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2025
AFOS/SECO
**EDUCATION
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San Antonio

Course # 118

Anterior Segment Lasers
for the Optometric Physician

Jeff Anastasio, OD

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Disclosure statements:
No financial relationships to disclose

All relevant relationships have been mitigated.

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Anterior Segment Lasers for
the Optometric Physician

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Financial Disclosures

- Currently I have no disclosures
- I am primarily a clinician and educator in private practice
- Board member of American Society of Optometric Surgeons
- Member of Laser and Surgical Procedure Exam Committee, NBEO

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Are Optometrists Qualified to do advanced procedures?

- Currently 11 States allow laser procedures and Lumps and Bumps and beyond in the United States
- Currently 15 additional states allow advanced procedures but prohibit laser surgery in the United States
- Schools are teaching the procedures

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MOST COMMON LASER PROCEDURES

- YAG
- SLT
- PI
- PRK
- ASP?
- Femtosecond?

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YAG LASER CAPSULOTOMY

- Uses a 1064 nm YAG laser
- Pre Op
 - Entering VA
 - BP
 - Anterior Segment evaluation
 - Examine size and shape of pupil pre-dilation
 - IOP
 - Dilate, pretreat with alpha agonist of choice typically Brimonidine or Apraclonidine
 - Wait at least 25 minutes for pharmacologic affect

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YAG LASER CAPSULOTOMY

- Focus is imperative
 - Always ensure laser is in focus for you
 - Do NOT assume the HeNe beam alignment and focal point of the laser are the same
- Use of a Laser Lens is Practitioner preference
 - Abraham lens
 - If using a lens, you will need a coupling Solution
 - Hydroxypropyl methycellulose is standard.... I like a viscous PM artificial tear gel
- Arm Support
- Proparacaine OU with or without a lens

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YAG LASER CAPSULOTOMY

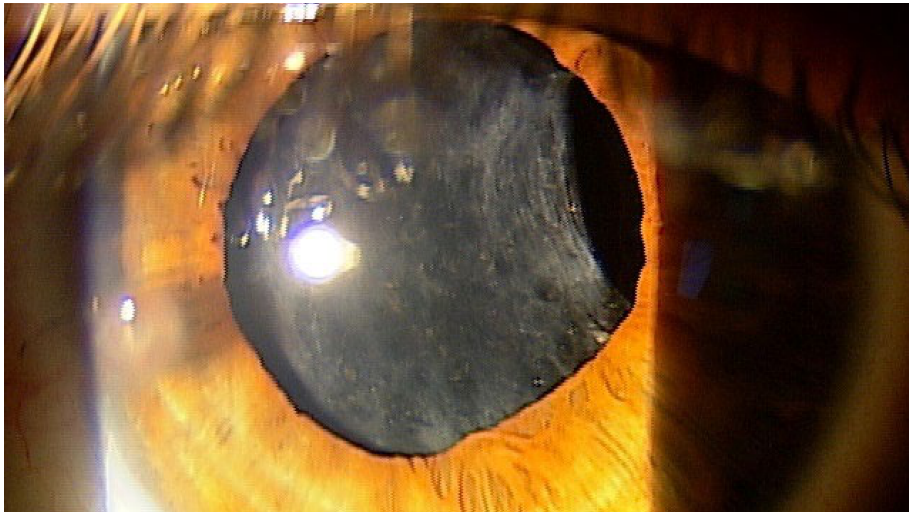
- Power
 - Typical starting point is 0.8mJ-1.5mJ
 - Watch tissue reaction with power setting... Don't be afraid to increase when needed
- Offset
 - YAG Laser energy is directed back towards the practitioner from point of focus
 - To protect the IOL a posterior offset is recommended, typically 250 microns
- Pulses
 - Single pulse setting

