

Sightline's 17th Annual Continuing Education Program

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Under Pressure - IOP Considerations in the Ocular Surgery Patient (Cataracts, EK and MIGS)

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Financial Disclosure



None of the speakers today have a financial interest or are compensated by any company regarding the topics to be discussed.

Pre-Op - The Surgical Referral

- Control the referral
 - Recommend the office that you would go to or send a family member
- Communication with Surgical Office
 - Historical vs Current Information
 - VA, Refraction, IOP
 - Other historical factors
 - Trauma, Surgery, Medications, Allergies, Failed treatments,
 - Amblyopia, Pseudoexfoliation, Fuch's
 - **REASON FOR REFERRAL**

Pre-Op Considerations

- Communicate reason for referral to the patient
 - Give some expectations
 - Give recommendations (targets, type of IOL, procedure, etc.)
 - ie. cataract surgery is not done the day of the exam
 - ie. patient with Fuch's will have discussion on transplant
 - If patient is on pressure lowering drops, discuss the need to continue

Prior to Referral for Cataract Evaluation

- Take a quick look at the following:
 - Epithelium
 - Dryness, Basement Membrane Dystrophy, etc.
 - Endothelium
 - Guttae
 - Lens
 - Do the lens changes correlate with patient's acuity??
 - Macula
 - ERM's, Pseudoholes, etc.
 - Optic Nerve
 - Any atrophy or pallor
 - Glaucoma, NAION, etc.

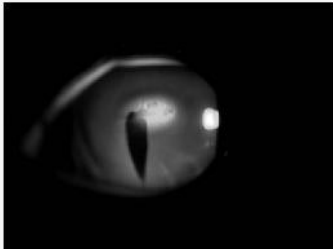
Pre-Op in Surgical Patients

- Optic Nerve Status
 - Healthy nerve vs nerve with atrophy
 - Central Corneal Thickness - risk for damage
 - Visual Field - current defects
 - Pre op IOP - needs to be reasonable to proceed with planned surgical procedure, have to plan for IOP spike
 - Patients with normal optic nerves tend to tolerate IOP changes
 - **Patients with glaucoma do not...and they are more likely to see pressure spikes!!**

Low IOP Post-op

- Causes for low IOP in immediate post op period
 - Non healing/leaking wound - (+) Seidel
 - If IOP is low, paint fluorescein strip above wound
 - Look for "dark area" within fluorescein pool
 - Cyclodialysis
 - Ciliary body insufficiency

Positive Seidel Sign

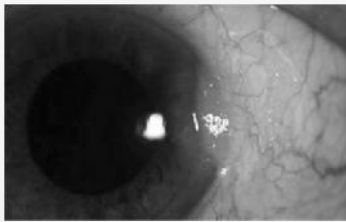


Management of Wound Leak

- Bandage contact lens
- Aqueous suppressant
 - Timolol BID
 - Brimonidine BID
- Wear shield full time to limit any rubbing
- Continue with regular drops, stressing not to rub eyes
- See patient back the next day, remove lens and recheck IOP and wound
 - If IOP back in normal range and negative seidel, discontinue aqueous suppressant and see back in a week
 - If IOP still low and wound continuing to leak, refer pt back to surgeon

Management of Wound Leak

- If significant leak or wound that continues to leak, refer back to surgeon
 - Consider a suture or Resure Glue



High Post-Op IOP - Cataracts

- Causes for pressure to increase in post op period
 - Immediate Post Op
 - Retained Viscoelastic material
 - Retained lens fragments (anterior and posterior)
 - Inflammation
 - Late post-op
 - Steroid response

Retained Viscoelastic

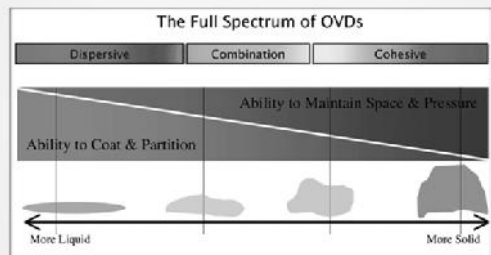
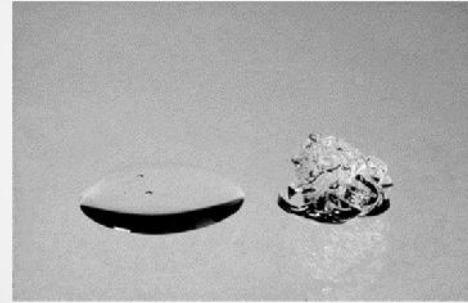


Figure 1. Ophthalmic viscosurgical devices can be described according to the consistency spectrum, from dispersive to cohesive. Dispersive OVDs have a better ability to coat and partition, while cohesive OVDs have a better ability to maintain space and pressurize. Combination products aim to address both ends of the spectrum.

