

Images in Spine Surgery: Os Odontoideum

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A 12 old year boy was doing back flips on a trampoline when he landed on his neck. He had transient quadriplegia for few minutes but subsequently started recovering partially. At the time of presentation to the emergency department he had motor weakness in upper and lower extremities (2+5) and decreased sensations in both legs. The weakness was slightly more pronounced in the upper limbs compared with the lower limbs, more so in the central cord syndrome pattern. His bladder and bowel function was intact. X-rays and CT scan showed an Os Odontoideum. MRI confirmed the diagnosis and also showed a signal change in the spinal cord in T2 weighted images at the atlantoaxial articulation due to the instability induced injury. The patient showed gradual and consistent improvement after admission and was given few days to recover from the central cord syndrome. He was later operated for stabilization and fusion of Atlantoaxial articulation (C1- C2 Joint). He underwent C1 lateral mass screws and C2 pars screws and rod instrumentation along with a tricortical iliac crest autograft to promote fusion posteriorly. At the time of latest followup, at about 2 months, he was able to ambulate independently without support and had complete sensory recovery.



Figure 1. Lateral View of cervical spine, showing Os Odontoideum with the upper arrow pointing to the Os and lower arrow to the dens.



Figure 3. Coronal reconstruction of upper cervical spine CT scan showing the Os Odontoideum and the defect (arrow).



Figure 2. CT scan cervical spine with sagittal reconstruction shows the Os, the hypoplastic Dens and the arrow pointing to the defect.



Figure 3. Coronal reconstruction of upper cervical spine CT scan showing the Os Odontoideum and the defect (arrow).



Figure 5. X-ray C-Spine (Postoperative Films) show stabilization of C1-2 articulation by posterior instrumentation and the tricortical bone graft is anchored by a small maxillofacial plate.

Commentary

Os Odontoideum is an uncommon craniovertebral junction abnormality which manifests as a separate ossicle apart from a hypoplastic dens. The etiology is debated to be either congenital or traumatic.¹ Signs and symptoms arise due to Atlantoaxial instability with absence of restraining mecha-

nism of the transverse ligament and dens. Patients can present with wide range of symptoms from neck pain to neurologic symptoms (transitory episode of diffuse paresis following trauma, Progressive Myelopathy), to vertebrobasilar symptoms to sudden death. Surgical stabilization of C1-2 articulation is indicated if there is neurologic involvement, more than 10 mm of instability on supervised flexion-extension films, or persistent neck complaints. Prophylactic stabilization is controversial.²

References

1. Menezes AH, Pathogenesis, dynamics, and management of os Odontoideum. *Neurosurg Focus*. 1999; 6:
2. Wills BP, Dormans JP. Nontraumatic upper cervical spine instability in children. *J Am Acad Orthop Surg* 2006; 14:233-45.