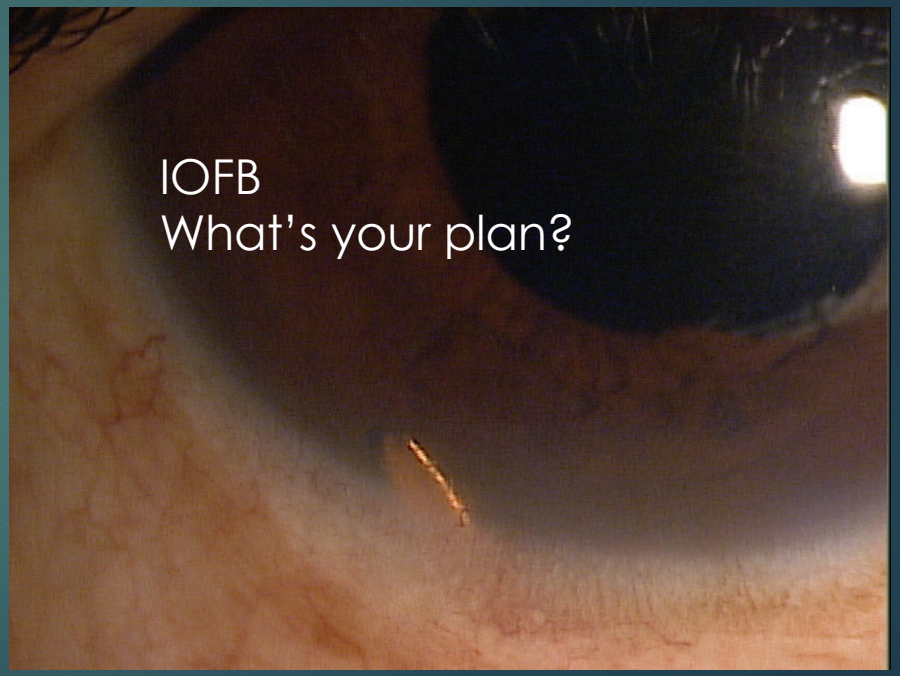
- IOP is 14 OU
- Any questions?

Topiramate-Induced Acute Bilateral Angle Closure Glaucoma and Transient Myopia: A Teaching Case Report

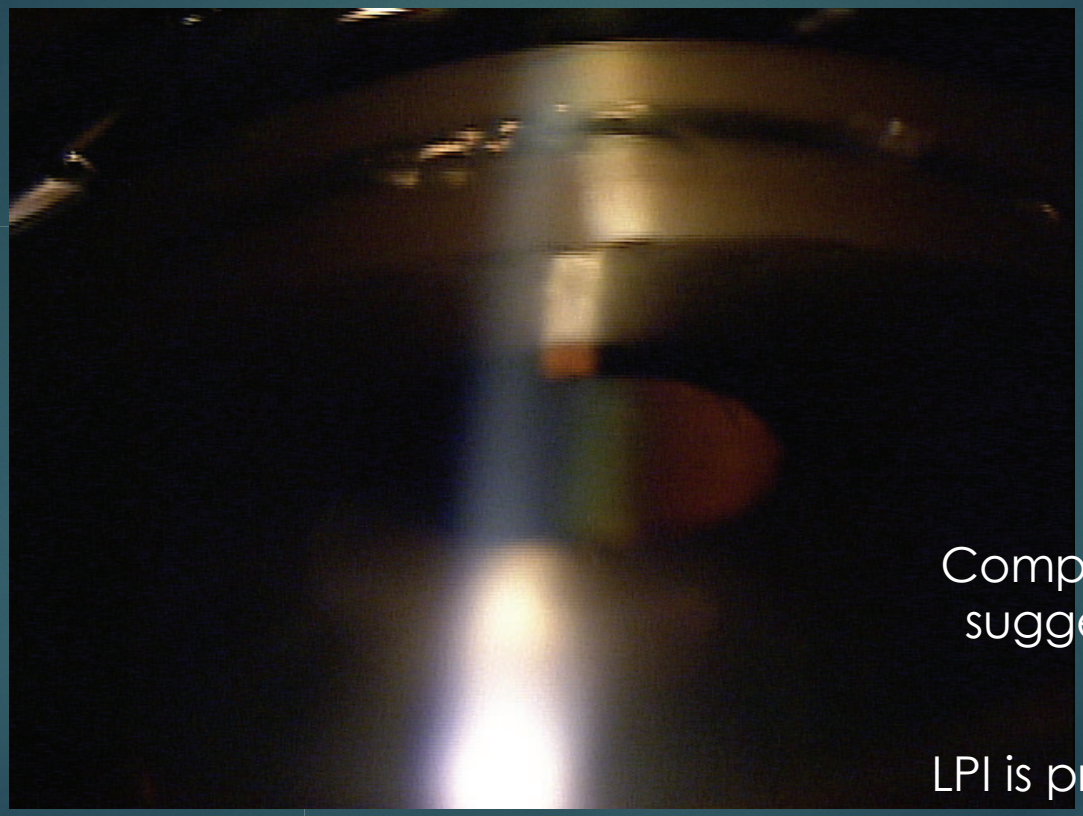
Vanessa Santos-Nevarez OD, Jenette Cantrell OD, FAAO, Paul Gruosso OD, Joseph Miller OD, FAAO, Tina Culotta-Glynn DO

