



Solar Retinopathy: Case Report

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Authors' contributions

This work is carried out in collaboration of all authors. Authors TSM, ALMS and FBDMR designed the study, wrote the first draft of the manuscript and managed the literature search. Authors EFD and DAC revised it critically for intellectual contents. Authors TCR and FBDMR were involved in the assessment and treatment of the patient. All authors read and approved the final manuscript.

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Case Study

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ABSTRACT

Aims: To describe a solar retinopathy.

Presentation of Case: ALPN, 29 years old, male, with cognitive deficit that started after a car accident that occurred at the age of 6 years, attends the ophthalmology clinic of the University Hospital Antônio Pedro, Rio de Janeiro, Brazil with complaints of decreased visual acuity and metamorphopsia in both eyes (AO) started approximately 8 months ago. Family members reported that after the accident, the patient had the habit of spending mornings and afternoons looking at the sun.

Discussion: Solar retinopathy is caused by the photochemical and thermal effects of ultraviolet radiation on retinal cells, especially in the outer retina and retinal pigment epithelium (RPE). Symptoms can start a few hours after direct observation of the sun, and in most cases a bilateral involvement, although asymmetrically with variable visual acuity.

Conclusions: A Solar retinopathy has a multifactorial origin, as it is related to the exposure time and the susceptibility of each individual. The use of hats and sunglasses with protection against ultraviolet rays and anti-reflection are effective preventive measures to be adopted if there is a need for exposure and observation of sunlight.

Keywords: Solar maculopathy scotoma; psychiatric patients; sun damage; phototoxicity; optical coherence; tomography.

1. INTRODUCTION

Maculopathy or solar retinopathy is a photochemical condition of the macula secondary mainly to inadequate exposure to light sources, such as excessive and inadvertent observation of sunlight. The pathophysiology involves external radiation to the Retinal Pigmented Epithelium (RPE), with subsequent damage to the outer segment of the photoreceptors [1,2,3].

The damage from such exposure can start about 1 to 4 hours after exposure to a light source, with the main symptoms being metamorphopsia, central and pericentral scotoma, photophobia and mild to moderate loss of vision, which are commonly bilateral [1,3,4].

Solar retinopathy is caused by the direct or indirect observation of intense light sources and occurs mainly in individuals with psychiatric disorders, at religious events or after using recreational illegal substances [2,3,5].

In the acute phases, foveolar lesions can be seen, usually single, which tend to turn yellow in the days following exposure, and may be surrounded by an area of gray pigmentation (Table 1) [1,2,4,5].

The lesion is replaced by an inflammatory process characterized by the presence of exudation and edema, followed by loss of reflex and thinning of the fovea [1,2,4,5].

The severity of the condition varies according to the intensity and spectrum of light, with those below 300 - 350 nm being the most harmful. In

addition to the type and intensity of light, pupil dilation, focus of rays on the fovea and chronicity of exposure to light sources are important factors influencing the severity of the condition [1,4,5,6].

Visual prognosis is variable and, in some cases, it can lead to severe and irreversible loss of vision. Optical Coherence Tomography (OCT) is critical for diagnosis, as it initially shows hyperreflective images that become hyporefective as the photoreceptors recover. Typical retinal lesions are disorganization and loss of the interdigitation zone between photoreceptors and RPE, in addition to interruption of continuity of the inner and outer segments of the photoreceptors [1,5,6,7,8].

Solar maculopathy is a preventable lesion, since several pieces of equipment have been created in order to protect the eye during excessive exposure to light, such as ultraviolet filters. However, the most important is the awareness of the population about the existence of this pathology and what measures are available from its installation in order to avoid further damage and future sequelae [2,4,6,8,9].

