manifestations of blepharoconjunctivitis. Given that 5 cases of laboratory-acquired general vaccinia infection were reported to the Centers for Disease Control and Prevention between 2005 and 2007,4 proper personal protection and immunization guidelines should also be emphasized in laboratories using vaccinia.

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Bitemporal Hemianopia Caused by Retinal Disease

A bitemporal hemianopia is almost always caused by damage to the optic chiasm and can occur from the direct or indirect effects of a variety of lesions, including tumors,1 aneurysms,2 and, less frequently, inflammatory and ischemic diseases. We describe a patient with a nonprogressive bitemporal hemianopia caused not by optic chiasmal dysfunction but by retinal disease that was diagnosed by multifocal electroretinography (mfERG) after results from neuroimaging studies were repeatedly normal.

Report of a Case. A 67-year-old woman with a history of previously treated tuberculosis, migraine headaches, and osteopenia was found to have a bitemporal hemianopic defect during a routine visual field test as part of an eye examination at an outside institution in 2003. Magnetic resonance imaging results were normal. The patient subsequently was seen by us for another opinion in 2004. On examination, her visual acuity was 20/20 OU with normal color vision and normal pupillary responses to light and near stimulation. Repeat magnetic resonance imaging results were normal. The results of mfERG were interpreted as normal, although there was a great deal of noise in the tracings that made them difficult to interpret. Visual evoked potentials were slightly delayed bilaterally. A multifocal visual evoked potential was attempted but was unsuccessful because of excessive noise. We elected to follow up with the patient.

The patient was evaluated at regular intervals during the next 4 years. At each assessment, the visual field de-
Effects appeared stable (Figure 1B). Repeat magnetic resonance imaging and computed tomographic angiography gave normal results.

In 2008, full-field ERG gave normal responses; however, repeat mFERG showed abnormal topography bilaterally with severely reduced activity in the nasal retinas of both eyes corresponding to the temporal hemifields (Figure 2A). A retinal evaluation now showed attenuation of the retinal arteries in both eyes with atrophic peripapillary changes bilaterally, more noticeable in the right eye, that extended some distance from the optic disc along the arcades (Figure 1C). Fluorescein angiography showed that the areas of choroidal and retinal atrophy were associated with marked hyperfluorescence in the mid to late stages of the angiogram in both eyes but without any leakage from choroidal or retinal vessels. Optical coherence tomography showed marked thinning of the maculae (Figure 2B). The results of dark adaptation testing were consistent with a deficiency in the rate of both cone and rod responses. A diagnosis of acute zonal occult outer retinopathy, a disorder known to produce diffuse or focal field defects, was made.

Comment. To our knowledge, this is the first case report of bilateral temporal hemianopic defects from a retinal disorder. In this case, the funduscopic examination results were initially normal and the results of mFERG were also thought to be normal, although in retrospect the tracings were contaminated by excessive noise. Subsequently, although repeat mFERG results were abnormal, full-field ERG showed no abnormalities; this was probably because a sufficient proportion of the retina in both eyes had not yet been affected. Full-field ERG assesses overall retinal function. Thus, the poor responses from the abnormal nasal retina that was initially affected and therefore produced what
Figure 2. Results of multifocal electroretinography and optical coherence tomography. A, Topographical mapping of multifocal electroretinographic amplitude responses in the left (OS) and right (OD) eyes (top) showing bilateral nasal abnormalities that correspond to bilaterally abnormal waveform traces (bottom). B, Optical coherence tomography of the left (OS) and right (OD) maculae showing marked thinning. N indicates nasal; T, temporal; S, superior; and I, inferior.
appeared to be bilateral temporal scotomatous field defects were overshadowed by the normal responses from the part of the nasal retina that was still normal as well as the intact temporal retina. This case highlights the potential for retinal disorders to produce visual field defects that mimic those produced by optic nerve or chiasmal lesions, the importance of obtaining appropriate and correctly interpreted electrophysiological tests to assess patients with unexplained visual field defects, and the need to perform serial examinations and repeat testing when the cause of such abnormal visual fields is unclear.

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**Author Contributions:** Dr Miller had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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