

Case report

Transient complete visual loss and subsequent cystoid macular edema after intracameral lidocaine injection following uneventful cataract surgery

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Abstract

Purpose: To report a case of transient visual loss following uncomplicated cataract surgery with unpreserved intracameral lidocaine.

Methods: A 61-year-old woman with nuclear sclerosis cataract underwent uncomplicated phacoemulsification and in-the-bag intraocular lens (IOL) implantation.

Results: After opening the eye patch on the first postoperative day, the patient complained of complete blindness. Her vision was no light perception (NLP) and the Marcus-Gunn was found to be 4+. Eight hours later, the patient's visual acuity improved to count fingers at 1 m. After two days, the vision improved surprisingly to 20/20 without any Marcus-Gunn. After 4 weeks, the vision decreased surprisingly to 20/80 without any Marcus-Gunn. On this day, macular optical coherence tomography (OCT) was performed, and cystoid macular edema was detected.

Conclusion: Transient visual loss after intracameral lidocaine has been reported after violation of posterior capsule during cataract surgery, and here, we report a case of transient visual loss despite uncomplicated cataract surgery.

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Keywords: Intracameral lidocaine; Transient visual loss; Macular edema

Introduction

The use of preservative-free intracameral lidocaine as an assistant for topical anesthesia during cataract surgery has become a widespread method. This safe method can reduce patient discomfort which may be caused due to tissue manipulations during surgery.^{1,2}

Retinal toxicity and transient visual loss caused by intraocular lidocaine injection have been described in the previous reports.³ These cases have been reported following complicated

cataract surgery commonly due to vitreous lost or inadvertent intravitreal lidocaine injection during retrobulbar anesthesia.^{4–9}

We report a case of transient, complete visual loss, following uncomplicated cataract surgery.

Case report

A 61-year-old woman presented to our clinic complaining of blurred vision in her left eye. Preoperative best corrected visual acuity was 20/100. Dense nuclear sclerosis cataract was obvious on slit-lamp examination. No distinct pathology was seen in funduscopy. Marcus-Gunn was negative, and other examinations including intraocular pressure were unremarkable.

Mydriatics comprising homatropine 1% plus phenylephrine 10% (Sina daru) were instilled 2 hours before surgery. Uncomplicated cataract surgery was done with 3.2 mm small-incision performed under topical anesthesia augmented with 0.5 ml intracameral preservative-free lidocaine 1% without epinephrine (Lignodic, Caspian Tamin CO, Iran). After

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continuous curvilinear capsulorhexis and hydro dissection, nucleus fragmentation was performed by horizontal chop method.

After complete removal of all lens materials, a one-piece hydrophobic acrylic intraocular lens (IOL) [Millennium Biomedical, Inc. (MBI) California, USA] was placed in capsular bag, and stromal hydration was done. There was no obvious leakage from incisions at the end of surgery. No subconjunctival, neither intracameral antibiotic nor steroid, was injected. The patient was discharged from the operation room after patching the eye.

After opening the eye patch on the first postoperative day, the patient complained of complete blindness. Her vision was no light perception (NLP), and the Marcus-Gunn was found to

be 4+. On slit-lamp examination, anterior and posterior segment was normal, with no evidence of disc swelling or retinal ischemia.

Eight hours later, the patient visual acuity improved to count fingers at 1 m and Marcus-Gunn was only 1+. On the second postoperative day, the patient's best visual acuity improved to 20/20. After 4 weeks, the vision decreased surprisingly to 20/80 without any Marcus-Gunn. On this day, macular optical coherence tomography (OCT) was performed using spectral domain-optical coherence tomography (SD-OCT) (Spectralis® Heidelberg Engineering, Heidelberg, Germany), and cystoid macular edema was detected. Topical betamethasone and ketorolac eye drops were administered (Fig. 1).

