

Ophthalmic Procedures Made

SARAH GLASS, MD, PGY-2 | CASEY EYE INSTITUTE, OHSU
OAO TECHNOLOGY MEETING 2019
MARCH 9, 2019



Financial Disclosures

- ▶ I have no actual or potential conflict of interest in relation to this presentation.

Objectives

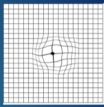

- ▶ Understand the principles of aseptic technique when assisting with minor ophthalmic procedures.
- ▶ Gain an understanding of the indications for, general steps, and set-up for common ophthalmic procedures
- ▶ Be able to educate patients about post-procedure expectations and standard post-procedure care.

Common Procedures

- ▶ Intravitreal injection
- ▶ Chalazion excision
- ▶ Eyelid biopsy
- ▶ Laser procedures:
 - ▶ YAG capsulotomy
 - ▶ Laser peripheral iridotomy (LPI)
 - ▶ Glaucoma lasers
- ▶ Fluorescein angiography
- ▶ AC tap
- ▶ Etc. etc

Case 1: 78 yo male with 1 week blurred vision

- ▶ Long history of non-neovascular AMD
- ▶ Reports decreased vision in the left eye, + distortion on Amsler grid
- ▶ BCVA
 - ▶ 20/25, 20/100
- ▶ DFE
 - ▶ OD: many soft drusen
 - ▶ OS: many soft drusen, in macula, sub-retinal hemorrhage consistent with neovascular AMD


Diagnosis?

- ▶ Wet AMD (neovascular age-related macular degeneration)
- ▶ Patient receives intravitreal anti-VEGF injection in clinic that day

Intravitreal Injection

COMMON INDICATIONS:

- ▶ Anti-VEGF/ Corticosteroids:
 - ▶ Wet AMD
 - ▶ Diabetic retinopathy
 - ▶ CNV (choroidal neovascularization)
 - ▶ Macular edema
- ▶ Antibiotics:
 - ▶ Endophthalmitis



Anti-VEGF

- ▶ Inhibits vascular endothelial growth factor (VEGF)
- ▶ Examples:
 - ▶ Bevacizumab (AVASTIN®)
 - ▶ Ranibizumab (LUCENTIS®)
 - ▶ Aflibercept (EYLEA®)
 - ▶ ANCHOR/ MARINA trials

Intravitreal Injection

- ▶ Supplies
- ▶ Patient positioning
- ▶ Anesthesia
- ▶ Sterile technique
- ▶ Complications

Supplies



- ▶ Setup:
 - ▶ Sterile field
 - ▶ Anti-VEGF medication
 - ▶ Tb syringe for marking
 - ▶ Tb syringe for subconjunctival anesthesia
 - ▶ Tb syringe for injection
 - ▶ 2% lidocaine without epinephrine
 - ▶ 30 g x2 needle for injection
 - ▶ 18g needle x2 for drawing up med
 - ▶ 5% povidone iodine
 - ▶ Proparacaine drops
 - ▶ Sterile gloves
 - ▶ Cotton swabs
 - ▶ Masks
 - ▶ Eyelid speculum (typically wire)

Patient Positioning/ Room Setup

- ▶ Recline patient to 30 degrees
- ▶ Assistant performs time out
 - ▶ Verify patient name, DOB, laterality, procedure
- ▶ Draw up medication with 1cc syringe, 18g needle w/sterile technique
 - ▶ Bevacizumab 1.25mg in 0.05cc
 - ▶ Ranibizumab 0.5mg in 0.05cc
- ▶ Masks for all medical personnel
- ▶ Patient asked not to speak during procedure from this point forward


Anesthesia

- ▶ 1. 1 drop proparacaine
- ▶ 2. Subconjunctival 2% lidocaine without epinephrine
 - ▶ 30 gauge needle on Tb syringe
 - ▶ Surgeon forms subconjunctival bulla in superotemporal or inferotemporal quadrant