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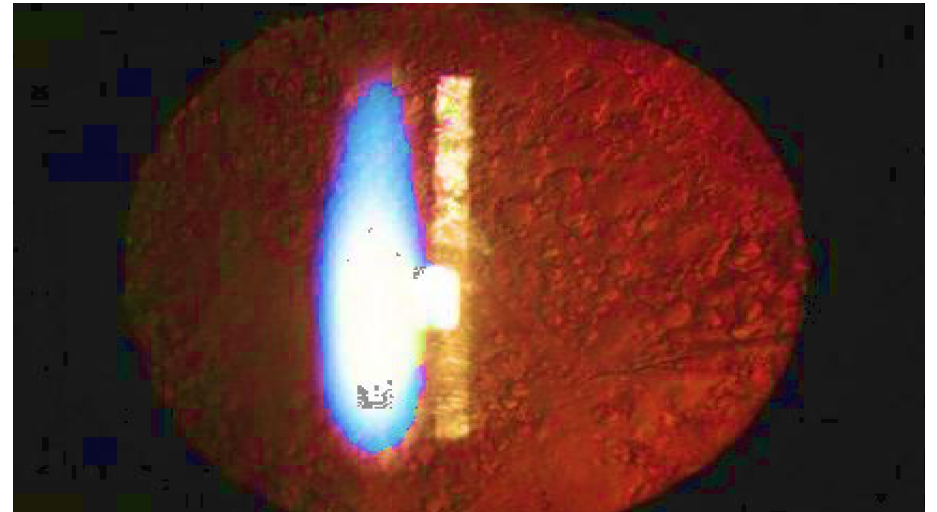
YAG LASER CAPSULOTOMY

- Pattern
 - Cruciate or cross pattern most common
 - Circinate (Circular)
 - Horseshoe
- Size
 - Typically want to create an opening of the capsule larger than Scotopic pupil size
- Total Energy
 - More energy greater risk of IOP spike
 - If more than 100mJ of energy administered, consider stopping and follow up procedure

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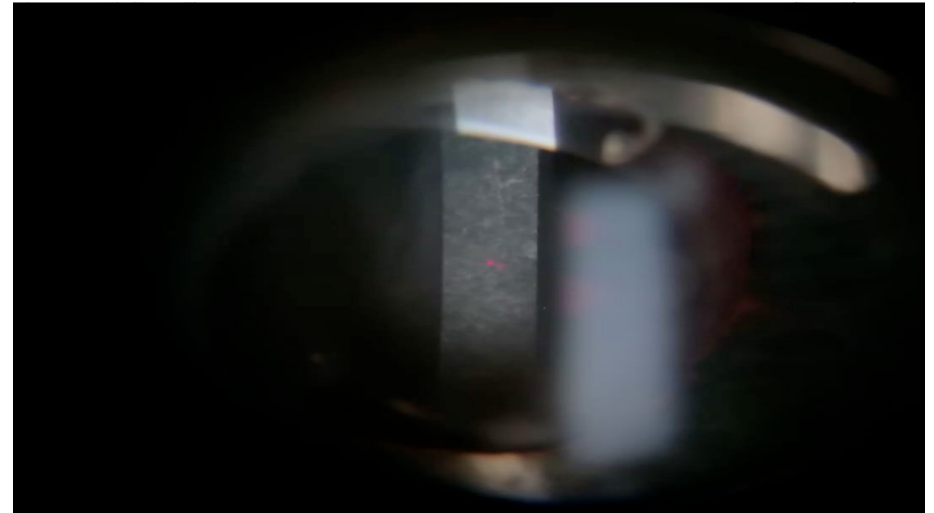
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YAG LASER CAPSULOTOMY

- Post Op
 - Immediately after procedure
 - Flush Eye to remove coupling solution
 - Add alpha agonist of choice
 - Steroid?
 - Discuss expectations floaters, possible redness
 - 30-60 minutes Post op
 - Check VA
 - BP
 - Anterior Segment
 - IOP
 - Rx Steroid?
 - Follow up Visit

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YAG LASER CAPSULOTOMY Complications

