Reverberating flow pattern in the central retinal artery in cerebral circulatory arrest

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Neurology® 2020;94:276-277. doi:10.1212/WNL.00000000000008918

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Figure 1 Transcranial Doppler and central retinal arteries (CRA) waveforms

(A) Reverberating flow pattern in the right (and left, not shown) middle cerebral artery (MCA). (B) The right (and left, not shown) CRA showed similar waveforms to MCA.

Figure 2 Technique for ultrasound assessment of the central retinal arteries (CRA) flow

(A) A linear transducer is placed in an axial position over the globe, with the eyelids closed and covered by a generous amount of gel. (B) In color Doppler, the CRA (a) is coded red, indicating flow moving toward the globe (G), while the central retinal vein (v) is coded blue, indicating flow moving away from the globe. (C) In spectral Doppler, the CRA typically shows low resistance velocity waveforms (represented in the antegrade channel), while the central retinal vein has a phasic flow (represented in the retrograde channel).

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Go to [Neurology.org/N](https://www.neurology.org/N) for full disclosures. Funding information and disclosures deemed relevant by the authors, if any, are provided at the end of the article.

A 49-year-old woman developed signs of brain death after a severe traumatic brain injury. Transcranial Doppler (TCD), performed 4 hours after cessation of brain function based on the clinical neurologic examination, showed a reverberating flow pattern in the anterior (figure 1A) and posterior cerebral circulation (not shown), indicating cerebral circulatory arrest (CCA). At the same time, both central retinal arteries (CRA) showed a similar TCD pattern (figure 1B).

Doppler flow patterns of CCA in the CRA have been reported in pediatric patients with brain death.¹ However, experience in adults is absent. CRA could offer a simple way to assess for CCA in the anterior cerebral circulation, potentially useful

when obtaining flow signals through the cranial bone is not possible (figure 2, technique).

Study funding

No targeted funding reported.

Disclosure

The authors report no disclosures relevant to the manuscript. Go to Neurology.org/N for full disclosures.

Reference

1. Riggs BJ, Cohen JS, Shivakumar B. et al. Doppler ultrasonography of the central retinal vessels in children with brain death. *Pediatr Crit Care Med* 2017;18: 258–264.

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Neurology 2020;94:276-277 Published Online before print January 22, 2020

DOI 10.1212/WNL.00000000000008918

This information is current as of January 22, 2020

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