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Relationship between Vertical Components of Maxillary Molar and Craniofacial Frame in Normal Occlusion: Cephalometric Calibration on the Vertical Axis of Coordinates

Il-Hyung Yang*, Ah-Reum Han and Jongtae Kim

Dental Research Institute and Department of Orthodontics, School of Dentistry, Seoul National University, South Korea

Objective: Most of the vertical measurements in cephalometry dealt with angular values which are less intuitive than linear values. The aim of this study was to evaluate the correlation between vertical position of maxillary first molar and vertical skeletal measurements in the lateral cephalograms using linear measurements on vertical axis of coordinates with calibration.

Materials and Methods: Lateral cephalograms of 103 Korean adults (male 52 persons, female 51 persons, average age 23 years 9 months) with normal occlusions were measured for the vertical position of maxillary first molar (U6-SN) and the other vertical skeletal variables. Pearson correlation analysis and multiple linear regression analysis were performed three times with linear raw values, calibrated values by anterior cranial base length, and calibrated values by posterior cranial base length (PCB) to find variables that were related with U6-SN.

Results: Among the vertical skeletal variables, ODI, SN-GoMe, gonial angle, facial axis, and facial height ratio were significantly correlated with U6-SN, and skeletal hyperdivergency had positive correlation with U6-SN. 7 newly-driven measurements regarding the position of palatal plane were significantly positively correlated with U6-SN. Each of three multiple linear regression analyses generated a two-variable model: Sella to palatal plane and Nasion to palatal plane. Among the three models, the calibrated model by PCB yielded highest value of adjusted R², 0.880.

Conclusion: The vertical position of maxillary first molar could be determined by the vertical position of maxilla. Cephalometric calibration on the vertical axis of coordinates for vertical linear measurements could strengthen the analysis itself.

Biography:

Il-Hyung Yang, D.D.S., M.S.D., Ph.D. Dr. IH Yang is the program director of the department of orthodontics at the Seoul National University (SNU) School of Dentistry, Seoul, Rep. of Korea, where he holds the rank of assistant professor. He completed his orthodontic training, master degree, and PhD in Orthodontics from SNU School of dentistry and a diplomate of the Korean Board of Orthodontics. He has worked as a member of the Committee of Planning, the Business, the Scientific Affairs, and the Education and the vice Secretary general of the Korean Association of Orthodontists (KAO).