Median Occipital Condyle Associated With Atlantoaxial Instability and Myelopathy: A Case Report

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SUMMARY

A Median Occipital Condyle is a rare occurrence. We have not found any clinical studies in the literature and myelopathy due to a median condyle has been reported once before. Myelopathy due to anomalies of the craniovertebral junction is rare in neurosurgical practice. We describe a case of a 72-year-old man presenting with progressive myelopathy related to a median occipital condyle located at the anterior foramen magnum region.

KEY WORDS:
Median occipital condyle, Myelopathy, Craniovertebral junction

INTRODUCTION

Median occipital condyle have been presented in post-mortem anatomic studies, but there is a lack of clinical studies regarding this anomaly in the literature [1,2]. One of the manifestations of variant segmentation is the third condyle. This structure occurs as a projection on basion of the foramen magnum. Some occurrences are expressed as a simple rounded tubercle, but in more developed cases there is actually an articular facet that receives the tip of the odontoid process forming a true diarthrosis. In a series of 600 skulls, some suggestions of craniovertebral malformations, including a third condyle, was present in 14 per cent [3].

This is a case of a patient with median occipital condyle, associated with atlantoaxial instability (AAI), who started to have the symptoms 3 months prior to the presentation without any past history of trauma. He underwent C1 laminectomy and an occipito-cervical fusion with screw-rod fixation.

CLINICAL PRESENTATION

A 72 years old Man presented to our clinic with a 3 months history of progressive upper limbs weakness which gradually worsened and involved the lower limbs. However he still could walk independently. He also complained of feeling numbness in the upper limbs. However there was no neck or shooting pain down the arms and hands. He denied any urinary or bowel incontinences and his symptoms were not preceded by trauma or fall. On examination, the cranial nerves were all grossly intact. Motor examination showed no muscle wasting of upper limbs, tone was normal and power was reduced to 4 over 5 bilaterally for both, proximal and distal muscles. All the tendon reflexes were brisk. The Babinski's test showed up-going plantars.

The sensation for light touch was reduced in both upper limbs without pointed to any specific dermatomes. However, patient described the numbness was more on the fingers compared to the arms. The pin-prick and joint positions were normal. Motor examination of the lower limbs revealed the same findings; there were hyperreflexia of knee and ankle jerks and the power were uniformly reduced to 4 over 5 bilaterally involving proximal and distal muscle groups. There was no saddle anaesthesia and the anal tone was intact. With the history and clinical examinations, the lesion could be localised to the cervical spinal cord and above the level of C5. There were no symptoms and signs of radiculopathy to suggest any roots involvement.

IMAGING

His CT cervical showed an anomalous bone element, suggesting initially an odontoid fracture, but with the lack of soft tissue swelling, it could not be an acute fracture of the odontoid peg. The odontoid process was relatively short, with a thick and flaccid transverse ligament, compatible with atlanto-axial chronic instability. The spinal canal was narrow at the C1-2 level. The spinal cord at this level showed compatible with chronic oedema or myelomalacia, and not with an acute contusion. CT appearance was consistent with the presence of a median occipital condyle associated with atlanto-axial instability.

DISCUSSION

Atlantoaxial instability (AAI) may result for many reasons, including hypoplasia of the odontoid process and from laxity of the transverse ligament [4]. The patient we described, had a large third occipital condyle, associated with a hypoplastic odontoid process and laxity of the transverse ligament, according to the examination. These abnormalities resulted in AAI, which caused a mild chronic spinal cord impingement, and perhaps a sudden cord lesion with a trivial trauma.

Atlantoaxial subluxation (AAS) is defined as the situation in which the atlas is unstable relative to the axis due to the disruption or insufficiency of the ligamentous complex of the atlantoaxial joint. This has many causes, including congenital diseases. The cause of congenital craniovertebral junction varies. In patients with C1-2 subluxation, what probably transiently happened to our patient, the condition is likely related to ligamentous laxity. Osseous malformation of the dens region may be accounted for abnormal ligamentous

