OPTICAL COHERENCE TOMOGRAPHY IN SOLAR ECLIPSE RETINOPATHY

TOMOGRAFÍA DE COHERENCIA ÓPTICA EN LA RETINOPATÍA POR ECLIPSE

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ABSTRACT

Case report: We describe the case of a patient suffering from acute visual loss soon after watching a solar eclipse. Optical coherence tomography was the main diagnostic tool used.

Discussion: Solar retinopathy is now an unusual cause of visual loss, although there are still some cases diagnosed, especially after viewing solar eclipses. Optical coherence tomography is suitable for detecting permanent retinal injuries related to solar exposure, with the outer retinal layers being typically affected (Arch Soc Esp Oftalmol 2006; 81: 297-300).

Key words: Solar retinopathy, optical coherence tomography.

INTRODUCTION

Solar retinopathy has been documented for many years. The cases described at present are related to direct exposure to solar radiations in well-defined circumstances such as solar eclipses, psychiatric disease, religious rituals, use of hallucinogenic drugs, military and astronomy professionals (1). It is believed that the mechanism which causes the damage is photochemical, involving mainly the outermost retinal layers. The most frequent visual symptoms are reduction of visual acuity and central scotoma. Exploration shows a small yellowish foveal lesion (2,3). The diagnostic is usually made with

RESUMEN

Caso clínico: Se describe el caso de un paciente que sufrió pérdida visual aguda tras visualización directa y mantenida de un eclipse solar. El diagnóstico se realiza principalmente mediante tomografía de coherencia óptica.

Discusión: La retinopatía solar es actualmente una causa poco frecuente de pérdida visual. No obstante, se describen algunos casos, especialmente tras la visualización de eclipses de sol. La tomografía de coherencia óptica constituye una prueba diagnóstica adecuada para detectar alteraciones, de forma característica, en las capas más externas de la retina, secundarias a la exposición solar constante.

Palabras clave: Retinopatía solar, tomografía coherencia óptica.
anamnesis and funduscopy. Fluorescein angiography (FA) doesn’t usually show alterations. The recent introduction of Optical Coherence Tomography (OCT) has opened new diagnostic possibilities.

CASE REPORT

A male patient, 30 years old, without relevant history, is attended in the urgency admission section due to sudden reduction of vision and central scotoma in the right eye (RE). He referred gazing directly and continuously at the sun through his RE for 3 minutes during the solar eclipse which took place Oct. 3, 2005. In the exploration, the best corrected visual acuity was of 20/50 in the RE and 20/25 (Snellen) in the left eye (LE). The anterior segment was within normal ranges, as were the pupillary reflexes of the retinal pigmentary epithelium (RPE) and a yellowish lesion in the foveal area (fig. 1). Fluorescein angiography values were within normal ranges, as well as the visual field (Octopusestrategia Top). Amsler’s grid did not exhibit alterations. Exploration with OCT-III revealed a clear defect in the external segment of foveal photoreceptors, without any other significant findings (fig. 2).

The patient was checked again two months later, repeating the diagnostic tests performed in the first checkup. Best corrected visual acuity had gone down in the RE to 20/80, remaining stable in the LE. In addition, the patient referred dischromatopsia. The Farnsworth 25 chromatic test did not show alterations. The OCT revealed a defect in the external segment of foveal photoreceptors although of a lesser magnitude than the one of the first assessment (the defect was compared with the same OCT section) (fig. 3). The remaining tests performed yielded normal results.

DISCUSSION

Solar retinopathy is characterized by the involvement of the outermost layers of the retina. Three mechanisms have been described which could explain said retinal damage. The retina pigmentary epithelium (RPE) absorbs an important percentage of solar radiations with an ensuing increase of tissue temperature in surrounding areas, thus producing thermal damage. On the other hand the high energy waves and low levels of ultra-violet (UV) A
or radiations close to UV (320-400 nm) are responsible for the photochemical damage. It is generally believed that retinal involvement could be the result of the combination of thermal and photochemical damage (4). Solar radiation produces pointed damage in the apical melanosomes of the RPE followed by alterations in the outermost segment of foveal photoreceptors (1,5). The defect depends directly on the intensity, duration, exposure range, pupillar dilatation, the transparency of the means, the focusing and refraction capacity, with higher risk for slight emmetrope or hypermetrope in whom radiations are transmitted directly to the fovea (4). Funduscopic exploration typically shows a characteristic yellowish lesion in the foveal area. Frequently, FA is normal although it sometimes shows diffusion of contrast in the acute phase as well as window defects in the chronic (2). The alterations described by OCTIII show excavation areas in the hyper-reflecting layers of the RPE and of the outermost segments of the photoreceptor layer (1,2,4). Some authors have described via OCT the presence of a hyper-reflecting point in the vitreous cavity at about 70 µm from the retina (4). The most frequent symptoms are reduction of VA, metamorphopsies, central scotoma, dischromatopsia and photophobia.

In conclusion, the main diagnostic of this entity is mainly based on anamnesis and funduscopic observation due to the lack of data provided by FA. The diffusion of the OCT would facilitate solar retinopathy diagnosis.

REFERENCES