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MICROCYSTOID MACULOPATHY ASSOCIATED WITH TAMOXIFEN USE DIAGNOSED BY HIGH-RESOLUTION FOURIER- DOMAIN OPTICAL COHERENCE TOMOGRAPHY

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Abstract

Purpose—To describe a case of microcystoid maculopathy diagnosed by high-resolution Fourier-domain optical coherence tomography (Fd-OCT) in a patient treated with tamoxifen who had previously unexplained vision loss.

Methods—Report of a case of a 66-year-old woman treated with tamoxifen for 4 years who had progressive unexplained vision loss in the left eye for 2 years.

Results—Visual acuity was 20/25 in the right eye and 20/70 in the left eye. Findings of funduscopy and fluorescein angiography were unremarkable except for minimal pigment alteration in the macula in the left eye. Stratus OCT showed possible microcystoid changes in the fovea in both eyes. Fd-OCT revealed scattered intraretinal microcystoid changes and patches of focal loss of photoreceptors in the macula in both eyes with foveal involvement in the left eye. Full-field electroretinogram was normal. Multifocal electroretinogram showed some decreased response in the peripheral macula and borderline low foveal response in both eyes.

Conclusion—Microcystoid maculopathy associated with tamoxifen use can be diagnosed by Fd-OCT in a normal appearing fundus. It can present as unexplained vision loss.

Tamoxifen retinopathy is characterized by refractile deposits in the retina seen during funduscopy.¹ Loss of central vision can occur and is thought to be secondary to cystoid macular edema observed by funduscopy and fluorescein angiography.² This report describes a case of microcystoid maculopathy diagnosed by high-resolution Fourier-domain optical coherence tomography (Fd-OCT) in a patient treated with tamoxifen who had previously unexplained vision loss.

Case Report

A 66-year-old woman presented with unexplained progressive loss of vision in the left eye for 2 years. Her medical history was noteworthy for breast cancer diagnosed 4 years earlier for which she was treated with mastectomy and radiation. She had been receiving treatment with tamoxifen (20 mg every day) for 4 years. Her other medications included paxoxetine,

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metoprolol, atorvastatin, and amlodipine. She had no history of niacin use, sun gazing, or eye surgery.

At presentation, best-corrected visual acuity was 20/25 in the right eye and 20/70 in the left eye. Results of anterior segment examination were unremarkable. Dilated fundusoscopic examination showed unremarkable findings for the right eye but revealed minimal pigment alteration in the fovea in the left eye (Fig. 1, A and B). Fluorescein angiography was unremarkable except for minimal mottled staining in the fovea in the left eye (Fig. 1, C and D). Stratus OCT showed possible microcystoid changes in the fovea in both eyes (Fig. 2, A and B). Fd-OCT demonstrated scattered microcystoid changes clearly in the macula involving the fovea in both eyes (Fig. 2, C and D). These changes were seen extending from the inner nuclear layer to the photoreceptor outer segment layer. Scattered patches of focal loss of photoreceptors were noted in the macula in both eyes, with foveal involvement in the left eye (Fig. 2D). Full-field electroretinogram was normal. Multifocal electroretinogram showed some decreased response in the peripheral macula in both eyes and borderline low foveal response in both eyes.

She returned 9 months later noting new blurring of vision in the right eye. Visual acuity was 20/30 in the right eye and 20/80 in the left eye. Results of fundusoscopic examination were unchanged, but Fd-OCT showed a new focal loss of the photoreceptor near the fovea in the right eye, similar to changes noted previously in the left eye. Tamoxifen therapy was discontinued.

Discussion

Tamoxifen citrate, a nonsteroidal antiestrogen, is a drug known to cause toxic retinopathy characterized by refractile retinal deposits.^{1,2} In the current case, these fundus findings were absent, and the initial diagnosis was unexplained vision loss. Nonetheless, Fd-OCT revealed microcystoid changes in the macula with focal photoreceptor loss. Tamoxifen maculopathy was suspected based on a recent report of Stratus OCT results for two patients with typical fundus findings of tamoxifen retinopathy.³ Cystoid changes in the macula with focal loss of photoreceptors were noted for both patients, similar to our case. Thus, tamoxifen treatment was discontinued for our patient with no other known cause for cystoid macular edema or maculopathy. Of note, perifoveal telangiectasia may mimic tamoxifen maculopathy with macular crystals and OCT findings demonstrating foveal cysts, photoreceptor disruption, and outer retinal atrophy, but fluorescein angiography in this case did not show the leakage or vascular changes associated with perifoveal telangiectasia.⁴

The current case exemplifies how newer retinal imaging systems have made possible diagnosis of clinical entities that may previously have been overlooked. Fd-OCT used in this case was developed at the University of California at Davis and provides axial resolution of 3.5 μm and transverse resolution of 10 μm .⁵ Because Fd-OCT is now commercially available, clinicians may use this new tool to diagnose subtle maculopathy previously overlooked. This case demonstrates that maculopathy associated with tamoxifen use can present in a normal appearing fundus.

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Fig. 1. Fundus photographs and fluorescein angiograms at presentation. **A**, Fundus photograph of the right eye is normal. **B**, Fundus photograph of the left eye shows minimal pigment alteration in the fovea. **C**, Middle-phase fluorescein angiogram of the right eye is unremarkable. **D**, Middle-phase fluorescein angiogram of the left eye shows minimal mottled staining in the fovea.

Fig. 2. Stratus and high-resolution Fourier-domain optical coherence tomography (Fd-OCT) images of both eyes at presentation. Stratus OCT images of the right (**A**) and left (**B**) eyes show possible microcystoid changes in the central macula. Fd-OCT images of the right (**C**) and left (**D**) eyes show microcystoid changes in the fovea involving the inner nuclear layer (INL) and outer nuclear layer (ONL; arrows). Left eye image also shows focal patches of loss of photoreceptor outer segment layer (OSL) involving the fovea (arrows). NFL, nerve fiber layer.