

# SPECIFIC FEATURES OF JOINT SPACE IN PATIENTS WITH PHYSIOLOGICAL OCCLUSION ON COMPUTED TOMOGRAM HEAD IMAGE

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The biomechanics of the lower jaw movement is subject to the articulation laws, which follow the temporomandibular joint morphology. The major elements of the joint bone structures include the temporal bone articular fossa and the articular head of the mandible condylar process. The lower jaw articular heads have an ellipsoid shape, elongated in the horizontal (transverse) direction. The articular heads axes are directed toward the large occipital foramen and, when crossing, shape an angle with a very variable magnitude [3, 4, 8]. Numerous studies have proven the relationship between the articular heads shape and the dental arches. Modern classifications for dental arch shapes distinguish gnathic and dental types, which differ in their morphometric parameters. It is a proven fact that pathological occlusion has an effect on the location of the temporomandibular joint elements and the tactics for complex treatment [1, 2, 5, 6, 7, 10]. The main methods for studying the temporomandibular joints include radiography, where the most objective one is the method of cone-beam computed tomography [6, 9, 11, 12]. The software of the tomographs available nowadays allows measuring angular and linear parameters of various structures comprising the craniofacial complex. Tomogram image sections construct articular heads' transversal axes and then the angle of their intersection is measured. However, we could find no data on the methods for linear measure-

ments of inter-articular relationships, which was the purpose of this work.

*Aim:*

to develop a method for constructing an articular triangle on head CT transversal sections, which would allow assessing the spatial location of the mandible articular heads.

## MATERIALS AND METHODS

Cone-beam computed tomography (cephalostat PaX-i3D SC, VATECH Global) was employed to carry out a survey involving 28 people (both males and females) in their first period of mature age with a full set of permanent teeth and an orthognathic bite. The CT sections passing through the mandible articular heads were used to make measurements using landmarks represented as dots and lines. The articular heads had the medial and lateral poles of the ellipse marked on them, which were interconnected with a straight line thus producing the articular heads longitudinal axis. The obtained marks were further used to develop a research method.

## RESULTS AND DISCUSSION

The method for constructing an articular triangle implied connecting the longitudinal axes of the articular heads thus shaping the apex of the triangle. The base of the triangle was a line connecting the articular heads' lateral poles. The proposed method allowed measuring the distance between the articular heads in millimeters as well as measuring the articular heads angle. In case of physiological occlusion, all the examined articular triangles, as a rule, were equilateral. In addition, the proposed method allowed us to measure the triangle height and calculate its area as the product of half the inter-articular distance by the articular triangle height. The proposed method of constructing an articular triangle will help understand the articulation laws and identify the dental system individual specifics. The data can be used in orthopedic dentistry when designing artificial dental arches.

## CONCLUSION

Given the above, the shape of the articular triangle can be used when selecting a method for treating

occlusion anomalies in the transversal direction, for diagnosing anomalies of the articular heads location, and for evaluating their symmetrical spatial arrangement.

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