Case Report

Cystoid Macular Edema in Acute Presentation of Central Retinal Artery Occlusion

Wei Yan Ng, Doric W. K. Wong, Ian Y. S. Yeo, and Daphne C. Y. Han

Department of Ophthalmology, Singapore National Eye Centre, Singapore 168751

Correspondence should be addressed to Wei Yan Ng, ng_wei_yan@yahoo.com

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A seventy-six-year-old lady with poor vision of the left eye due to previous retinal detachment presented with acute visual loss of her right eye secondary to central retinal artery occlusion. Clinical examination showed a pale right optic disc, macular edema, and a cherry red spot. Optical coherence tomography done four hours after onset showed right acute cystoid macular edema and diffuse inner retinal thickening. Subsequent treatment with intravenous carbonic anhydrase inhibitor resulted in some visual improvement. Central retinal artery occlusion has been known to produce diffuse intraretinal edema instead of cystoid changes. We would like to discuss a case of acute cystoid macular edema in acute central retinal artery occlusion.

1. Introduction

Central retinal artery occlusion is a disastrous ophthalmic emergency which presents with an acute painless visual loss and carries a very poor prognosis. Hayreh demonstrated using histological studies that central retinal artery occlusion results in damage to inner retinal areas, while outer retinal areas are preserved [1]. This in turn leads to intra-cellular retinal edema of the innerretinal layer which differs from cystoid macular edema which is extracellular arising between the inner nuclear and outer plexiform layer [1–3]. Apart from a case of aphakic cystoid macular edema in a patient with previous branch retinal artery occlusion described by Friberg and Landers [4], there have been no literature reports of acute cystoid macular edema in acute central retinal artery occlusion. Our case could indicate that the outer retinal layer is involved as well in central retinal artery occlusion.

2. Case Report

A seventy-six-year-old lady with a history of hypertension and previous sclera buckle for left eye retinal detachment presented to Singapore National Eye Centre with acute loss of vision of the right eye. There was no prior history of trauma or pain. On examination, visual acuity of the right eye was hand motions in the temporal region and perception of light in all four quadrants with a right grade 2 relative afferent pupillary defect. Intraocular pressure measured by Goldmann Applanation Tonometry was sixteen bilaterally. Anterior segment examination was unremarkable. Fundal examination of the right eye showed a pale optic disc and macular edema, and a cherry red spot. Optical coherence tomography done four hours after onset showed right acute cystoid macular edema and diffuse inner retinal thickening. Subsequent treatment with intravenous carbonic anhydrase inhibitor resulted in some visual improvement. Central retinal artery occlusion has been known to produce diffuse intraretinal edema instead of cystoid changes.

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once a day, while no surgical intervention is required for
the calcified plaque. Her vision remained stable and did not
improve beyond counting fingers during her course of stay.
The patient is currently considering left epiretinal membrane
surgery for maximization of visual function.

3. Discussion

Central retinal artery occlusion is a devastating event and
final visual outcome has been generally poor. It has proven
to be difficult to manage with poor treatment outcomes. It
presents classically as a foveal cherry red spot as a result
of diffuse retinal edema in the ganglion cell layer that
obeys the underlying choroidal circulation, while the
fovea, which is devoid of ganglion cells, allows transmission
of the underlying vascular choroidal hue. Histopathological
and optical coherence tomography studies have confirmed
that the damage occurs in the inner retinal layers resulting in
diffuse intraretinal edema of the inner retinal layers [1–3, 5].
Schmidt et al. have further shown that macular thickness
resulting from inner retinal edema does not correlate well
with eventual functional outcome [6]. However, there have
been no reports of acute cystoid macular edema developing
in an acute central retinal artery occlusion.

Cystoid macular edema arises due to the breakdown
of the blood-retinal barrier causing accumulation of fluid
within the retina, specifically between the inner nuclear
and outer plexiform layers, resulting in a “flower petal”
appearance [7, 8]. The occurrence of cystoid macular edema
in our patient suggests that central retinal artery occlusion
does not only affect the inner retinal but the outer retinal
layer and outer blood-retinal barrier as well. With the
experience of our case, it could also be worthwhile to
consider optical coherence tomography in the acute stages
of central retinal artery occlusion.

In conclusion, our patient illustrates a rare occurrence
of cystoid macular edema in acute central retinal artery
occlusion on optical coherence tomography. Treatment of
the cystoid macular edema could provide some benefits for
the patient.

Conflict of Interests

The authors have no financial interest that is related to the
paper.

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