Magnetic Resonance Imaging Findings in Temporal Arteritis

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We investigated the use of MRI with a gadolinium-based contrast agent (Magnevist, Schering-Plough) for the noninvasive evaluation of temporal arteritis. In contrast-enhanced MRI, arteritis is revealed by increased signal intensity of the inflamed vessel wall. Thickening of an inflamed vessel wall as well as perivascular edema also can be demonstrated and potential aneurysms of the inflamed vessel can be excluded. A dedicated 8-channel phase-array head coil was used on a 1.5-T scanner (Sonata, Siemens Medical Solutions) to produce a stack of high-resolution images with an in-plane resolution of 0.3 mm × 0.2 mm and a slice thickness of 3 mm. Characteristic findings of an inflamed vessel wall in temporal arteritis are shown in Figure 1, in which the image is perpendicular to the vessel orientation. Such contrast-enhanced MRI can provide useful information about the presence, localization, and extent of inflammation of the temporal artery beyond that obtained from clinical and ultrasonographic means. If inflammation is found, then the place of the biopsy can be determined, and potentially the number of false-negative biopsy specimens may be reduced. In addition, treatment with corticosteroids can be monitored as shown in Figures 1 and 2, in which signs of inflammation decreased during therapy.

Figure 1. High-resolution MRI of the frontal branch of the right temporal artery. A, The coronal T1-weighted 2D spin-echo sequence (TR 500 ms, TE 22 ms, FOV 120×120 mm², matrix 384×512) clearly depicts the right temporal artery (arrow). B, A contrast-enhanced, fat-saturated T1-weighted 2D spin-echo sequence at the identical position as in A. Note the contrast enhancement in the thickened vessel wall, which strongly indicates arteritis (arrow).

Figure 2. High-resolution MRI of the same patient after 8 weeks of corticosteroids at nearly the same region and identical scan parameters as in Figure 1. The patient’s clinical symptoms had disappeared by week 8. The contrast enhancement of the formerly inflamed vessel wall is significantly less pronounced (arrow) and no perivascular edema can be detected. The concomitant vein shows bright signal intensity within its lumen (arrowhead). As a result of flow voids, the lumen of the arteries is black and delineates the contrast-enhancing vessel wall clearly. This finding helps to differentiate the temporal artery from its concomitant vein.

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