Odontoid fracture outcome

Certain types of odontoid fractures can lead to gross instability of the atlantoaxial complex and present a significant risk for a potentially catastrophic spinal cord injury

The frequency of fatalities at the time of the accident resulting directly from odontoid fractures is unknown, it has been estimated as being between 25–40 % [1)].

Nonunion rates of Odontoid fractures have been reported to be up to 40% and mortality up to 35%, and poor functional outcomes are common.

Atlantoaxial instability (AAI) may be more likely to experience nonunion and mortality, suggesting the possibility that aggressive management could be warranted. Further investigation with a large prospective study including patient-important functional outcomes is justified [2)].

Odontoid fractures lead to limitations in mobility of the cervical spine even after treatment with methods that in theory should preserve the C1/C2 mobility [3)].

Nonunion

Radiographic criteria of nonunion of odontoid fractures

Defect in the dens with contiguous sclerosis of both fragments (vascular pseudarthrosis).

Defect in the dens with contiguous resorption of both fragments (rarefying osteitis or atrophic pseudarthrosis)

Defect in the dens with definite loss of cortical continuity

Movement of dens fragment demonstrated on flexion-extension x-rays.

The most common symptom of nonunion is continued high posterior cervical pain beyond the time that the brace is removed. Late myelopathy can develop in as many as 77% of mobile nonunions as a result of motion and soft tissue proliferation around the unstable fracture site.

References

1)
Crockard HA, Heilman AE, Stevens JM. Progressive myelopathy secondary to odontoid fractures: clinical, radiological, and surgical features. J Neurosurg. 1993; 78:579–586
2)
Evaniew N, Yarascavitch B, Madden K, Ghert M, Drew B, Bhandari M, Kwok D. Atlantoaxial instability in acute odontoid fractures is associated with nonunion and mortality. Spine J. 2015 May 1;15(5):910-7. doi: 10.1016/j.spinee.2014.03.029. Epub 2014 Mar 22. PubMed PMID: 24662216.
3)
Wolan-Nieroda A, Maciejczak A, Przysada G, Kużdżał A, Magoń G, Czarnota M, Drużbicki M, Guzik A.

Assessment of cervical range of motion in patients after axis fracture. Neurol Neurochir Pol. 2017 Dec 6. pii: S0028-3843(17)30461-9. doi: 10.1016/j.pjnns.2017.11.013. [Epub ahead of print] PubMed PMID: 29691052.