Cataract Surgical Management in Patients with Retina and Inflammatory Comorbidities

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Routine Cataract Surgical Management

a. Preoperative Regimen
b. Perioperative Regimen
c. Postoperative Regimen
d. Informed Consent and Patient Expectations
Nonsteroidal Anti-inflammatory Drugs

Corticosteroids

PRE-SURGICAL Cataract Instruction for Operative Eye

Begin both drops 3 days prior to your surgery.

Use the drops in your SURGICAL EYE ONLY. Start with either bottle and be sure to wait approximately 5 to 10 minutes between each drop.

**Anti-inflammatory**
- Prednisolone or Allevio - 1 drop once a day starting 3 days before your surgery date
- or
- Ketorolac - 1 drop 4 times a day starting 3 days before your surgery date
- or
- Bromsite - 1 drop twice a day starting 3 days before your surgery date

**Antibiotic**
- Besivance - 1 drop once a day starting 3 days before your surgery date
- or
- Ciprofloxacin 0.3% - 1 drop 4 times a day starting 3 days before your surgery date
- or
- Tobramycin 0.3% - 1 drop 4 times a day starting 3 days before your surgery date

- Right Eye
- Left Eye

Antibiotics
Antibiotics

**Topical Antibiotics**

1. Usually started prior to surgery as a prophylaxis to endophthalmitis
2. Newer generation fluoroquinolones usually preferred to avoid resistance
3. Only one fluoroquinolone specifically designed for ocular use
4. Aminoglycoside such as Tobramycin or Gentamicin used in cases of fluoroquinolone allergy.

**Intracameral Antibiotics**

1. Used routinely in Europe with studies suggesting a benefit in preventing endophthalmitis.
2. Is considered off-label, but is gaining popularity in the US.
3. Intracameral moxifloxacin has been shown an effective prophylaxis of endophthalmitis.
Triamcinolone and Moxifloxacin (Trimoxi) may be injected at a dose of 0.2 ml by Transzonular or Pars Plana Approach (Dropless Surgery)
1. Cataract surgery can instigate an inflammatory response and cause significant CME.
2. NSAIDs used for anti-inflammatory prophylaxis.
3. NSAIDs used also to address pain following cataract surgery.
4. Suggested mode of action to decrease prostaglandin activity that may lead to CME.

Nonsteroidal Anti-inflammatory Drugs
Corticosteroids

1. Used in conjunction with NSAIDs to prevent CME.
2. Rate of subclinical CME apparent on OCT can be as high as 4 to 11 percent.
At the end of cataract surgery, 0.5 mg of Moxifloxacin unpreserved in 0.1 ml is injected into the anterior chamber as prophylaxis against endophthalmitis.

Note: The dose of moxifloxacin (0.5 mg/0.1 ml) was based on calculations targeting an anterior chamber concentration of moxifloxacin that would exceed the minimum inhibitory concentration for susceptible bacteria.\textsuperscript{28}
IOL Optimization Concerns

- Toric IOL
- Multifocal
- Monofocal

Previous Refractive Surgery

Prior Retina Vitreous Surgery

Femtosecond Laser
Pre-Operative Cataract Evaluation
Radial basis function (RBF) IOL power selection performs the same for short, normal and long eyes. Based in artificial intelligence, this methodology is entirely data driven and free of calculation bias. This approach also employs a validating boundary model, indicating when it is performing within a defined area of accuracy.
The fourth- and fifth-generation formulas (the Holladay II, the Olsen formula and the Barrett Universal II formula) can use as many as seven variables (keratometry, axial length, anterior chamber depth, lens thickness, horizontal white-to-white measurement, age and preop refraction in the case of the Holladay II, for example).
Lattice degeneration with atrophic holes: Prophylactic treatment prior to cataract surgery if symptomatic of vitreous traction. Risk of detachment is low if lattice asymptomatic.
Retinal tears may occur in areas of lattice degeneration.
Cystic Retinal Tuft is usually asymptomatic and not prone to detachment. Prophylactic treatment not needed.
Acute Horseshoe Tear has very high risk of RD (30-50%) and should be treated. Severe cataract requires surgery to allow treatment. Cataract wound should be sutured if further surgery anticipated soon.
Operculated Tear treatment usually not necessary if no vitreous traction and asymptomatic.
Retinoschisis visual loss defined pre-op by visual field. Usually does not need treatment unless there is both an inner and outer wall hole that can lead to detachment.
Pre-Op Macula Off RD with one early inferior star fold (not shown).

