Rotational Vertebral Artery Compression Syndrome in Rheumatoid Arthritis-Associated Cranial Settling

Brian P Curry, MD  Daniel S Ikeda, MD

Walter Reed National Military Medical Center, Bethesda, MD
Disclosures

None.

The views expressed in this lecture are those of the authors and do not necessarily reflect the official policy or position of the Department of the Navy, Department of the Army, the Department of Defense, nor the U.S. Government

We certify that all individuals who qualify as authors have been listed; each has participated in the conception and design of this work, the analysis of data, the writing of the document, and the approval of the submission of this version; that the document represents valid work; that if we used information derived from another source, we obtained all necessary approvals to use it and made appropriate acknowledgements; and that each takes public responsibility for it.
Introduction

• Rheumatoid arthritis (RA) is a chronic autoimmune disease causing progressive and debilitating joint destruction and systemic complications.

• The cervical spine is frequently affected, particularly the atlantoaxial and atlantooccipital joints, typically causing neck pain. Neurological deficit is relatively uncommon. Rarely, RA cervical spine disease may present with symptoms of vertebrobasilar insufficiency.

• We describe a patient with intermittent vertebrobasilar insufficiency on standing and with head rotation, which resolved following decompression and fusion.
Case Presentation

• A 72-year-old man with RA was referred for evaluation of severe axial neck pain and gradual, progressive myelopathy and functional decline. He was largely dependent on a wheelchair for mobility, only standing and ambulating with a walker for short distances.

• He was also experiencing intermittent vertigo and syncopal and near-syncopal events, primarily when standing or when turning his head to the left. Workup revealed paroxysmal atrial fibrillation as well as orthostatic hypotension, though his vertigo and syncope did not appear temporally related to arrhythmias, and persisted despite medical treatment of his orthostasis.
Case Presentation

- Imaging demonstrated severe degeneration, with pannus formation and hypertrophy of the posterior atlantoaxial ligament, causing cervicomedullary compression and cord signal change.

- In light of his vascular symptoms, we obtained noninvasive vascular imaging. CT angiogram of the neck revealed severe extrinsic compression of the distal V3 segment of the left vertebral artery between the posterior arch of C1 and the occiput, with resultant vessel diameter of < 1 mm.
a. Sagittal T2 MRI, demonstrating C1-2 pannus with cord signal change
b. Axial T2 MRI, demonstrating that the left vertebral artery contacts, but is not compressed by, the C1-2 pannus
c. Coronal CT angiogram, demonstrating significant left vertebral artery compression between the skull base and the posterior arch of C1(arrow)
d. Sagittal CT angiogram, demonstrating significant left vertebral artery compression between the skull base and the posterior arch of C1(arrow)
Case Presentation

• He underwent left C1 hemilaminectomy and C1-3 posterior spinal fusion. There was obvious extrinsic compression of the distal extradural left vertebral artery, which was improved following left C1 hemilaminectomy.

• Postoperatively, he reported immediate improvement in neck pain and syncopal symptoms.

• He was discharged on postoperative day five to an acute rehabilitation facility, and was doing well at three-month follow-up, with no pain or syncopal symptoms and ambulatory with a rolling walker.
a. Coronal CT angiogram (postoperative) demonstrating resolution of left vertebral artery compression (arrow)

b. Sagittal CT angiogram (postoperative) demonstrating resolution of left vertebral artery compression (arrow)

c. 3D reconstruction from preoperative CT angiogram demonstrating severe compression of distal extradural vertebral artery

d. 3D reconstruction from postoperative CT angiogram demonstrating resolution of compression
Conclusions

• Cervical spine involvement is a common and early finding in RA. Rarely, RA-associated cervical spine disease may manifest as symptoms of vertebrobasilar insufficiency.

• This case highlights the need for a high degree of suspicion for vertebrobasilar involvement when treating a patient with RA-associated cervical spine disease, and suggests it would be reasonable to include noninvasive vascular imaging as part of their routine preoperative workup.