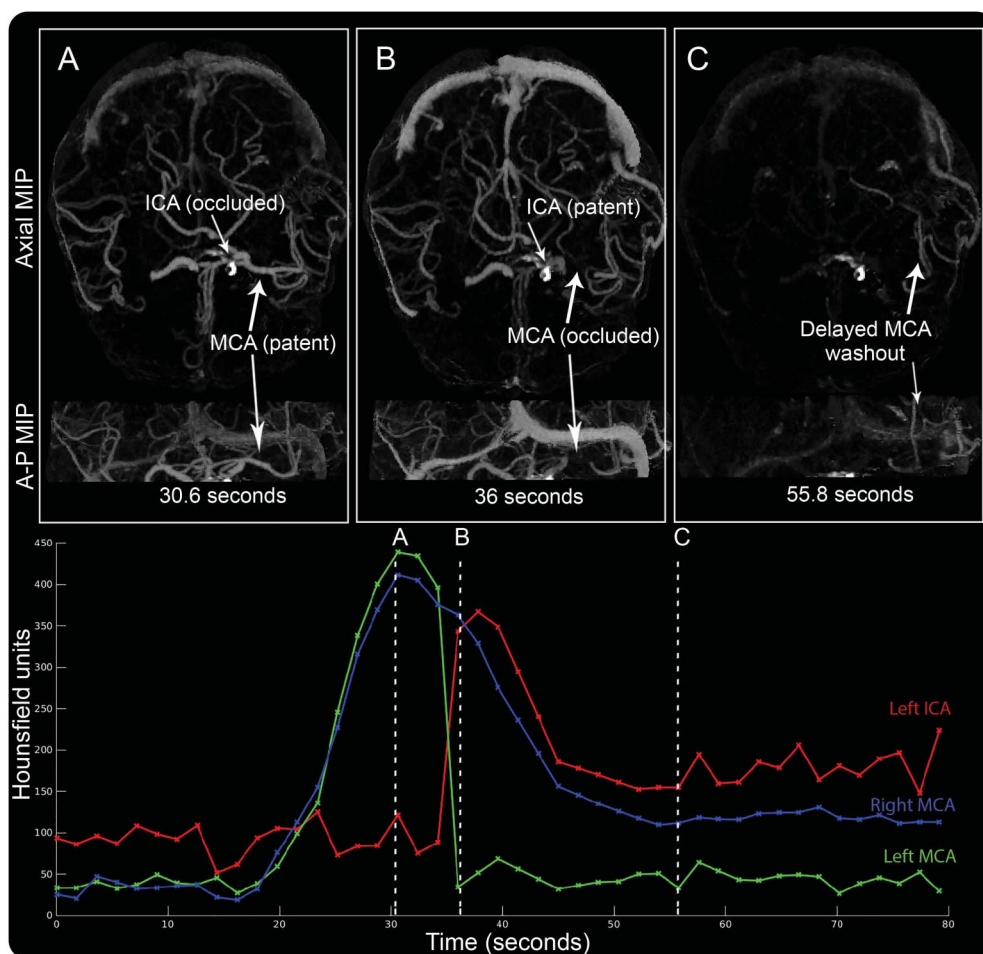


# Ultra-acute CT perfusion imaging

A stroke in the scanner



**Figure 1** Clot fragmentation visualized with dynamic CT angiography

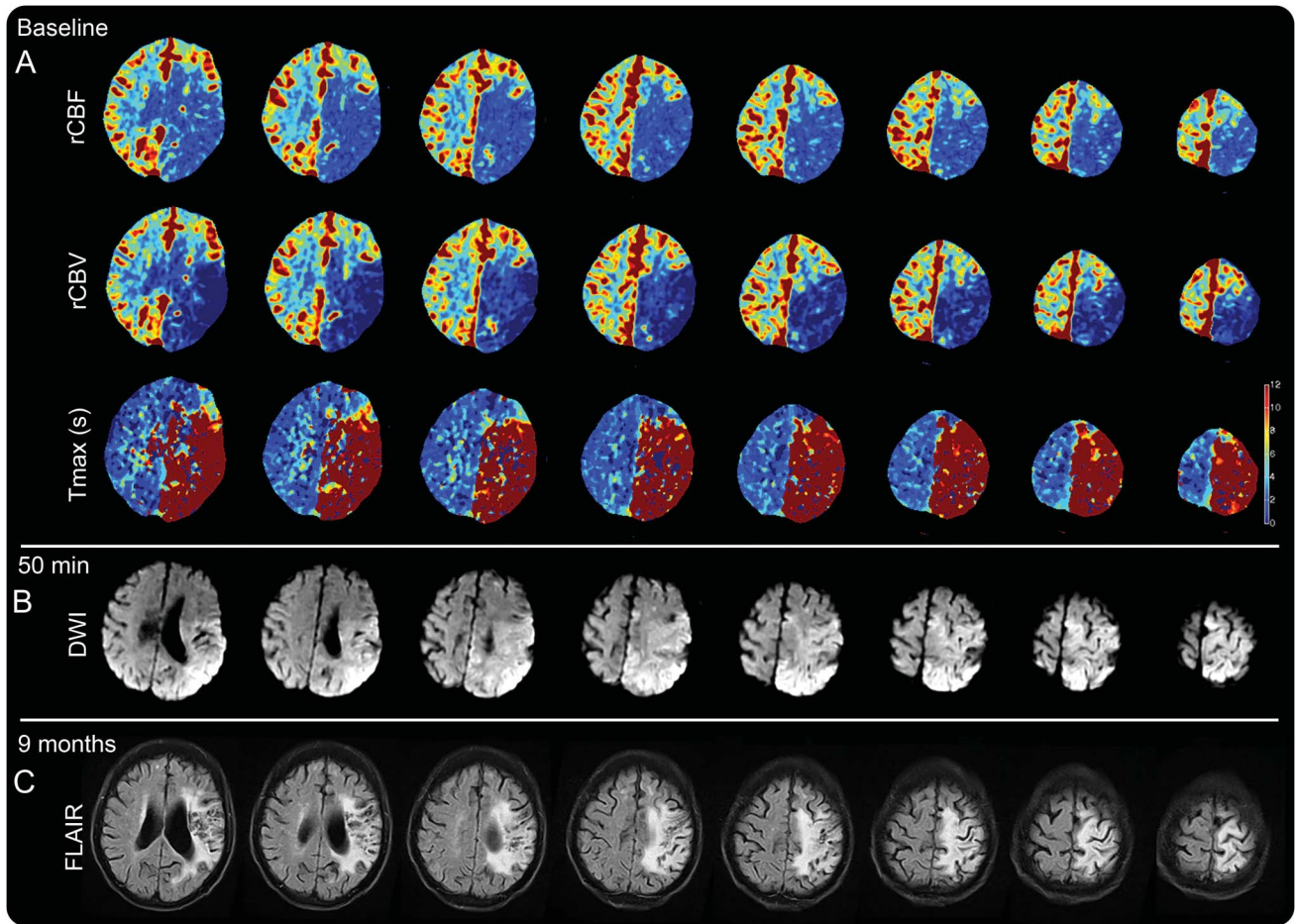


(A) Early phase: left ICA is occluded; the middle, anterior, and fetal posterior cerebral arteries fill through a patent anterior communicating artery. (B) Middle phase: clot dislodged from ICA and fragments obstruct MCA, anterior cerebral artery, and fetal PCA branches. (C) Late phase: stagnation of CT contrast in distal MCA and PCA branches. ICA = internal carotid artery; MCA = middle cerebral artery; MIP = maximum intensity projection; PCA = posterior cerebral artery.

A stroke patient with a mild right hemiparesis (NIH Stroke Scale score 4) underwent dual-slab CT perfusion (CTP). In the midst of acquiring the lower CTP slab, she became aphasic and developed a dense right hemiparesis (NIH Stroke Scale score 17). Reconstruction of the CTP into a dynamic CT angiogram demonstrates fragmentation of an internal carotid artery thrombus at the time of clinical worsening (figure 1; video on the *Neurology*<sup>®</sup> Web site at [Neurology.org](http://Neurology.org)). The upper CTP slab, acquired 2 minutes later, provides the earliest known view of the hemodynamics of ischemic stroke in humans. It demonstrates total absence of flow to the middle cerebral artery territory during the ultra-acute phase (figure 2). Follow-up imaging demonstrates infarction of this territory.

Supplemental data  
at [Neurology.org](http://Neurology.org)

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(A) Hyperacute CT perfusion (2 minutes): CBV and CBF are severely reduced while Tmax is severely prolonged in the ACA, MCA, and posterior cerebral artery territories. (B) Acute DWI (50 minutes): restricted diffusion of the ACA and MCA territories. (C) FLAIR (9 months): infarction of the territories that demonstrated restricted diffusion. ACA = anterior cerebral artery; DWI = diffusion-weighted imaging; FLAIR = fluid-attenuated inversion recovery; MCA = middle cerebral artery; rCBF = regional cerebral blood flow; rCBV = regional cerebral blood volume.

*Author contributions:* Soren Christensen: collected data, analyzed and interpreted data, and drafted the report. Chrystal Obi: saw the patient, interpreted the case, and edited the report. Greg Albers: interpreted the case and edited the report. Maarten Lansberg: interpreted the case and edited the report.

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