

# In the Shadow of Eclipse: Solar Retinopathy

## Tutulmanın Gölgesinde: Solar Retinopati

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Solar maculopathy is a rare, well-defined clinical entity which usually occurs in individuals who look directly at the sun or watch an eclipse without any protection. It was observed that prolonged exposure to bright ambient light might cause damage to a thin, cumulative retina at the level of photoreceptors and retinal pigment epithelium. Initial studies on the damage caused by light on the retina were conducted by Deutschmann and Widemark.<sup>1-3</sup>

Solar retinopathy was first described by Bechman et al. by visualizing the hyperreflective area in the fovea with optical coherence tomography (OCT).<sup>4</sup> It has already been revealed that the outer retinal layers are more affected in the acute phase of solar retinopathy. However, researchers have discovered that in the current cases series in Türkiye on November 25, 2022, various pathological findings such as foveal reflective areas, deterioration in the photoreceptor layer, and irregularity in the outer retinal layers have been observed.

The outer membrane of photoreceptor cells contains high amounts of polyunsaturated fatty acids and is extremely sensitive to lipid peroxidation. Vitamin E is an effective antioxidant that delays the intracellular accumulation of lipokine pigments, which contain the end products of lipid peroxidation. On the other hand, CoQ10 supports adenosine triphosphate biosynthesis in mitochondria and is an antioxidant that plays an important role in oxidative metabolism and management.<sup>5</sup>

In the current cases with solar retinopathy (7 cases), specific damages in the retinal pigment epithelium, photoreceptor segment and outer retinal layers were detected using spectral domain-OCT imaging in solar retinopathy cases. After the first visit of the cases, coenzyme-Q and vitamin E complex support was started and followed up to 6 months. It was detected that there was no significant decrease in visual acuity was observed in the patients. Following 6 months, it was observed that there was an

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improvement in subjective central vision in each patient. Following 6 months, it was observed that there was an anatomical improvement in spectral domain-OCT level in all cases.

Researchers have conducted that solar retinopathy exposed to solar eclipse was examined and it was observed that the changes were in the outer retinal layers and photoreceptor segments. It is considered that the outer limiting membrane is effective in maintaining the best corrected visual acuity level.

As a result of giving vitamin supplements to solar retinopathy patients with outer retinal defects, no pathological findings were detected except for minimal irregularity in the ellipsoid region on OCT.

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