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Analysis of skeletal components of temporomandibular joint of an early medieval Croatian population

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The temporomandibular joint (TMJ) is one of the most complex joints in the human body. Anatomical configuration of TMJ allows a large range of mandibular movements and transmission of masticatory forces and loads onto the skull base. The measurements of TMJ's anatomical structures and their interpretations contribute to understanding of how the pathological changes, tooth loss, and the type of diet (changed through human history) can affect biomechanical conditions of masticatory system and the TMJ. The human TMJ and its constituent parts are still subject of extensive investigation and affords are made in order to determine the most precise and suitable measuring method. The aim of this study was to examine the morphology of skeletal components of TMJ of early medieval population in Croatia. For that task different measurement methods were used in order to reveal differences between the methods and their (dis)advantages. The study was performed on 30 specimens – human dry skulls, aged from 15 to 55 years. The selected skulls were a part of bigger collection from early medieval period from which only fully preserved specimens in measured areas were included. Articular-eminence inclination in relation to the Frankfurt horizontal was measured using two methods. Also, the height of the articular-eminence (glenoid fossa depth) and the length of curved line – highest to the lowest point of the articular-eminence were measured. Measurements were performed on lateral skulls' photographs, orthopantomographs and lateral cephalograms using VistaMetrix software on skulls' images. Results obtained were statistically analyzed using SPSS statistical software. Statistically significant ($p < 0.05$) differences were revealed when comparing results of different measurement methods. Results of this study indicate that the used measurement methods are not equally precise. Some methods have limitations due to the fact that some measuring points are difficult to determine and/or they are not bright enough to be precisely determined.

Keywords: temporomandibular joint; articular-eminence; inclination; medieval