

BILATERAL OCCIPITAL POLE HYPERTENSIVE STROKE DIAGNOSED WITH MACULAR INTEGRITY ASSESSMENT (MAIA) MICROPERIMETRY

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Purpose: To describe the utility of microperimetry testing in the diagnosis of a bilateral occipital stroke.

Methods: Retrospective case report.

Results: A 57-year-old male with hypertension presented with complaints of bilateral blurred central vision and bilateral hypertensive retinopathy with cotton-wool spots. Automated perimetry demonstrated a central scotoma in both eyes that did not respect the vertical midline; however, microperimetry testing revealed a bilateral homonymous hemianopia that suggested cerebrovascular disease which was subsequently confirmed with magnetic resonance imaging.

Discussion: In cases of unexplained central visual loss, microperimetry testing may be a useful ancillary test for the diagnosis of cerebrovascular disease.

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Ischemic stroke is a common cause of vision loss.¹ As described by Horton and Hoyt,² the human striate cortex has a disproportionately large area dedicated to the central visual field. As a result, central visual field defects are commonly seen with occipital strokes,^{3–6} but can be difficult to detect in bilateral cases where the defects cross the vertical midline.⁷ Furthermore, when faced with visible retinal pathology in the setting of vision loss, the clinician may falsely attribute visual complaints to retinal pathology without excluding cerebrovascular disease.

The following case describes a 57-year-old hypertensive man who presented with central visual field loss and

hypertensive retinopathy and was found to have a homonymous visual field defect on microperimetry, which led to the diagnosis of bilateral occipital ischemic strokes on magnetic resonance imaging.

Case Report

A 57-year-old man with bilateral central visual loss was referred to the Retina Service at Wills Eye Hospital after he was found to have bilateral central scotomas on automated Humphrey 30-2 visual field testing (Figure 1, B and C). Medical history was significant for hypertension that was well controlled on lisinopril and hydrochlorothiazide with the exception of a recent hypertensive episode of 242/110. Review of systems was positive for a mild frontal headache, and blood pressure at the time of ophthalmic evaluation was 136/88.

Presenting best-corrected visual acuity was 20/40 for the right eye and 20/30 for the left eye without afferent pupillary defect. Color plates, visual fields to confrontation, and intraocular pressure were within normal limits. The anterior segment disclosed trace nuclear sclerotic cataracts bilaterally. Posterior segment examination was notable for a few cotton-wool spots and trace arteriovenous nicking in the posterior pole of both eyes consistent with mild hypertensive retinopathy (Figure 1, E and F).

Spectral domain optical coherence tomography and optical coherence tomography angiography were normal in both eyes (Figure 1, A, D, I, and J). To better assess the central visual scotoma observed on automated perimetry, the macular integrity

