

Features of Osseous Structure of TMJ in Children with Juvenile Idiopathic Arthritis – CBCT Study

Hadeel Al-Shwaikh, Ilga Urtane

Rīga Stradiņš University, Orthodontic Department, Latvia

Introduction. The temporomandibular joint (TMJ) is frequently affected (17–88%) in juvenile idiopathic arthritis (JIA) leading to disturbed mandibular function and growth [Cron, 2009; Fjeld, Arvidsson, et al., 2010]. TMJ arthritis is difficult to diagnose at an early stage since relatively few symptoms and clinical findings are related to this joint. As well as 71% of JIA patients who TMJ destruction is found in are clinically asymptomatic [Weiss, et al., 2008]. The pathologic process can affect growth long before conventional radiographic changes are seen. The advantage of using cone beam computed tomography (CBCT) is the possibility for acquiring 3D images which enable an accurate description of TMJ morphology and disorders whilst incurring a significantly lower radiation dose than conventional computer tomography [Swennen, et al., 2006; Loubele, et al., 2009; Davis, et al., 2012].

Aim. The aim of the study is to assess the osseous components of the TMJ for the presence of destruction signs in children with JIA by the research diagnostic criteria of temporomandibular disorders (RDC/TMD) in CBCT images.

Material and methods. This study included CBCT images of TMJs from 65 patients (130 joints) up to the age of 17 affected with JIA (mainly seronegative polyarthritis). Data was processed and analysed according to the software corresponding to the I-CAT Vision equipment (Imaging Sciences International, Inc. Hatfield PA, USA). Standardised protocol was used for the equipment (voltage: 120 KV, current: 38 mA, field of view: 13/17 cm, resolution: 0.4 voxels, radiation dose ~36 µSv). Structural changes in the osseous structures of the joint, were assessed in the sagittal, coronal and axial planes and quantified by the RDC/TMD [Ahmad, et al., 2009] – indeterminate osteoarthritis (IOA), and osteoarthritis (OA).

Results. The presence of TMJ destruction signs was asymmetrical between the left and right joints. In all patients TMD signs were observed: articular surface flattening (86.15%), condylar surface erosion (56.15%), osteophytes (10.53%), and condylar hypoplasia (27.69%). In the mandibular fossa flattening was observed in 20.77%, subcortical sclerosis in 10% and surface erosion in 9.23% of all TMJs. Condyles in a concentric position with enough joint space were the most common observation with regards to position of condyle in the fossa (48.46%). OA was diagnosed in 84.62% of patients and IOA in 15.38%.

Conclusion. Cone beam computer tomography is useful for the early diagnosis of osseous structure disorders of the temporomandibular joint. Osteoarthritis of the temporomandibular joint is a frequent diagnosis in children with juvenile idiopathic arthritis. Females are more often diagnosed with JIA in comparison to males with a ratio of ~3 : 1.

VI