ASSESSMENT OF CONDYLAR MORPHOLOGY IN DIFFERENT FACIAL PATTERNS –A CBCT STUDY

Dr.Shruti Patil, Dr.Shrinivas.M.Basavaraddi, Dr.Ameet.V.Revankar, Dr.Roopak.D.Naik, Dr.Balaram.D. Naik
SDM College of Dental Sciences and Hospital; Shri Dharmasthala Manjunatheshwara University Dharwad, Karnataka, India

Introduction:

Mandibular condyle, a part of TMJ, its volume, shape have been found to be crucial for stability of treatment outcomes in patients undergoing orthodontics, Because each person has a unique craniofacial morphology, condyle and fossa load differently in each individual resulting in a unique TMJ morphology.
This suggests that the size and position of the condyle and glenoid fossa can be influenced by craniofacial anatomy. The skeletal pattern is known to have a significant impact on the diagnostic , prognostic and treatment planning aspects of orthodontic treatment. Occlusal force characteristics and masticatory muscular activity are both influenced by jaw base divergence and anteroposterior skeletal relationship . Several attempts are made to establish corelationship of condylar morphology and facial pattern using multiplanar CT scans of the condyle . However, its relationship with various facial types and jaw base divergences is yet unclear and understanding the relationship amongst condylar position, morphology and vertical skeletal pattern is limited. Hence the objective of the study is to assess the condylar morphology in different facial patterns.

Cone Beam Computed Tomography (CBCT) is being widely used in measuring bony structures as it generates high-resolution images with less distortion and requires lower radiation when compared with conventional computed tomography (CT).
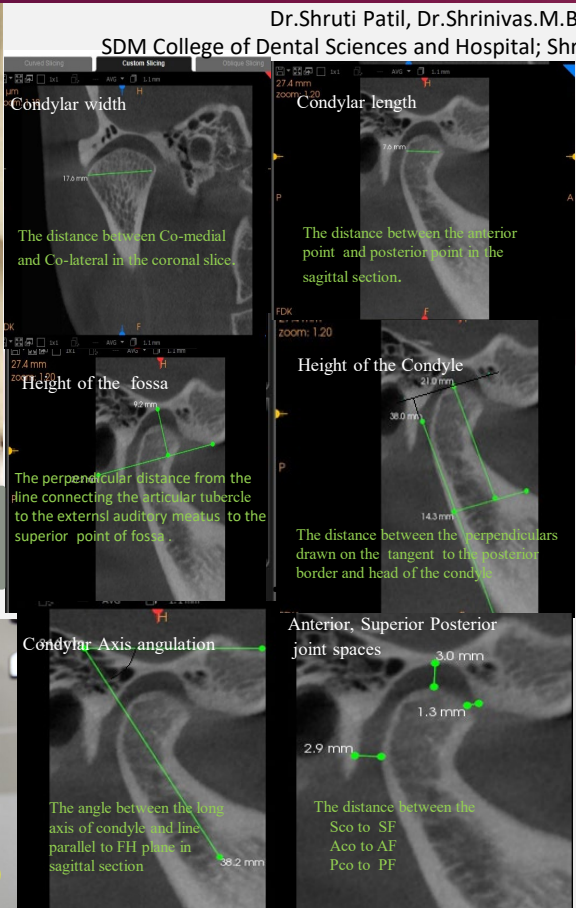
Materials and Methodology

