PRESUMED TENOFOVIR TOXICITY

A patient's medication history led to retinal atrophy and other findings.

BY NAVNEET MEHROTRA, MBBS, DNB, FRF; MANISH NAGPAL, MBBS, MS, FRCS; AND SHAM TALATI, DO

A 46-year-old man presented with chief complaint of progressive, painless decrease in vision in both eyes for the past 1.5 months. He has been diabetic for 2 years and is HIV positive. He has been taking the retroviral drug tenofovir disoproxil orally for the past year as well as oral metformin for diabetes for the past 2 years. The patient's CD4 count was 75 and CD3 + CD4 was 278.

On examination, VA was 6/9 in each eye. The anterior segments were normal, and fundus exam showed a normal optic disc in each eye with pigmentary alterations at the macula and around the disc (Figure 1; all images acquired on Mirante, Nidek).

Spectral-domain OCT showed outer retinal atrophy in each eye (Figure 2). Autofluorescence imaging showed multiple hyperautofluorescent areas surrounding the macula and optic disc in each eye (Figure 3). Fluorescein angiography showed multiple areas of window defects in each eye (Figure 4).

DISCUSSION

We present a case of presumed tenofovir ocular toxicity. The patient had been taking tenofovir for the past year. Tenofovir is an antiretroviral drug, a nucleoside reverse

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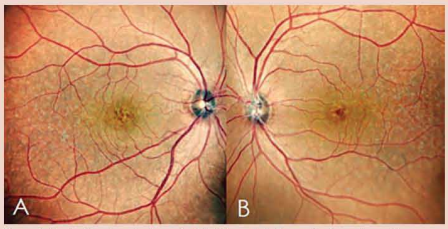

Figure 1. Central fundus photographs (right eye, A; left eye, B) show pigmentary anomalies surrounding disc and macula.

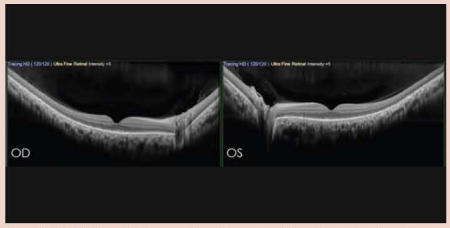

Figure 2. SD-OCT shows fairly normal foveal contour with photoreceptor disruption (outer retinal atrophy) in each eye

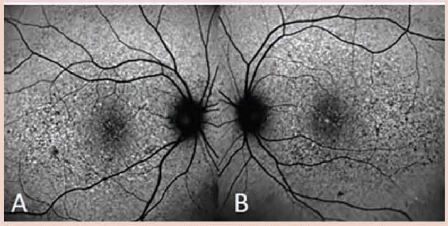

Figure 3. Autofluorescence images (right eye, A; left eye, B) show area of increased autofluorescence surrounding the macula and optic disc.

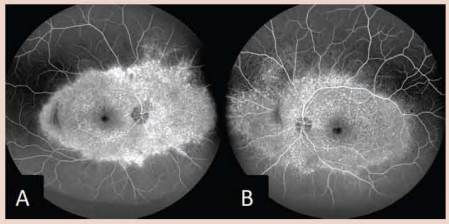

Figure 4. Fluorescein angiography (right eye, A; left eye, B) shows multiple areas of window defects.

with very early-stage ideas to submit them—even those who have only a great idea. We can help you, too.

We recommend that submitters take an important step toward protecting their idea by submitting at least a provisional application for patent. We are happy to provide some guidance on how accomplish that before completing the submission.

We have a panel of four or five judges. Each finalist is given 5 minutes to pitch their idea, followed by a moderated question-and-answer session with the judges that lasts 10 minutes.

The final judging criteria include the magnitude of the problem, innovativeness of solution, market strategy and potential for reimbursement, competitive analysis, business model, and intellectual property information.

Importantly, we do *not* expect anyone to have addressed any of these issues at the time of their original submission. Fleshing out these important components of a business plan is the goal of The Winning Pitch Challenge ecosystem, which includes participation in the mentorship program, receiving feedback from judges at the end of Round 2, and utilization of free resources available through the website.

After the judges vote for the winners, the finalists receive feedback from each judge, and then we present the winners with a $25,000 first place prize, $15,000 for second place, and $5,000 for third place.

The Winning Pitch Challenge is generously supported by the judges, mentors, and industry. No one benefits financially from this except for the participating physician innovators. None of the event directors, judges, or mentors receive any compensation for their participation. In fact, they support this event both financially and with their time and effort. They continue to support this program because they believe it can help accelerate innovation in retina, and we are grateful to all of them for their continued support. ■

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Deadline: May 17, 2020
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transcriptase inhibitor that is excreted through the kidney. Several antiretroviral drugs have been associated with retinal toxicities. Subramaniam et al reported outer retinal atrophy due to tenofovir use.[1] Our patient also showed retinal pigment epitheliopathy due to long-term use of the drug. Another nucleoside inhibitor, didanosine, has been shown to cause chorioretinal atrophic changes in the mid-periphery,[2] and ritonavir, a protease inhibitor, has been reported to cause central pigment epitheliopathy.[3] It is important to suspect early ocular toxicity with the chronic use of these antiretroviral drugs in order to prevent damage as was seen in our patient described here.

1. Subramaniam S, Jeat AW, Nasaruddin RA, Hamzah JC, Omar RNR. Presumed tenofovir-induced ocular toxicity. *Medical Journal of Malaysia*. 2018;73(Suppl 2):43.
2. Haug SJ, Wong RW, Day S, et al. Didanosine retinal toxicity. *Retina*. 2016;36 (Suppl 1):S159-S167.
3. Papavasileiou E, Younis S, Zygoura V, et al. Ritonavir-associated toxicity mimicking retinitis pigmentosa in an HIV-infected patient on highly active antiretroviral therapy. *Retin Cases Brief Rep*. 2017; 11(4):306-309.

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