Injection/ Aseptic Technique

- ▶ Don sterile gloves
- ▶ Insert sterile eyelid speculum
- ▶ Topical povidone iodine (PI) to eye after sub-conj lidocaine
 - ▶ 3mm posterior to limbus if pseudophakic
 - ▶ 3.5-4mm posterior to limbus if phakic
- ▶ Mark site of injection with TB syringe without needle
 - ▶ 3mm posterior to limbus if pseudophakic
 - ▶ 3.5-4mm posterior to limbus if phakic
- ▶ Apply 1 additional drop of PI 5% to injection site
 - ▶ WAIT 30 seconds for PI to dry
- ▶ Injection given
- ▶ Immediately cover injection site with sterile swab for 5 seconds
- ▶ Remove speculum
- ▶ Rinse eye well with sterile saline (failure to rinse well leads to calls about post-procedure iodine irritation)
- ▶ Cover other eye, ask patient to count fingers



Why do we care about aseptic technique?

- ▶ Endophthalmitis
 - ▶ Most feared complication – aseptic technique is absolutely critical!
 - ▶ Incidence 0.019%-0.09% (Lau et al)
 - ▶ Evidence supports using povidone iodine antiseptic, eyelid retraction with speculum, preventing oral flora from entering eye (not talking vs wearing mask)

Intravitreal Injection

What to expect after the procedure

- Soreness at the injection site
- Subconjunctival hemorrhage (especially if sub-conj anesthesia used)
- Transient elevation of eye pressure

Worrisome symptoms:

- Decreased vision
- Worsening pain/ redness
- Flashes/ floaters/ curtain across vision

Case 2: 63 yo F with nighttime glare

- ▶ CEIOL both eyes 8 months prior
- ▶ Began to develop glare similar to pre-op in the RIGHT eye
- ▶ BCVA
 - ▶ 20/40+
 - ▶ 20/20
- ▶ DFE with posterior capsular opacification extending into visual axis




Diagnosis?

- ▶ Posterior Capsular Opacification
- ▶ Patient undergoes YAG capsulotomy

YAG Capsulotomy

- ▶ COMMON INDICATIONS:
 - ▶ **YAG Capsulotomy:**
 - ▶ Symptomatic posterior capsular opacification (PCO) – laser opens posterior capsule to create clear visual axis



Patient FAQs– Capsulotomy

- What is this procedure?** A laser is used to create a small hole in the membrane behind the plastic lens to clear the vision
- Will this make my vision better?** Ideally, yes. In some cases, it may not.
- Will it hurt?** No, it should not be painful.
- When do I need to follow up?** About 2 weeks, at that time the eye will need to be dilated again
- Why do I need to use the steroid eye drop?** To prevent inflammation after the procedure

YAG Capsulotomy

- ▶ Supplies
- ▶ Setup
- ▶ Procedure
- ▶ Post-procedure Care

Supplies

- ▶ Capsulotomy:
 - ▶ **Tropicamide 1% / phenylephrine 2.5% drops**
 - ▶ Proparacaine drops
 - ▶ **Capsulotomy lens**
 - ▶ Hypromellose 2.5% or celluvisc
 - ▶ Apraclonidine 0.5% drops
 - ▶ Saline flushes

Setup - Capsulotomy

- ▶ Work up patient:
 - ▶ Vision/ pupils/ IOP
 - ▶ **Dilate** patient's eye
 - ▶ Physician consents patient
 - ▶ Set up Laser

	YAG Capsulotomy	YAG LPI
Power	1 mJ	2.0 – 5.0 mJ
Shots/ pulse	1	1
Focus (anterior/posterior)	Posterior	Posterior

Procedure - Capsulotomy

1. Assistant performs time out: Verify patient name, DOB, laterality, procedure
2. Instill 1 drop **proparacaine** to operative eye
3. Fill YAG capsulotomy with **hypromellose** or celluvisc
4. Position patient in laser
5. Ensure all have laser safety glasses
6. Contact lens placed on eye, laser procedure completed
7. Wash out extra hypromellose or celluvisc with saline
8. Instill 1 drop **apraclonidine** 0.5%

