DIAGNOSIS AND MANAGEMENT OF PSEUDOPHAKIC CYSTOID MACULAR EDEMA

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Abstract
Introduction: Cystoid macular edema (CME) is a common clinical entity that has been described following cataract surgery. Epiretinal membrane is another finding that is associated with postoperative macular problem. Subjective complain and clinical appearance may be similar between those macular disease, thus a thorough assessment to the patient is necessary to rule out the underlying condition and plan the appropriate management.

Purpose: To report the diagnosis and management of patient with cystoid macular edema and epiretinal membrane.

Case Report: An 84 years-old man was referred with chief complain of distorted vision on both eyes since 1 month and worsen on 1 week. He underwent uneventful cataract surgery on both eyes 2 years before. OCT results on presentation showed diffuse retinal thickening suggesting an intraretinal fluid. Diclofenac sodium eyedrops 4 times daily was given. Spectralis OCT done 1 month after the treatment showed epiretinal membrane on the right eye. Best corrected visual acuity was stable of 20/30. No surgical treatment treatment was needed although the subjective complain persists.

Conclusion: CME is a common complications after cataract surgery that can cause decreased vision. Inflammation after surgery also contributes to the formation of epiretinal membrane. Treatment is mainly pharmacological, unless debilitating metamorphopsia or significant reduction of visual acuity is present.

Keywords: cystoid macular edema, pseudophakic, epiretinal membrane

I. INTRODUCTION
Contemporary cataract surgery has an excellent success rate over 90%, in terms of both improving visual acuity and enhancing subjective visual function. However, for good visual outcome after cataract surgery, a fully functional healthy macula is necessary. There are several macular diseases that may correlate with poor postoperative vision after cataract surgery, for example, cystoid macular edema, epiretinal membrane, diabetic macular edema, vitreomacular traction, macular hole, retinal vein occlusions, age-related macular degeneration, and photic injury.

Cystoid macular edema (CME) is thought to be caused by abnormal permeability of the perifoveal retinal capillaries characterized by intraretinal edema contained in honeycomb-like cystoid spaces due to the radial foveal arrangement of both glia and Henle inner fibers. The term Irvine-Gass syndrome is used for CME following cataract surgery, which is a common and important setting. Most such cases of CME are mild and asymptomatic; it is relevant to distinguish between symptomatic, or clinical, CME and edema apparent only on fluorescein angiography (angiographic CME).

Epiretinal membrane (ERM), another cause in postoperative setting, may be asymptomatic in early stages, but may progress to cause metamorphopsia and
visual improvement also. The incidence of mild ERM may almost double within 1 year of cataract surgery, although may not causing visual impairment. Fluorescein angiography is often a useful diagnostic tool in cases of epiretinal membranes. Both CME and ERM can be managed conservatively as long as the reduction in visual acuity is low and subjective complain are not debilitating.15

II. CASE REPORT

An 84 years-old man was referred to Vitreoretinal Unit Cicendo National Eye Center with chief complain of distorted vision on both eyes since one month before presentation and worsen in the past 1 week. He underwent an uneventful cataract surgery on both eyes 2 years ago, and NdYAG laser capsulotomy two weeks before presentation.

Best corrected visual acuity was 20/30 on both eyes. Ophthalmology examination were normal. Indirect funduscopy revealed reduced foveal reflexes on both eyes with macula seemed edematous, patient was then suspected as having cystoid macular edema and advised to undergo OCT and fluorescein angiography (FA) to confirm the diagnosis, but the FA was a high-risk procedure to be done on this patient as he was having chronic kidney disease.

OCT result showed retinal thickening and possible intraretinal fluid accumulation on the macula on the right eye especially on the temporal area. The patient was given diclofenac sodium eyedrops 4 times daily. His subjective complain still remained one month later, corrected visual acuity using his own spectacles was 0.2 for right eye and 0.5 for left eye, and funduscopic pictures were relatively the same. OCT 1 month after therapy still showed retinal thickening with the presence of epiretinal membrane.

**Figure 2.1** Posterior segment of both eyes showing myopic fundus and reduced foveal reflexes

**Figure 2.2** Time Domain-OCT result of right eye on first visit at Vitreoretinal Unit

**Figure 2.3** Time Domain-OCT result of left eye on first visit at Vitreoretinal Unit
The slow onset of symptoms in this patient is somewhat uncommon in PCME, but the prior cataract surgery and NdYAG laser capsulotomy makes this diagnosis the most likely. Surgical complications that may predispose eyes to PCME include vitreous loss, vitreous traction at incision sites, vitrectomy for retained lens fragments, iris trauma, posterior capsule rupture, intraocular lens (IOL) dislocation, early postoperative capsulotomy, and the use of iris-fixated or anterior chamber IOLs. The patient underwent an uneventful cataract surgery, so the possible cause of the CME may be the NdYAG capsulotomy that may release prostaglandin and cause inflammation and fluid accumulation on the macula.

CME can be recognized by an otherwise unexplained reduction in visual acuity, by the characteristic petaloid appearance of cystic spaces in the macula on ophthalmoscopy or FA, or by retinal thickening on OCT. Clinical CME is frequently diagnosed based on visual loss to the 20/40 level or worse. Macular edema after cataract surgery may be associated with some loss of contrast sensitivity even in the absence of reduced Snellen acuity. This patient complained of reduced visual acuity after 2 years following bilateral cataract surgery. Best corrected visual acuity declined from 0.6 on right eye and 0.7 on left eye from 0.32 on right eye and 0.5 on left eye. The patient was also complain distorted vision, as supported by the Amsler grid test. Anterior segment examination showed dense posterior capsular opacification on both eyes. Nd:Yag laser was done on the right eye and on the next visit there was improvement of visual acuity on right eye.

