“Post operative Care of the Cataract Patient”
“A photographic voyage through the mundane”
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No disclosures

Risks of Cataract Surgery
- Cataract surgery has possible sight threatening complications:
  - Retinal Detachment
  - Endophthalmitis
  - Corneal Decompensation
  - Anesthesia complications
  - Cystoid Macular Edema
  - Oh yeah, and death…

Outline: Post op guessing game
- But this stuff isn’t what we see
- More often we look at “non sight threatening” findings and wonder:
  - What is that?
  - Is that what’s causing the patient’s symptoms?
  - Does it need treated or will it go away on its own?
As ODs, we are at an inherent disadvantage in assessing eyes postoperatively. Why?

We don’t see what happens during the surgery

Goals

- Improve recognition of the wide range of normal and slightly abnormal findings
- Improve understanding of how what takes place during surgery impacts what we see in the clinic
- Quick review of some of the more sight threatening complications
- Make you more familiar with the “jargon” of cataract surgery

Features to Assess at postoperative visits

- Incision (most important early in course)
- Cornea
- Anterior Chamber
- Iris
- Lens
- Posterior capsule integrity
- Macula and posterior pole
- Peripheral Retina and vitreal cavity (most important late in the course)
The Incision

- Incisions always need to be assessed
- Two common incisions:
  - Clear Corneal Incision
  - Scleral Tunnel

CCI

- Quicker, simpler incision
- Less pain with topical anesthesia
- May be used to reduce ATR cyl
- Does not compromise future glaucoma surgery

Scleral tunnel

- Takes longer to create
  - Greater risk of iris damage and hyphema
  - Impacts future filtering surgery
  - More dependent on level of anesthesia
Scleral tunnels = generally lower risk of endophthalmitis

Good incision's gone bad: It's not the appearance, it's the behavior

- Broad range of normal
- What's abnormal?
  - Leaking Wound
  - Inadvertent bleb formation

Leaking Wounds
Leaking wound

- Treatment
  - May reduce steroid
  - IOP reduction
  - May tamponade with a BSCL
  - In all medical interventions, should adjust antibiotic strategy
  - Glue or suture wound in non resolving cases

Once leaking... now sealed

- Very low IOP
- Shallow anterior chamber
- Patient statement of "eye leaking" or "wet spot on the pillow" the first few days after surgery

Clues to assess wound for leak

- Very low IOP
- Shallow anterior chamber
- Patient statement of "eye leaking" or "wet spot on the pillow" the first few days after surgery
Inadvertent Bleb

- Only possible with scleral tunnel
- A persistently leaking scleral tunnel with an intact conjunctival flap represents a direct route from AC to sub-conjunctival space
- In these cases, filtering blebs can form
- Only requires surgical treatment when creating foreign body sensation and in severe cases, hypotony issues

SCLERAL TUNNEL

- Lower endophthalmitis rate nationally
- More astigmatically neutral
- Less corneal edema
- Risk of bleb formation and hyphema
- May impact future trabeculectomy
- Requires deeper anesthesia
- Takes longer than a CCI
- Greater flexibility with IOL-X

CLEAR CORNEAL INCISION

- Less astigmatically neutral (helpful for small amounts of against the rule astigmatism)
- A quicker incision for the surgeon
- Preserves superior conj. for easier glaucoma surgery
- Better comfort with topical anesthesia
- Higher rate of corneal edema
- Higher endophthalmitis rate nationally

Paracentesis Ports

- Supplemental, small ports for surgeon
  - May have
    - Blood
    - Localized Edema
    - Iris adhesions
    - Lens fragments
    - Vitreous
- Useful for tapping in cases of very elevated IOP post operatively
Corneal (Stromal) Edema

Epithelial Edema

Factors involved in development of post-op edema

More Common
- Wound type
- Inflammatory response
- Very elevated IOP
- Amount of phaco-emulsification
- Shallow AC
- No viscoelastic use
- Endothelial function

Less Common
- Retention of lens fragments
- Detachment of Descemet's Membrane
- Toxic Anterior Segment Syndrome
- Endophthalmitis
**Treatment of Corneal Edema**

