Detection of Carotid Atherosclerotic Plaque Ulceration, Calcification, and Thrombosis by Multicontrast Weighted Magnetic Resonance Imaging

Article in Circulation · August 2005
DOI: 10.1161/CIRCULATIONAHA.104.494419 · Source: PubMed

8 authors, including:

- **Baocheng Chu**
  University of Washington Seattle
  86 PUBLICATIONS  4,082 CITATIONS
  [SEE PROFILE]

- **Marina S Ferguson**
  University of Washington Seattle
  44 PUBLICATIONS  3,556 CITATIONS
  [SEE PROFILE]

- **Jianming Cai**
  Chinese PLA General Hospital (301 Hospital)
  49 PUBLICATIONS  2,659 CITATIONS
  [SEE PROFILE]

- **Michel Kliot**
  University of California, San Francisco
  110 PUBLICATIONS  3,275 CITATIONS
  [SEE PROFILE]

Available from: Baocheng Chu
Retrieved on: 25 August 2016
62-year-old man presented to the emergency department with a chief complaint of severe headache and decreased vision in his left eye. Initial physical examination demonstrated a new-onset left homonymous hemianopsia, which warranted a stroke workup. The patient’s head CT was significant for a 2.3×3.7-cm acute hemorrhage in the right posterior parietal and occipital lobes. Conventional angiography was performed and interpreted as >90% stenosis of both internal carotid arteries without ulceration. The remainder of the work-up, including echocardiogram, was negative. An ensuing carotid magnetic resonance examination with a phased-array carotid coil and high-resolution (0.3×0.3 mm pixel size) multicontrast weighted sequences confirmed the stenosis and demonstrated ulceration and calcification in both carotids and mural thrombus formation in the left carotid (Figures 1 and 2). After completely recovering from the stroke, the patient underwent staged bilateral carotid endarterectomy. Histological examination of the specimens confirmed the MRI findings of bilateral ulceration and left mural thrombus formation (Figure 3).

Disclosure
Dr Kliot is cofounder of a company, UltraImage Corp, which is now part of Pathway Medical Technologies and develops and makes MRI phase-array coils similar to those used in this article.
Figure 2. All weightings of the left carotid artery show a distinct ulcer (long arrows) and a small calcification (short arrows). The striking hyperintensity on the ulcer surface in the T2-weighted (T2W) image indicates the presence of a mural thrombus. Focal contrast enhancement on postcontrast-enhanced T1W (T1W-CE) indicates vasculature at the base of the thrombus.

Figure 3. H&E stain of right and left carotid endarterectomy specimens. The right plaque contained extensive calcifications and fibrosis. A well-defined penetrating ulcer extends 4 mm from the lumen surface through a fibrotic matrix. A penetrating ulcer with mural thrombus formation is seen in the left carotid endarterectomy specimen. Asterisks are placed in the lumen of the common and the internal arteries of both carotids. Location indicators are millimeter distance to the bifurcation. + indicates locations in the internal carotid artery; −, locations in the common carotid artery.
Detection of Carotid Atherosclerotic Plaque Ulceration, Calcification, and Thrombosis by Multicontrast Weighted Magnetic Resonance Imaging
Baocheng Chu, Marina S. Ferguson, Hunter Underhill, Norihide Takaya, Jianming Cai, Michel Kliot, Chun Yuan and Thomas S. Hatsukami

Circulation. 2005;112:e3-e4
doi: 10.1161/CIRCULATIONAHA.104.494419

The online version of this article, along with updated information and services, is located on the World Wide Web at:
http://circ.ahajournals.org/content/112/1/e3

Permissions: Requests for permissions to reproduce figures, tables, or portions of articles originally published in Circulation can be obtained via RightsLink, a service of the Copyright Clearance Center, not the Editorial Office. Once the online version of the published article for which permission is being requested is located, click Request Permissions in the middle column of the Web page under Services. Further information about this process is available in the Permissions and Rights Question and Answer document.

Reprints: Information about reprints can be found online at:
http://www.lww.com/reprints

Subscriptions: Information about subscribing to Circulation is online at:
http://circ.ahajournals.org/subscriptions/