D. M Dekshikh, B. M. Farzaneh

TEMPOROMANDIBULAR JOINT ANATOMY USING CBCT: ASSESSING CONDYLE POSITION AND JOINT SPACE IN THE PEOPLE WITH NORMAL FUNCTION OF TEMPOROMANDIBULAR JOINT.

Scientific advisor: assist. KidyasovaT.V.
Department of Human Morphology
Belarusian state medical university, Minsk

Resume. *This study provided assessment of the temporomandibular joint spaces and position of condyle in glenoid fossa using cone-beam-computed tomography.*

Keywords: *temporomandibular joint, condyle, glenoid fossa, joint space, cone beam computed tomography.*

Relevance. Temporomandibular joint disorders are the most common disorders in dentistry which can give no symptoms in the beginning [1]. Most of them are internal derangement. By using CBCT in their routine work the dentists can assess the first signs of asymptomatic disorders like a narrowing of joint space and abnormal position of condyle in glenoid fossa. The newer technique such as cone-beam computed tomography (CBCT) produces images using lower radiation doses and higher resolution than normal CT. It has best modality for evaluation of the osseous components [2]. Finally clinical decision changed in more than half of the patients when it was based on physical, panoramic and CBCT examinations compared with a decision based on physical and panoramic examinations only [3].

Aim: The purpose of this study is to assess the position of condyle in glenoid fossa and joint spaces in the people with normal function of temporomandibular joint.

Objectives:

1. To evaluate the joint spaces in anterior (Ajs), posterior (Pjs), superior (Sjs), medial (Mjs), lateral (Ljs) aspects.
2. To define the position of condyle in glenoid fossa.

Material and methods. CBCT images of 30 patients (20 males and 10 females between 18-25 years old) were analyzed in axial, coronal and sagittal view. The patients had no history of temporomandibular joint disorders such as absence of history of pain, clenching , joint sounds, without limitation of mandible motions. Also as a criteria was chosen the absence of the extracted teeth. Their CBCT images were obtaned according to many reasons except TMJ disorders

Were assessed bilaterally (right and left sides): position of condyle in glenoid fossa (centric or eccentric), Ajs, Pjs, Sjs, Mjs, Ljs. On axial view was chosen the largest medio-lateral dimension of condyle heads [3]. Ajs, Sjs, Pjs were measured on reconstructed sagittal images (Figure 1A), on the coronal view with the same thickness were evaluated Mjs and Ljs (Figure 1B).

All images were taken in an upright position of patients using Galileos GAX5 (Sirona Dental System, Bensheim, Germany) and analyzed by program GALILEOS Viewer.

Results and discussion. The program "Statistica" was used to assess the data. In this group of 30 patients (20 males and 10 females between 18-25 years old) without any history of temporomandibular joint disorders were evaluated:

1) the common position of condyle in glenoid fossa was 95anterior position-3%,posterior position -2%.;

2) mean values of Ajs-2.0±0.7mm,Pjs-2.3±0.8mm,Sjs-3.2±0.7mm,Mjs-2.7±0.9mm,Ljs-2.3±0.5mm in right side and Ajs-1.8±0.4mm,Pjs-2.0±0.5mm,Sjs-2.9±0.9mm,Mjs-2.8±0.9mm,Ljs-2.0±0.5mm in left side are presented in table 1;

3) comparing of the joint spaces ratios between two sides is shown in table 2;

4) significant differences between the values of Ajs, Pjs, Sjs, Mjs, Ljs in right and left sides.

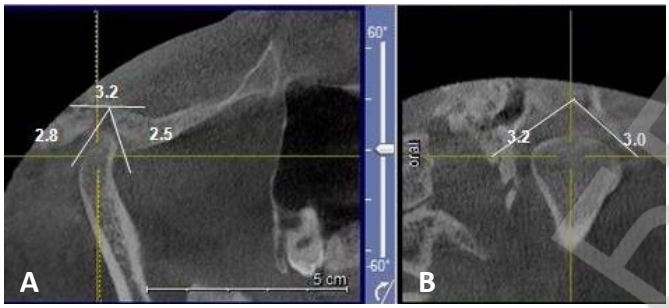

Figure 1. – A. The measurement method of the superior, anterior, posterior joint spaces B – the measurement method of the medial and lateral joint spaces.

Table 1. The mean values of joint spaces in right and left sides.

Joint spaces	**Right side(n=30)** **Mean ± SD**	**Left side(n=30)** **Mean ± SD**
Anterior	2,0±0.7	1,8±0.4
Superior	3,2±0.8	2.9±0.9
Posterior	2,3±0.8	2,0±0.5
Medial	2,7±0,9	2,8±0.9
Lateral	2,3±0,5	2.0±0.5

Table 2. Comparing of the joint spaces retios between two sides.

Joint space ratio	**Right side (n=30)** **Mean ± SD**	**Left side(n=30)** **Mean ± SD**
P/A	0,9±0,3	1,2±0,5
S/A	1,5±0,5	1,7±0,5
M/L	1,1±0,8	1,3±0,6

Conclusions:

The algorithm of assessment of joint space and condyle position and data received in this study can be useful for clinical evaluation of temporomandibular joint. In many cases the narrowing of the space should be the first and most common finding to describe in the setting of degenerative osteoarthritis and chronical internal derangement which

don’t give any symptoms in the beginning .The evaluation of joint spaces should be done always in right and left sides independently.

References

1. Dalili, Z. Assessing joint space and condyle position in the people with normal function of temporomandibular joint with cone-beam computed tomography / Z. Dalili, N. Khaki, S. Javad Kia et al. // Dental Research Journal. – 2012. – Vol. 9. – №. 5. – P. 607-612.

2. Larheim, T. A. Temporomandibular joint diagnostics using CBCT / T. A. Larheim, A. K. Abrahamsson, M. Kristensen et al. // Dentomaxillofacial Radiology. – 2015. – Vol. 44. – №. 1. – P. 20140235. doi: 10.1259/dmfr.20140235.

3. Morales, H. Imaging approach to temporomandibular joint disorders / H. Morales, R. Cornelius //Clinical neuroradiology. – 2016. – Vol. 26. – №. 1. – P. 5-22.