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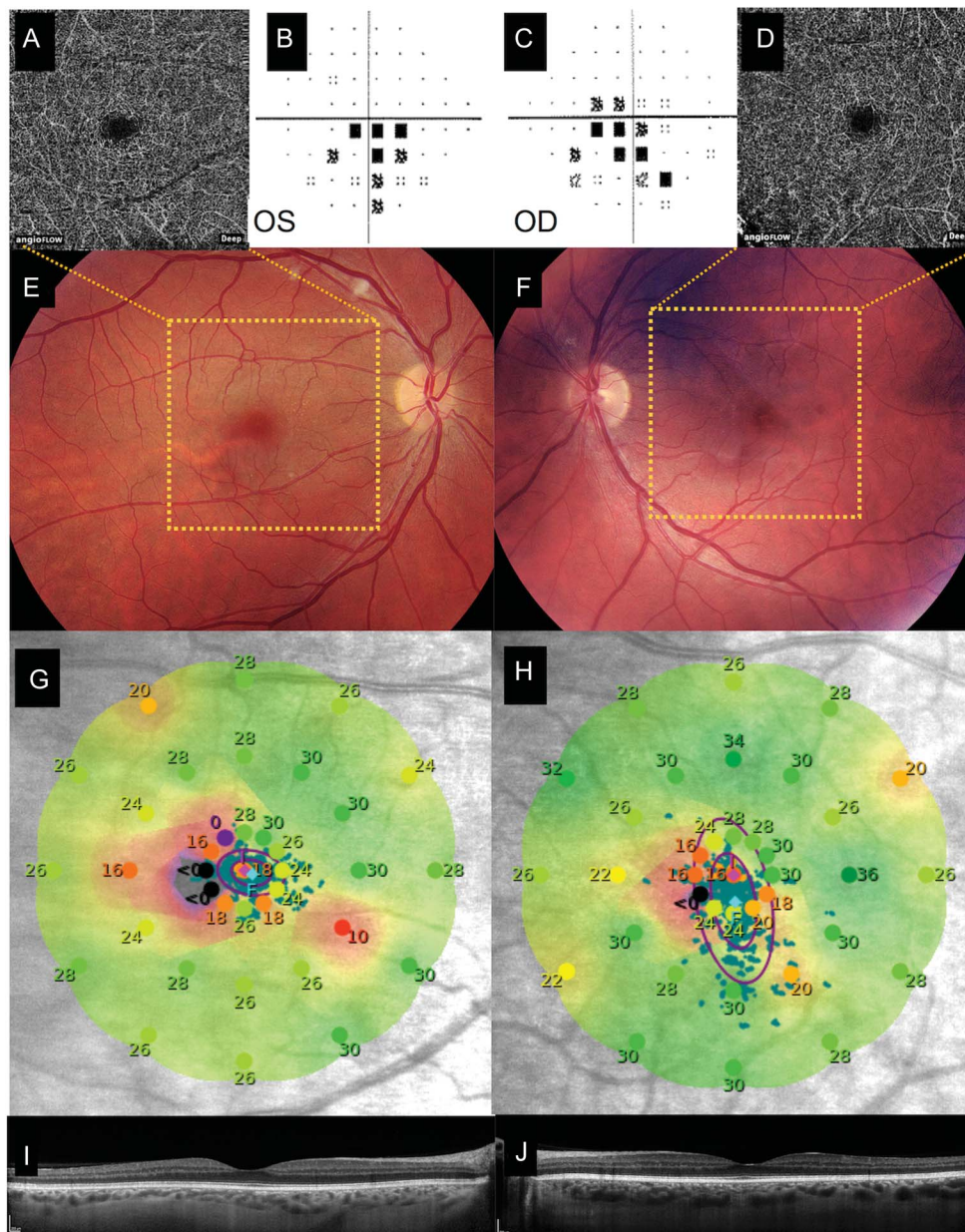


Fig. 1. Humphrey visual field 30-2 pattern deviation plots demonstrate central visual scotoma in both eyes (B and C). Fundus photographs show few small cotton-wool spots in both eyes (E and F). Optical coherence tomography and angiography are normal with no retinal edema, whitening, capillary flow void, or enlargement of the foveal avascular zone (A, D, I, and J). Corresponding macular integrity assessment microperimetry demonstrates the left greater than the right bilateral homonymous hemianopia (G and H).

assessment microperimeter (Haag-Streit, Essex, United Kingdom) was used and demonstrated homonymous bilateral central visual field defects suggestive of cerebrovascular disease (Figure 1, G and H). The patient was then urgently sent for magnetic resonance imaging, which revealed bilateral posterior pole infarcts (Figure 2). Further testing with magnetic resonance angiography also revealed bilateral vertebral artery stenosis.

Evaluation for other risk factors for stroke was unrevealing, and the patient’s hypertension remained controlled with medical management. The patient’s vision gradually improved to 20/25 in both eyes with some persistence of central blur in 6-month follow-up.

Discussion

We report a case of a bilateral central vision loss, which was better characterized as a bilateral homon-

ymous central scotoma after microperimetry testing. Central vision loss is a common complaint with a very broad differential diagnosis. In the absence of ocular findings, neuroimaging is often performed to evaluate the posterior visual pathway.

Microperimetry is a relatively new testing modality for detailed assessment of the central visual field used in research studies including treatments for macular degeneration and other retinovascular disease. It has also been shown to be helpful in documenting both expansion and restoration of the visual field in patients receiving visual rehabilitation after occipital stroke.^{8,9} However, to the best of our knowledge, microperimetry has not been previously reported to detect small

