

Comment on: Development of intracranial vasculitis in giant cell arteritis during tocilizumab treatment by Naderi

Sirs,

We read with interest the case report presented by Dr Nazanin Naderi (1) highlighting the development of intracranial arteritis in a 70-year-old patient with giant cell arteritis (GCA) following the introduction of tocilizumab. Herein we report a contrary illustrative case in which intracranial vasculitis at GCA diagnosis was reversed with glucocorticoids and tocilizumab.

An 81-year-old male initially presented with features of polymyalgia rheumatica and elevated inflammatory markers [erythrocyte sedimentation rate (ESR) 68 mm/hr, C-reactive protein (CRP) 54.7 mg/L] without symptoms of GCA. He responded with symptom resolution and inflammatory marker normalisation following the initiation of prednisone 20 mg/day with subsequent taper. Five months later, while on 5 mg/day oral prednisone, he presented to a local emergency room with new-onset headache, jaw claudication, double vision, disequilibrium, bilateral lower extremity weakness and upper extremity numbness. ESR was 58 mm/hr and CRP 29.8 mg/L. Magnetic resonance imaging (MRI) of the brain demonstrated multiple subacute infarcts in the bilateral cerebellar hemispheres. Blood cultures were negative. Echocardiogram was negative for valvular abnormalities or intracardiac thrombus. Electrocardiogram showed normal sinus rhythm. Computed tomography with angiography of the head and neck showed occlusion of the basilar artery and left vertebral artery. Temporal artery biopsy was performed and was positive for giant cell arteritis (GCA) bilaterally. He received three days of 500 mg intravenous methylprednisolone followed by 60 mg/day prednisone which he remained on until referral to our institution two weeks later.

Upon initial evaluation at our institution, magnetic resonance angiography (MRA) of the head and neck with vessel wall imaging (VWI) was pursued for further arterial characteristics and confirmed occlusion of both the left vertebral and mid segment basilar artery (Panel A, arrow). The basilar artery (Panel B, arrow) and the left vertebral artery showed concentric wall thickening and ongoing contrast enhancement. Tocilizumab 162 mg/ml subcutaneous weekly was added and steroids tapered. Seven months later, while in remission on weekly tocilizumab and 5 mg/day prednisone, repeat brain MRA with VWI was performed. The previously occluded basilar (Panel C, arrow) and left vertebral artery were now patent (Panel C) with near resolution of wall thickening and enhancement (Panel D).

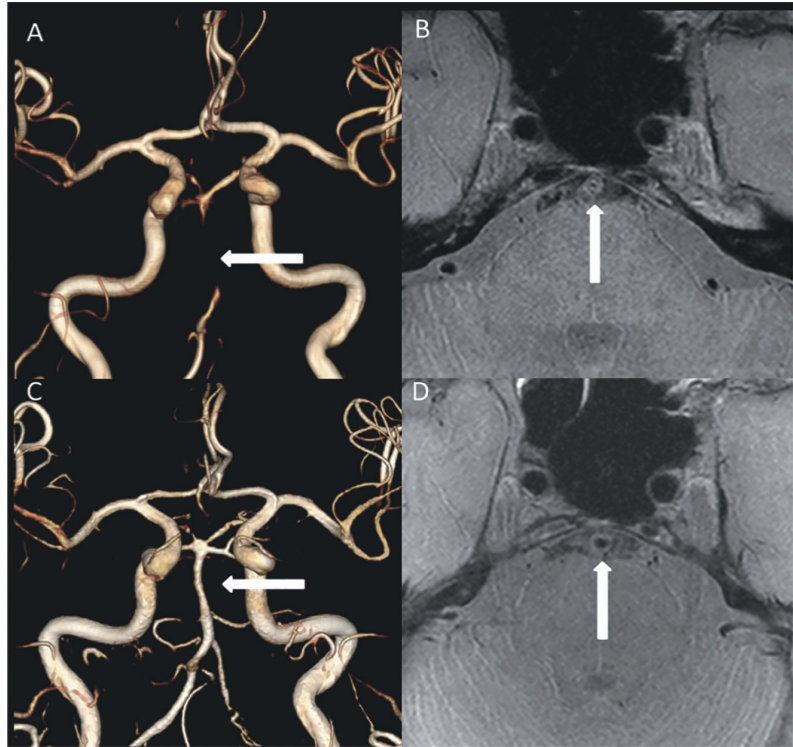


Fig. 1. Occlusion of the basilar and left vertebral artery (panel A, 3D reformatted magnetic resonance angiography) with vessel wall thickening and concentric enhancement (panel B, vessel wall imaging protocol, axial view) despite pulse dose steroids. Following initiation of tocilizumab and glucocorticoid taper, basilar artery became patent (panel C) with near resolution of arterial thickening and enhancement (panel D).

Intracranial artery involvement in GCA often has devastating outcomes (2-3). Though considered rare, involvement of the intracranial circulation has been reported with notable frequency (up to 50%) in patients undergoing systematic MR brain evaluations with vessel wall imaging (4). The report by Naderi clearly describes a patient in which initial brain imaging performed prior to the initiation of tocilizumab was without evidence of intracranial vasculitis confirming the development of this following initiation. Prior reports have noted progression of intracranial GCA despite tocilizumab use (2-3). The reason for progression is uncertain but animal studies have shown poor cerebral spinal fluid penetration of tocilizumab after intravenous administration (5). While approved for the treatment of GCA, the utility of tocilizumab in the subset of patients with intracranial involvement remains uncertain. To our knowledge, this is the first report of GCA with intracranial artery involvement with dramatic improvement with tocilizumab and high dose glucocorticoids. Given variable reported outcomes to date, further research is necessary to understand the impact of tocilizumab on intracranial GCA before it is routinely employed.

M.J. KOSTER¹, MD
K.J. WARRINGTON¹, MD
V.T. LEHMAN², MD

¹Department of Internal Medicine, Division of Rheumatology, Mayo Clinic, Rochester; ²Department of Radiology, Division of Neuroradiology, Mayo Clinic, Rochester, MN, USA.

Please address correspondence to: Matthew Koster,

Department of Internal Medicine, Division of Rheumatology, Mayo Clinic, 200 First Street SW, Rochester, MN 55905, USA.

E-mail: koster.matthew@mayo.edu

Competing interests: none declared.

© Copyright CLINICAL AND EXPERIMENTAL RHEUMATOLOGY 2021.

References

1. NADERI N: Development of intracranial vasculitis in giant cell arteritis during tocilizumab treatment. *Clin Exp Rheumatol* 2020; 38: 207-9.
2. ALSOLAIMANI RS, BHAVSAR SV, KHALIDI NA *et al.*: Severe intracranial involvement in giant cell arteritis: 5 cases and literature review. *J Rheumatol* 2016; 43: 648-56.
3. SANCHEZ-ALVAREZ C, HAWKINS AS, KOSTER MJ, LEHMAN VT, CROWSON CS, WARRINGTON KJ: Clinical and radiographic features of giant cell arteritis with intracranial involvement. *ACR Open Rheumatol* 2020; 2: 471-7.
4. SIEMONSEN S, BREKENFELD C, HOLST B, KAUFMANN-BUEHLER A, FIEHLER J, BLEY T: 3T MRI reveals extra and intracranial involvement in giant cell arteritis. *Am J Neurorad* 2015; 36: 91-7.
5. NELLAN A, LESTER MCCULLY CM, CRUZ GARCIA R *et al.*: Improved CNS exposure to tocilizumab after cerebrospinal fluid compared to intravenous administration in rhesus macaques. *Blood* 2018; 132: 662-6.