Solar Retinopathy from Religious Sun Gazing: A Case Report

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Disclosure: The authors report no conflict of interest.

ABSTRACT

Objective: To report a case of a 42-year-old male who developed bilateral solar retinopathy from two-decade history of religious sun gazing.

Methods: This is a case report.

Results: Patient presented with a visual acuity of 20/70 OD and 20/50 OS that improved with pinhole to 20/20. Amsler grid testing revealed the presence of bilateral central scotoma. Fundus exam showed yellow-white foveolar lesions in both eyes. Optical coherence tomography scan of the macula showed a gap in the retinal pigment epithelium line at the central fovea with generalized macular thinning in both eyes. These corresponded with window-defect hyperfluorescent dots in the foveal avascular zone on fluorescein angiography. These clinical findings and the history of sun gazing are consistent with solar retinopathy.

Conclusion: We report a rare case of a 42-year-old male with subtle findings solar retinopathy. Careful examination and high index of suspicion are needed for correct diagnosis. Avoiding direct sun-gazing, use of protective UV filters, and remote observation thru videography and the like are recommended.

Keywords: solar retinopathy, solar maculopathy, eclipse retinopathy, foveomacular retinitis, sun gazing

Philipp J Ophthalmol 2024;49:168-170

Solar retinopathy, also known as eclipse retinopathy, foveomacular retinitis, or solar retinitis, is a rare thermally-induced, photochemical, retinal injury secondary to directly staring at the sun.[1] It presents uniquely as it only damages a small area of the retina, particularly the fovea. Frequent associations include solar eclipse viewing and sun gazing in religious practices.[2] It has also been reported to occur after sunbathing, telescopic solar viewing, psychiatric conditions, and the use of some psychotropic drugs.[2] The prevalence of solar retinopathy is estimated at 0.01%.[3] This paper reports a case of solar retinopathy to draw attention on the dangers of sungazing and its irreversible sequelae.

CASE REPORT

We present a 42-year-old male , a member of a religious cult, who practiced sun gazing for more than two decades in hopes of witnessing apparitions. Patient consulted due to loss of central vision in both eyes.

On ophthalmologic examination, the patient had a visual acuity of 20/70 on the right eye and 20/50 on the left eye. These improved to 20/20 in both eyes with pinhole. Amsler grid testing showed loss of the central black dot revealing the presence of bilateral central scotomas. Anterior slit-lamp and the rest of the ophthalmologic examination were unremarkable for both eyes. Color photographs of both fundi showed yellow-white dots at the foveal centers in both eyes (**Figure 1**). The rest of the retina was unremarkable. Optical coherence tomography (OCT) scans of the macula showed small defects in the retinal pigment epithelium (RPE) under the foveal depressions and outer retinal cavitation (**Figure 2**). On fundus fluorescein angiography, the yellow-white dots on the color photos exhibited a window-defect type of hyperfluorescence. This was more obvious in the left fundus (**Figure 3**).

DISCUSSION

We report a case of solar retinopathy in a 42-year-old male who practiced religious sun gazing for several years. He presented with bilateral loss of central vision. Although visual acuity with pinhole was 20/20 in each eye, Amsler grid testing revealed bilateral central scotomas. Automated perimetry, however, was not performed. On careful examination of the fundus, he had small yellow dots on the fovea that displayed window-defect type of hyperfluorescence on fluorescein angiography. These also corresponded to outer retinal cavitation and small defects in the underlying RPE on OCT.

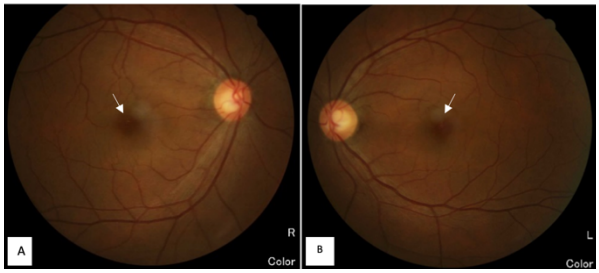

Figure 1. Color photos of right (A) and left (B) retina showing typical yellow-white dots on the foveola (arrows).