- Reduce endothelial stressors:
  - Time
  - Reduce high IOP
  - Reduce excess inflammation
  - Treat infection (duh)
  - Topical hyperosmotics? - minimal effect in these cases unless edema is primarily epithelial in nature
- Surgical management:
  - Removal of lens fragments
  - Repositioning of Descemet’s detachments when significant
  - Posterior Lamellar Keratoplasty in the case of non-clearing edema over 3 months

**Snail tracking**

- Deposits on the corneal endothelium
- Very common feature of early post operative course with modern cataract surgery
- Generally thought to be deposits from viscoelastic use, though may actually represent focal transient areas of endothelial stress
- Occur in 70% of cases at day one
- Self limiting

**Anterior Chamber Findings**

- White cells and pigment
- Fibrin
- Hyphema
- Lens Fragments
- Vitreous
- Findings may be free floating, or at the angle, or at a paracentesis port
Cell, pigment, fibrin, hypopyon

- Anterior Chamber white cells are universal in the early postoperative period
- They should dissipate in the first 1-3 weeks postoperatively
- Lingering cell beyond this time is uncommon, though not rare, and should alert the clinician to carefully assess for lens fragments

Lens Fragments

- Occur during phacoemulsification, rate increased with use of viscoelastic
- Often settle behind the pupil and during the first day, or night migrate to the AC
- May be cortical or epinuclear
- May resolve spontaneously or require surgical removal depending on size and type
- Epinuclear fragments (which look like quartz) are more damaging to the internal structures of the eye and less likely to dissipate

Cell, pigment, fibrin, hypopyon

- Fibrin and hypopyon – NOT normal findings. Eyes with these should be presumed to indicate infectious endophthalmitis unless otherwise proven
Infectious Endophthalmitis

- Most dreaded complication of surgery
- Prognosis is poor
- Early intervention improves outcomes
- May be acute or delayed onset depending on etiology.

Acute: Generally manifests 48-72 hours after surgery. *S. epidermidis*, *S. aureus* and Beta Hemolytic Streptococcal spp (like *Strep pneumoniae*)

Delayed Onset: manifests several weeks after surgery. *S. epidermidis*, *P. acnes* and fungus are etiologies

Incidence is increasing from 0.07%-0.3%

Visual outcome poor without treatment. With treatment:
- 20/40 or better 47%
- 20/100 or worse: 25%
- 20/800 or worse 11%

Refer back to the surgery center for intra vitreal antibiotic and a possible vitreal biopsy (they’ll probably refer to retina)
Toxic Anterior Segment Syndrome (TASS)

- A form of sterile endophthalmitis
- Looks like infectious form
- BIG CLUE: TASS develops within first 24 hours and vision is often less impacted than with infectious endophthalmitis
- Still need to work under the assumption that an eye suspicious for TASS has infectious endophthalmitis

Hyphema

- Hyphema is rare with CCI, more common with scleral tunnel due to leaking episcleral vessels
- As mechanism is different than a traumatic hyphema, cycloplegics may not have much value
- Time, “house arrest” activity reduction, and increased steroids are helpful
- As with a traumatic hyphema, with pressures of 50 mmHg or greater, an AC washout is indicated

Vitreous in AC

Migration of vitreous increases risk of CME and retinal detachment.
Once there, may just be observed unless wicking or causing visual symptoms
Wicks increase risk of endophthalmitis and require removal.

Different time frames
- Early
- Late

Increased IOP is the most frequently encountered condition at post op day 1 which requires treatment.
Estimated that between 18-45% of patients will experience early pressure spikes with up to 10% reaching over 30 mmHg.
Why is the intraocular pressure elevated after cataract surgery?
- Primary = Viscoelastic use
- Pigment/blood
- Inflammatory debris
- Transiently compromised trabeculum

Medical management
- Topicals and orals
- “Burping the paracentesis”
- Time - Early IOP spikes after CE are nearly always transient

What causes late spikes?
- Steroid

Small (smallest implantable medical device) filtering device implanted in the trabecular meshwork which reduces IOP through enhancing outflow
- Impact is relatively low.
  - Mean reduction in meds is ~1.3
  - Mean reduction in meds with CE alone is 1.0...
- Only approved for implantation at the time of cataract surgery
- Only approved for use with mild to moderate primary open angle glaucoma
- Done after the cataract surgery, which opens the angle and facilitates placement
- Check positioning at 1 week post op with gonio
Iris prolapse and insufficient dilation lead to iris and pupillary abnormalities.