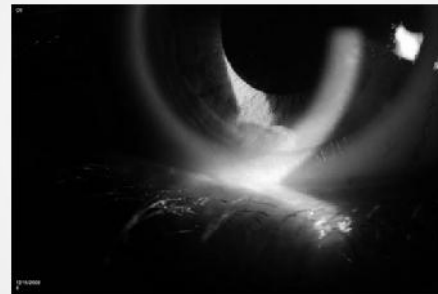
Dispersive vs Cohesive Viscoelastics



Management of Retained Viscoelastic

- Time
 - Viscoelastic material will absorb

Retained Lens Fragment



Retained Lens Fragment



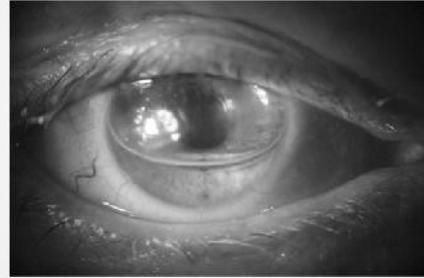
Management of Retained Lens Fragment

- Nuclear lens fragments will usually need to be surgically removed.
 - These fragments have the appearance of a piece of rock salt.
- Cortical material can be monitored and may absorb.
 - These fragments have a fluffy or wispy appearance.
- If lens fragment is observed, need to watch the following:
 - Corneal edema
 - Requires referral back to surgeon for removal.
 - Inflammation
 - May require more frequent or longer dosing of steroid.
 - IOP
 - Manage accordingly.

High Post-Op IOP - EK

- Causes of Pressure increase
 - Immediate post op
 - Pupil block causes by gas bubble
 - Inflammation
 - Long term
 - Steroid response

Post-Op Bubble for EK Surgery



Treat it like a Patriot's Football



Steroids - Friend or Foe?

- Positive effects of Steroids
 - Anti-inflammatory
 - Reduce swelling
 - Inhibit wound healing and fibrosis
 - Limit wound healing response
 - Reduce scarring

Steroid - Friend or Foe?

- Negative effects of steroids
 - Hasten the formation of posterior subcapsular cataracts in phakic patients
 - Cause immunosuppression
 - Virus
 - Fungus
 - Can cause elevated intraocular pressure

1960's Experiment on Normal Subjects

- Mansour Armaly, MD
 - Placed steroid drops in the eyes of normal volunteers 3 times per day for 1 month
 - Found 3 levels of responders:
 - 66% - pressure increased by less than 5mmHg
 - 30% - pressure increased by 6 to 15mmHg
 - 5% - pressure increased by more than 15mmHG
- **These numbers suggest that you need to worry about one out of every three people in the healthy population having a steroid response.**

Patients Most Likely to Have Steroid Response

- POAG patients
- Low tension glaucoma patients
- Glaucoma Suspects
- Kids 4-6 years old
- First degree relative of patients with POAG
- Patients with myopia
- Type 1 diabetics
- Previous Steroid responder
- Patients with traumatic glaucoma
- Fuch's or keratoconus patients who undergo penetrating keratoplasty

Management of Post-op IOP Spike

- All treatment is relative to health of optic nerve and pre-op IOP
- **In an otherwise healthy eye** at 1 day post op:
 - IOP >30mmHg, insert drop of aqueous suppressant and see back in a week
 - IOP >40mmHg, insert aqueous suppressant and make patient return for IOP check in 30-60 minutes
 - If a nice reduction in pressure is noted, prescribe aqueous suppressant bid and see in a couple days to a week
 - If minimal or no reduction, add more drops and give patient 250-500mg acetazolamide and recheck again in 30-60 minutes.
 - If reduced, continue drops and see in 1 day
 - If not reduced, refer patient back to surgeon

Management of Post-op IOP Spike

- IOP Lowering Drops
 - Beta Blockers - Timolol
 - Alpha Adrenergic Agonists - Brimonidine (prefer 0.1% or 0.15%)
 - Carbonic Anhydrase Inhibitors - Dorzolomide
 - Prostaglandin Analogs - Latanaprost
- Oral Preparations
 - Acetazolamide - 250 and 500mg tablets, 500mg ER

Beta Blockers (timolol)

- Reason to use
 - Onset of action occurs after 10-20 minutes and lasts for 24 hours
- Method of action
 - Decreases aqueous production
- Not recommended in patients with asthma, uncompensated heart failure, and COPD.
- Works quickly, cheap (\$4 cash at Walmart, \$11-\$12 at other locations) and safe

Alpha Adrenergic Agonist (brimonidine)