Complications - Capsulotomy

- ▶ Pits in IOL
- ▶ Transient rise in IOP
- ▶ Rarely damage to posterior segment structures

Post-Capsulotomy

What to expect after the procedure

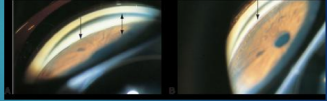
- Dilated eye for 4-6 hours (capsulotomy)
- Mild blurred vision
- May see one large floater descend in field of vision (the posterior capsule fragment)
- Possible FB sensation/ irritation

Post-operative Care

- Prednisolone acetate 1% QID x 1 week
- Return in 2 weeks for DFE and IOP check. MRx if capsulotomy done
- Call for decreased vision/ pain/ flashes/ floaters

Case 3: 68 yo F present for annual exam

- ▶ Hyperopic, comes for annual exam
- ▶ Several brief periods of R eye pain, brow ache, rainbow haloes around lights
- ▶ Family history of angle closure glaucoma
- ▶ BCVA: 20/20 OU
- ▶ SLE:
 - ▶ Cornea: clear
 - ▶ AC: Narrow by Van Herick technique
- ▶ Gonioscopy: appears closed 180 degrees



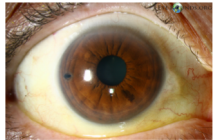
AAO

Diagnosis?

- ▶ Angle Closure Suspect
- ▶ Patient undergoes Laser Peripheral Iridotomy

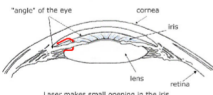
Laser Peripheral Iridotomy

- ▶ COMMON INDICATIONS:
 - ▶ **YAG Laser Peripheral Iridotomy (LPI)**
 - ▶ Anatomically narrow angles
 - ▶ Angle closure suspect
 - ▶ Angle closure glaucoma – laser creates alternative path for aqueous to enter the anterior chamber



Eyerounds

Patient FAQs– LPI



"angle" of the eye cornea iris
lens retina
Laser makes small opening in the iris facilitating fluid flow in the eye. LPI (LJO, 2003)

What is this procedure?	A laser is used to create a small hole in the side of the iris to help fluid drain from the eye.
Why do I need this?	The angles in the eye are narrow, placing the patient at risk for a rare but devastating form of glaucoma – angle closure glaucoma.
Will this make my vision better?	No.
What will it feel like?	It often feels like a mild rubber-band snapping, but it is transient
Will I still have glaucoma after this?	Yes, this only aims to lessen the risk of angle closure glaucoma
Why do I have to come back in 1 week?	The pressure must be rechecked.

YAG Laser Peripheral Iridotomy

- ▶ Supplies
- ▶ Setup
- ▶ Procedure
- ▶ Post-procedure Care

Supplies - LPI

- ▶ LPI:
 - ▶ **Pilocarpine 1% drops**
 - ▶ Proparacaine drops
 - ▶ **Abraham Iridotomy Lens**
 - ▶ Hypromellose 2.5% or celluvisc
 - ▶ Apraclonidine 0.5% drops
 - ▶ Saline flushes

Setup - LPI

- ▶ Work up patient:
 - ▶ Vision/ pupils/ IOP
 - ▶ **Apply 1 drop each Pilocarpine 1% and Apraclonidine 1% (20 mins prior to procedure)**
 - ▶ Physician consents patient
 - ▶ Set up Laser

	YAG Capsulotomy	YAG LPI
Power	1 mJ	2.0 – 5.0 mJ
Shots/ pulse	1	1
Focus (anterior/posterior)	Posterior	Posterior

Procedure - LPI

1. Assistant performs time out: Verify patient name, DOB, laterality, procedure
2. Instill 1 drop **proparacaine** to operative eye
3. Fill Abraham iridotomy contact lens with **hypromellose** or celluvisc
4. Position patient in laser
5. Ensure all have laser safety glasses
6. Contact lens placed on eye, laser procedure completed
7. Wash out extra hypermellose or celluvisc with saline
8. Instill 1 drop **apraclonidine** 0.5%
9. Recheck IOP 30-45 minutes post-procedure