Cataract surgery concerns in eyes with previous SBP: SBP makes AL longer. Astigmatism, strabismus, ERM, CME or glaucoma may develop. Recurrent RD is low (1% 10 yrs postop).

Post-Op following PPVIt, Gas/Fluid Exchange, internal drainage of SRF, and endolaser.

I utilized both PPVIt, Gas, and an encircling scleral buckle to repair this RD that also had PVR. (Slides 3-6 taken from lecture slides produced by eyemovies.)
Cataract Surgery after Vitrectomy
Cataract Surgery Concerns in the Vitrectomized Eye

1. Loss of capsular support since eye is fluid filled and vitreous is not present. Chamber may deepen excessively during cataract surgery. Reverse pupillary block may occur.
2. Unstable or damaged posterior capsule. If cataract progressed rapidly after vitrectomy, posterior capsule may have been damaged and hydrodissection avoided.
3. Zonules may have been weakened by prior vitrectomy and there is greater risk of dehiscence during cataract surgery.
4. Presence of silicone oil and whether there are plans to remove it. This poses difficulty in choosing the proper power IOL. Silicone IOL should not be used since silicone oil may adhere to the IOL after YAG posterior capsulotomy.
5. Cataract surgeon’s toolbox to deal with these possible difficulties:
   a. Pupil expansion devices such as Malyugin rings or iris hooks.
   b. Capsular hooks to hold capsule in place in areas of zonular dehiscence.
   c. Nucleus disassembly techniques and MiLoop nucleus cutter.
   d. Instruments to suture IOL in sulcus or to iris if not adequate capsular support.
   e. Specialized IOLs and suture material or Anterior chamber IOL.
   f. Capsular stain material – Trypan Blue.
   g. Vitreous stain material – Triamcinolone.
   h. Endophthalmitis prevention – Intracameral moxifloxacin.
6. Higher risk of CME
Indications for Pars Plana Vitrectomy in the Phakic Eye

Epiretinal Membrane (Macular Pucker)
Vitreomacular Traction Syndrome
Macular Hole
Vitreous Hemorrhage
Vitreous Opacities: Degenerative Changes, Asteroid Hyalosis,
Neoplastic Infiltration,
Infectious (Fungal, Helminthic)
Rhegmatogenous Retinal Detachment
Traction Retinal Detachment
Refractory Uveitis
Intraocular Foreign Bodies
Aqueous Misdirection Syndrome

Taken from AAO. Focal Points vol. XXXIV, no. 4, April 2016
Concerns of Cataract Surgery in the Vitrectomized Eye

OCT of the Macula desirable prior to Cataract Surgery in the Vitrectomized Eye. *(This helps to more appropriately set postoperative vision expectations).* Important to pay special attention to the Ellipsoid Zone ( IS/OS Junction).

Vitrectomized Myopic Eyes

Challenges of IOL Measurements of Axial Length (Koch-Wang Modifications)

Refractive State of the other eye. Will monovision, contact lens wear, refractive surgery or refractive lens surgery be anticipated in the other eye? Was there prior scleral buckle procedure accompanying vitrectomy which might portend strabismus?
Pearls to Consider in Cataract Surgery on the Vitrectomized Eye

1. The globe is softer than normal, may have unstable zonules and a deeper anterior chamber—These factors raise the possibility of intraoperative miosis and fluctuations in chamber depth.

2. Posterior capsule instability is something that the surgeon should be wary of in vitrectomized eyes.

3. Rapid cataract development can be caused by injury to the posterior capsule during vitrectomy (or prior intravitreal injection).

4. Be more cautious with hydrodissection.

5. Be wary of mobility of the posterior capsule.

6. Supplemental tools may be necessary such as capsular tension ring, instruments to suture IOL in sulcus, or Anterior Chamber IOL.
Dealing with Zonular Instability
Toric IOLs are more prone to rotate especially if placed vertical as high myopes may have larger vertical capsule diameters and lower power IOLs are used.

Multifocal IOLs not a good choice in these cases due to the chance of macular pathology developing over time.