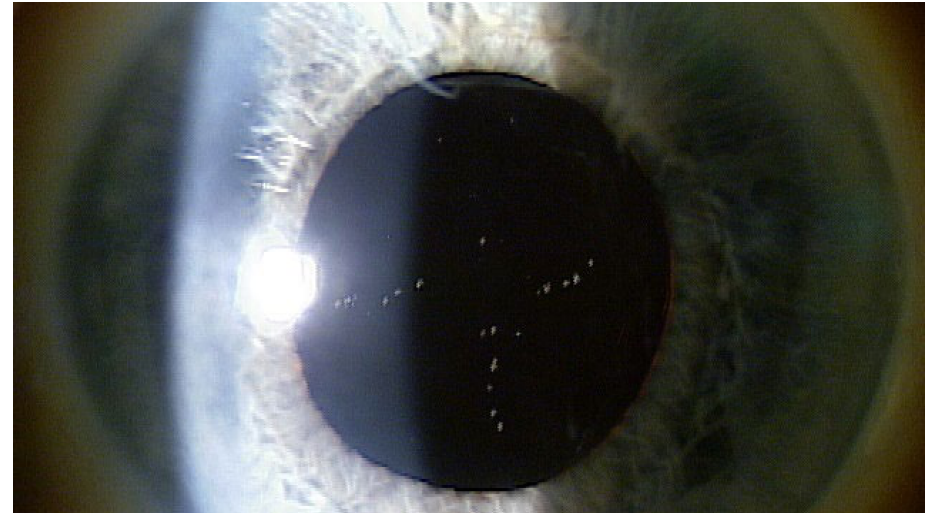
- All complications are rare from the procedure, but these are more commonly observed
- Pitting of IOL
- IOP Spike
- Uveitis

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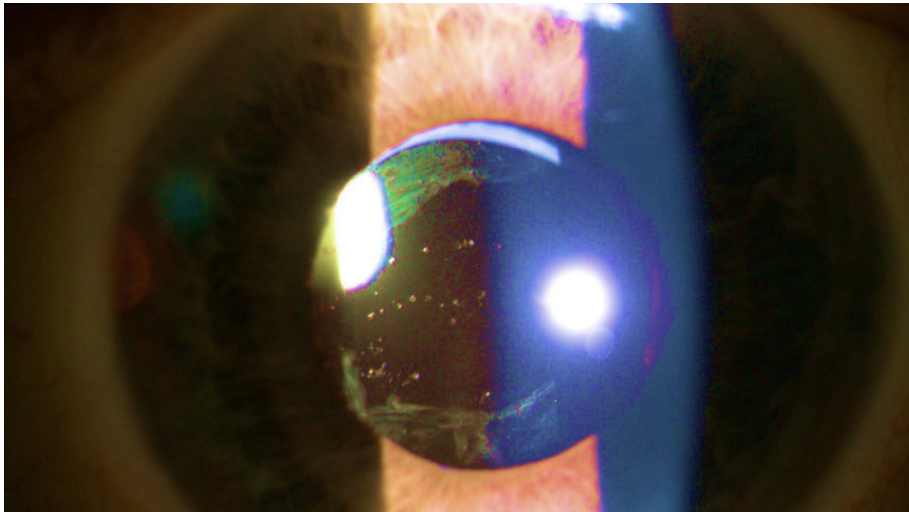
YAG LASER CAPSULOTOMY

- Pitting of the IOL
 - Pitting can damage the IOL, also can cause visual acuity issues
 - Confirming focus before the procedure helps lessen risk of pitting
 - Avoid visual axis with your treatment pattern
 - Use sufficient offset to avoid the IOL

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YAG LASER CAPSULOTOMY Complications

- IOP Spike
 - Most common complication¹
 - Typically occurs 30-60 minutes after procedure is completed
 - More common with higher energy and larger capsular opening
 - Smaller capsulotomy opening helps prevent
- Uveitis
 - Treat topical steroid of choice

¹Karathan E, B D, Koyak S. An Overview of Nd:YAG Laser Capsulotomy. Med Hypothesis Diagn Innov Ophthalmol. 2014 Summer(2): 45-50

