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LETTER

Utility of cranial and cervical vessel magnetic resonance imaging as a diagnostic aid in a patient with suspected giant cell arteritis

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Giant cell arteritis (GCA) is the most common systemic vasculitis (1). The inflammation targets the aorta, the main branches of the aorta, and the temporal arteries (1, 2). A serious complication of GCA can be sudden, permanent loss of vision due to ischaemic vascular changes (2). Rapid and accurate diagnosis is therefore crucial in the early stages of GCA (1). However, diagnosing GCA can be challenging (2). According to the European Alliance of Associations for Rheumatology (EULAR) treatment guidelines, magnetic resonance imaging (MRI) or positron emission tomography–computed tomography (PET-CT) can be used as alternatives to ultrasound in diagnostics (3). Clinically, there is only limited experience with the use of MRI in this indication (3), and it has been suggested that the diagnostic accuracy of MRI should be studied further (4).

We present a 68-year-old man with hypothyroidism and hypercholesterolaemia, who had previously been treated for polymyalgia rheumatica from 2017 to 2019, which had since been in remission. The patient presented for evaluation with fatigue lasting for 2 weeks, a fever of 38ºC for 1 week, and bilateral temporal pain. He had no symptoms indicating an infection focus or visual impairment. Laboratory tests showed a significantly elevated C-reactive protein level (CRP) of 143 mg/L and erythrocyte sedimentation rate (ESR) of 113 mm/h. The temporal pulses were palpable but mildly tender. An experienced rheumatologist performed an ultrasound examination, revealing a clear halo sign in all branches of the temporal arteries bilaterally, and the compression test was also positive. A cranial and cervical vessel MRI was performed using a 1.5 T machine with a vasculitis protocol and gadolinium contrast. The imaging showed thickening and pathological enhancement in the proximal parts of the temporal arteries bilaterally, most prominently in the frontal branches (Figure 1A, B), consistent with vasculitis. Similar enhancement was observed in the parietal branches and occipital arteries. There were no inflammatory changes in the cervical vessels, but pathological enhancement was observed in the right brachiocephalic artery and subclavian artery (Figure 1C). Supporting this finding, the [^{18}F]fluorodeoxyglucose (FDG) PET-CT scan showed increased tracer uptake in the temporal arteries bilaterally (Figure 1D). The brachiocephalic and subclavian arteries, and the proximal areas of the carotid arteries were also affected. Moreover, the ascending aorta, aortic arch, descending aorta, and abdominal aorta were affected (Figure 1E). The findings from all investigations were consistent with GCA. According to the EULAR recommendations, there was no need for a temporal artery biopsy owing to the high suspicion of GCA and the rapid positive imaging results obtained by ultrasound, MRI, and PET-CT (3).

High-dose glucocorticoid treatment with prednisolone was initiated at the dose of 40 + 20 mg, and all imaging studies were conducted before starting the treatment. As the prednisolone dose was tapered to 17.5 mg per day at the end of 7 weeks, the patient's stiffness increased and temporal pain gradually returned. CRP was 10 mg/L and ESR was 15 mm/h. The treatment was intensified by increasing the prednisolone dose and initiating tocilizumab at the dose of 162 mg once weekly. These measures helped to alleviate the symptoms, and prednisolone was completely tapered off approximately 10 months after the start of treatment. However, 2 months after discontinuing prednisolone, the patient reported tenderness in the temporal regions bilaterally. An ultrasound examination again showed a positive compression test in the main and frontal temporal artery branches bilaterally. Supporting this finding, the cranial and cervical vessel MRI showed mild wall enhancement in the right brachiocephalic artery (Figure 2A) and in the left proximal parts of the temporal artery and frontal branches in the left temporal artery (Figure 2B), consistent with vasculitis. The findings were, however, milder than in the initial phase. As treatment,