Silicone IOLs should be avoided in these patients. Silicone oil may be contemplated at some point if there are retina problems to address.
Reverse Pupillary Block Syndrome in High Myope Vitrectomized Eye

<table>
<thead>
<tr>
<th>Table 2. Koch–Wang Regression Modifications for Myopic Eyes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Holladay 1 optimized AL = (0.829 × IOLM AL(^a)) + 4.266</td>
</tr>
<tr>
<td>Haigis : optimized AL = (0.929 × IOLM AL) + 1.562</td>
</tr>
<tr>
<td>SRK/T: optimized AL = (0.854 × IOLM AL) + 3.722</td>
</tr>
<tr>
<td>HofferQ: optimized AL = (0.853 × IOLM AL) + 3.579</td>
</tr>
</tbody>
</table>

\(^a\)IOLM AL refers to axial length measurement made with the IOLMaster (Carl Zeiss Meditec, Dublin, CA).
Cataract Surgery Toolbox

1. **Nuclear Disassembly Devices and Techniques** – Divide and Conquer, Horizontal and Vertical Chopping, Akahoshi Nucleus Pre-Chopper, and MiLoop Nucleus Divider.
2. **Capsule Stains** – Trypan Blue.
3. **Pupil Expanders** – Malyugin Ring, Iris Hooks.
5. **Capsular Stabilization Devices** – Capsular Tension Rings.
6. **Scleral and Iris Sutured IOL Techniques.**
7. **Vitreous Stain** – Triamcinolone
8. **Endophthalmitis Prevention**- Intracameral moxifloxacin.
Divide and Conquer
Phacotechniques
Divide and conquer

1. Large central furrow is sculpted

2. Divide nucleus into halves by using opposing forces of phaco tip and second instrument

3. Rotate nucleus

4. Aspirate and phaco at the iris level
Horizontal Phaco Chop

Finger like chopper is passed around equator of nucleus and phaco tip is impaled into the nucleus. Then the chopper is pulled towards the phaco tip to bisect the nucleus.
Vertical Phaco Chop

Sharp vertical chopper is passed in front of the phaco tip and impaled into the nucleus. Then the chopper is pulled towards the phaco tip to bisect the nucleus.
Akahoshi Nucleus Prechopper
MiLoop Device Used to Vertically Encircle the Nucleus to Divide It
Trypan Blue Staining to Improve Capsule Visibility
Pupil Expansion Devices for Small Pupil Surgery
Malyugin Ring
Iris Hooks for Use in Small Pupil Cases
Capsule Hooks to Provide Mechanical Capsular Support where Zonules are Broken
Capsular Tension Rings for Zonular Dehiscence
When There is Inadequate Capsular Support for the IOL in the Posterior Chamber
ACIOL or McCannell Suture
Triamcinolone Steroid Injected into the Anterior Chamber to Identify Vitreous
Active Inflammation (Anterior and Intermediate Uveitis):
High risk for postop complications:
• Postop synechiae of iris and lens capsule.
• Membrane formation
• IOL deposits
• Zonular problems
• Cystoid Macular Edema

Patients should be inflammation occurrence free for 3 months prior to Cataract Surgery. Prophylactic anti-inflammatory medications should be used pre and post op. Topical and/or oral corticosteroids may be needed to prevent postop severe inflammatory exacerbations.
Cataract Surgery in Patients with Diabetes

Risk factors: Diabetes, hypertension, and BMI have been implicated for lens opacities. Diabetes associated with age-related and cortical cataract. Health and Nutrition Examination Survey/Framingham study: increased risk of age-related cataract in diabetics <65 years old.

Pre-existing maculopathy is strongly associated with a poor visual outcome. Macular edema should be adequately treated prior to surgery.

Recommend Khan Academy: Review of Diabetes
Cataract Surgery in Patients With Diabetes

Surgically induced miosis more often in the diabetics

Cataracts in type 2 diabetics sticky and leathery.

Postsurgery inflammation may risk retinopathy progression.

Postoperative treatment with NSAIDS are very important.

Anterior capsular phimosis is more common in diabetic patients;
Cataract Surgery in Patients With Diabetes

A larger optic area could be crucial to adequate diabetic retinopathy management. We use a 6.0 mm optic.

