CASE REPORTS

Homonymous Horizontal Sectoranopia Caused by an Occipital Lobe Infarct

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ABSTRACT

Homonymous horizontal sectoranopia is a rare visual field defect that characteristically occurs after damage to the lateral geniculate nucleus (LGN). While there are many reports of homonymous horizontal sectoranopia resulting from LGN damage, there are very few reports of homonymous horizontal sectoranopia resulting from damage to other areas of the brain. We present a unique case of a patient with a homonymous horizontal sectoranopia with an occipital lobe infarct. Visual field and radiologic findings are presented. To our knowledge, this is one of the few reported cases of homonymous horizontal sectoranopia resulting from an infarct to the occipital lobe.

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Introduction

Homonymous horizontal sectoranopia is a wedge-shaped defect in the visual field that surrounds the horizontal meridian and typically results from an insult to the lateral geniculate nucleus (LGN).¹ Ultimately, an understanding of the blood supply to the retrochiasmal visual pathway is important in localising a lesion causing a distinctive visual field defect. The LGN is structurally arranged into six neuronal layers that are retinotopically organised. The LGN has a dual blood supply consisting of the anterior choroidal artery (AChA), a branch of the middle cerebral artery, and the posterior lateral choroidal artery (PLChA), a branch of the posterior cerebral artery. The AChA supplies the lateral and medial portions of the LGN. A lesion of this artery results in contralateral defects of the upper and lower quadrants of the hemifield, i.e. homonymous quadruple sectoranopia. In contrast, the PLChA supplies the hilum and centre of the LGN. A lesion of this artery results in a contralateral wedge-shaped defect, i.e. homonymous horizontal sectoranopia.² However, based on our patient and other case reports, the region of insult corresponding to homonymous horizontal sectoranopia may not be as exclusive as previously described. We present a case of occipital lobe infarct mimicking a homonymous horizontal sectoranopia of LGN origin.

Patient description

A 71-year-old African-American male with a past medical history significant for hypertension and hyperlipidaemia presented to our clinic complaining of a 2-month history of a “blind spot in his left eye”. He explained that when driving he would see a car approaching on his left side which would disappear and then reappear moments later. He denied other visual symptoms including blurry vision, diplopia, flashes, and floaters. His ocular history was significant for an anatomical narrow angle of both eyes for which he underwent laser peripheral iridotomy of both eyes as a glaucoma suspect. Additionally, he had uneventful cataract surgery with posterior chamber intraocular lens implantation in both eyes. Of note, the patient denied any recent stroke-like episodes or symptoms.

On examination, the patient’s visual acuity was 20/25 OD and 20/20 OS. His intraocular pressures were 18 mmHg in both eyes. His pupils were equal and reactive to light without an afferent pupillary defect. Confrontational visual fields were full to finger counting, and extraocular movements were full in both eyes. His anterior segment exam was unremarkable. Posterior segment exam revealed optic nerves that were flat, sharp, and of good colour with small cup-to-disc ratios in both eyes.

Retinal nerve fibre layer analysis by optical coherence tomography was unremarkable in both eyes. A 30-2 Humphrey visual field (HVF) test revealed a congruous well-defined central wedge-shaped defect in the left visual field of both eyes, surrounding the horizontal meridian, and consistent with an homonymous horizontal sectoranopia (Figure 1). Goldmann-type kinetic perimetry was done on the Octopus perimeter which confirmed the findings of a left-sided homonymous horizontal sectoranopia (Figure 2). When looking at prior studies, no baseline glaucomatous damage was found on HVF testing. Thus, he was sent for neuroimaging because of suspicion for a lesion in the LGN. Brain magnetic resonance imaging (MRI) revealed several areas in the right occipital lobe consistent with a subacute ischaemic infarct with haemorrhagic conversion (Figure 3). Of note, no abnormalities of the LGN were appreciated on imaging.

Discussion

Homonymous horizontal sectoranopia is an unusual visual field defect, accounting for only 0.3% of all homonymous field defects.¹ Classically, an homonymous sectoranopia results from an

infarct to the LGN in the distribution of the lateral posterior choroidal artery. Although ischaemic infarction is the most common cause of LGN damage leading to homonymous horizontal sectoranopia, other causes include trauma, infection, malignancy, malformations, and central pontine myelinolysis.¹⁻⁵

Although less common, there have been a few cases of apparent homonymous sectoranopia resulting from lesions in the optic radiations and the temporo-occipital and parieto-occipital lobes.^{2,3,6,7} Holmes et al. were the first to report homonymous horizontal sectoranopia caused by damage to the optic radiations in 1931.⁶ Since then, reported cases of homonymous horizontal sectoranopia have been sparse, especially cases resulting from damage to areas of the brain other than the LGN. Grossman et al. were the first to document a case of homonymous horizontal sectoranopia caused by an ischaemic infarct to the occipital cortex.⁷ In addition to this previously reported case, our patient's cause of homonymous horizontal sectoranopia is uncharacteristic, resulting from damage to the occipital lobe rather than the LGN. Other than our case, reports are limited.

On initial examination, confrontational visual fields were normal in our patient. This may seem

Figure 1. 30-2 Humphrey visual field revealed a left-sided congruous wedge-shaped defect characteristic of a homonymous horizontal sectoranopia.

Figure 2. Octopus perimetry with a pattern supporting the diagnosis of homonymous horizontal sectoranopia.

Figure 3. Brain MRI with and without contrast revealed haemosiderin (white arrows) in the right occipital lobe suggestive of a subacute infarct, as seen in the axial (A, T2 FLAIR), sagittal (B, T1 FLAIR), and coronal (C, T1 FLAIR) cuts.

counter-intuitive, but confrontational visual field technique is notoriously variable and most often concentrates on the peripheral or mid-peripheral visual field. Also, it is well known that confrontational fields are less sensitive in detecting visual field defects compared with automated and kinetic perimetry.⁸ A report of homonymous horizontal sectoranopia caused by a defect in the optic radiations also noted normal confrontational field testing prior to perimetry.⁹

The 30-2 visual field done on our patient showed a congruous central defect in the left visual field of

both eyes characteristic of homonymous horizontal sectoranopia. The reliability indices of the visual field were acceptable in both eyes. It has been reported previously that an homonymous hemianopia can be confused with homonymous horizontal sectoranopia on automated perimetry due to a narrow field of view.¹⁰ In our patient, using Goldmann-type kinetic perimetry, the same diagnosis of homonymous horizontal sectoranopia was confirmed.

Based on our patient's visual field findings, it seemed likely the location of injury was the LGN. Only after neuroimaging, we were able to

determine that an occipital lobe infarct was the origin of his symptoms, rather than a defect in the LGN. While it may be difficult to localise a lesion in the retrochiasmal pathway, our patient's case demonstrates that neuroimaging can be a useful tool during the assessment of a patient with a visual field defect. Clinicians must keep in mind that infarcts in other areas may mimic the clinical presentation of an LGN infarct.

Declaration of interest

The authors report no conflict of interest. The authors alone are responsible for the content and writing of the article.

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