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Rotation of the second cervical vertebra in pediatric patient

Rotação da segunda vértebra cervical em paciente pediátrico

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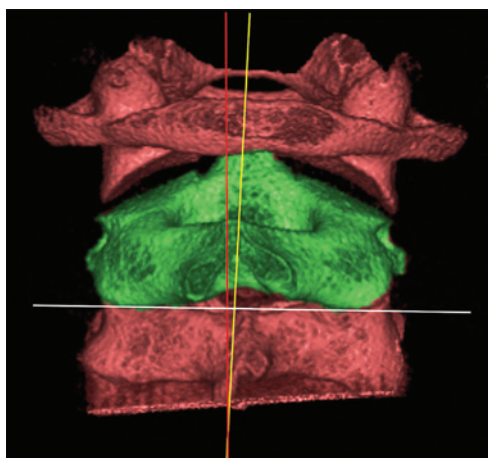


Figure 1. Tridimensional reconstruction of first three cervical vertebrae (posterior view). Rotation of the second cervical vertebra can be observed (green). The yellow line highlights the median sagittal plane; red line represents the rotation of second vertebra; white line indicates latero-lateral inclination of the second vertebra



Figure 3. Coronal reconstruction of cervical vertebrae. Red arrows indicating latero-lateral inclination of the second vertebra

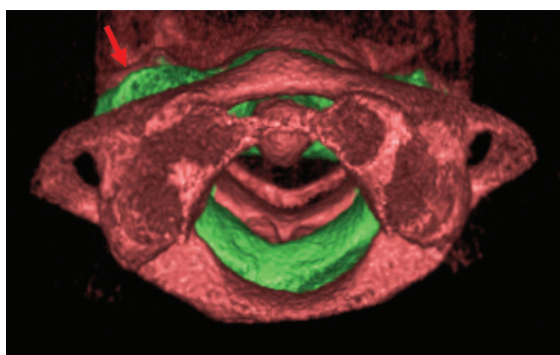


Figure 2. Tridimensional reconstruction of first three cervical vertebrae (transversal view). A rotation of the second vertebra is observed (green). Red arrow indicates the rotation of the second vertebra



Figure 4. Axial reconstruction. Yellow line showing medium sagittal plan; Red line indicating rotation of the second cervical vertebra

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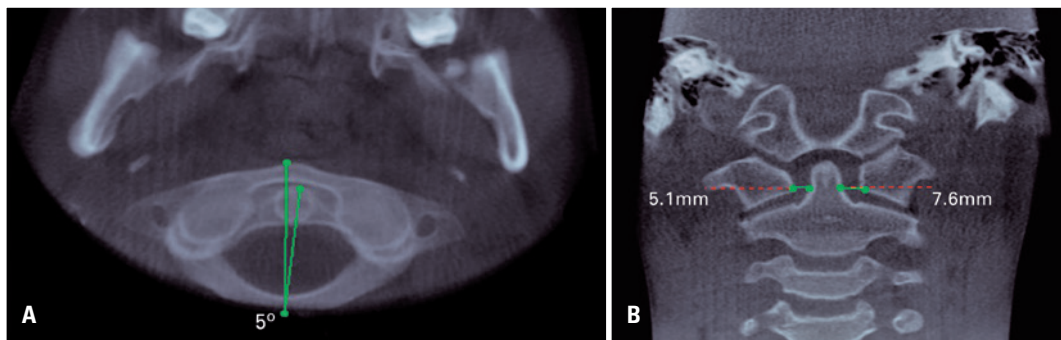


Figure 5. Cone beam computed tomography showing 5° of axial rotation in relation to medium line (A), atlanto-axil space of 5.1 and 7.6mm (B)

Rotatory instability is characterized by the rotation between two vertebral bodies, and it constitutes the most common cause of torticollis in children.⁽¹⁻⁵⁾ This prevalence occurs because of specific anatomic characteristics of childhood, such as disproportion between head-neck, underdeveloped cervical musculature, laxity of the joint capsule, ligament elasticity and horizontal shape of the articular facets between atlas and axis vertebrae.⁽³⁻⁷⁾ This condition can occur due to inflammation/infection^(2,6,7) or trauma,^(1,2,4,6) or because of neurogenic or idiopathic origin.⁽²⁾

The diagnosis includes clinical and imaging exam.^(7,8) Among imaging exams of bone tissue, radiographies in anteroposterior and lateral projections are of limited use because they do not enable a precise visualization of this alteration, due to difficulties in positioning patients (head offset or source of X-rays, and overlap of structures), leading to radiographic interpretation challenges.^(1,6,7) Computed tomography is considered the gold standard procedure.^(1,6,7) Images of tridimensional reconstruction provides a global visualization of rotation, therefore helping to establish the diagnosis.^(2,3,7) In addition, the magnetic resonance image can also be requested to evaluate the risk of vascular-nervous bundle compromising and injuries of the ligaments adjacent to vertebrae.^(1,5-7)

A 12-year-old boy was referred to our radiologic clinic to undergo a cone beam computed tomography for orthodontic purposes. We carried out a tridimensional, axial, coronal and sagittal reconstruction (Figures 1 to 5). During imaging assessment, we observed 5° of rotation of the second cervical vertebra in relation to medium line and a space between atlanto-axial vertebrae of

5.1mm (right side) and 7.6mm (left side) (Figure 5). In anamnesis, the patient reported trauma experienced 1 year earlier and, after the incident, presence of constant torticollis.

Correct diagnosis is crucial for adequate management. Treatment can be conservative using immobilization,^(3-5,7,9) traction or manual reduction,^(3,4,7,9) with the use of analgesic,⁽³⁾ physiotherapy^(1,9) or surgery.^(3,7,9)

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