

## Poster Presentation

*“Correlation between the occurrence of  $\Delta Y$  MLT in symmetric mandibular movements and different skeletal classes: a cephalometric and condylographic study.”*

Alessandro Carmignani (1), Roberto Carmignani (1), Markus Greven (1,2,3,4)

(1) Private Office, Italy

(2) Vienna school of interdisciplinary dentistry (VIESID)

(3) Department of Craniofacial Growth and Development Dentistry, Division of Orthodontics, Kanagawa Dental College

(4) Medical University of Vienna

**Keywords:** TMJ, Condylographie, MRI, Internal derangement

### Abstract.

**Hypothesis.** Null hypothesis ( $H_0$ ): is there any probability that a lateral condylar shifting observed during symmetric movements (protrusion-retrusion and open-close) is more frequently related to one of the three possible static intermaxillary relationships (Skeletal class I, II, III)?

**Objective(s).** The aim of this investigation is to demonstrate if there is a correlation between the mandibular lateral translation during symmetric movements ( $\Delta Y$  MLT) in mandibular dynamics and the different skeletal classes in human beings. The main goal is to evaluate the relationship between the occurrence of max  $\Delta Y$  in P/R or O/C movements at different levels of severity and the subjects skeletal classes. The second goal is to test the concordance between the max  $\Delta Y$  values, measured in P/R and O/C movements, referring to four different cutoff (0.65; 0.70; 0.75; 0.80 mm).

**Material and methods.** 108 patients (46 males, 62 females, mean age 44,1 years) from a private dental practice were examined by a 3D computerized condylography to detect the occurrence of a  $\Delta Y$  MLT during the symmetric movements. For each patient were analyzed condylographic tracings in both sides (216 TMJ): two for P/R and two for O/C movements. The maximum  $\Delta Y$  MLT value occurring in one side was taken as the measurement of the Y axis distance to the maximum point of translation, in both tracings. A lateral cephalometric tracing was executed and evaluated, according Slavicek's analysis in order to define the sagittal intermaxillary skeletal relationship, individually for each patient.

Paired Student's t-test was used to evaluate the difference between the two repeated measures of  $\Delta Y$  MLT in P/R and in O/C movements. Two different multinomial logistic regression models were performed to estimate the association between the skeletal classes patients belong to and the severity levels of the lateral translation; statistical models also include age and gender as independent variables. Moreover, in order to test the correlation among the risk of presenting a pathological level of  $\Delta Y$  MLT both in P/R movements and in O/C movements a chi-square test was performed for each skeletal class using four (4) different cut-off (0.65, 0.70, 0.75, 0.80mm).

**Results.** The repeated measures carried out for each patient are highly correlated and this confirms the accuracy of the clinical instrument analysis (electronically assisted condylography) are measuring with, independently from the patient skeletal pattern relationship.

Patients belonging to different skeletal classes do not show statistical differences in terms of  $\Delta Y$  MLT average value in P/R or in O/C movements. However, the multivariate analysis highlights that the skeletal class II patients show a higher risk of presenting a pathological  $\Delta Y$  MLT in O/C movements if compared to the skeletal class I patients. During the P/R movements a higher level of risk concerns patients belonging to the skeletal class I. Moreover, the skeletal class I patients show a high level of probability to present a pathological level in both types of symmetric mandibular movements at any cut-off, while skeletal class II patients have major probability to present this complex pathological profile only in the case of highest lateral translation (more than 0.8 mm).

**Conclusion (s).** Chi-square tests show that the occurrence of  $\Delta Y$  MLT both in P/R and in O/C is associated within the Skeletal class I at any level of cut-off. On the contrary patients belonging to the Skeletal class II have a probability of presenting a pathological level of  $\Delta Y$  MLT in both types of mandibular movements only if the cut-off is 0.8mm (the largest width of lateral translation). A wider sample of subjects belonging to the Skeletal class III is necessary to increase the statistical power of the findings.