Teaching Video NeuroImages: ECG-gated 4D-CTA Can Detect Aortic Plaque Mobility in Cryptogenic Stroke

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An 80-year-old man developed an acute ischemic stroke and right posterior cerebral artery (PCA) occlusion (Figure A-B). Cardiac and carotid artery ultrasound examinations and 24-hour electrocardiogram monitoring did not identify any embolic sources. ECG-gated 4D-CTA showed a non-calcified plaque with a superimposed mobile component on the ascending aorta (Figure C, Video). Virtual angioscopy using the datasets from ECG-gated 4D-CTA showed the seaweed-like mobile component in the 3D view (Figure D, Video). This was diagnosed as aortogenic embolism. The antithrombotic therapy was changed from clopidogrel to warfarin with an international normalized ratio of 2.0 to 3.0, and low-density lipoprotein cholesterol levels were controlled to less than 70 mg/dL by rosuvastatin.

Aortic plaque is one of the causes of cryptogenic stroke1. ECG-gated 4D-CTA can evaluate aortic plaque mobility in the ascending aortic arch and the whole aortic arch. ECG-gated synchronization reduces motion artefact compared to non-ECG-gated CT and improves the assessment of plaque morphology and mobility2. Additionally, the virtual angioscopic view, which is an image-processing technique to provide endoluminal views of blood vessels3, can show plaque mobility in 3D and make it easy to understand the positional relationships between the plaque and the aortic arch branches.
Legends

Figure. Radiologic findings

A. Non-contrasted brain MRI DWI sequence imaging shows a high-intensity signal in the right posterior cerebral artery (PCA) region.

B. Non-contrasted brain MRA sequence imaging shows the right PCA occlusion (arrowhead).

C. Coronal view of ECG-gated 4D-CTA shows the plaque (black-arrow) with the superimposed component (white-arrow).

D. Virtual angioscopy from the viewpoint of the ascending aorta (small-arrow in C) shows the superimposed component (white-arrow).

Video. ECG-gated 4D-CTA show the moving component wiggling with the pulsatile flow. Virtual angioscopy shows the seaweed-like mobile component on the proximal portion of the aortic arch branches.
Appendix 1: Authors

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Teaching Slides-http://links.lww.com/WNL/B371

Video-http://links.lww.com/WNL/B372
References


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