2. CASE REPORT

ALPN, 29 years old, male, with cognitive deficit that started after a car accident that occurred at the age of 6 years, attends the ophthalmology clinic of the University Hospital Antônio Pedro, Rio de Janeiro, Brazil with complaints of decreased visual acuity and metamorphopsia in both eyes (AO) started approximately 8 months ago. Family members reported that after the accident, the patient had the habit of spending mornings and afternoons looking at the sun.

Table 1.

Symptoms of Solar Retinopathy	Signs of solar retinopathy
1- Metamorphopsia	1-Yellowish-looking foveolar lesions
2- Central scotoma	2-Generally single lesions on the posterior pole
3- Paracentral scotoma	3-Lesions surrounded by grayish pigmentation
4- Photophobia	4- Retinal edema exudation
5- Mild to moderate vision loss	5- Loss of foveal reflex and foveal thinning.

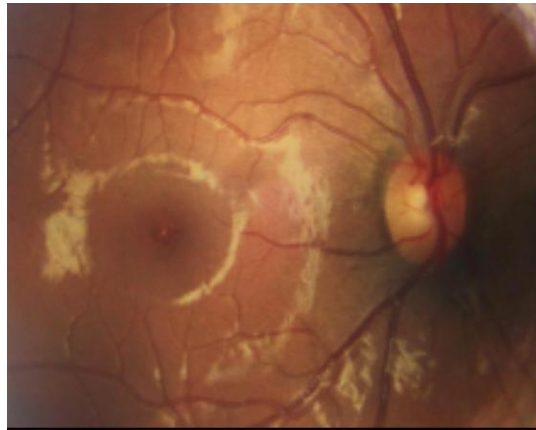


Fig. 1.

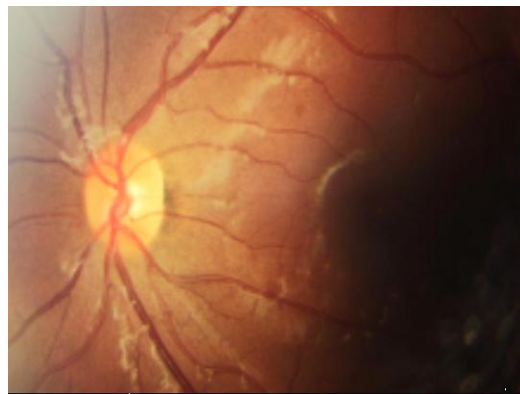
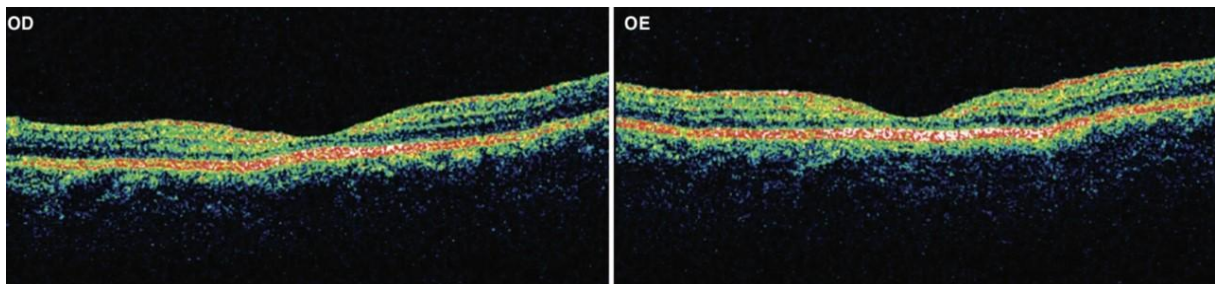


Fig. 2.



Figs. 3 and 4

On ophthalmologic examination, he had visual acuity of 20/60 and 20/80 with correction.

Biomicroscopy and intraocular pressure were physiological.

Retinography showed foveolar lesion with well-defined, irregular borders of brown color in AO, without other alterations (Figs. 1 and 2).

Optical coherence tomography (OCT) showed focal loss in the photoreceptor layer in the foveolar region of AO (Figs. 3 and 4).

