Fibromuscular Dysplasia: MR Angiographic Diagnosis and Comparison to Conventional Angiography

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Purpose
Fibromuscular dysplasia (FMD) frequently involves the internal carotid arteries (ICA). Fibromuscular dysplasia typically involves the distal cervical carotid artery, producing multiple web-like narrowings and a bead-like appearance to the intervening segments (“string of beads” appearance). A study was done to evaluate the ability of MR angiography (MRA) to detect and specify the diagnosis and compare that effectiveness to catheter angiography.

Materials & Methods
Fifty patients with suspected stenosis of the internal carotid artery were studied with both MR and catheter angiography. This included five patients with FMD, the remainder either normal or with atherosclerosis of the carotid arteries. MR technique included 2D and 3D time-of-flight technique through the cervical carotid arteries. Carotids were evaluated for presence, location and severity of stenosis, as well as suspected cause.

Results
MRA easily detected those patients with FMD and enabled the interpreting radiologist to distinguish it from atherosclerosis, by delineating the disease in the distal cervical segment and sparing the carotid bulb. The multiple web-like narrowings were well seen with MRA as well as catheter angiography. All of the patients with normal vessels or atherosclerotic stenosis were determined correctly to not have FMD.

Conclusion
While arteriosclerosis is far more common to affect the ICA, MRA serves well in distinguishing it from FMD as it depicts both its presence and features. Patients with FMD are at increased risk for cerebral aneurysm and carotid dissection, thus the detection of FMD on MRA might prompt additional imaging to exclude these based on clinical circumstances.