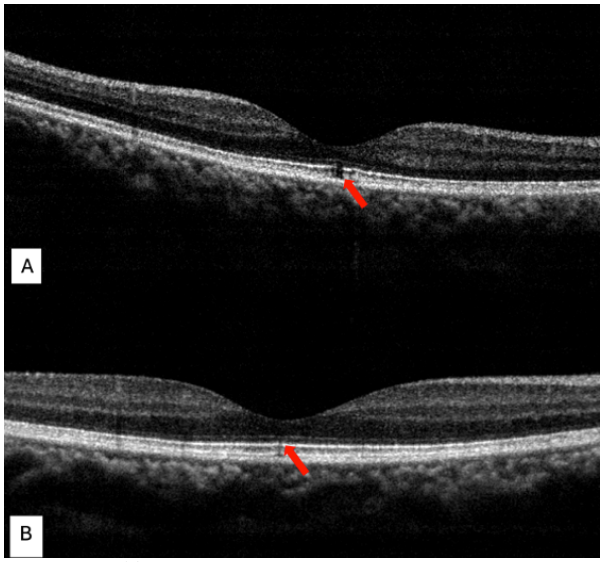

Figure 2. OCT imaging of the right (A) and left (B) macula showing typical outer retinal cavitation (arrows).

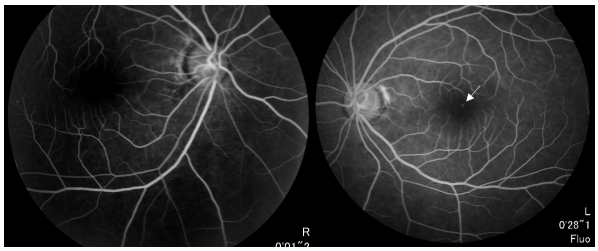

Figure 3. Arterio-venous phase of fundus fluorescein angiography showed the presence of a hyperfluorescent dot in the foveal center of the left eye (arrow).

In a retrospective study of 253 patients with solar retinopathy, almost all cases were reported in adults (98.81%).[3] Majority were males (73.12%).[3] Patients with emmetropia and hypermetropia are at increased risk for solar retinopathy due to the sharp transmission of light on the macula.[4] Conversely, myopic patients are less in danger because the focal point of light falls anterior to the retina.[3] Additionally, young patients are more vulnerable in developing solar retinopathy since there is no protective filtering effect yet from radiant energy by age-related cataracts. [4]

Clinical presentation usually includes decreased visual acuity, central scotoma, dyschromatopsia, metamorphopsia, micropsia, and headache.[1] In our case, the patient consulted due to bilateral central visual loss. The pathophysiology of solar retinopathy is primarily due to direct radiant damage to the retina. Ultraviolet radiation from the sun causes a combination of photochemical injury from the short wavelengths and thermal damage from the longer wavelengths.[2] Solar retinopathy has a typical pattern of isolated bilateral central foveal damage, sparing the rest of the retina because refractile capabilities of the cornea and crystalline lens and the focal point created by the sun rays perfectly align to the fovea. The dark RPE is particularly susceptible to damage due to its light-absorbing property, unlike the transparent central retina. However, since the RPE supports the overlying photoreceptors, in this case the central cones, damage to the RPE also results to injury to the overlying retina, which manifest as a central scotoma. In our patient, despite the absence of a formal perimetry test, central scotoma was noted bilaterally on Amsler grid testing.

Solar retinopathy was first described using time-domain OCT by Bechmann and colleagues, wherein foveal hyperreflectivity and involvement of all retinal layers were seen.[5,6] In our case, OCT disclosed the presence of a gap in the RPE line directly under the foveal center and generalized foveal thinning. As these subtle findings can easily be missed, a careful slice-by-slice examination of the OCT images must be done. There is no known beneficial treatment for solar retinopathy. Thus, preventive measures are essential.[1] The only way to prevent solar retinopathy is to refrain from gazing at the sun. When viewing an eclipse, the use of a pinhole camera is advised.[2] Public education is also important prior to solar events to raise awareness and prevent solar retinopathy.

In summary, we report a rare case of a 42-year-old male with bilateral central scotoma, yellowish foveal hypopigmentation, and no other retinal pathology. Such small RPE pigment changes can be easily missed, therefore a high index of suspicion and thorough history-taking are necessary for the correct diagnosis. A thorough retinal examination, including the judicious use of OCT and fluorescein angiography testing, is essential for establishing the diagnosis of solar retinopathy.

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