Abstract

- What is the treatment?
- Do we see this anywhere else?



IOFB
What's your plan?

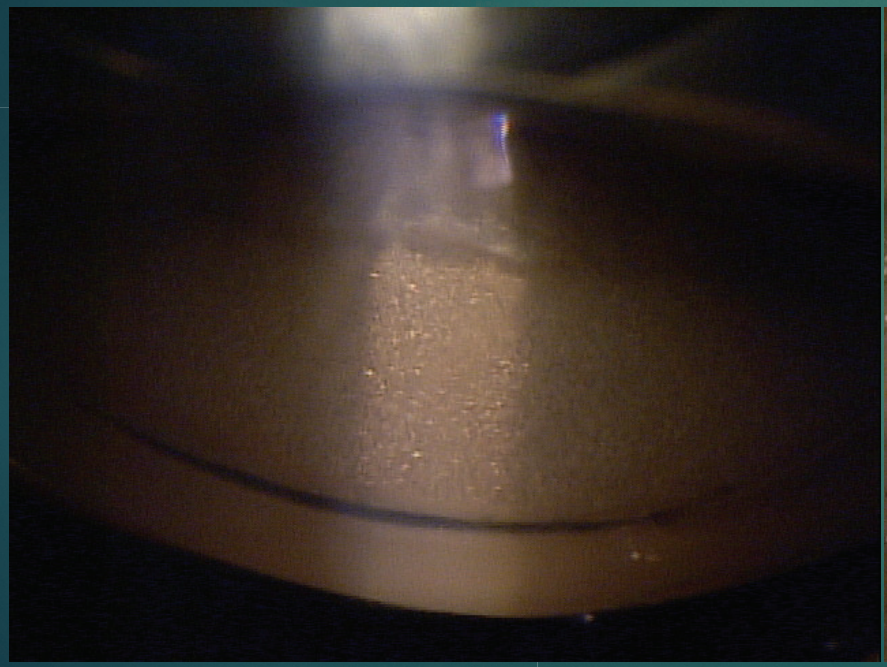


