Fused cervical vertebrae: a coincidental finding in a lateral cephalogram taken for orthodontic diagnostic purposes

Renu Sarah Samson,[1] Eby Varghese,[2] Sumanth Nagraj Kumbargere,[3] Pramod Redder Chandrappa[4]

[1]Faculty of Dentistry, Department of Orthodontics, Melaka-Manipal Medical College, Bukit Baru, Malaysia
[2]Faculty of Dentistry, Department of Paediatric Dentistry, Melaka-Manipal Medical College, Bukit Baru, Malaysia
[3]Faculty of Dentistry, Department of Oral Medicine, Melaka Manipal Medical College, Melaka, Malaysia
[4]Department of Oral Pathology and Microbiology, College of Dental Surgery, Davangere, Davangere, Karnataka, India

Correspondence to
Dr Renu Sarah Samson, renusamson@gmail.com

Accepted 7 September 2016

DESCRIPTION

Lateral cephalograms are of utmost importance in orthodontic diagnosis and treatment planning. Usually, the orthodontist focuses only on the facial skeleton and thereby overlooks the cervical spine area, which otherwise would have benefited patients with cervical spine anomalies, especially those with clinical symptoms.

An average built adolescent reported for orthodontic correction of forwardly placed teeth. The diagnostic lateral cephalogram showed a class II skeletal pattern and increased overjet. Coincidentally, in this otherwise asymptomatic patient, fused cervical vertebrae (FCV) was noticed involving the C2–C3 vertebrae (figures 1 and 2). The patient gave no attributable history of trauma or infection.

FCV, also known as block vertebra may be congenital (chorda dorsalis) or acquired (juvenile rheumatoid arthritis or trauma or infections). It has an incidence of 0.4–0.7% and may affect any segment of the vertebral column but more commonly seen to affect the cervical vertebrae. Most patients remain asymptomatic until third decade of life. Repeated injuries or even trivial events such as sneezing may trigger the onset of symptoms. Symptoms include severe neck pain and limitation of neck movements, muscular weakness and sensory deficits. Other features such as shortening of spine, prominent trapezius muscles, osseous malformations such as scoliosis, kyphosis, etc, may also be noticed.[1]

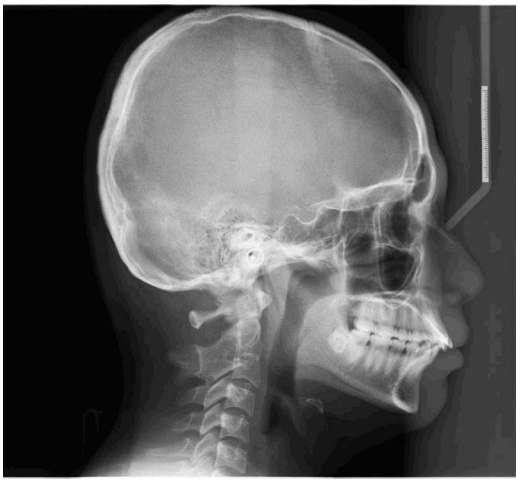

Figure 1 Lateral cephalogram of the patient showing the fusion of C2 and C3 vertebrae.

Figure 2 Fused C2 and C3 vertebrae.

Stretching and laxity of the ligaments between the occiput and the atlas in FCV can result in compression of the spinal cord or brainstem. The presence of block vertebra results in biomechanical stress in the adjoining segments leading to premature degenerative changes at the adjoining motion segments leading to vertebral disc tear, rupture of transverse ligament, fracture of odontoid process and spondylosis. Occipitalisation of atlas may be associated with C2–C3 fusion with instability at the C1–C2 articulation.[2]

Early diagnosis of FCV involving C2–C3 may result from an incidental radiographic finding. Thus, an orthodontist may play a pivotal role in detection of asymptomatic cervical spine abnormalities. Detecting FCV in the early stages can help in documenting any further change due to injury, ageing or progression of a degenerative process and also motivates the patients to change their lifestyle to lead a normal life.[3]

Management includes lifestyle changes to prevent and delay aggravation or the use of non-operative measures such as cervical collars and traction. Surgical intervention has a high risk of morbidity and mortality. Patient counselling on risk factor management and monitoring of complications is highly recommended. The present patient was advised lifestyle modifications to avoid any neck injuries and further evaluation by an orthopaedist.

To cite: Sarah Samson R, Varghese E, Kumbargere SN, *et al*. *BMJ Case Rep* Published online: [*please include* Day Month Year] doi:10.1136/bcr-2016-217566

Learning points

- Lateral cephalograms can disclose various pathologies that are important to physicians and orthopaedists. Orthodontists commonly use these radiographs for orthodontic diagnosis and treatment planning. It is therefore recommended that they should study the non-dental aspects of the lateral cephalograms including the cervical spine areas before proceeding with morphometric measurements.
- Therapeutic procedures involving neck extension and rotational movements may carry the risk of causing damage to the spinal cord and vertebral artery. Such procedures must be carried out with care.
- During endotracheal intubation of such patients, extreme caution must be exercised to avoid hyperextension of the neck as it can lead to disc prolapse. It is also recommended that all patients undergoing cisternal puncture must be screened for block vertebra.

Acknowledgements The authors would like to thank professor Abdul Rashid Haji Ismail, for the relentless support and encouragement in the publication of this case report as well as the Department of Oral Radiology for the expert services offered.

Contributors RSS contributed to the documentation, manuscript writing and correspondence. EV was involved in manuscript editing and submission. SNK contributed to imaging and investigations. PRC was involved in manuscript proof reading and editing.

Competing interests None declared.

Patient consent Obtained.

Provenance and peer review Not commissioned; externally peer reviewed.

REFERENCES

1 Tiwari A, Chandra N, Naresh M, *et al*. Congenital abnormal cervical vertebrae—a case report. *J Anat Soc India* 2002;51:68–9.
2 Soni P, Sharma V, Sengupta J. Cervical vertebrae anomalies- incidental findings on lateral cephalograms. *Angle Orthod* 2008;78:176–80.
3 Sherekar SK, Yadav YR, Basoor AS, *et al*. Clinical implications of alignment of upper and lower cervical spine. *Neurol India* 2006;54:264–7.