- Intra Operative Floppy Iris Syndrome (IFIS) is the chief cause of iris difficulties during surgery.
  - Caused by alpha 1 blocking prostate medication such as Flomax (tamsulosin).
  - Results in poor dilation, iris prolapse, iris billowing and pupillary constriction during surgery.
- Cessation of medication does not offer any immediate benefit.

1 week post Malyugan ring
Treatment of Iris abnormalities

- Patient’s are often unaware of iris findings that are prominent on microscopic exam.
- Even when patient aware of abnormality, typically there is no treatment indicated
- In severe cases, pupiloplasty may be attempted

Posterior Capsular Tear

- May occur during creation of Capsulorrhexis, phaco, or while polishing the capsule.
- Creates compromised lens stability with standard “in the bag” approach
- Increases risk of vitreous loss, CME, RD
- May require:
  - Anterior vitrectomy
  - Injection of intravitreal steroid (to aid in anterior vitrectomy)
  - Modification of lens insertion

Capsular Tears: Intravit steroid

Intra vitreal Triessence 1 day PO – capsular tears often require the surgeon to perform an anterior vitrectomy to prevent vitreal loss. Intra-vit triamcinolone is used to help the surgeon visualize the vitreous

By the way: Trimoxi
Optic is placed in capsule, but haptic remains anterior to it and are placed in the sulcus – utilizes remaining capsular integrity.

Note ovalization of capsular opening around the haptics; indicates optic capture was used to stabilize the lens.

- Reassurance and close monitoring are the chief treatments.
- These eyes have a higher rate of CME and RD careful/timely evaluation and review of symptoms is appropriate.
A proliferation of residual lens epithelial cells after cataract surgery results in a loss of clarity of the capsule and reduced vision. Treatment is with a YAG laser capsulotomy, which is the most common late postoperative complication with rates estimated at 30-50% within 5 years of surgery. But why would you get it at the 1 day post op? It occurs as a result of residual cataract, rather than lens cell proliferation. Treat with YAG—generally no sooner than 3 months post op with standard in the bag insertion of IOL, sooner with sulcus based lens. Patients with significant PSC and Posterior polar cataracts need to be informed of increased likelihood of YAG in the early postoperative period prior to CE.
Early PCO

Capsular Phimosis

Other capsular stuff

Capsular Tension lines/Striae


What do you see?
Capsular tension lines/striae

- Occurs as a result of mismatch in size of the IOL and the capsule
- Occurs in up to 56% of eyes after cataract surgery
- May rarely cause a “Maddox Rod” phenomenon
- Treat with YAG three months later in patients persevering symptoms

Other stuff that finds its way on to the lens/capsule: Lens Glistenings

- Fluid accumulations in “microvoids” of the optic of the lens.
- Occur as a result of temperature gradients
- Primarily a problem with acrylic lenses, though PMMA also shows a low incidence
- Typically don’t generate symptoms
- Treatment is a lens exchange (typically for PMMA)
Any central capsular opacity may be YAGed whether its anterior or posterior but:
- Anterior capsular issues (phimosis) do not open as well as posterior capsular issues
- Dusting off focal deposits (such as giant cells) is feasible, but has a greater likelihood of causing IOL pitting – focal deposits are typically not visually significant and so don’t justify risk of treatment in general
- Stuff in the lens (glistenings) can’t be removed with the YAG

Influenced by:
- Zonular support/dehiscence
- Capsular support

These features can be negatively impacted by:
- Conditions that inherently weaken this apparatus: Pseudoexfoliation, Trauma and Marfan’s
- Capsular tears
- Significant NS
- Large subsequent YAG
IOL Stability/Capsular Support

- May be improved in questionable cases with insertion of capsular tension ring
- This ring increases stability of capsule. It is placed inside the capsule after the capsulorhexis and is left inside the eye at the conclusion of surgery

Poor capsular/zonular stability can lead to:

- Mild Iridodenesis early in the postoperative period is common, and not indicative of poor support
- For a dislocated lens, if it is stable and the patient is asymptomatic, the lens can be left alone.
- If the patient is symptomatic or lens is dramatically unstable, re-fixing the IOL, usually with sutures, can be done.
- If the IOL is on the retina, it may be removed, or may stay. Crystaline lens nucleus that is dropped, must be removed

IOL decentration
Toric IOL positioning

- Toric lenses have markings similar to toric contact lenses that allow you to assess rotation.
- The desired location of the markings needs to be passed on to you by the surgery center.
- The lens has potential to rotate out of the desired location within the first 1-2 weeks post-operatively. Repositioning is indicated if patient is symptomatic of blurred vision and the lens is misaligned by a significant degree.