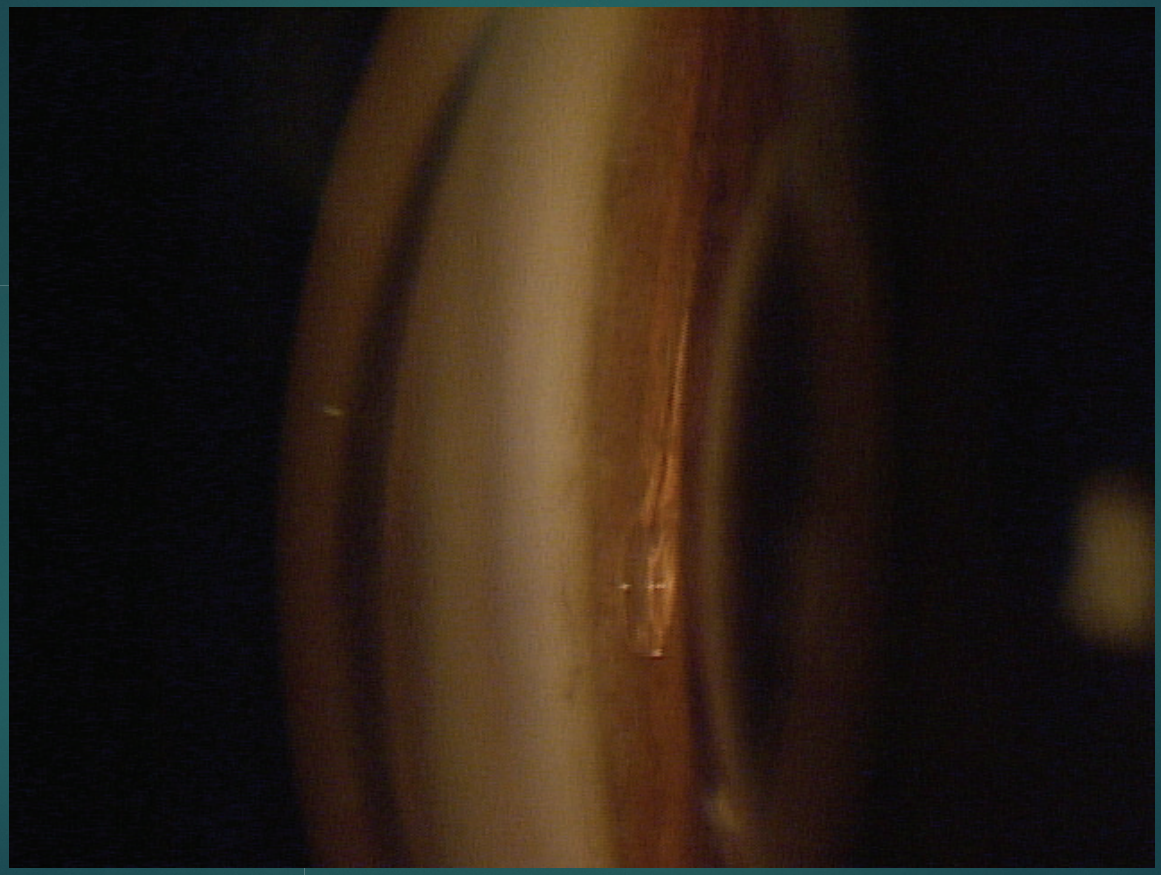
57yoM
20/40
IOP 25
2+NS

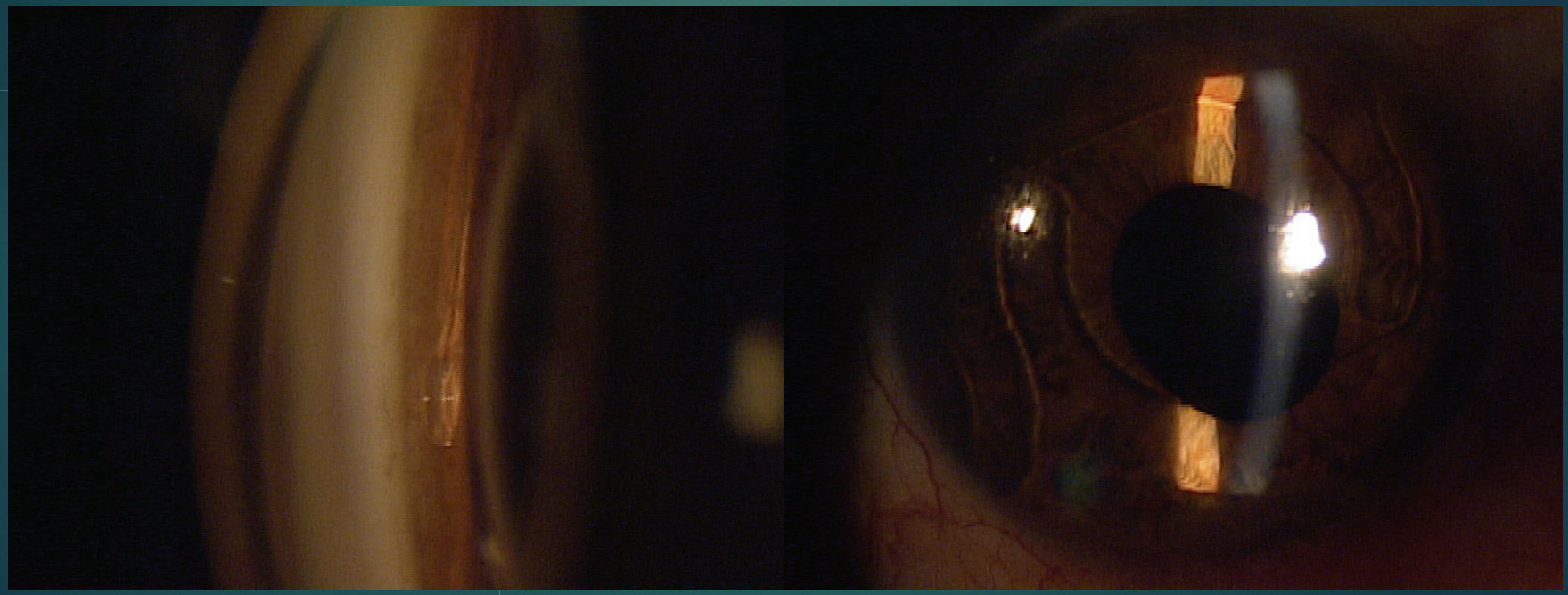
Compression on Gonio
suggest scattered PAS