Selective Laser Trabeculoplasty

- Uses a 532 Q switched frequency doubled YAG Laser
- Pre Op
 - VA, BP, Anterior Segment Evaluation, IOP
 - Gonioscopy
 - Need to know have an open angle and would ideally like to see CB in at least one quadrant
 - Need to evaluate pigmentation of TM
 - Treat with Alpha Agonist of choice, Brimonidine and Apraclonidine common
 - Pilocarpine is optional
 - Wait at least 25-30 minutes post alpha agonist treatment

Selective Laser Trabeculoplasty

- Initial Energy Setting
 - SLT is pigment dependent, more pigment more energy delivered
 - Standard pigmented TM 0.6mJ – 1.0 mJ appropriate
 - Pigmented TM use less power... 0.4mJ to 0.6 mJ appropriate
- Confirm Focus
- Most lasers don't allow adjustment of pulses and offset in SLT mode
- Position patient in laser and be certain you have enough movement available to see the superior and inferior angle.
- Have an arm rest available for the procedure

Selective Laser Trabeculoplasty

- Must use a laser lens
 - Latina and rapid SLT lens are most common
- Each has a "Flange"
- Coupling fluid required for both
- Latina Lens pictured



Selective Laser Trabeculoplasty

- Rapid SLT lens pictured

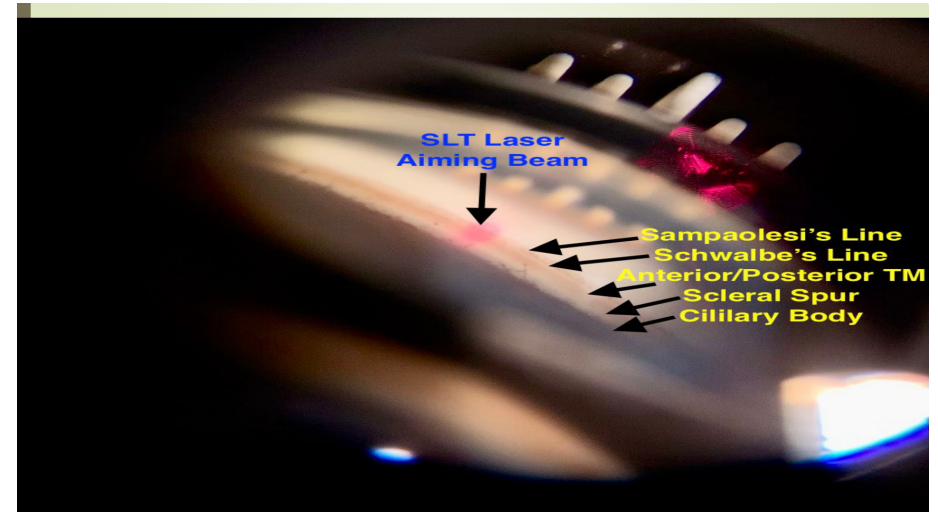


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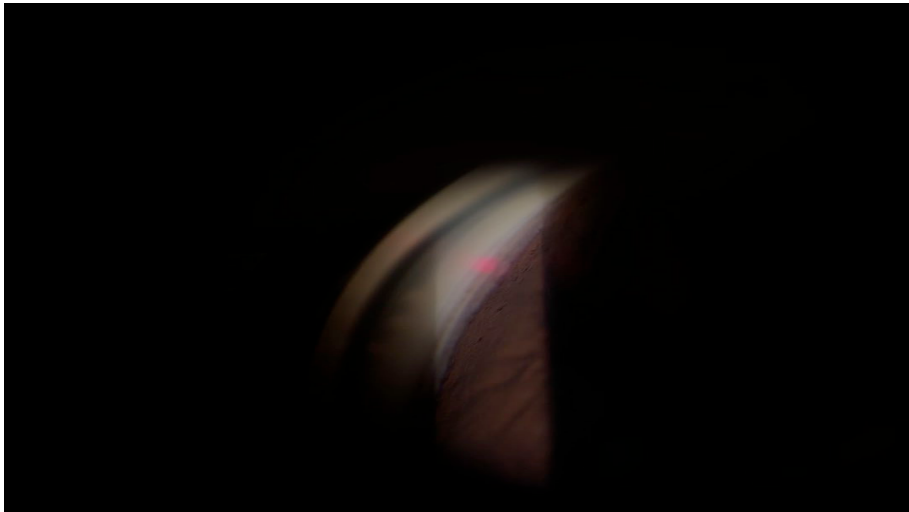
Selective Laser Trabeculoplasty

