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SHORT COMMUNICATION

Optical coherence tomography findings in branch retinal artery occlusion

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PURPOSE. *To report the optical coherence tomography (OCT) findings in a 35-year-old man with acute inferior branch retinal artery occlusion.*
METHODS. *OCT findings in acute branch retinal artery occlusion were evaluated.*
RESULTS. *OCT disclosed diffuse thickening of the neurosensory retina in the inferior perifoveolar area. Increased reflectivity was noted in the inner retinal layers from the surface of the retina to the photoreceptor layers. Decreased reflectivity was observed from the photoreceptor layers and the retinal pigment epithelium secondary to the shadowing effect. Foveolar depression, photoreceptor layer in the fovea, and retinal pigment epithelium underneath the fovea were normal. OCT findings in the superior perifoveolar area were also normal.*
CONCLUSIONS. *In retinal artery occlusion, denaturation and breakdown of the normally transparent intracellular protein and an increase in the intracellular fluid cause ischemic whitening of the retina. Otherwise there is no retinal thickening secondary to the accumulation of serous fluid escaping from retinal capillaries into the extracellular space. The OCT findings support these descriptions. (Eur J Ophthalmol 2006; 16: 352-3)*

KEY WORDS. *Branch retinal artery occlusion, Optical coherence tomography*

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INTRODUCTION

Retinal artery occlusion is a potentially devastating visual disorder usually caused by closure of the vessel by atheroma or emboli. Embolization is the most common cause of obstruction in the branch retinal artery occlusion. Sustained blockage of blood flow to the eye may lead to irreversible damage and secondary ocular complications (1). In retinal artery occlusion, the retina appears white as a result of cloudy swelling caused by intracellular edema, especially at the posterior pole where the nerve fiber and ganglion cell layers are thickest. Denaturation and breakdown of the normally transparent intracellular protein and an increase in the intracellular fluid rather than extracellular fluid accumulation lead to white cloudy swelling appearance of the retina (2). Optical coherence tomography (OCT) findings may aid understanding of the structural changes in acute branch retinal artery occlusion.

Case report

A 35-year-old man had a sudden superior scotoma in the left eye for 1 day. His best-corrected visual acuity was 20/20 in the right eye and 20/200 in the left eye. During examination, a relative afferent pupillary defect was noted in the left eye. Slit-lamp examination as well as intraocular pressure were normal in both eyes. Fundus examination of the left eye was notable for retinal whitening and associated edema along the distribution of the inferotemporal branch retinal artery. The right eye was normal. Fluorescein angiography confirmed nonfilling of the inferotemporal branch retinal artery in the left eye. No emboli could be seen (Fig. 1). The search for an etiologic explanation revealed double rheumatismal mitral and aortic valvular disease, which was referred to and treated by the appropriate department.

OCT was performed using the OCT 3000 scanner (Carl

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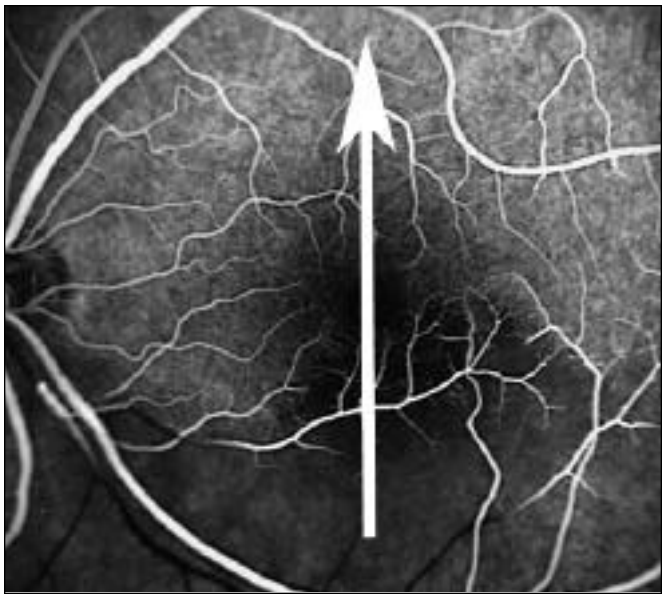

Fig. 1 - *Fluorescein angiography of the left eye confirmed nonfilling of the inferotemporal branch retinal artery.*

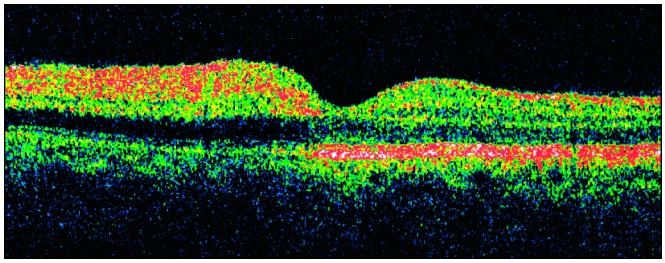

Fig. 2 - *A vertical optical coherence tomography (OCT) tomogram through the fovea disclosed diffuse thickening of the neurosensory retina in the inferior perifoveolar area. Increased reflectivity was noted in the inner retinal layers from the surface of retina to the photoreceptor layers. Decreased reflectivity was observed from the photoreceptor layers and the retinal pigment epithelium secondary to the shadowing effect. Foveolar depression, photoreceptor layer in the fovea, and retinal pigment epithelium underneath the fovea were normal. OCT findings in the superior perifoveolar area were also normal.*

Zeiss Ophthalmic System Inc., Humphrey Division, Dublin, CA). OCT disclosed diffuse thickening of the neurosensory retina in the inferior perifoveolar area. Increased reflectivity was noted in the inner retinal layers from the surface of retina to the photoreceptor layers. Decreased reflectivity was observed from the photoreceptor layers and retinal pigment epithelium secondary to the shadowing effect. Foveolar depression, photoreceptor layer in the fovea, and retinal pigment epithelium underneath the fovea were normal. OCT findings in the superior perifoveolar area were also normal (Fig. 2).

DISCUSSION

In retinal artery obstruction, widespread ischemic whitening of the retina occurs. If the block is complete, progressive whitening and swelling of the inner half of the retina develop. These physical changes are caused by denaturation and breakdown of the normally transparent intracellular protein, an increase in the intracellular fluid, and, finally, complete cellular necrosis. Acute ischemic whitening of the retina is a more accurate descriptive term for this change than retinal edema, which is best reserved for retinal thickening secondary to the accumulation of serous fluid escaping from retinal capillaries into the extracellular space, producing multiple cystoid changes in the outer retinal layers (3, 4). Our OCT findings support these descriptions. Increased reflectivity in the inner retinal layers and decreased reflectivity from the retinal pigment epithelium and photoreceptor layers secondary to the shadowing effect in the affected area are the main OCT findings in branch retinal artery occlusion.

The authors have no proprietary interest in the material used in this study.

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