Case Report

Sudden Onset Quadriparesis after Minor Injury to Neck in a Male with OS Odontoideum

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Abstract
Os odontoideum is a rare anomaly of the second cervical vertebra. Here, a young male patient with quadriparesis secondary to myelopathy associated with os odontoideum is reported. The patient was totally asymptomatic prior to this episode which was precipitated by trivial neck injury. He started recovering with conservative measures and was referred to our neurosurgery department for further evaluation and definitive surgical intervention as there is always a chance of recurrence of symptoms in these patients. There is a role for conservative treatment of an asymptomatic incidentally found, radiologically stable, and noncompressive os odontoideum, however surgery has a definite role in symptomatic cases.

Case Report

A 35 year old male presented in our Medicine department with sudden onset of weakness of all four limbs following a minor injury to his neck while doing household work. This was associated with retention of urine, constipation as well as loss of sensations to all the modalities in similar distribution. The patient initially complained of mild shortness of breath, which subsided few days later on its own. There was no history of fever or any other major illness in the past. Examination of higher mental functions, spine, cranium and cranial nerves were within normal limit as was fundoscopy. Sensations were diminished in all four limbs and trunk however no sensory level could be delineated. Hypertonia was present in all four limbs, deep tendon reflexes were exaggerated and plantar was bilaterally extensor. Lhermitte’s sign was present. Complete haemogram, serum electrolytes, liver and renal function test were normal. Family history was non-contributory. Patient was non-addict, normoglycemic but hypertensive that was controlled on medications.

His X-ray cervical spine revealed os odontoideum where the dens was small and the posterior arch of C1 was displaced anteriorly (Figure 1). Subsequently a MRI cervical spine was done, which confirmed the presence of os odontoideum and subsequent spinal cord compression with myelopathy in cervical region (Figure 2).

Discussion
Os odontoideum (Greek ‘tooth like’), first described from postmortem studies by Giacomini in 1886, is a rare congenital anomaly of the 2nd cervical vertebra. It is a small accessory ossicle of variable size and shape with smooth, well-corticated borders which is separated from the base of a shortened odontoid process with no bony connection to the body of the axis. This bony abnormality weakens the atlantoaxial joint stability with potential to cause spinal cord compression. It is important to check the sagittal plane rotation angle and the instability index to evaluate the instability in os odontoideum. A sagittal plane rotation angle of more than 20 degrees or an instability index of more than 40% predisposes the patient to develop myelopathy.

Although traditionally, it was believed that this defect is congenital, there is now emerging consensus on the traumatic etiology of os odontoideum as well. Patients with Down’s syndrome are predisposed to this condition. However, the etiology does not play a major role in its diagnosis or

Fig. 1: Plain X-ray lateral view of neck showing os odontoideum (white arrow). The dens is small and the posterior arch of C1 is displaced anteriorly

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Os odontoideum has been classified into two anatomic types, orthotopic and dystopic. Orthotopic describes an ossicle that moves with the anterior arch of C1, whereas dystopic defines an ossicle that is functionally fused to the basion. The initial diagnosis of os odontoideum can be made with plain cervical spine x-rays but, magnetic resonance imaging and computed tomography are advisable for detailed evaluation and preoperative planning. Clinico-radiologically, this defect frequently mimics acute fracture of the odontoid. However, in an acute fracture or non-union of the odontoid the gap between the os odontoideum and the odontoid process is narrow and irregular and extends into the body of the axis below the level of the superior facet whereas in an os odontoideum, the gap extends to above the superior articular facet of the atlanto-axial joint. Patients with this condition can be asymptomatic or present with wide range of neurological dysfunctions. In a study featuring the clinical manifestations of various cranio-cervical abnormalities, the incidence of spastic quadriparesis in os odontoideum was found to be 80%.

Management depends on clinical presentation of the individual. In persons already diagnosed, it is best to avoid even trivial injuries to neck however it is difficult to do so in daily life. Patients with os odontoideum, either with or without C1-C2 instability, who have neither symptoms nor neurological signs and incidentally detected may be managed with clinico-radiographic surveillance and advice to avoid trauma as much as possible. On the other hand, surgery has a definite role in symptomatic cases like in patients who present with quadriparesis or any other neurodeficits and most importantly in patients with recurrent quadriparesis due to trivial neck injuries. Nowadays, the main surgical intervention is posterior decompression after reduction and fusion via independent C1 and C2 instrumentation. In experienced hands, an irreducible persistent anterior compression from os odontoideum can be approached by a trans oral route with good results.

In this case the patient was referred to our neurosurgery department for further workup and necessary management. The incidental detection of an os odontoideum should not be neglected. Rather, it should be promptly referred for appropriate spinal evaluation and surveillance as an understanding of the pathology and anatomy of this condition is essential to recognize and properly treat these patient. Special precautions are to be taken in children and athletes whose sporting activities may have to be restricted as minor trauma can precipitate the symptoms in these groups.

References


Fig. 2: Subsequently a MRI cervical spine was done, which revealed presence of os odontoideum and subsequent spinal cord compression with myelopathy in cervical region.