- Treatment area
 - 360 vs 180 vs 90 degrees
 - Depends upon patient and pigmentation level
- Laser Target is 400 microns should cover the entire TM
- Target pattern is each spot should touch edge to edge
- Champagne bubbles
 - Should see bubble formation, not always every pulse but should see some
 - Violent bubbles on each pulse could be too much energy
- High energy can also manifest as pain to the patient or possible blanching of the TM

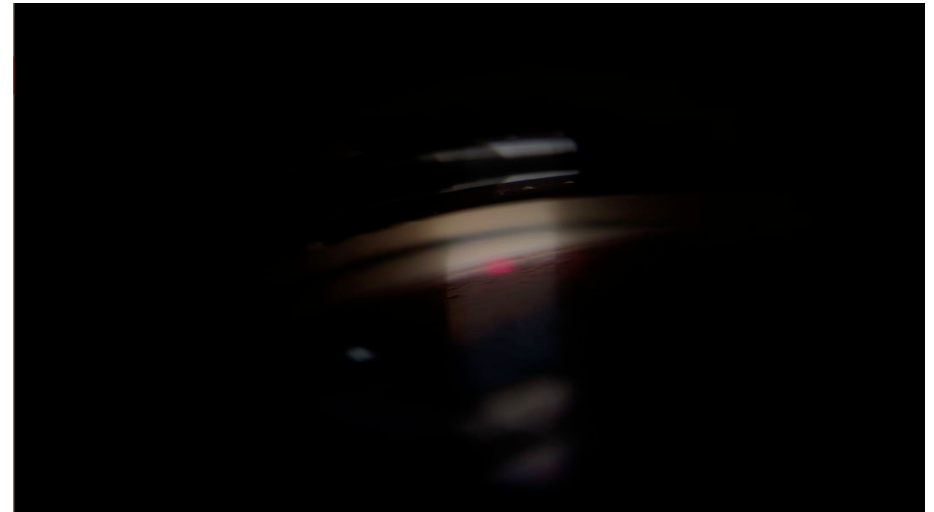
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Selective Laser Trabeculoplasty Post Op

- Rinse out coupling fluid
- Drop of alpha agonist of choice, Brimonidine or Apraclonidine most common
- Check VA, BP, Anterior Segment, IOP
- Rx steroid or NSAID?
- Follow up 11-14 days, 2-3 months

Selective Laser Trabeculoplasty Complications/Considerations

- Pigmented Angle
 - Must decide on amount of angle to treat based on pigmentation
 - Will want to lower power setting if heavy pigment
- Hyphema
 - It is Possible
 - Apply pressure to globe through laser lens it will cause the bleeding to stop

Selective Laser Trabeculoplasty Complications

- IOP Spike
 - Potentially serious complication after laser surgery
 - Any IOP rise over 10mmHg after laser surgery is a potential emergency
 - In office treatment protocol
 - Start with another drop of alpha agonist
 - Can add timolol or timolol combination drop
 - Alternate every 15 minutes
 - If after 30-45 minutes no drop can consider oral CAI
 - If IOP still rising after 1 hour consider oral hyperosmotic. 0.5 to 1.0 g/kg of oral glycerin or isosorbide
 - If no response may require IV Mannitol 1.5-2.0 g/kg infused over 30 minutes

Selective Laser Trabeculoplasty

- Apprehensive Patient
 - Currently most states that allow Laser privileges also allow an Rx for controlled substances
 - If a patient is very apprehensive treat the patient
 - Rx (2) 5 mg tablets of Diazepam
 - Have patient take one 30 minutes prior to arrival at office, if needed take the second during pre op
 - If you go this route DO NOT allow patient to drive to or from your office
 - Alprazolam, Lorazepam other options