Posterior capsule opacification incidence is decreased with a square edged design lens.

A silicone IOL should be avoided in patients at high risk of developing diabetic retinopathy.

Caution when using multifocal IOLs in diabetics.
Cataract Surgery in Patients With Diabetes

Development of post-op cystoid macular edema

Worsening diabetic macular edema

Progression to proliferative diabetic retinopathy

Development of rubeosis iridis

Patients with well-controlled type 2 diabetes mellitus can often be treated as normal individuals.

Those with retinopathy and macular edema whenever possible should be treated before cataract surgery.
Clinical Example of CSME/DME

Example of Response to Focal/Grid Laser Treatment

What is CSME (Clinically Significant Macular Edema)?
Retinal thickening within 500 microns of Foveal Avascular Zone Center
Or
Hard Exudate and retinal thickening within 500 microns of center
Or
Retinal thickening of 1 disc area within 1500 microns of center

Clinically Significant Macular Edema

Pre Focal/Grid Laser Treatment

Post Focal/Grid Laser Treatment
Cataract Surgery in Patients With Diabetes

There are patients who have such dense cataracts that the extent of their diabetic retinopathy cannot be seen. A VEGF inhibitor or PRP may be needed intraoperatively or shortly thereafter.

Dense cataracts may lead to poor diabetic control because patients cannot measure out the correct amount of insulin nor check their blood sugar.
Cataract Surgery in Patients With Diabetes

NSAIDs are important in patients, such as those with DM.

Consider a NSAID for a week prior to surgery and NSAIDs for a month for lower risk patients (e.g., DM with no retinopathy) and for 2-3 months for higher risk patients.

Some patients might need antiVEGF preoperatively.
Cataract Surgery in Patients With Diabetes

Patients with macular edema or those at high risk for macular edema are not good candidates for multifocal IOLs.

Multifocal IOLs are reasonable in type 2 DM patients with great control of their blood sugars and no existing retinopathy.

Type 1 DM patients are not good candidates.
<table>
<thead>
<tr>
<th>History</th>
<th>Retinopathy</th>
<th>IOL</th>
<th>Pre-op</th>
<th>Operative</th>
<th>Post-op</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type II good control</td>
<td>None</td>
<td>Consider acrylic</td>
<td>NSAID</td>
<td>Normal</td>
<td>NSAID</td>
</tr>
<tr>
<td>Type I good control</td>
<td>None</td>
<td>Consider monofocal acrylic</td>
<td>NSAID</td>
<td>Normal</td>
<td>NSAID</td>
</tr>
<tr>
<td>Poor control</td>
<td>None</td>
<td>Consider monofocal acrylic</td>
<td>NSAID</td>
<td>Normal</td>
<td>NSAID</td>
</tr>
<tr>
<td>Poor control</td>
<td>Background DR</td>
<td>Monofocal acrylic</td>
<td>NSAID; OCT to r/o DME</td>
<td>Normal</td>
<td>NSAID</td>
</tr>
<tr>
<td></td>
<td>DME</td>
<td>Monofocal acrylic</td>
<td>NSAID; OCT; retina consult; VEGF inhibitor</td>
<td>Normal</td>
<td>NSAID; retinal consultation</td>
</tr>
<tr>
<td></td>
<td>Neovascularization</td>
<td>Monofocal acrylic</td>
<td>NSAID; OCT; retina consult; VEGF inhibitor; PRP</td>
<td>May have small pupil; add suture for early laser</td>
<td>NSAID; retinal consultation</td>
</tr>
<tr>
<td></td>
<td>s/p Vitrectomy</td>
<td>Monofocal acrylic</td>
<td>Usually already w/u from retina; silicone oil makes IOL selection tricky</td>
<td>May have small pupil; may have loose zonules; may have posterior capsule damage (Figure 1)</td>
<td>NSAID; continued retina consultation</td>
</tr>
</tbody>
</table>
Clinical Features of Diabetic Retinopathy and DME

Retinal thickening  Dot blot hemorrhages
Exudation  Splinter hemorrhages
Hard exudates  Cotton-wool spots
Lipid precipitants  IRMA
Microaneurysms  Retinal neovascularization

Early Treatment Diabetic Retinopathy Study defined Clinically Significant Macular Edema (CSME)