Complications - LPI

- ▶ Microhyphema/ Hyphema
- ▶ Post-procedure IOP spike
- ▶ Damage to other structures
- ▶ Dysphotopsias

Post-LPI

What to expect after the procedure

- Mild blurred vision
- Mild brow ache from pilocarpine
- Possible FB sensation/ irritation

Post-operative Care

- Prednisolone acetate 1% QID x 1 week
- Return in 1-2 weeks for IOP check, repeat gonioscopy
- Call for decreased vision/ pain/ flashes/ floaters

Case 4: 45 yo F with LUL bump

- ▶ Present x 4 weeks
- ▶ Initially improved with warm compresses, erythromycin ointment prescribed by PCP
- ▶ BCVA: 20/20 OU

Diagnosis?

- ▶ Chalazion
- ▶ Patient undergoes chalazion excision that day

Chalazion Excision

- ▶ INDICATIONS:
 - ▶ Chalazion not resolving with conservative therapy (warm compresses, erythromycin ointment)

Chalazion Excision

- ▶ Supplies
- ▶ Patient positioning
- ▶ Anesthesia
- ▶ Sterile technique/ Procedure
- ▶ Post-operative Care

Supplies

- ▶ Setup:
 - ▶ Sterile field
 - ▶ 3cc syringe
 - ▶ 18g needle, 30g needle
 - ▶ 2% lidocaine with epinephrine
 - ▶ Proparacaine drops
 - ▶ 5% povidone iodine swabs
 - ▶ Sterile gloves
 - ▶ Antibiotic ointment
 - ▶ Cotton swabs/ sterile gauze
 - ▶ Chalazion clamp
 - ▶ Chalazion curette
 - ▶ 11 blade
 - ▶ Bishop forceps
 - ▶ High temp cautery (out but not opened)
 - ▶ Pathology specimen jar (if recurrent)
 - ▶ Surgical marking pen

Patient Positioning/ Room Setup

- ▶ Set up minor procedure room including local anesthetic in 3c syringe w/sterile technique
- ▶ Print out patient labels for pathology specimen
- ▶ Correct eyelid and incision site is marked prior to anesthesia
- ▶ Assistant performs time out
 - ▶ Verify patient name, DOB, laterality, procedure

Anesthesia

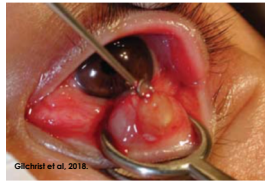
- ▶ 1. 1 drop proparacaine
- ▶ 2. Physician injects subcutaneous 2% lidocaine with epinephrine locally into area of interest



Glitchist et al, 2018.

Procedure/ Sterile Technique

1. Don sterile gloves
2. Topical povidone iodine to eyelid and eye
3. Clamp placed and lid typically everted
4. Incision made perpendicular to lid margin, contents expressed
5. Curette used to express material
6. Chalazion capsule removed with forceps and scissors
7. Control bleeding with pressure and cautery if needed
8. Clamp removed
9. Antibiotic ointment placed in eye



Chalazion Excision

What to expect after procedure

Bruising at site of excision
Mild bloody tears for 1-2 days
Foreign body sensation

Post-operative Care

Ointment BID-TID for 1-2 weeks
Return in 1-2 weeks
Call for worsening pain/ redness

References

- Lou et al. Current Evidence for the Prevention of Endophthalmitis in Anti-VEGF Intravitreal Injections. *J Ophthalmol*. 2018
- Gichrist, H, and Lee, G. Management of chalazia in general practice. *Australian Family Physician* 2018.
- Bagheri et al. *Wills Eye Manual* 7th Edition.
- Nyers et al. "Intravitreal Injection Technique: A Primer for Ophthalmology Residents and Fellows" *EyeRounds*
- Chen et al. "Glaucoma Laser Treatment: Laser Peripheral Iridotomy" *Digital Journal of Ophthalmology*. 2003.