Complications Following Cataract Surgery

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Post-operative Complications

- First 24 hours
- First week
- First month
- First few months
- Years later
- Special Considerations for modern technologies (Femto, Multifocal)

Although this talk will focus on complications that present AFTER surgery, it’s important to understand that the causes of the complications occur DURING surgery.

First Day

- High pressure
- Low pressure
- Toxic Anterior Segment Syndrome (TASS)
- Corneal edema
High IOP
• Eye may be inflamed or quiet
• Vision may be good or poor
• Cornea may be edematous or normal
• Patient may be comfortable or not
  • Brow ache, nausea, even vomiting

High IOP
• Things are clogging the trabecular meshwork
  • Retained viscoelastic
  • Pseudoexfoliation, pigment dispersion
  • Debris
  • Retained lens fragments

High IOP
• If no history of glaucoma, and IOP<30, may be OK to just monitor
• If IOP>30 or h/o glaucoma, bring down IOP
  • Topical medications
  • Oral diame
  • Burp the paracentesis
  • See patient next day

Low IOP
• Decreased aqueous production
• Ciliary body inflammation or injury
• Increased aqueous outflow
  • Leaky wound
  • Ciliary body cleft
Dislocated IOL Secondary to Wound Leak

Seidel test

Low IOP

Leaky wound
• Seidel test (may be negative if IOP is low)
• Anterior chamber may be flat
• Treatment options
  • Large bandage contact lens
  • Return to OR for suturing

Low IOP

• Most causes of low IOP resolve with management or on their own within a few days of surgery
• Vision loss from macular edema if IOP is very low for greater than a few weeks
Toxic Anterior Segment Syndrome (TASS)

- Looks like endophthalmitis, but presents in the first 24 hours.
- May be mild, or may be severe and blinding
- Corneal edema is almost always present.
- Can occur in clusters from a single ASC

TASS

- Caused by exposure of the interior of the eye to a toxic agent during surgery
  - Detergents
  - Water instead of saline
  - Antibiotic ointment entering the eye
  - Incorrect preparation of injected meds

Treatment is aimed at decreasing inflammation
- Endophthalmitis must usually be ruled out
- Patients with severe cases will often end up with poor vision
- Clusters often result in temporary ASC closings while the cause is deduced

Corneal edema

- Problem with the endothelial pump that normally pumps water out of the cornea.
Corneal Edema

- Usually self limited
- Endothelial cells are stunned from trauma of surgery
  - Weaker endothelial cells
  - Fuchs’ corneal dystrophy
  - Older patient
  - Increased energy in eye
    - Longer surgery time
    - Harder nucleus (more phaco energy)

Other causes of corneal edema the day after cataract surgery

- Elevated intraocular pressure
- Descemet’s detachment

Descemet’s Detachment

- Corneal edema is extensive, and may be sectoral
- Often, an edge of descemet’s membrane can be seen at the border between edematous and non-edematous cornea

Treatment is dependent upon reattaching Descemet’s and endothelium to the posterior surface of the corneal stroma.

- If it’s small, can be accomplished with an air bubble and positioning.
- If it’s large, may need suturing
First Week

- Infectious endophthalmitis
- Refractive surprise

Infectious Endophthalmitis

- Pain
- Anterior chamber cell, hypopyon
- Elevated IOP
- Corneal edema
- Decreased vision

Infectious Endophthalmitis

- Bacterial infection of the interior of the eye
- May be anterior, posterior, or both
- Presentation and prognosis are both dependent upon the organism
- Usually presents 2-4 days after surgery

Infectious Endophthalmitis

- Etiology is usually a leaky wound
  - Increase in incidence after standard surgery changed from superior scleral tunnel with conjunctival closure to temporal clear cornea.
  - A high percentage (30-50%) of patients have colonizable bacteria in A/C immediately after surgery, yet most don’t get infections.