Inclusion criteria: (South Indian Origin)
Sample size : 90
Age: 18-30 years

Carestream CBCT MACHINE
FOV: 8X8 cm2
Tube voltage-120kv
Tube Current- 4mA
Exposure time- 15sec
Imaging software
Carestream imaging software
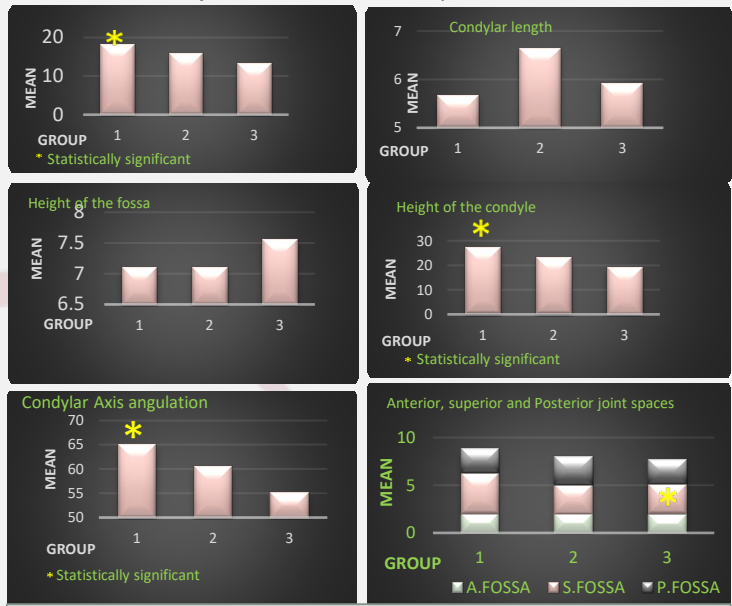(Carestream Health, Inc, Rochester, NY, USA)

Group 1: Hypodivergent- FMA<22degrees

Group 2 :Normodivergent- FMA-22-25 degrees

Group 3:Hyperdivergent- FMA>25 degrees

Condylar width — The distance between Co-medial and Co-lateral in the coronal slice.

Condylar length — The distance between the anterior point and posterior point in the sagittal section.

Height of the fossa — The perpendicular distance from the line connecting the articular tubercle to the external auditory meatus to the superior point of fossa .

Height of the Condyle — The distance between the perpendiculars drawn on the tangent to the posterior border and head of the condyle.

Condylar Axis angulation — The angle between the long axis of condyle and line parallel to FH plane in sagittal section

Anterior, Superior Posterior joint spaces — The distance between the Sco to SF, Aco to AF, Pco to PF

Condylar width — MEAN (GROUP 1, 2, 3) — * Statistically significant

Condylar length — MEAN (GROUP 1, 2, 3)

Height of the fossa — MEAN (GROUP 1, 2, 3)

Height of the condyle — MEAN (GROUP 1, 2, 3) — * Statistically significant

Condylar Axis angulation — MEAN (GROUP 1, 2, 3) — * Statistically significant

Anterior, superior and Posterior joint spaces — MEAN (GROUP 1, 2, 3) — A.FOSSA, S.FOSSA, P.FOSSA

Discussion:

- Cohlmia et al used CBCT to differentiate the size of the condyle in various jaw base divergences and sagittal skeletal conditions. Similar to the current study, the width of the condyle was found to be highest in the hypodivergent whereas it was least with respect to hyperdivergent group.
- Similar to our study, Poluha et al concluded that hyperdivergent subjects have higher condylar translation in both condyles when compared to hypodivergent patients.
- According to Park et al subjects with a hyperdivergent skeletal pattern have narrow and highly positioned condyles when compared with a hypodivergent skeletal pattern, which was found in the current study
- Jyotirmay et al , which concluded that the length of the condyle was identical in different sagittal and vertical locations without remarkable variation.

CONCLUSION: The hypodivergent individuals have condyles which are larger in size,height and larger condylar axis angles whereas hyperdivergent individuals have more superiorly positioned condyles. This relationship should be considered when planning orthodontic treatment.
CLINICAL IMPLICATIONS: This study's clinical implications can be explained by the fact that that the width and height of the condyle differ with vertical skeletal patterns. Detecting such variations and abnormalities is therefore critical, particularly during orthodontic treatment and orthognathic surgery. Treatment outcomes would improve if condylar structure and position, as well as the centric relationship, were taken into consideration while treatment planning.

References

SOUTH JORDAN