

# Mystery Case: Bilateral temporal crescent sparing after cardiac arrest

Daniel Josef Lindegger, MD, Maria Helfenstein, MD, Oliver Job, MD, and Misha Pless, MD

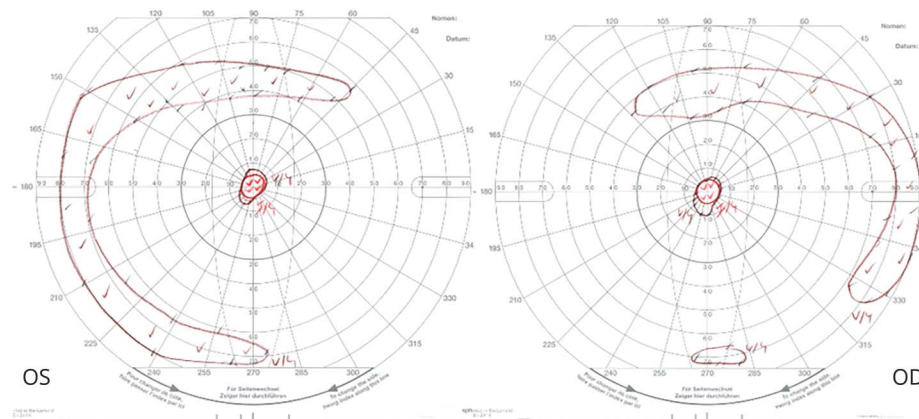
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## Correspondence

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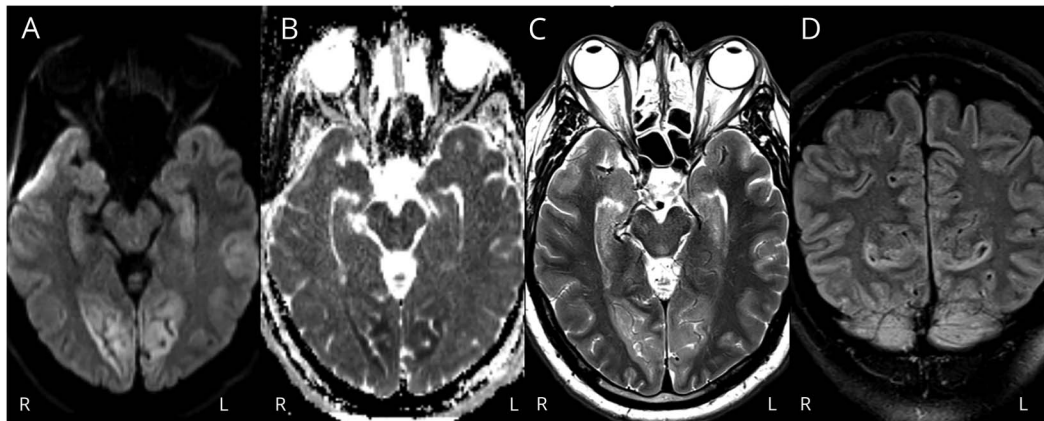
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**Figure 1** Perimetry features



Goldmann kinetic perimetry 6 months after cardiac arrest shows bilateral central and temporal crescent sparing homonymous hemianopias.

**Figure 2** MRI features



Axial diffusion-weighted imaging (A), apparent diffusion coefficient (B), T2-weighted (C), and coronal fluid-attenuated inversion recovery (D) MRI obtained 3 days after cardiac arrest demonstrate bilateral calcarine cortex signal abnormalities.

A 48-year-old man complained of tunnel vision after he experienced a cardiac arrest with out-of-hospital resuscitation. Best-corrected visual acuities were 20/15 OD and OS. Pupil responses were unremarkable. Goldmann perimetry showed bilateral homonymous hemianopia with central sparing and presence of temporal crescents (figure 1). Fundusoscopic examination was normal OU. MRI demonstrated bilateral posterior watershed infarctions (figure 2). This

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### Survey and Results

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particular visual field pattern with sparing of 2 visual field regions located on opposite anatomic poles in the visual cortex is rare<sup>1</sup> and presumably results from vascular redundancy and sparing of the anterior and posterior most aspects of the calcarine cortex.<sup>2</sup>

### Author contributions

Daniel Josef Lindegger: study concept and design, acquisition and interpretation of data, drafting the manuscript. Maria Helfenstein: critical revision of manuscript for intellectual content. Oliver Job: critical revision of manuscript for intellectual content. Misha Pless: study concept and design, critical revision of manuscript for intellectual content, supervision.

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### Disclosure

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### Mystery Case responses: A 48-year-old man with vision loss

The Mystery Case series was initiated by the *Neurology*<sup>®</sup> Resident & Fellow Section to develop the clinical reasoning skills of trainees. Residency programs, medical student preceptors, and individuals were invited to use this Mystery Case as an educational tool. Responses to multiple choice questions formulated using this case were solicited through a group email sent to the American Academy of Neurology Consortium of Neurology Residents and Fellows and through social media. We received 394 responses. The majority of respondents (70%) had been in practice for 1–4 years; 59% were residents or fellows while 28% were faculty/board-certified physicians; the remainder were medical students or advanced practice providers. A total of 70% resided outside the United States. A wide range of practice settings was represented.

When shown the patient's visual field testing results, 33% of the respondents correctly recognized the spared temporal crescents while 27% correctly recognized the central sparing. A total of 23% appeared to have misinterpreted the spared temporal portions as being involved by the lesion, leading

them to label the defect as bitemporal hemianopia (as classically seen with a chiasmatic lesion associated with a sellar/pituitary mass). If we take a close look at the figure, however, we can see the check marks placed by the tester within the boundaries to indicate the presence of normal vision in this region. A total of 17% thought this was tunnel vision (as might be seen with glaucoma); while this would be appropriate if there was only central sparing, the presence of spared temporal crescents indicates that there is more to this defect than just tunnel vision. A total of 21% called the abnormality a bilateral scotoma; however, given the extent and congruent pattern of the defect, it would be most appropriate to call this a bilateral homonymous hemianopia with central sparing and spared temporal crescents. However, only 7% of the respondents additionally identified the abnormality as bilateral homonymous hemianopia. Interpretation of this field defect was likely further complicated by the absence of clear respect for the vertical meridian.

That being said, when asked to then localize the lesion, 22% of respondents correctly localized the deficit to the bilateral calcarine cortex (the most appropriate choice listed). Homonymous hemianopia localizes a lesion as being retrochiasmatic and contralateral to the field defect; a congruent defect indicates a posterior (vs anterior) retrochiasmatic lesion.<sup>1</sup> A lesion of the calcarine cortex would be expected to cause contralateral homonymous hemianopia; with bilateral field defects, a bilateral lesion is indicated. The most popular answer, favored by 38% of the respondents, was a lesion of the optic chiasm. This appeared to be in keeping with the misinterpretation of the field defect as bitemporal hemianopia.

This case helps review key principles of interpreting visual field testing, and also highlights pitfalls that can arise from different methods of presenting results (e.g., shading in affected areas vs the check marks used in this case), particularly when the task of test interpretation falls upon someone who did not directly perform the test, as is often the case for neurologists.

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