Current DME treatment standard: Center involving macular edema or retinal thickening and increased central subfield thickness on OCT.
Diabetic Vitrectomized Eyes and Cataract Surgery

Worse eye disease since surgery was required. Pupils often dilate poorly and mechanical pupil dilation device such as Malyugin ring may be required. Zonules may have been weakened. Nuclear sclerosis may be dense. Corneas may have poor epithelial adhesion and endothelial weakness. Very important to do meticulous cortical cleanup to prevent capsular phimosis.
Epiretinal Membrane (Macular Pucker)
Cataract surgery concerns in patients with Epiretinal Membrane or Macular Pucker

1. Incidence of ERM over age 49 is 7%, 31 % bilateral. Diagnose by OCT.

2. Informed consent: Appropriate vision expectations, further surgery possible to remove ERM.


4. CME is 5 times more common in ERM patients undergoing cataract surgery and suggests need for prophylactic extended treatment with corticosteroids and NSAIDS.
Office repair of this severe macular hole was carried out using 20 % C3F8 gas preceded one week by Avastin to lessen the stiffness caused by the edema of the rim of the hole. The hole closed easily. Vision improved to 20/50 from 20/400.
Causes of nuclear sclerotic progression thought to be oxidative damage. Vitreous is thought to protect against this. Cataractous changes can also be induced by instrument touch, tamponading agents (silicone oil, gases). Beware of zonular weakness and posterior capsular damage.
Cataract Surgery in Patients with Vein Occlusions
Ischemic or Non-Ischemic
# Major Studies of Retinal Vein Occlusion

<table>
<thead>
<tr>
<th>STUDY</th>
<th>KEY FEATURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>CRUISE</td>
<td>Demonstrated safety and efficacy of ranibizumab for central retinal vein occlusion (CRVO) over sham.</td>
</tr>
<tr>
<td>BRAVO</td>
<td>Demonstrated safety and efficacy of ranibizumab for branch retinal vein occlusion (BRVO) over sham.</td>
</tr>
<tr>
<td>HORIZON</td>
<td>Extension study of CRUISE: quarterly dosing rather than monthly was better than sham, but not as good as monthly dosing. Not as good results as CRUISE.</td>
</tr>
<tr>
<td>COPERNICUS</td>
<td>Demonstrated safety and efficacy of aflibercept for CRVO over sham.</td>
</tr>
<tr>
<td>GALILEO</td>
<td>Demonstrated safety and efficacy of aflibercept for CRVO over sham; dosing every 2 months after 3 monthly loading doses was effective.</td>
</tr>
<tr>
<td>CRAVE</td>
<td>No difference was found between bevacizumab and ranibizumab for retinal vein occlusion (RVO)-related macular edema.</td>
</tr>
<tr>
<td>MARVEL</td>
<td>No difference was found between bevacizumab and ranibizumab for RVO-related macular edema.</td>
</tr>
<tr>
<td>SCORE</td>
<td>Intravitreal triamcinolone improved vision in CRVO-related macular edema, and improved vision in BRVO-related macula edema with efficacy similar to focal laser, with significant risk of cataract and glaucoma.</td>
</tr>
<tr>
<td>GENEVA</td>
<td>Intravitreal dexamethasone implant improved vision in CRVO- and BRVO-related macular edema, but with small risk of cataract and glaucoma.</td>
</tr>
<tr>
<td>BVOS</td>
<td>Focal laser was effective for visual acuity less than 20/40 present for 3 months in the absence of macular ischemia; panretinal photocoagulation recommended when neovascularization develops.</td>
</tr>
<tr>
<td>CVOS</td>
<td>Focal laser reduced edema but did not improve vision (trend toward improvement in young patients); panretinal photocoagulation recommended when neovascularization develops.</td>
</tr>
</tbody>
</table>
Technique of Ozurdex Injection Trans Pars Plana
Cataract surgery patients with RVO should be treated until the CME resolves and stabilizes for 2-3 months unless the severity of the cataract precludes retina observation. **Patients are at a 30 times greater risk of postoperative CME even if preop CME was not present.** Corticosteroid and NSAID drops may need to be of prolonged treatment duration to prevent this.

