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Imaging studies in the diagnosis of large vessel vasculitis

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For the assessment of large vessel vasculitis various noninvasive imaging modalities such as colour-coded Duplex Sonography, Positron Emission Tomography (PET), Computed Tomography (CT) and Magnetic Resonance Imaging (MRI) exist. Currently, none of the above mentioned techniques renders the spatial resolution that would be necessary to sufficiently image the vessels that are affected in small vessel vasculitides. However, in the diagnosis of large vessel vasculitides such as giant cell arteritis (GCA) they may be utilized with various advantages and disadvantages. Characteristic findings of temporal arteritis can be visualized by colour-coded duplex sonography with a dark halo being the most specific sign (1). It is a relatively cost-efficient but observer dependent imaging modality (2) and it may be difficult to distinguish inflammatory from atherosclerotic mural changes (3). ^{18}F-fluoro-2-deoxy-D-glucose PET is very sensitive in detecting extracranial involvement of large vessel vasculitis and may be used for noninvasive monitoring of mural inflammatory changes under therapy (4, 5). However, it provides no information on inflammatory changes of the superficial cranial arteries. Contrast enhanced CT is widely available and has been shown to be suitable for assessing aortitis and extracranial large artery involvement (6, 7). However, despite its submillimeter spatial resolution no reports about assessment of the superficial cranial arteries in GCA utilizing CT has been published. High resolution MRI allows assessment of the superficial cranial arteries in high detail (Fig. 1) (8). Unaffected artery segments can be distinguished from inflamed segments allowing assessment of the cranial involvement pattern (9). In combination with MR-angiography the extracranial involvement pattern can be demonstrated in a single comprehensive MR examination assessing the cranial, cervical and thoracic vasculature (10). Under successful long-term treatment MR sings of mural inflammation decrease significantly and eventually vanish entirely (11). In contrary to colour-coded Duplex Sonography acquisition of high resolution MRI is almost independent of the investigator's expertise. In contrary to PET, which is a very sensitive whole body screening tool for detecting extracranial involvement of large vessel vasculitis, MRI allows visualization

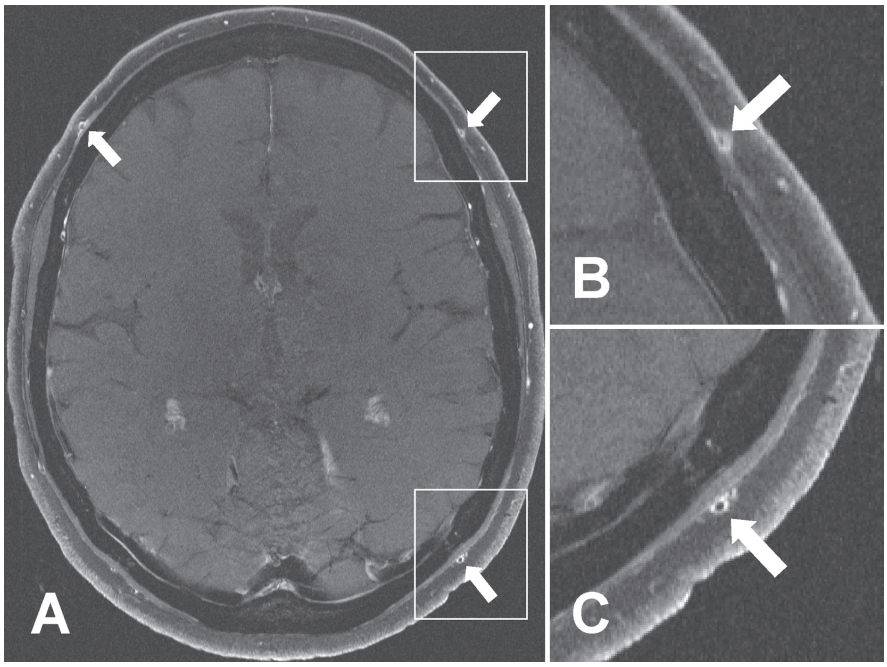

Fig. 1. High resolution MRI demonstrates the cranial involvement pattern of the superficial cranial arteries in a patient with proven giant cell arterits (arrows in A). Mural thickening and contrast enhancement can be readily revealed on the enlarged images of the left frontal branch of the supercial temporal artery (arrow in B) and the left superficial occipital artery (arrow in C).

and assessment of both, the superficial cranial arteries in high detail and the extracranial large artery involvement within the same investigation. A comparative multicenter trial is about to be initiated to determine the most efficient use of various image modalities in giant cell arteritis.

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