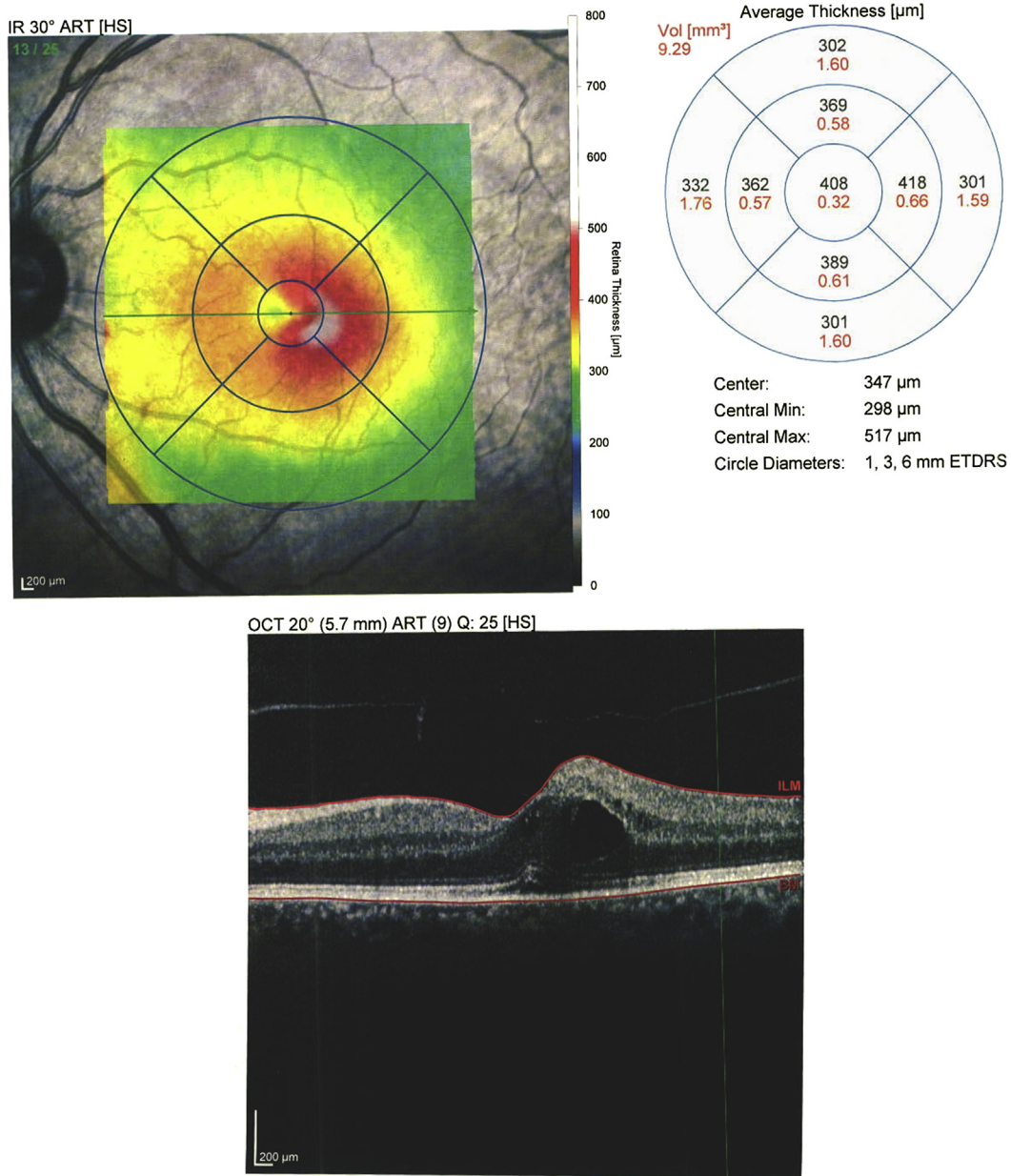


Fig. 1. Macular spectral domain-optical coherence tomography (SD-OCT) with cystoid macular edema, four weeks after surgery.

Discussion

Intracameral lidocaine has an important role to decrease patient subjective experience of pain and may improve patient cooperation with surgeon during topical anesthesia surgery.⁴

Intracameral lidocaine has been reported to cause temporary visual loss^{5,6} and reversible retinal electrophysiological changes.^{3,6}

To best of our knowledge, all cases of transient visual loss following intracameral lidocaine were reported after complicated cataract surgery commonly due to vitreous lost or inadvertent intravitreal lidocaine injection. Here, we have reported complete visual loss after an uncomplicated surgery.^{5–9}

Gills et al.,¹ Eshraghi et al.,⁹ and Falzon et al.⁸ have reported cases with intracameral lidocaine-induced transient complete visual loss after complicated cataract surgery due to posterior capsular opening and vitreous lost. Adverse effects of lidocaine on the retina and optic nerve may increase after violation of crystalline lens posterior capsule during cataract surgery.⁹ In our case, visual loss occurred while the posterior capsule was intact. Normally, the lens capsule and anterior hyaloid face have a barrier effect against intracameral lidocaine. Pars plana lensectomy and vitrectomy facilitate the diffusion of the lidocaine into the posterior segment.⁹

Posterior diffusion of intracameral solutions during uncomplicated surgery through intact zonular fibers or through a zonular tear have been reported in some studies. The OCT-based early macular edema in our case may be compatible with this hypothesis.¹⁰ (Fig. 1).

Hoffman and Fine⁶ reported amaurosis for a few hours after intracameral lidocaine injection to repair a traumatic corneal graft dehiscence, while their patient had previous complicated cataract surgery.

In contrast to our case that complete visual recovery occurred during the first 2 days, amaurosis in Eshraghi et al. and Falzon et al. cases were prolonged for 4–7 days. This may be due to more vitreous concentration of lidocaine after capsular violation.^{8,9}

Schechter reported a case of an immediate visual acuity of NLP due to unintentional intraocular lidocaine injection through the pars plana without causing any trauma to the anterior segment or retina, which improved to 20/40 and then 20/20 after one day and one week, respectively, due to a higher concentration of drug near the retina.⁷

In our case, cystoid macular edema was shown on the fourth week after surgery by OCT, which may suggest retinal toxicity by lidocaine. There are some reports of macular edema that was induced by intracameral lidocaine soon after surgery. One study showed that mixture of intracameral lidocaine and phenylephrine did not induce more significant macular edema than the standard regimen of topical mydriatics plus intracameral lidocaine. This study introduced intracameral lidocaine as a significant cause for macular edema.¹¹

Before surgery, we used topical Homatropine plus phenylephrine for pupillary dilatation as a matter of routine,

although intracameral phenylephrine may not induce more significant macular edema in an uneventful phacoemulsification based on previous studies.^{11,12}

The exact mechanism of transient visual loss is uncertain. Toxicity of lidocaine to rat retinal ganglion cells has been demonstrated.¹³ In a rabbit study, transient changes in b-wave amplitude and implicit time of electroretinograms have been documented after intravitreal lidocaine injection.³ There was a report for toxicity of intracameral anesthesia on retinal nerve fiber layer that induced transient visual loss.⁶ In cats, vacuolization of nerve fiber layer and presence of microscopic lesions in synapses between horizontal cells, bipolar cells and photoreceptors have been demonstrated after intravitreal injection of lidocaine.^{5,13} Repeated intracameral lidocaine injections during cataract surgery may increase the potential retinal toxicity risks. Further studies are recommended to evaluate this hypothesis.

In conclusion, transient visual loss after intracameral lidocaine has been reported after violation of posterior capsule during cataract surgery, and here, we reported a case of transient visual loss despite uncomplicated cataract surgery.

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