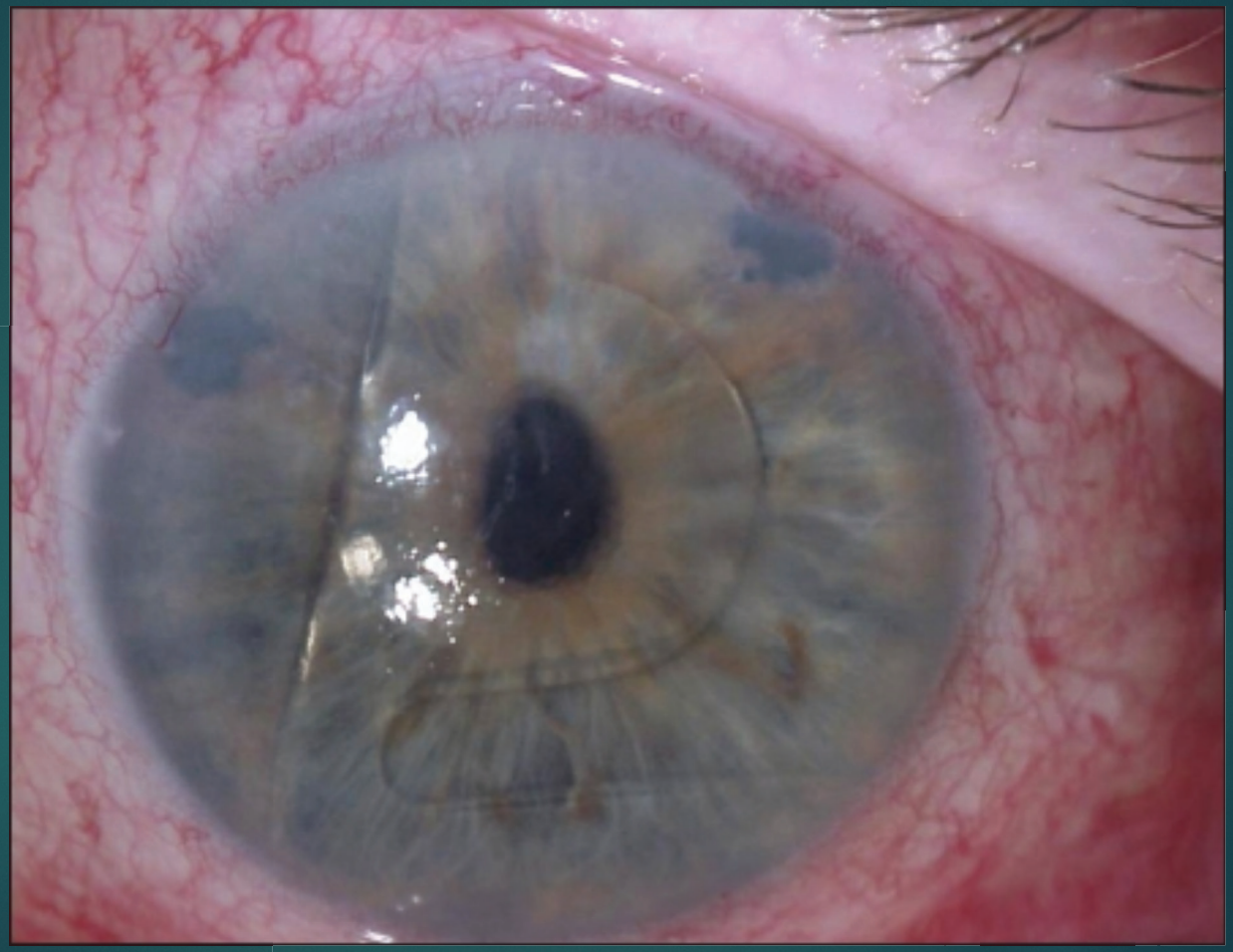
LPI is probably a bad idea!

