Lightning Maculopathy:
A Case Report

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Introduction

Lightning maculopathy describes acute visual loss and macular changes that occur after one is injured by lightning. The visual loss may vary according to the nature of involvement. Lesions described include macular edema, macular hole, cyst, or a solar retinopathy-like picture, cataract, retinal detachment, retinal artery occlusions, and relative afferent pupillary defect. Visual recovery often occurs over time, even with severe maculopathy.

Case Report

A 35 years old female presented to us with complaints of defective vision following an episode of lightning 1 month ago. She was struck by lightning when she stepped out of her house, following which she fell on the ground and became unconscious. She was taken to local hospital where she regained her consciousness and was given first aid to the wounds she sustained during her fall.

She noticed blurring of vision following the episode which did not improve over the last one month, hence she was referred to us.

On examination, best corrected visual acuity was 6/12, N8 in her right eye and 6/9 N8 in her left eye. Anterior segment examination was within normal limits and the intraocular pressure recorded was 13 mm Hg in both eyes. There was no RAPD. Fundus examination with indirect ophthalmoscopy and slit lamp biomicroscopy revealed lesions simulating macular holes in both eyes with pigmentary changes in the peripheral retina.

She underwent scanning with Spectral Domain Optical Coherence Tomography which revealed bilateral symmetrical cystoid macular edema. She was put on a short course of systemic steroids and reviewed periodically. After 2 months, the vision had improved to 6/9 N6 in both the eyes and the cystoid edema though present showed a significant reduction.

Discussion

Some form of ophthalmic injury is seen in majority of the lightning victims. The injury may be in the form of anterior or posterior segment involvement. Anterior segment injuries seen are thermal keratopathy, uveitis, hyphema, anterior or posterior subcapsular cataract, dislocated lens. Posterior segment involvement is in the form of vitreous hemorrhage, retinal hemorrhage, retinal edema, cystoid macular edema, macular holes, chorioretinal rupture, central retinal vein and artery occlusions, associated neuroophthalmic injuries like thermal papillitis, optic neuropathy, loss of pupillary reflexes, anisocoria, Horner’s syndrome, multiple cranial nerve palsies and nystagmus may also be seen.

Lee et al reported four routes of lightning strike:

- Direct strike: when the current flows directly through the victim and is facilitated by metal objects.
- Splash: when lightning strikes an object and then arcs through the path of least resistance.
- Contact: when lightning strikes an object the victim is in contact with such as while talking over the phone or in the bathtub by current flowing through the wires or pipes.
- Ground current: when lightning strikes the ground and travels along the surface towards the victim.

Our patient was struck probably by the fourth mechanism. The macula is very sensitive to thermal damage due to high melanin content in the RPE which constitute the main obstacle to current flow. Electrical current could also damage RPE by electrolysis. Localised inflammation in response to lightning injury could contribute to retinal pigment epithelial dysfunction. Macular edema seen after lightning may be replaced by cysts or macular holes. Initially macular holes due to lightning were reported by Lee et al to undergo spontaneous closure.

Optical coherence tomography is an important tool to differentiate between macular holes and cystoid macular edema. These two entities should be differentiated properly because cystoid changes due to lightning resolve spontaneously over time whereas macular hole may sometimes require surgical intervention.

Handa et al have reported a case of maculopathy which initially presented as retinal cysts with surrounding edema and later evolved to simulate a full thickness hole.

Rivas et al reported a case similar to ours, of bilateral macular lesions resembling macular holes in which the OCT demonstrated small cyst formation at the fovea suggesting the importance of OCT in evaluating a case of lightning maculopathy.
References