Color fundus photograph of the right eye of a 23-year-old man with retinal vasculitis and branch retinal vein occlusion (BRVO) due to Behcet's disease.
Cataract Management in AMD Cases

Dry NonExudative AMD

Wet Exudative AMD
Cataract Surgery in Patients with Pre-existent AMD

1. Diagnosis of Type of AMD, Wet or Dry, made with macular SD-OCT, FAF, and IVFA.
   a. Dry or Nonexudative AMD: monitored with Amsler grid, SD-OCT and FAF (fundus autofluorescence).

1. Increasing evidence reveals the risk for worsening of preexisting AMD following cataract surgery is low. Evidence from the Age-Related Eye Disease Study (AREDS) indicates that vision improves across the spectrum of AMD severity with cataract surgery.

2. Informed consent of patients with Dry AMD: Goal is to optimize patient’s vision and optical aids. The visual prognosis will remain guarded as cataract surgery does not treat the AMD.
   b. Wet or Exudative AMD: monitored with Amsler grid and SD-OCT. Intravenous Fluorescein Angiography may be used in some cases to identify the choroidal Neovascular membrane.

1. Treatment of this condition is with one of the anti-vegf medications: Avastin (bevacizumab), Lucentis (ranibizumab), Eylea (Afibercept), and the dosing regimens are usually monthly or a treat and extend approach can be used. Patients are monitored with the Amsler grid and the SD-OCT looking for intraretinal or subretinal fluid, or rpe abnormalities. Treatments are usually effective in making the choroidal neovascular membrane go away, intra and subretinal fluid go away, and improve vision.
Geographic Atrophy - Photo demonstrates hypoautofluorescence with loss of RPE. This leads to overlying retinal thinning, retinal tubule formations and reverse shadowing since RPE is not present to absorb laser light energy.
Geographic Atrophy – 1 or more areas 175 µ in diameter of discrete loss of the RPE with overlying thinning of the neurosensory retina.
Lots of intra-retinal fluid (irf) in inner nuclear layer.

Solid rpe detachment with fibrotic scarring present.

Loss of healthy rpe function.
Diagnosis of Choroidal Neovascularization in Neovascular Age-Related Macular Degeneration

Clinical assessment: Painless, progressive blurring or distortion of central vision. Change in Amsler grid.

Subretinal fluid, hemorrhage, lipid, retinal pigment outfield detachment with drusen, intraretinal fluid.
Since November 2012, 16 Avastin injections to left eye.

VA 20/80.

Patient not happy.
Late leakage of minimally classic lesion is seen on IVFA.
Chronic RPE Detachment is seen with very little intraretinal fluid.
JK 73 yowm
11/5/2014, OS
IR & OCT 30° ART [HS] ART(9) Q: 13

First Eylea 2.0 mg IVI

JK 73 yowm
11/5/2014, OS
After 2nd and 3rd Eylea 2.0 mg IVI

Vision now improved to 20/20. Extremely happy.
Fluorescein angiography can be helpful in displaying the late leakage present with occult choroidal neovascular membrane.
Cystoid Macular Edema (CME) is retinal thickening of the macula due to a disruption of the normal blood-retinal barrier; this causes leakage from the perifoveal retinal capillaries and accumulation of fluid within the intracellular spaces of the retina, primarily in the outer plexiform layer [1]. Visual loss occurs from retinal thickening and fluid collection that distorts the architecture of the photoreceptors. CME is a leading cause of central vision loss in the developed world [2].
Treatment of Pseudophakic Cystoid Macular Edema

**Corticosteroids** to inhibit phospholipase A2.

**Drops:** Prednisolone acetate 1% 4 times a day for 6 weeks in combination with **NSAID**. Difluprednate 0.05% (Durezol) is preferred but is more expensive.

**Intravitreal:** steroid such as **triamcinolone** (1-4 mg) or periocular (sub-Tenon) space (20-40 mg) can be used. Beware of increased intraocular pressure or steroid glaucoma.

**Intravitreal:** injectable dexamethasone biodegradable implant (**Ozurdex**, Allergan, Irvine, California) may cause less of a pressure response.

**Intravitreal:** longer acting steroid implant fluorocinolone acetonide (**Retisert**, Bausch and Lomb, Rochester, NY) for CME refractory to treatment and CME associated with uveitis. Higher risk of steroid glaucoma.