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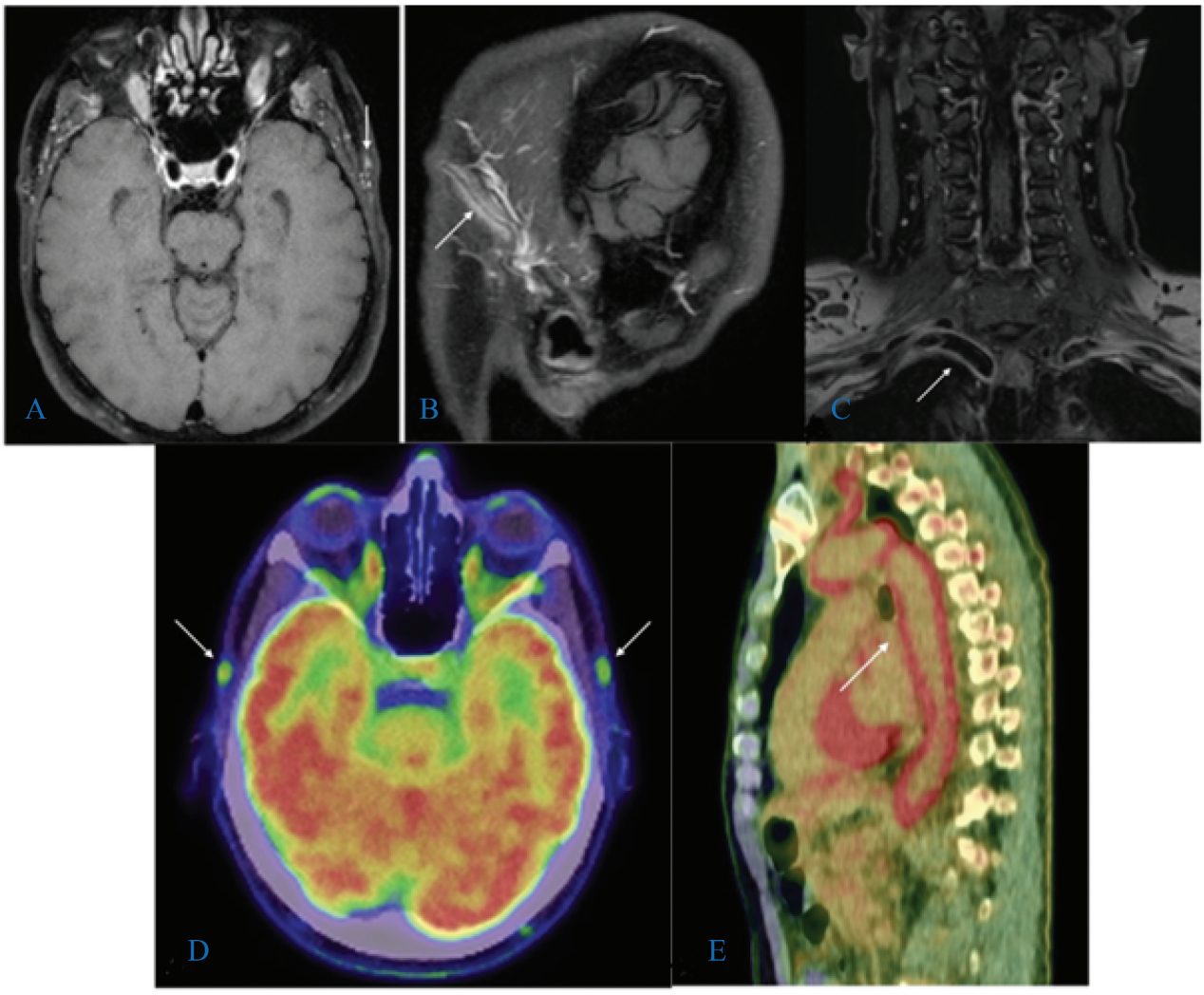

Figure 1. Magnetic resonance imaging (MRI) positron emission tomography–computed tomography (PET-CT) findings consistent with giant cell arteritis at the time of diagnosis. (A–C) T1-weighted three-dimensional black-blood magnetic resonance images with gadolinium contrast demonstrating pathological enhancement in the proximal segments of the temporal arteries in (A) axial and (B) sagittal views; and (C) in the right brachiocephalic artery and subclavian artery in the coronal view. (D, E) [^{18}F]Fluorodeoxyglucose PET-CT scans revealing increased tracer uptake in (D) the temporal arteries bilaterally and (E) the ascending aorta, aortic arch, descending aorta, and abdominal aorta.

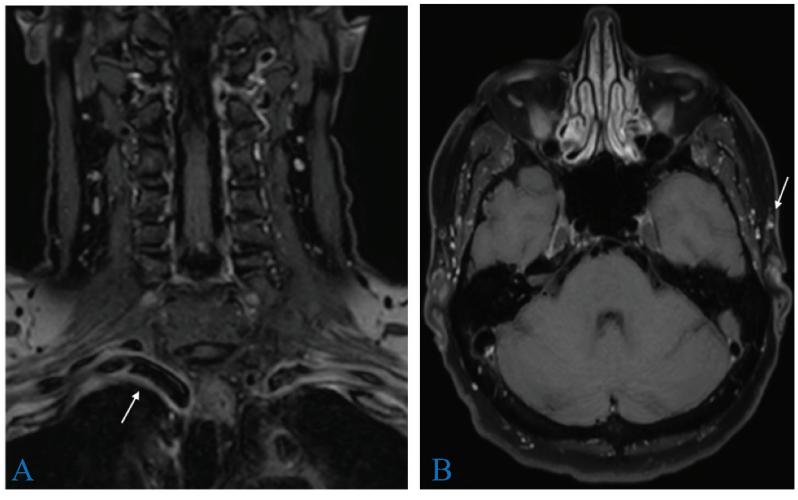

Figure 2. Magnetic resonance imaging findings indicative of giant cell arteritis during relapse. (A, B) T1-weighted three-dimensional black-blood magnetic resonance images with gadolinium contrast demonstrating wall enhancement in (A) the right brachiocephalic artery in the coronal view and (B) the proximal segments of the left temporal artery, including its frontal branches, in the axial view.

prednisolone was restarted, and tocilizumab continued as before. Imaging studies were again performed before starting glucocorticoids. Upadacitinib, which has been recently approved for GCA (5), and other off-label medications such as secukinumab or abatacept, could not be used because of the lack of reimbursement approval in Finland (6).

MRI has demonstrated good sensitivity and excellent specificity in detecting GCA in some studies (7, 8). Our case report further supports the role of cranial and cervical vessel MRI in the early diagnosis of GCA, as well as in the detection of relapse (3). This enables more accurate and rapid diagnosis of GCA. Our case additionally demonstrates that cranial MRI, when combined with cervical vessel imaging, significantly enhances the detection of vasculitic changes in regions that are inaccessible to ultrasound examination.

Disclosure of interest

No potential conflict of interest was reported by the authors.

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Ethics and informed consent

All the procedures followed were in accordance with the ethical standards of the local responsible committee on human experimentation and with the Declaration of Helsinki. Written informed consent was obtained from the patient for the publication of this case report and corresponding images.

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