Title:
The Medical Management of Lens Induced Glaucoma

Abstract: (35 word max)
Phaco lytic glaucoma and phacoantigenic uveitis may occur in the setting of very advanced cataract. The following case describes the successful medical management of these increasingly rare conditions.

Case History:
- Patient demographics: 69 year old white male
- Chief Complaint: 3 day history of sudden onset red, painful, light sensitive right eye
- Ocular History: traumatic glaucoma OD, went blind in the 1980s with sensory XT OD secondary to vision loss.
- Medical History: Hypercholesterolemia
- Medications: simvastatin 40 mg, aspirin 81mg.

Examination Pertinent Findings

Day 1:
- Vacci: OD: LP PH: NI OS: 20/20-
- Pupils: +APD OD OS: RRL
- Fields: OD: unable to test OS: FTFC
- Conjunctiva: 3+ injection with subconjunctival hemorrhage OD, clear OS
- Cornea: diffuse microcystic edema w/ several bullae OD, clear OS
- Anterior chamber: Hazy due to cornea OD, clear OS
- Intraocular pressure: 52 OD and 17 OS GAT
- Gonioscopy: visible posterior trabecular meshwork with no pigment or neovascularization OU
- Lens: Mature, white, cataract OD, mild NS OS
- Fundus: no view OD, unremarkable OS
- *For diagnosis and treatment – see sections below

Day 3:
- Pain improved
- Entrance testing: unchanged
- Cornea: diffuse microcystic edema w/ several bullae, several large irregular keratic precipitates OD, clear OS
- Anterior chamber: 3+ cell and flare OD, clear OS,
- Intraocular pressure measured 34 OD and 14 OS
- Lens: Mature cataract OD

Day 4:
• Entrance testing: unchanged
• Cornea: diffuse microcystic edema w/ several bullae, several large irregular keratic precipitates OD, clear OS
• Anterior chamber: 2+ Cell and flare OD
• IOP: 29 OD and 14 OS
• Lens: Mature Cataract OD

Day 7
• Pain returned
• Cornea: diffuse microcystic edema w/ several bullae, several large irregular keratic precipitates OD, clear OS
• Anterior Chamber: 3+Cell and flare OD
• Intraocular pressure 46 OD, 20 OS
• Lens: mature cataract OD

Day 24
• Pain free
• Cornea: trace MCE w/ no bullae OD
• Anterior Chamber: trace KP and 1+ cell / flare OD
• Intraocular pressure 28 OD, 12 OS
• Lens: mature cataract OD

Day 60
• Pain Free
• Cornea: Clear OD
• Anterior Chamber: Trace flare, no cells OD
• Intraocular Pressure: 27 OD, 10 OS
• Lens: mature cataract OD

Differential Diagnosis:

Leading Diagnosis: Phacolytic glaucoma
• presents in a patient with a longstanding blind eye due to mature cataract
• key findings: acute unilateral pain, redness, raised intraocular pressure, corneal edema, open angle, possible non-granulomatous anterior chamber reaction

Phacomorphic Glaucoma
• presents in a patient with a longstanding blind eye due to mature cataract
• key findings: acute unilateral pain, redness, raised intraocular pressure, corneal edema, closed angle which was ruled out with gonioscopy

Phacoantigenic Uveitis
• granulomatous anterior chamber inflammation, associated with longstanding mature cataract.
Posner-Schlossman Syndrome
- Recurrent usually unilateral events of non-granulomatous iritis with elevated pressures.
- Rule out because: the granulomatous nature of the inflammation rules out this diagnosis.

Herpetic Iridocyclitis
- Uveitis and iris atrophy in the setting of shingles
- Concurrent findings may include, external rash, dendritic corneal ulcerations

Sympathetic Ophthalmia:
- granulomatous panuveitis secondary to severe, typically penetrating, injury

Discussion and Diagnosis:
Final Diagnosis: Phacolytic Glaucoma with secondary Phacoantigenic Uveitis

Lens induced or phacogenic glaucoma are becoming less and less common today in developed countries. The ease of access for cataract surgery prevents most cataracts from reaching the mature or hypermature state. Most cases occur in patients with a longstanding history of severely reduced vision in one eye. There are two major subtypes of phacogenic glaucoma they are: phacomorphic and phacolytic.

Phacomorphic glaucoma is an acute secondary angle closure due to increased size of the crystalline lens pushing the iris anteriorly causing blockage of the angle. In our patient this subtype was ruled out upon gonioscopy showing and open iridocorneal angle to the trabecular meshwork.

As the lens increases in size there is potential for leakage of lens proteins through tiny openings in the capsule. In phacolytic glaucoma this material and macrophages cause a blockage in the trabecular meshwork, increasing the pressure. The lens proteins may also cause a non-granulomatous uveitic response. While our patient may have originally presented with phacolytic glaucoma, he likely progressed to phacoantigenic uveitis.

The difference in presentation between phacolytic and phacoantigenic uveitis is the presence granulomatous keratic precipitates in the former uveitic response. Phacoantigenic uveitis is also more likely to cause a synechiae. The granulomatous presentation is thought to be related to a type 3 hypersensitivity of the body to its own lens material.2 Inflammation can occur between 24 hours to 14 days after the rupture of the capsule, leaving plenty of time for phacolytic glaucoma to arise. Majority of phacoantigenic uveitis cases are found to occur after recent ocular surgery or trauma, Thach et al reported that in 20% of cases occur without report of surgery or trauma. A definitive diagnosis of phacoantigenic uveitis would need a vitreal biopsy, to show macrophages with engorged cytoplasm.

Treatment and Management

Day 1
- In office. 1 drop of Cosopt and 1 drop of Brimonidine
- Pressure lowered to 42 OD.
- Drop schedule: Cosopt 1 gtt BID OD, Brimonidine 1 gtt BID OD and Latanoprost 1 gtt QHS OD.
Day 3
- D/C Latanoprost due to A/C inflammation.
- Start 1gtt 1% Pred Forte qhs and cyclopentolate TID.

Day 7
- Ophthalmology consult
- Subtenons Kenalog injection
- Maintained topical therapy.

Day 24
- Maintain topical therapy

Day 60
- Reduced Pred Forte to TID
- Continue antihypertensive therapy
- Patient defers cataract surgery

Treatment Options:
- Medical: Pressures and inflammation may be managed with topical medications
- Lens Extraction: most common treatment by removing all inflammatory triggers, signs and symptoms should subside.
- Enucleation: the most extreme option, typically done after the previous two options have failed.

In our case, after discussing with the patient, it was decided to continue medical management, which in turn has been successful for the past few months. JJ continues to be followed regularly and is content with current therapy. He also understands that if at some point drop therapy ceases to be effective cataract removal should be considered further.

Conclusion

Phacolytic glaucoma and phacoantigenic uveitis can be a potentially painful complications for patients with a longstanding history of severe vision loss in one eye. Severe ocular complications may occur with increased inflammation and intraocular pressure, so eye care providers should be aware of anterior chamber and lens changes in these patients. With early diagnosis and treatment, medical management can be successful controlling complications, when surgical intervention is not pursued. Patient educated on sign and symptoms can further shorten time of diagnosis and treatment.
Bibliography

1. Papaconstanitou D et al; Lens induced glaucoma in the elderly; Clinical Interventions in Aging; 2009