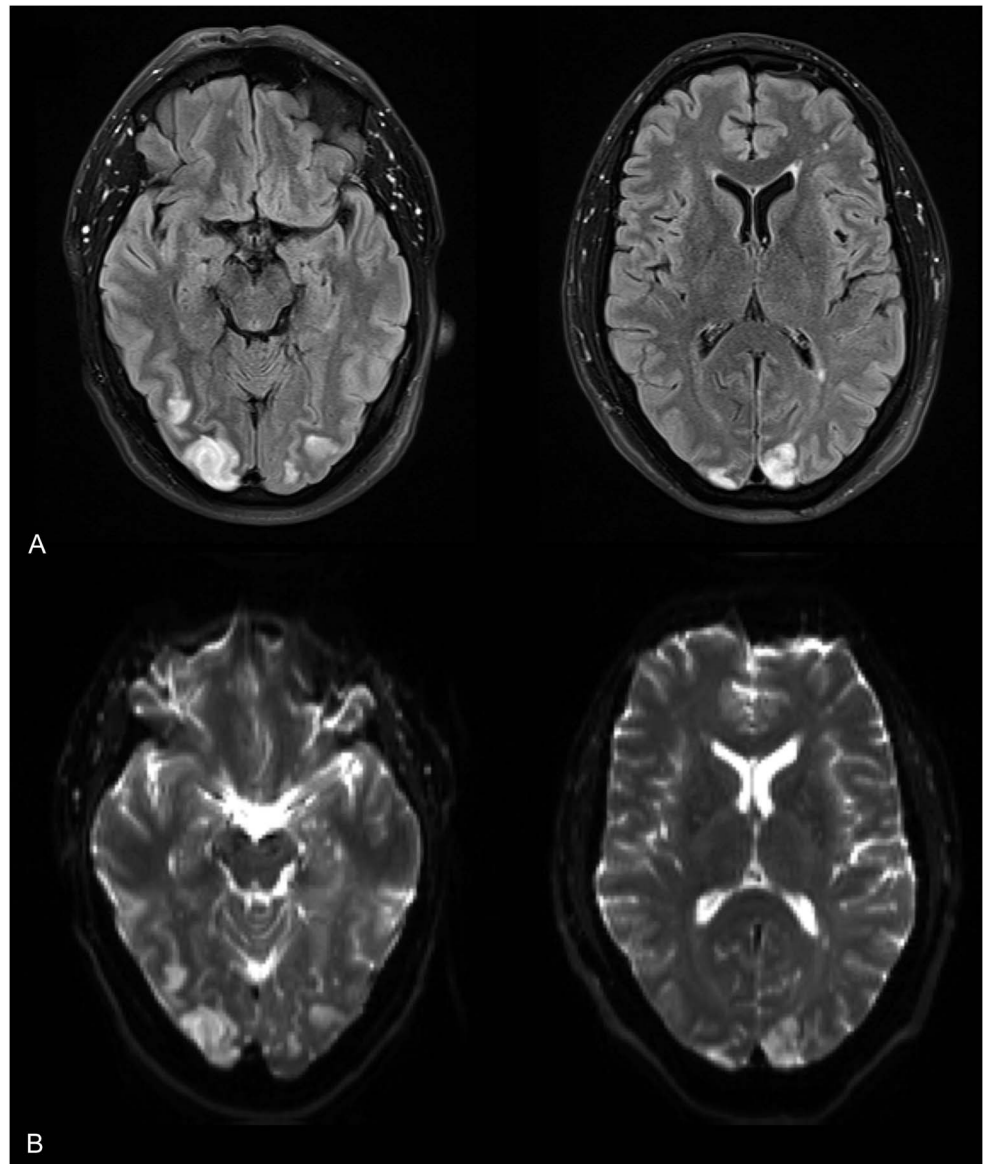


Fig. 2. Magnetic resonance imaging T1-weighted (A) and diffusion-weighted imaging (B) demonstrate large bilateral ischemic occipital pole stroke.

defects in the visual field attributable to a bilateral posterior pole stroke.

Although Amsler grid testing or automated Humphrey visual field 10-2 testing may have also detected a homonymous defect, based on our experience, we believe that the detailed assessment of the macular visual field with microperimetry may better detect subtle causes of central vision loss due to posterior cerebrovascular disease compared with standard automated perimetry. Evidence from the glaucoma literature has indeed demonstrated increased sensitivity for subtle central and paracentral field defects with microperimetry over standard automated perimetry particularly in patients with unsteady fixation.¹⁰ This test for macular function may thus increase our index of suspicion for

cerebrovascular disease and allow for better and prompt management of patients with vision loss.

Key words: ischemic stroke, central scotoma, visual field.

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