Cystoid Macular Edema

- Common source of post operative vision loss
- Associated with inflammation and retinal traction
- Clinical CME occurs in 0.2-3% of patients after surgery (subclinical is up to 30% of eyes)
- Risk increases with any vitreal loss as well as in diabetics or patients with ERMs

CME

- Difficult to detect with microscope. Retinal yellowing and cystic spaces are sometimes observed
- OCT, when available, is a valuable diagnostic tool
- CME will also generate a characteristic petaloid hyper-fluorescence on Fluorescein angiography
- Any patient with reduced BSVA around 3 weeks after surgery should have CME on the top of the differential diagnosis list
**CME**

- Treatment: topical steroids and NSAIDs
- Oral acetazolamide is sometimes helpful
- Follow-up Intervals are monthly
- If recalcitrant, referral for intra vitreal therapy may be considered
- Patients who are at higher risk of CME (diabetics and those with ERMs) may benefit from pre and post operative use of NSAIDs

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**Retinal Detachment**

- Cataract surgery constitutes the single greatest controllable risk factor for retinal detachment
- Cataract surgery increases the risk of retinal detachment by up to 4 times for 20 years
- Evaluation of peripheral retina is standard practice for all patients around 1 month after surgery
- More frequent evaluation of peripheral retina should be undertaken in symptomatic patients and those with eventful surgery (broken capsule, lost vitreous, dropped lens)

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**Dysphotopsias:**

*stuff we don’t see, but patients do*

“I see halos”
Positive dysphotopsias

- Seeing halos, arcs or streaks of light
- Primary cause of patient dissatisfaction after uneventful cataract surgery – up to 67% of patients experience
- Typically dissipates over the first month postoperatively due to neuro-adaptation
- Not seen in previous PMMA era of IOL material
- Why?

Positive Dysphotopsias

- Due to changes in material reflectivity and edge design
  - PMMA → Acrylic
  - Round → sharp edge design
- These features which allow smaller incision and reduce PCO increase intensity of reflection from lens edge and concentrate it on a small part of the retina which leads to patient perception

Inhibition of Migrating Lens Epithelial Cells at the Capsular Bend Created by the Rectangular Optic Edge of a Posterior Chamber Intraocular Lens
Positive Dysphotopsia vs other sources of glare/ flashes of light

- Most common in a lighted environment as opposed to retinal photopsias
- Will be present the day after surgery as opposed to PCO derived glare issues
  - If you treat a patient with dysphotopsia for PCO (meaning you send for a YAG) the patient’s symptoms will be permanent – must be treated with an IOL exchange prior to a YAG

Negative Dysphotopsias

- “I see a shadow off to the side”
  - A patient reported dark crescent in temporal field – this scotoma is not demonstrable on automated or confrontation fields
  - (not to be confused with RD)
  - Less common than positive dysphotopsia (incidence around 3%)
  - Less likely to resolve than positive dysphotopsia
  - Surgery may be attempted to reduce or eliminate long lasting symptoms, though as our understanding of the phenomenon is not complete, surgical fixes may or may not work
Negative Dysphotopia Cause

- Not from corneal incision
- Probably from exposure of the nasal capsulorhexis or deepening of the posterior chamber
- Treatment should focus on either covering the anterior rhexis or collapsing the PC
- Derived from orbital anatomy

Treatment for Negative Dysphotopsia
- covering the anterior capsulotomy-

Summary

- The clinical findings after surgery are the result of the exact surgical procedure and intraoperative complexity, preoperative patient characteristics and post operative healing characteristics
- The combination of these variables produces a broad range of post operative findings and complications
- Being aware of each of these possibilities will improve your confidence, your ability to identify and treat and your patient’s confidence in you
Now, run free...for lunch at least

Questions?
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