Fluorescein angiography and OCT can have benefit in confirming the diagnosis of CME. FA shows the source of edema to be abnormal perifoveal retinal capillary permeability, seen as multiple small focal

III. DISCUSSION

Cystoid macular edema (CME) is a common cause of decreased vision after complicated or uncomplicated cataract surgery. Pseudophakic cystoid macular edema (PCME), also known as Irvine–Gass syndrome, may occur angiographically after uneventful intracapsular and extracapsular cataract surgery in up to 40%-70% and 1%-30% of cases respectively; however, the incidence of clinically significant CME is much lower (0.1-13%). The rate of angiographic and clinical CME after phacoemulsification cataract surgery is lower (approximately 20% and 1-2%, respectively). PCME usually resolves spontaneously in about 90% of eyes and only a small subset of patients suffer permanent visual morbidity. The exact etiology of PCME remains unknown, but intraocular inflammation appears to play a key role in its development.
fluorescein leaks and late pooling of the dye in extracellular inflammatory cytokines and mast cell degranulation. NSAIDs that are available include ketorolac 0.4%, diclofenac, 0.1%, bromfenac 0.09% and nepafenac 0.1%. However, some cases are refractory to conservative and medical management. For these cases many following the course of the disease, however, the subjective complain and funduscopic findings of this patient remained. Spectral domain-OCT 1 month after treatment still showed retinal thickening with appearance of epiretinal membrane cystoid spaces. OCT findings of CME include diffuse retinal thickening with cystic areas of low reflectivity (reduced reflectivity) more prominently in the inner nuclear and outer plexiform layers. Because of the radial foveal arrangement of both glia and Henle inner fibers, this pooling classically forms a flower-petal pattern. 12-16

History of previous NdYAG laser capsulotomy, subjective complain of metamorphopsia, funduscopic picture, and OCT in this patient supported the diagnosis pseudophakic cystoid macular edema.

Pharmacologic treatment for CME commonly used steroid or NSAID. Steroid interrupts inflammatory cascade at the early phase to arachidonic acid that is activated by broken tissue. NSAIDs cause inhibition of prostaglandin synthesis and release by inhibiting the conversion of arachidonic acid to prostaglandin via the cyclooxygenase (COX) pathway. NSAIDs also suppress polymorphonuclear cell ability to move and chemotaxis in addition to decreasing expression of different modalities have been tried, such as periocular and intraocular steroids, extended topical and oral steroids, nonsteroidal anti-inflammatory drugs (NSAIDS) and, in many reports, vitreous surgery. 12,13,16

Epiretinal membrane (ERM) may be asymptomatic in early stages, but may progress to cause metamorphopsia and visual improvement. The incidence of mild ERM may almost double within 1 year of cataract surgery, although may not causing visual impairment. ERM formation occurs as a result of retinal gliotic proliferation along the surface of internal limiting membrane (ILM). Small, focal defects in the ILM allow these cells to "break through" to the retinal-vitreous interface and reproduce, creating a thin veil of tissue. A posterior vitreous detachment (PVD) is present in approximately 60–90% of patients at the time of diagnosis, as we found in this patient. Those with partial PVD and persistent vitreomacular adhesion are more likely to develop CME and present with a lower visual acuity. In cases where a PVD does not exist, the clinical findings may be very similar to those commonly seen in vitreomacular traction syndrome (VMT). FA is often a useful diagnostic tool in cases of epiretinal membranes, showing the degree of retinal vascular tortuosity and tethering, and is useful in assessing the extent of retinal wrinkling caused by the membrane. 2,12,13

Figure 3.1 Retinal vascular tortuosity caused by the ERM overlying the macula seen on FA. Note the tethering of the vessels in the papillomacular bundle.

The role of OCT in the diagnosis of epiretinal membranes is sometimes difficult due to the inability to delineate a hyperreflective epiretinal membrane with
OCT was more beneficial in eyes with epiretinal membranes where evaluation of changes in the contour of the normal foveal depression and increased retinal thickness induced by epiretinal traction could be ascertained. 2,12,13,14,17

Epiretinal membranes tend to remain anatomically unchanged with time, and vision rarely improves or worsens dramatically. Vitrectinal surgery has been performed to remove epiretinal membranes that have caused significant visual reduction. The goal of surgery is to relieve traction caused by the epiretinal membrane. The indications for surgery vary by individual, but surgery is usually reserved for those cases in which vision has decreased to the 20/60 level. Eyes with 20/50 vision are occasionally considered for surgery if the primary complaint is diplopia or if the patient suffers debilitating metamorphopsia and requires better vision to continue working. 1,2,5,11-14

Treatment for this patient was only pharmacological because the membrane was mild and BCVA still better than 20/50. Further consideration for surgery may be taken if the metamorphopsia becomes more disturbing and there is a decline in visual acuity.

IV. CONCLUSION
CME is a common complication after cataract surgery or Nd YAG laser capsulotomy that can cause decreased vision. Inflammation after surgery or laser also contributes to the formation of epiretinal membrane. Treatment is mainly pharmacological, unless debilitating metamorphopsia or significant reduction of visual acuity is present.

Detailed reassessment of subjective complain, ocular examination, and if possible, supportive examination, is necessary during follow up visits are necessary to decide the next management for patient. 1,2,7,8,12,13

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