Rotation of the second cervical vertebra in pediatric patient

Rotação da segunda vértebra cervical em paciente pediátrico

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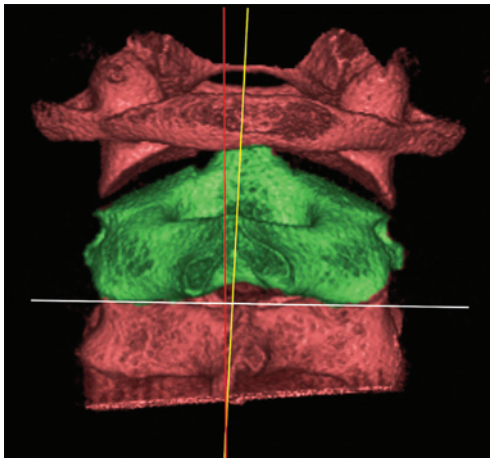

Figure 1. Tridimensional reconstruction of first three cervical vertebrae (posterior view). Rotation of the second cervical vertebra can be observed (green). The yellow line highlights the median sagittal plane; red line represents the rotation of second vertebra; white line indicates latero-lateral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

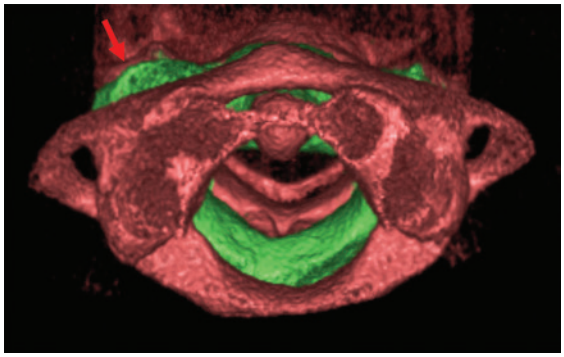

Figure 2. Tridimensional reconstruction of first three cervical vertebrae (transversal view). A rotation of the second vertebra is observed (green). Red arrow indicates the rotation of the second vertebra

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

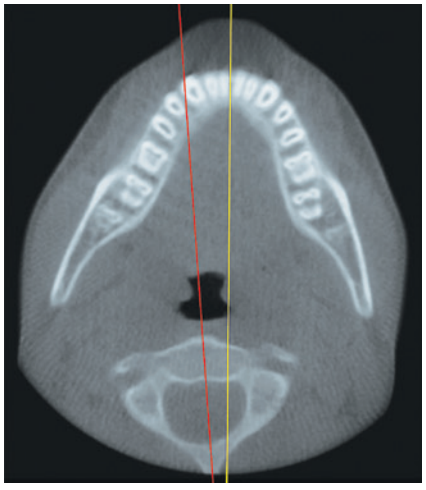

Figure 4. Axial reconstruction. Yellow line showing medium sagittal plan; Red line indicating rotation of the second cervical vertebra

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Figure 5. Cone beam computed tomography showing 5º 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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