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DIFFERENT POSITION OF MANDIBULAR CONDYLE IN THE GLENOID FOSSA

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ABSTRACT
The condylar position inside the glenoid fossa can be assessed by anterior, posterior, and superior joint space, this position is affected by many factors that play role in condyle displacement, some of this factor may return to orthodontic appliances, growth, disc displacement, and other pathological factors temporoMandibular joint is one of the most complex joint in the body and the optimal position of condyle is very important topic in the field of dentistry recently, especially in orthodontics**.**

KEYWORDS: Condylar position, Glenoid fossa, CBCT.

Condylar position in different facial skeletal classes

Park IY,Kim JH, Park YH used cone-beam computer tomography to assess the condylar position in the different facial types .the vertical facial type divided into hypodivirgant, normodivirgant, and hyperdivergant, according to SN-GoMe angle. The condylar position was determined sagittaly by anterior joint space, posterior joint space, superior joint space, mandibular fossa depth, and the angulation of the posterior wall of articular tubercle, and from axial side. The author found significant differences in the condylar position between the vertical facial types, in the hperdivergent facial types, superior joint space was significantly smaller. The author reported that during orthodontic treatment to take in the mind the correction of condylar position in addition to correction of dental malocclusion.[1]

Luciana Fonseca Merigue at el, 2016 they did their study on the 49 patients divided in to class I and class and class ii division 1 with mean age,[16.40] to assessment of condylar shape and position by CBCT. They used the pullinger and hollender formula to determine the condylar concentricity. When the result is zero it mean concentric position, negative result indicates posterior position while positive indicates anterior position. They observed more anterior position of condyle, and they reported that the anterior position of condyle in the patients doesn't need orthodontic treatment while the posterior position due to disc displacement.[2,3]

$$\frac{P - A}{P + A} \times 100\ (\%)$$

Juliana Macêdo de Mattosa, et al they use three dimentional measurements linear and angular for 41 angle class ii classification, and same number of class II subdivision malooclusion in the permanent dentition.

Asymmetric positioning of the glenoid fossae was found in Class II subdivision patients, whereas symmetry was found in the patients with Class II malocclusion. In the former group, the Class II side was more posteriorly and laterally positioned than Class I side.

Mandibular condyles were centrally positioned within the glenoid fossae in patients with Class II malocclusion or Class II subdivision malocclusion, without any differences by gender. Male patients showed more posteriorly and laterally positioned glenoid fossae **than** female patients.[4]

Condylar position difference in centric relation and centric occlusion.

Utt TW 1995 used mandibular position indicator for 107 pretreatment subjects to compare the condylar position between centric occlusion and centric relation. He found that all patients had measureable co-cr difference in one or more plane except one subject that showed no difference in all planes, and 31 class I subjects and 72 class II subjects showed no statistical difference in relation to co-cr change amount and direction.[5]

Osamu Hidaka in 2002 did his study on 150 patients, by taking the impression for maxilla and mandibular then transfer the centric relation and centric occlusion by the wax into the casts mounted on the articulator, to determine the condylar position in the centric relation and centric occlusion for subjects before orthodontic treatment. He found an asymmetry in the condylar position between centric relation and centric occlusion, where the right side showed forward displacement while left side showed downward displacement, and in the class III subject the condyler displacement tends in the left side direction.[6]

Cordary FE 2006 used the three -dimensional analysis to models of 596 asymptomatic patients to evaluate the condylar position in centric relation and centric occlusion. The models was mounted on the articulator after registration centric relation and centric occlusion for patients by 2 pieces wax recording method. His result show a significant difference between the centric occlusion and centric relation for every patient specially the change in the inferior direction, and the age and sex did not affect on the condylar displacement.[7]

Effects of orthodontic treatment on the condylar position

Zhou JH at el 2010 found no significant difference in the condyle position between twenty two patient after orthodontic treatment and twenty two patients without orthodontic treatment.[8]

Artun J 1992 did a study on 63 female treated by orthodontics, 34 female with class I without extraction, and 29 female class II division 1 with upper first premolar extraction, he found that the patients with extraction showed more posteriorly condylar position at medial and right central, he return this reason to the anterior position of condyle in the cases without extraction mostly.[9]

Ersin Yildirim a, Seniz Karacay b, Mustafa Erkan b 2014 TRY. Evaluated the changes in the mandibular condyle in 30 subjects before and after treatment by Twin- Block appliance. SNA, SNB, and ANB angles were measured in addition to Co-Gn, Co-A, and the distance from left to right condyle using CBCT. They observed that the condyle volume increased because Twin-Block appliance, and the condyle was growing backward and upward that lead to increase the mandibular length and the distance between left and right condyle.[10]

Sabine Ruf at el reported that the activator treatment can affect on the skeletal growth by increasing vertical growth of condyle, and decreasing sagittal growth.[11]

Hans Pancherz and Svenja Fischer (2003) did their study on 23 boys and 12 girls with class II Division 1 malocclusion, this patients treated with Herbst appliance, dividing them to four time groups: T1 before treatment, T2 after 7.5 month, T3 7,5 month after treatment, and T4 2-3 year follow up period, to evaluate the effect of Herbst appliance on the TMJ, they found that the Herbst appliance affected on TMJ as condylar growth and condyle – fossa relationship specially on the condylar growth.[12]

The relation between condylar position and occlusion

Crawford 1999 used the condylar position indicator to determine if there is relation between the condylar position and occlusion, and he found through his study a relation between the temporomandibular dysfunction and occlusion dictated condylar position.[13] David at el 1995found that the bite force can affect on the condyle seating in 22 subjects the standard hinge axis location procedures was used to measure the condylar movement, while the incisal bite force was measured by strain gauges. They measured the condylar position with bite force andwithout force. They found that the condyle moves in anterior and superior direction when the biting force was applied.[14]

CONCLUSION

Most of researches that studied on the condylar position in the facial types showed a difference in the condylar position between different facial types. Condylar position in the centric relation was different than in centric occlusion in most of studies. Some orthodontic appliances like Activator and Herbest appliance showed a clear effect on the condylar position. The condylar position was different between orthodontic treatment with extraction and orthodontic treatment without extraction subjects. By contrast, some studies found that orthodontic treatment has no effect on the condylar position.

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