Infectious Endophthalmitis

- Which organism and speed of treatment are the most important prognostic factors
- Emergency referral for tap-and-inject
- Patients with hand motions vision or worse may also benefit from vitrectomy
- Many patients will end up with 20/40 visual acuity or better.
Infectious Endophthalmitis

- We usually see patients at a day and a week after surgery.
- Infectious endophthalmitis usually presents at day 2-4 after surgery.
- Patients must be counseled to call if they have ANY complaints
- First symptom may be floaters

Refractive Surprise

- Error in measuring axial length
- Error in measuring k’s
- Error in calculating the correct IOL
- Error in recording the correct IOL in chart
- Error in grabbing wrong IOL by OR staff
- Error in packaging and labeling IOL

First Month

- Cystoid macular edema (CME)
- Posterior capsular opacification (PCO)
- Negative dysphotopsia

Cystoid Macular Edema (CME)

- Fluid within the retina
- Caused by either inflammation or vitreous traction
- CME 1-2 months after cataract surgery is called Irvine-Gass Syndrome
Cystoid Macular Edema (CME)

- Cystoid Macular Edema

Patients complain of decreased acuity
- No other symptoms (pain, redness, floaters)
- Slit lamp findings may be subtle
- OCT or fluorescein angiogram may be needed to make the diagnosis

Cystoid Macular Edema (CME)

- Treatment
- Topical steroid and NSAID
  - May recur once stopped
- May require steroid injection
- Source of inflammation or vitreous traction may have to be relieved

Posterior Capsular Opacification (PCO)

- The intraocular lens is placed into the clear capsular “bag” at the conclusion of surgery
- In 10-20% of patients, the bag does not stay transparent – it opacifies
  - Higher percentage for younger patients
Posterior Capsular Opacification (PCO)

PCO

Treatment
- YAG capsulotomy
  - Creates an opening in the posterior of the capsular bag
  - Once the bag has shrink-wrapped around the IOL, the posterior part is no longer needed

YAG Capsulotomy for PCO
Negative dysphotopsia

- Patients describe a black crescent in their peripheral vision.
- Because the shape of the IOL is so different from the shape of the crystalline lens that was taken out, some patients will notice that not all light reaches their peripheral retina.

Treatment

- Piggyback IOL
  - Put another IOL in the sulcus in front of the one that is in the bag
- IOL exchange
  - Take out that IOL and put in one with a different edge design

Piggyback IOL

First Few Months

- *P. acnes* endophthalmitis
- Fungal endophthalmitis
**Propionibacterium acnes endophthalmitis**

- Ongoing low to moderate inflammation weeks to months after cataract surgery.
- Only partially responsive to steroids
- Hypopyon may develop when steroids are stopped.

**Propionibacterium acnes endophthalmitis**

- White plaque is normally seen in the capsular bag.
- Inflammation worsens after YAG of this plaque.

**Propionibacterium acnes endophthalmitis**

- Tissue is needed for culture and biopsy
- Lab should hold culture plates for at least 2 weeks

**Propionibacterium acnes endophthalmitis**

- Patients normally do well with proper treatment.
- Mild cases respond to intravitreal vancomycin
- Some cases may need vitrectomy
- Severe cases may need vitrectomy with removal of bag and IOL

**Fungal Endophthalmitis**

- Presents similar to *P. acnes*, but with fluffy balls in vitreous instead of plaques in capsular bag.
- Diagnosis is made with vitreous tap.
- Patients may do poorly, as fungal elements are difficult to eradicate completely.
Fungal endophthalmitis (*Candida sp.*)

Many years
- Late dislocation of the IOL

Dislocation of the Intraocular Lens Implant
- Patients complain of vision loss that may be sudden.
- If IOL is only mildly dislocated, patient may have monocular diplopia
- Vision loss may be positional

Mild Dislocation

Moderate Dislocation

Severe Dislocation
Dislocation of the Intraocular Lens Implant

- Treatment is dependent upon patients’ symptoms.
- Some will not want further surgery, and will do OK with spectacles.
- Others will need IOL repositioning, suturing (to iris or sclera), or exchange.

Special Considerations

Femtosecond Laser

- Increased discomfort
- Increased redness
- Increased swelling
- Increased inflammation
- Increased expectations

Multifocal IOL’s

- Decreased quality of vision
  - Glare while driving
  - May need a lot of light while reading
  - Shallow depth of reading zone
  - Vaseline vision
  - Increased expectations
  - Dissatisfaction may be 10-20%
Multifocal IOL’s

Treatment
- Treat residual refractive error
- YAG capsulotomy
  - Once done, makes IOL exchange difficult
- Neuroadaptation
- IOL exchange
- Pre-operative counseling and careful screening

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Final Slide

• Most complications occurring after cataract surgery will result in good vision if diagnosed and managed appropriately.
• Many will not occur during regularly scheduled appointment times, so patients should be encouraged to call if they have any problems days, weeks, months or even years after surgery.