Emulsified Silicone Oil



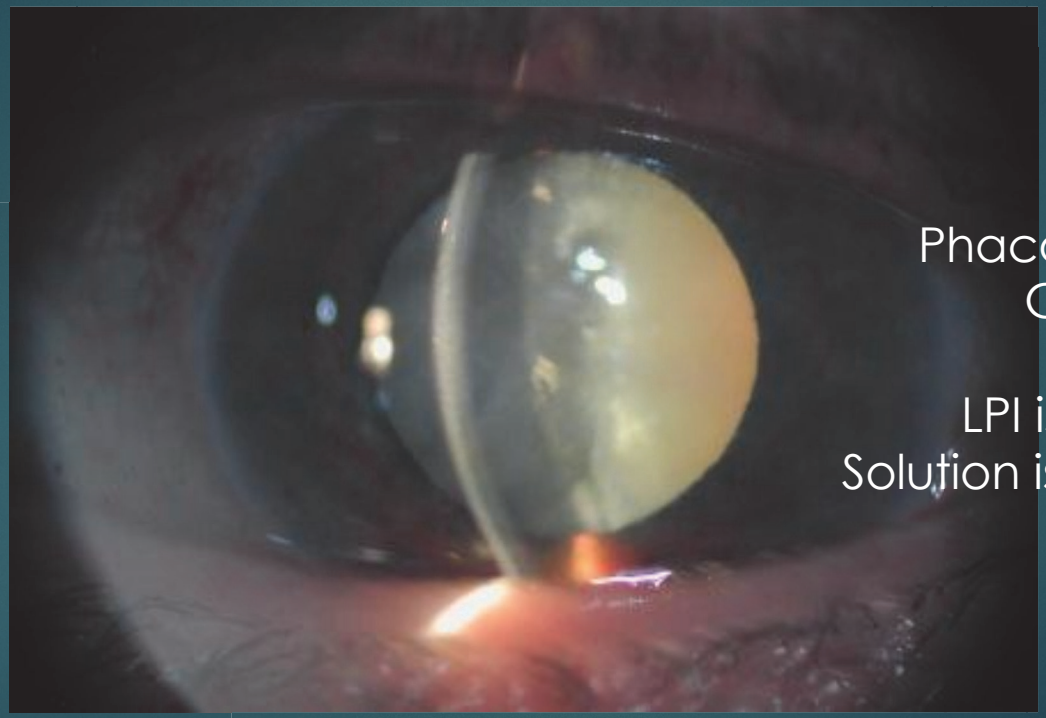






Anterior Chamber IOL's

- Do Gonioscopy!
- Look for correct angle placement of lens haptic
  - Suspect incorrect position in cases of asymmetric Guttata
  - Or PBK in an eye with ACIOL
    - Glaucoma tubes that rub the endothelium are similar offenders
- At risk for Pupillary block!
  - Need LPI

