

Optical Coherence Tomography Findings in a Patient with Myelinated Retinal Nerve Fiber Layer

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A 33-year-old man presented with low vision in his left eye. Best corrected visual acuity (OD: plano, OS: -7.5 diopters) was 20/20 in his right eye and counting fingers at 50 cm in the left eye. Relative afferent pupillary defect was 2+ in the left eye. Slit lamp examination was unremarkable in both eyes and intraocular pressure was within normal limits. Dilated fundus examination was normal in the right eye, but revealed a tilted disc and extensive myelinated retinal nerve fiber layer (MRNFL) involving the macula and optic nerve in the left eye (Fig. 1). Optical coherence tomography (OCT) showed significant hyper-reflectivity and increased thickness of the RNFL together with severe back-scattering in the same eye (Fig. 2).

DISCUSSION

MRNFL manifests as white to gray-white patches in the superficial retina corresponding to the distribution of retinal nerve fibers. Myelination of retinal ganglion cell axons begins from the lateral geniculate body proceeding through the optic tracts, chiasm and optic nerves during intrauterine life. This process normally terminates at the level of the lamina cribrosa, however it occasionally continues into the RNFL.¹ There are reports on unilateral MRNFL associated with axial myopia and amblyopia.^{2,3}

OCT can perform micron resolution cross-sectional or tomographic imaging in live tissues. When a light beam is directed onto the eye, it is reflected from or scattered at interfaces between different tissue layers with varying optical properties depending on the angle of the incident beam.⁴ Sources of increased reflectivity on OCT include inflammatory infiltration of the retina or choroid, fibrosis of retinal or subretinal



Figure 1. Fundus photograph of the left eye demonstrates tilted disc and extensive myelinated retinal nerve fibers involving the macula and optic nerve.

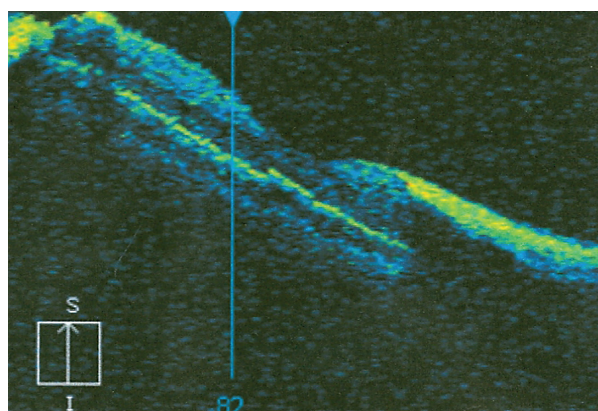


Figure 2. OCT of the same eye shows significant hyperreflectivity and increased thickness of the retinal nerve fiber layer together with severe back-scattering.

layers (such as a disciform or other types of scar), hemorrhages and hard exudate deposition.^{4,5}

In our case with MRNFL, OCT demonstrated significant hyper-reflectivity and increased

thickness of the RNFL together with severe back-scattering or shadowing due to inability of the laser beam to pass through the MRNFL; as a result, retinal layers behind the MRNFL were not visible. An interesting finding in our case was the simultaneous presence of normal RNFL and MRNFL on OCT images side by side.

Conflicts of Interest

None.

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