- Reason to use
 - Works quickly
 - Lowers IOP within 1 hours with a peak of 2-3 hours
- Method of Action
 - Dual method of action (aqueous suppression and increased aqueous outflow)
- Safe to use in adults
- Relatively cheap (\$17 cash at Costco, \$31-\$37 at other locations)

Carbonic Anhydrase Inhibitors (dorzolomide/acetazolamide)

- Limit use as drop in corneal dystrophy/graft
 - Has the potential to cause corneal edema
 - Not recommended in patients with poor endothelial function
 - Guttata
 - Corneal Graft (EK or PK)
 - More expensive (\$47 at Costco, \$84-\$122 at other locations)
- Acetazolamide
 - Used when IOP spike will not respond to drops
 - 250mg - 1gm per day in divided dosage
 - 30, 250mg tablets - \$57-\$70 at various locations

Prostaglandin Analogs (latanaprost)

- Limited use after surgery
 - Slower onset - 2-3 hours
 - Pro Inflammatory
 - More likely to cause CME post surgery
 - Can cause issue when determining if patient is having rejection episode
 - Cost - \$19 at Costco, more expensive at other locations \$51-\$111

Summary

- Post-Op IOP tolerance dependent on pre-op parameters
- Optic nerve health, IOP, CCT, visual field defects
- More relaxed with patient with healthy optic nerve and normal to thick pach's
- Tighter tolerance required when patient is at more risk of damage to post op spike.
- When pressure spikes, choose treatment with lowest risks.
- Beta blockers and Alpha agonists vs CAI's and prostaglandins

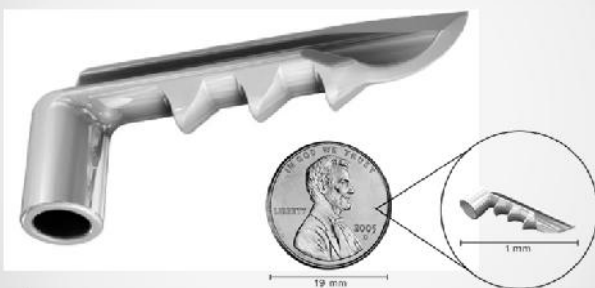
Other Considerations

- Patient with Ocular Hypertension who also has cataracts....
- Patient with glaucoma who is non compliant and needs cataract surgery....
- What are your options:
 - Drops
 - SLT
 - MIGS

Minimally Invasive Glaucoma Surgery

- Introduction:
- MIGS has emerged as a safe alternative to conventional surgeries for mild to moderate open angle glaucoma
- MIGS is a group of procedures that treat specific areas of outflow tract:
 - TM: iStent, Hydrus, Ab interno Canaloplasty, Trabectome, goniotome, Kahook dual blade
 - Supraciliary space: Cypass
 - Subconj space: Xen

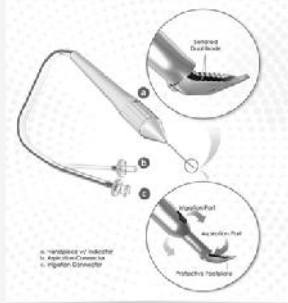
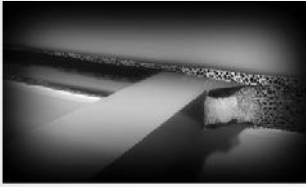
iStent



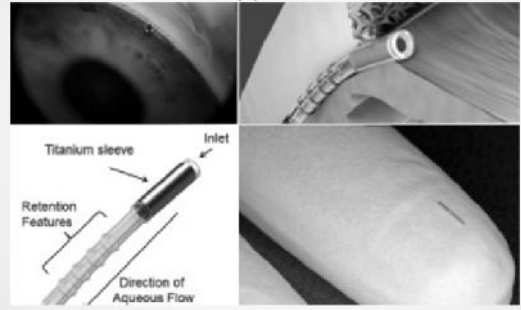
Trabectome (Neomedix)

- Trabectome is an ab interno trabecular ablation using microelectrocautery to ablate the trabecular meshwork and inner wall of Schlemm canal.
- Trabectome surgery may be performed independently or in conjunction with other intraocular procedures such as cataract extraction/IOL placement

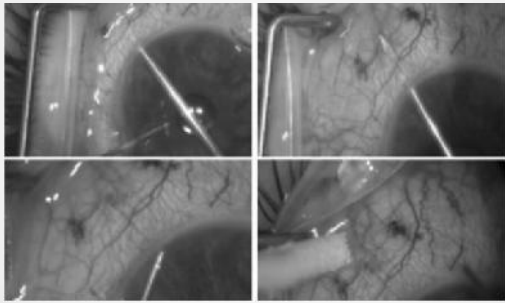
KDB vs Goniotome



Cypass



Xen



Xen



Don't let IOP get you Under Pressure