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Peripheral Iridotomy

- Uses 1064 nm YAG laser
- Pre op
 - VA, BP, Anterior Segment evaluation, IOP
 - Pretreat with alpha agonist and Pilocarpine
 - Confirm focus of laser
 - Initial energy setting
 - 2.5 mJ to 5.0 mJ to start
 - Pulses can be set at 1, 2, or 3
 - Offset is typically set at zero

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Peripheral Iridotomy

- Determine location of PI
 - Locate a crypt in the iris ideally at 11 or 1 o'clock
 - Some like 3 or 9 o'clock
- I suggest a laser lens
 - Iridectomy lens
 - Abraham lens
 - Will need coupling solution
- Arm support

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Peripheral Iridotomy Procedure

- Confirm location of PI
- Get a good view
 - Be prepared for a cloudy view/cornea if pupil block present
- Once treatment has begun try and get through the iris as quickly as possible
 - Expect bubbles, debris, and pigment to work into your view, longer you work the worse that can get
 - A lighter iris tends to be thinner than darker iris

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Peripheral Iridotomy Procedure

- End point of the procedure is a pigment plume from the treatment zone
 - Transillumination doesn't guarantee patency
- Once through the iris enlarge the PI opening to 0.5-1.0mm
- Be prepared for bleeding at treatment site
 - Main reason for laser lens to have a way to generate hemostasis
 - Gentle pressure will stop bleeding even with blood thinning medications

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Peripheral Iridotomy Post Op

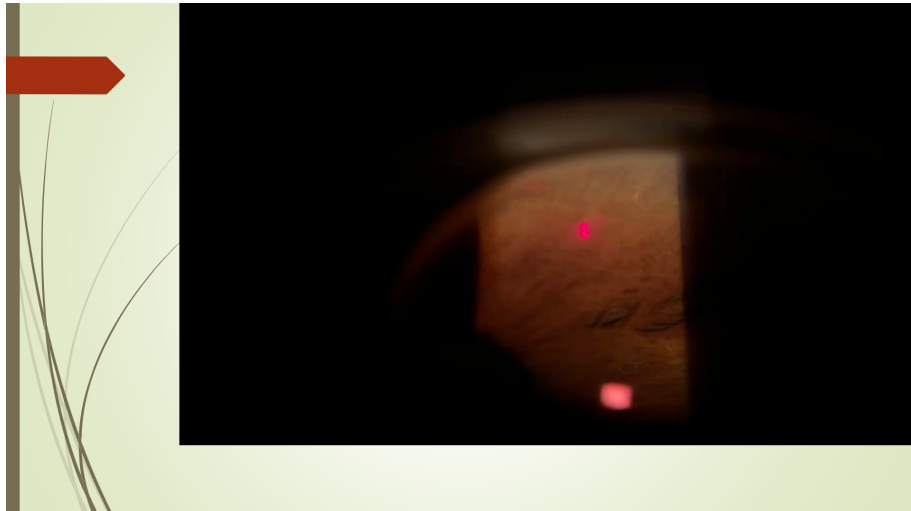
- Once procedure is completed flush coupling gel
- Add alpha agonist of choice
- Add one drop of topical steroid of choice
- 30- 60 minutes post op
 - Check VA, BP
 - Evaluate Anterior segment watching for residual bleeding
 - Check IOP
 - Rx Topical steroid
 - Follow up 1-3 days, 2-4 weeks

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Peripheral Iridotomy Complications

- Most common issue post operatively is not completing the PI
 - Many stop at transillumination, not pigment plume
 - Can be harder to tell if debris and bubbles cloud view
- Hyphema
 - Not a question of if, just a question of when you will have one
 - Have an idea of what you will tell your patient if hyphema occurs
- IOP Spike
 - Same treatment as other procedures
- Uveitis
 - Expected after PI
 - Rx steroid

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