Computerized visual field revealed central scotoma in AO and fluorescein angiography showed no relevant changes.

Therefore, the diagnosis of bilateral solar retinopathy in the chronic phase was confirmed, and the patient was instructed to interrupt the

causal factor and undergo semiannual follow-up at the ophthalmology clinic.

3. DISCUSSION

The classic Solar retinopathy is caused by the photochemical and thermal effects of ultraviolet radiation on retinal cells, especially in the outer retina and retinal pigment epithelium (RPE). Symptoms can start a few hours after direct observation of the sun, and in most cases a bilateral involvement, although asymmetrically with variable visual acuity. This pathology is caused by direct or indirect solar observation, mainly during the occurrence of a solar eclipse [3,7,9,10]. The incidence of this phenomenon is poorly documented due to the low demand for ophthalmological assistance, since the most affected group are psychiatric patients [2,10,11]. In our report, the patient presented retinal damage after years of exposure to sunlight, which is bilateral and with permanent reduction in visual acuity.

Vision is reduced to 20/40 to 20/80, but it can reach 20/200 or worse in more severe injuries with the appearance of symptoms of glare, central and paracentral scotomas, headache and metamorphopsia, but these are not always reported by patients [3,4,11,12]. The patient in the present report complained of metamorphopsia and decreased visual acuity, with this already presenting in the first consultation 20/60 in the RE and 20/80 in the LE. After 8 months of follow-up, there was a worsening of the VA, evolving to 20/80 in the RE and 20/100 in the LE due to chronic damage, mainly in the outer segment of the photoreceptors, with further stabilization of the VA after this worsening. The symptoms presented fit the profile of this morbidity mainly because they are associated with direct solar observation that caused a chronic progressive and indolent retinal lesion in OA.

When examining the fundus of the eye immediately after exposure, the macula may be unchanged. After 24 hours, there may be loss of the foveal reflex and within 7 days a yellowish foveal lesion may be present. After 2 weeks, the lesion disappears in milder cases [5,7,9]. However, in more intense cases, the fovea appears erythematous or as a small lamellar depression surrounded by a pigmented halo, this finding being highly suggestive of previous solar retinopathy. At later stages, there is loss of photoreceptors and a defined brownish-

looking foveolar defect with irregular borders [10,11,12].

Diagnosis can be corroborated through clinical history and funduscopy. However, OCT is essential to delineate and define the diagnosis, assess the extent and monitor progression of retinal damage, as performed with the patient in the report, despite the late search for help. Fluorescein angiography, in the acute phase, may demonstrate foveal leakage and, in the chronic phase, it does not show changes in most cases [2,3,7,9,12]. The visual field may show central or paracentral scotoma findings similar to those found in the patient's examinations. see the later search for help, in order to become a case with chronic findings in complementary exams.

The prognosis is good in most cases and is closely linked to the time and intensity of sun exposure. Although there is no specific treatment for this pathology, the best therapeutic measure is prevention, such as the use of caps, hats, glasses with ultraviolet filters and, mainly, avoiding this type of exposure [5,8,10].

4. CONCLUSION

A Solar retinopathy has a multifactorial origin, as it is related to the exposure time and the susceptibility of each individual. The use of hats and sunglasses with protection against ultraviolet rays and anti-reflection are effective preventive measures to be adopted if there is a need for exposure and observation of sunlight.

In cases where solar maculopathy is suspected, it is of fundamental importance that an OCT be performed for the detailed identification of the layers of the retina that have suffered from the photic damage.

Therefore, it is inferred that it is essential that there is greater guidance to the population about the possible harmful effects of exposure to light sources, since this habit can cause severe and even irreversible visual loss, prevention being one of the main ways to approach this comorbidity.

CONSENT

All authors declare that 'written informed consent was obtained from the patient (or other approved parties) for publication of this case report and accompanying images'.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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