

CLINICAL IMAGE

An odontoid fracture and vertebral artery injury in fast-track

T. Andrew Windsor¹ | Semhar Z. Tewelde¹ | Kelly M. Blosser² | Adam C. Richardson² 

¹Department of Emergency Medicine, University of Maryland School of Medicine, Baltimore, MD, USA

²Department of Emergency Medicine, University of Maryland Medical Center, Baltimore, MD, USA

Correspondence

Adam Richardson, Department of Emergency Medicine, University of Maryland Medical Center, Baltimore, MD, USA.

Email: adamrichardson@umm.edu

Abstract

While CT scans without IV contrast are obtained commonly to evaluate vertebral injuries, CT angiography scans should be considered whenever a fracture site approaches known vasculature.

KEYWORDS

computed tomography, CT angiogram, digital subtraction angiography, lobulated pseudoaneurysm, odontoid fracture, vertebral artery injury

A 53-year-old man presented to the emergency department 3 days after an MVC. He complained of neck pain, and while his cervical spine was tender to palpation, he had no neurological deficits and an otherwise unremarkable exam. Through various imaging modalities an odontoid fracture and vertebral artery pseudoaneurysm were discovered.

A 53-year-old man presented to the emergency department 3 days after he was the belted driver in a motor vehicle accident in which his vehicle was struck from behind. He

complained primarily of posterior neck pain, and while his cervical spine was tender to palpation, he had no neurological deficits and an otherwise unremarkable physical exam.

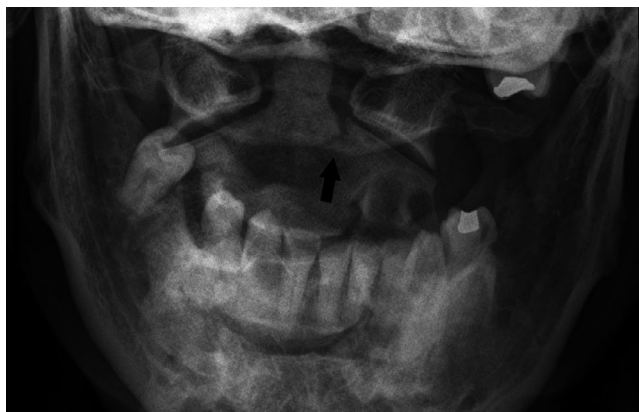


FIGURE 1 Open Mouth Odontoid View X-Ray showing a type III odontoid fracture



FIGURE 2 Coronal view noncontrast computed tomography showing a type III odontoid fracture with extension to the transverse foramen

This is an open access article under the terms of the Creative Commons Attribution-NonCommercial-NoDerivs License, which permits use and distribution in any medium, provided the original work is properly cited, the use is non-commercial and no modifications or adaptations are made.

© 2020 The Authors. *Clinical Case Reports* published by John Wiley & Sons Ltd



FIGURE 3 Coronal view computed tomography angiography showing the right vertebral artery with lobulated pseudoaneurysm at the C2 level, adjacent to the known type III odontoid fracture with associated AV fistula filling the vertebral venous plexus

An open mouth odontoid view x-ray (Figure 1) and computed tomography (CT) scan (Figure 2) revealed a comminuted type III odontoid fracture with extension to the right pars interarticularis and C2/C3 transverse foramen. This fracture pattern prompted a CT angiogram (Figure 3) revealing a lobulated right vertebral artery pseudoaneurysm and concern for vertebral arteriovenous fistula adjacent to the fracture. A complex high flow fistula was confirmed at the level of the C2 fracture by digital subtraction angiography (Figure 4) and repaired emergently by endovascular embolization (Figure 5).

Fracture-associated vascular injuries require timely intervention. Vessel injury patterns can range from wall injury causing mild stenosis to transection. Plain radiographs or CT scans may identify bony abnormalities, but a low threshold to obtain vascular imaging should be maintained whenever a fracture site approaches known vasculature and there are several tools to help guide decision making.^{1,2}

CONFLICT OF INTEREST

None declared.

AUTHOR CONTRIBUTIONS

TAW: cowrote the manuscript and coconducted the literature review. SZT: coordinated the writing of the manuscript and edited the manuscript. KMB: treated the patient and edited the manuscript. ACR: treated the patient, cowrote the manuscript, and coconducted the literature review.



FIGURE 4 Lateral view of digital subtraction angiography showing venous reflux and concern for arteriovenous malformation (AVM)



FIGURE 5 Lateral view of angiography status post endovascular embolization coiling

ORCID

Adam C. Richardson  <https://orcid.org/0000-0001-5714-8995>

REFERENCES

1. Drain JP, Weinberg DS, Ramey JS, Moore TA, Vallier HA. Indications for CT-angiography of the vertebral arteries after trauma. *Spine*. 2018;43(9):E520-E524.
2. Brommeland T, Helseth E, Aarhus Ma, et al. Best practice guidelines for blunt cerebrovascular injury (BCVI). *Scand J Trauma Resusc Emerg Med*. 2018;26(1):90. Published 2018 Oct 29.

How to cite this article: Windsor TA, Tewelde SZ, Blosser KM, Richardson AC. An odontoid fracture and vertebral artery injury in fast-track. *Clin Case Rep*. 2020;8:1847–1849. <https://doi.org/10.1002/ccr3.2952>