**Systemic:** steroids can have more side effects.
Treatment of Pseudophakic Cystoid Macular Edema

**NSAIDs** inhibit cyclo-oxygenase enzyme.

### Table 2. Topical Ophthalmic Nonsteroidal Anti-Inflammatory Solutions

<table>
<thead>
<tr>
<th>MEDICATION</th>
<th>DOSING REGIMEN</th>
</tr>
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<tbody>
<tr>
<td>Diclofenac sodium 0.1% (Voltaren)</td>
<td>Four times per day</td>
</tr>
<tr>
<td>Ketorolac tromethamine 0.5% (Acular)</td>
<td>Four times per day</td>
</tr>
<tr>
<td>Ketorolac tromethamine 0.4% (Acular LS)</td>
<td>Four times per day</td>
</tr>
<tr>
<td>Ketorolac tromethamine 0.45%, preservative-free (Acuvail)</td>
<td>Four times per day</td>
</tr>
<tr>
<td>Nepafenac 0.1% (Nevanac)</td>
<td>Three times per day</td>
</tr>
<tr>
<td>Bromfenac 0.09% (Bromday)</td>
<td>One time per day</td>
</tr>
</tbody>
</table>
### Table 1. Differential Diagnosis of Pseudophakic Cystoid Macular Edema

<table>
<thead>
<tr>
<th>Condition</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Diabetic macular edema</td>
<td>Retinal vein occlusion</td>
<td>Macular cyst</td>
<td>Solar retinopathy</td>
</tr>
<tr>
<td>Epiretinal membrane</td>
<td>Hypertensive retinopathy</td>
<td>Myopic foveal schisis</td>
<td>Nicotinic acid maculopathy</td>
</tr>
<tr>
<td>Vitreomacular traction syndrome</td>
<td>Stage 1 macular hole</td>
<td>Radiation retinopathy</td>
<td>Rhegmatogenous retinal detachment</td>
</tr>
<tr>
<td>Age-related macular degeneration</td>
<td>Prostaglandin-associated CME</td>
<td>Retinitis pigmentosa</td>
<td>X-linked juvenile retinoschisis</td>
</tr>
<tr>
<td></td>
<td>Lamellar hole</td>
<td>Pattern dystrophy</td>
<td>Goldman-Favre syndrome</td>
</tr>
</tbody>
</table>

![Imagery related to macular degeneration and cystoid macular edema](image-url)
Increased Frequency of Topical Steroids Provides Benefit in Patients With Recalcitrant Postsurgical Macular Edema

Peter A. Campochiaro, Yong S. Han, Tahreem A. Mir, Saleema Kherani, Gulnar Hafiz, Claudia Krispel, T.Y. Alvin Liu, Jiangxia Wang, Adrienne W. Scott, Ingrid Zimmer-Galler

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82-year-old man first seen 2 years after cataract surgery and insertion of a posterior chamber IOL (PCIOL) elsewhere. VA of 20/200 with severe PCSME with the IOL dislocated into the anterior chamber.
3 wks post IVTA 4mg VA 20/200, ME. IOL repositioned and sutured to the iris.
1 mo. PO IVTA. 2 mo. PO IVTA repeated. Pt refused further IVTA.

Started Ketorolac qid. VA at 8 months was 20/250 with severe ME.
Added PA qid + ketorolac qid through week 12,
Changed to PA q1hWA + ketorolac qid. Intraretinal fluid was substantially reduced at week 16 and eliminated by week 24.
Week 28, PA was reduced to qid. IOP-lowering drop was started – IOP 33.
Week 32, recurrent intraretinal fluid. PA increased to 5 times a day, IRF resolved.

After 2 months dosing frequency step-down was began.
Week 48, PA tid + ketorolac qid, with no edema and an improvement in baseline BCVA of 6 letters.
“We recommend that most patients with PCSME or POSME begin treatment with PA qid + ketorolac qid. If edema resolution does not occur within 12 weeks, a switch to PA q1hWA + ketorolac qid is recommended. Resolution of edema for at least 8 weeks should trigger gradual reduction in the frequency of topical steroid administration, with adjustments based upon edema recurrence. This approach may offer some patients with recalcitrant PCSME or POSME an alternative to intraocular steroid injection(s), with a trade-off of more frequent follow-up.”