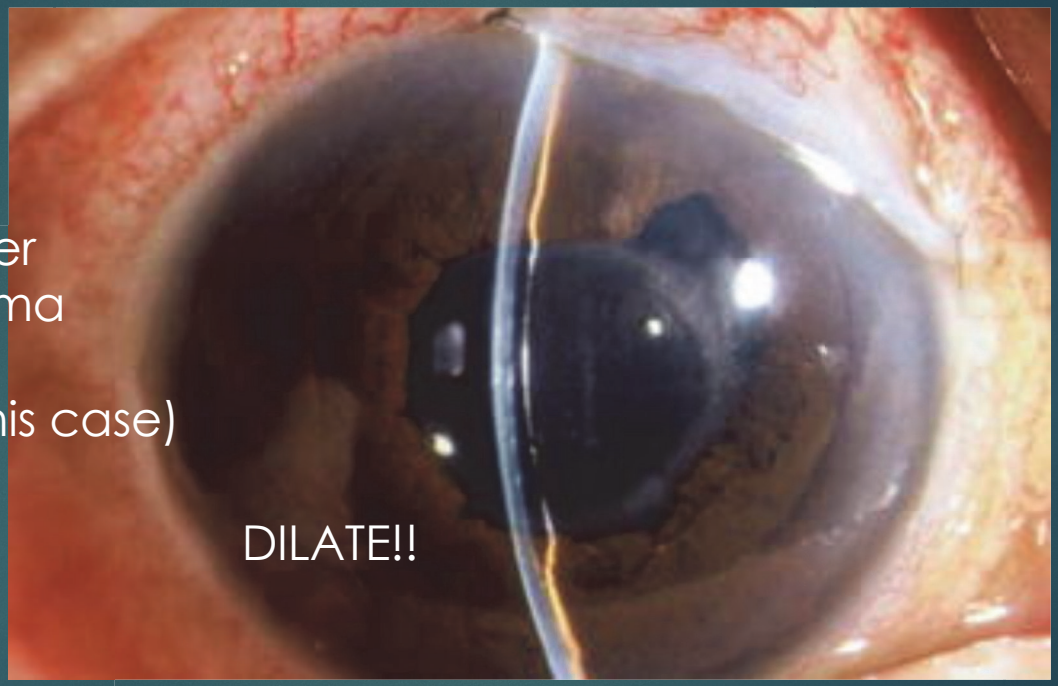


Phacomorphorphic Glaucoma

LPI is a bad idea
Solution is cataract surgery


1 mo following uneventful cataract surgery, a refractive iritis ensues
A retained lens fragment may only be visible on gonio!

Shallow chamber following glaucoma surgery (Trabeculectomy in this case)



End

- Practice…Practice……Practice!!!