This article was accepted: 13 October 2011
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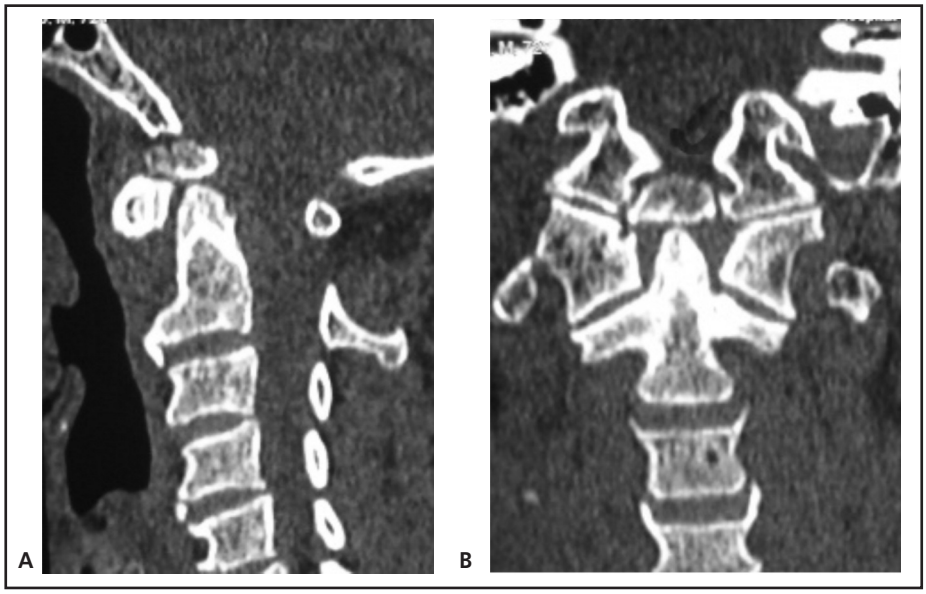

Fig. 1: Sagittal CT Cervical showed an anomalous bone seen between the anterior arch of the atlas and the occiput. The den is relatively short but retains its normal contour (A). Coronal view showed anomaly formation of bone above the dens of C2. CT appearance is consistent with the presence of a median condyle (B).

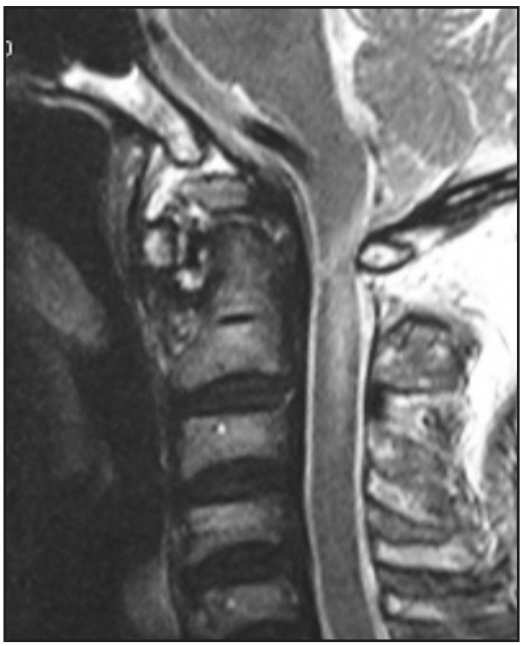

Fig. 2: Sagittal T2 MRI showed altered signal at C1 level which compatible with chronic oedema or myelomalacia.The cord changes are primarily due to the impingement by the posterior arch of C1.

laxity due to disturbances in the blood supply to the developing bone as a result of inordinate mobility [5]. In contrast, trauma is a relatively uncommon cause of such instability, and the pathomechanics are reported to be due to flexion, distraction and rotation

An Occipitocervical junction fusion with C1-C2 posterior screw-rod fixation and C1 laminectomy to decompress the canal was performed on this patient. Two screws at the lateral mass of atlas were introduced, and two more at the pedicle of the axis. Both screws were linked together with an adjustable rod that helps reduce the distraction between C1 and C2 and to the occipital plate for the fusion. Immediately after the surgery, patient already reported some improvement in sensation of the upper limbs. On his first follow up, motor examination showed the power of upper of upper and lower limbs had improved to 5 over 5 bilaterally although the reflexes still brisk. He also very pleased with the operation that now he could start feeling the sensation in his arms and legs, although it was not fully back to normal.

This unique clinical case live case, presents a very rare abnormality of the craniovertebral junction. Myelopathy is a very important complication of this abnormality. A larger series will be needed to better define its role in the management of this anomaly.

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