

Cephalometric components and their implications in mandibular positioning

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Abstract. The mandibular position is determined by several physiological factors, which should be considered for diagnosis, therapy and stability. Sixty-eight lateral skull radiographs were taken and plotted to determine the relationship of the occlusal plane with the mandibular position among others. A Spearman statistical analysis was performed to determine the relationship between these variables. The occlusal plane showed a statistically significant correlation with mandibular position.

Keywords: posterior occlusal plane, mandibular position, articular angle, sella angle, inclination of the clivus.

1. Introduction.

The position, size, and shape of the mandible are determined by different factors, such as the cranial base's flexion, the vertical dimension, and the incline of the occlusal plane. This last factor is related to function, so, if there is no functional lateral movement of the mandible during mastication, a malocclusion may develop [1].

2. General objective

To determine whether there is a relation between the posterior occlusal plane, the inclination of the clivus, the anterior cranial length, the articular angle, and the angle of the sella with regards to the mandibular position.

3. Methodology

A finite ($n = 68$) sample of lateral skull radiographs of patients with an average age of 19.5 years was used to determine the relation of the variables in Fig. 1 to mandibular position. Pearson's correlation statistical test was used for continuous variables, and Spearman's test for nominal variables, using a SPSS V. 26.0 program, as seen in Table 1.

Table 1. Correlation of the variables: posterior occlusal plane – horizontal frankfurt plane (POP-HFP), and mandibular position (SNB)

			POP – HFP
X-rays ($n = 68$)	SNB	Pearson's correlation	-0.625*
		Sig. (bilateral)	0.046
*The correlation is significant at the 0.05 level			

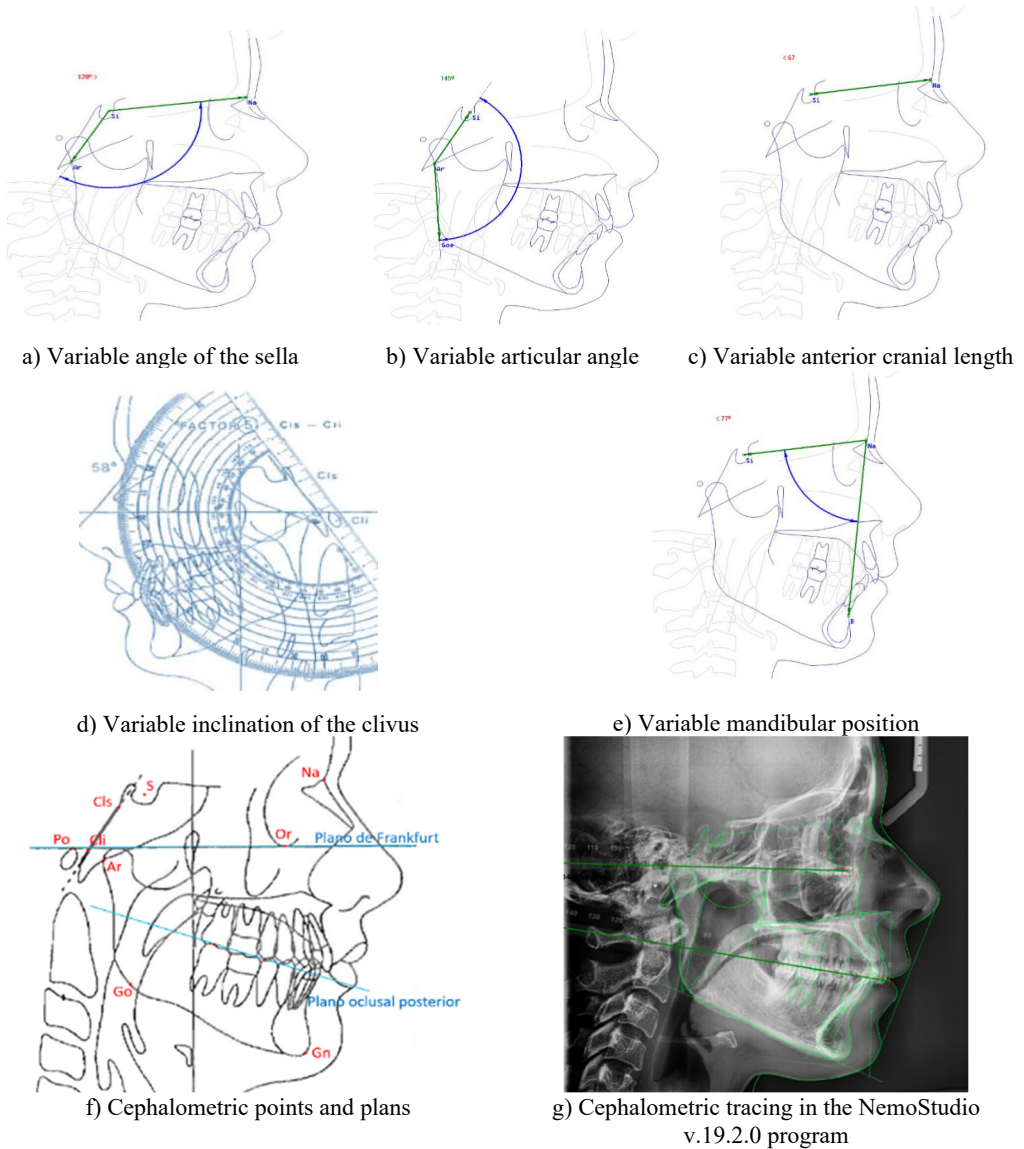


Fig. 1. Sample of lateral skull radiographs

4. Results

From Bimler's analysis, 27 of the x-rays analyzed belonged to patients with distocclusion, 23 to patients with mesiocclusion, and 18 to patients with normal occlusion. An inversely proportional relation was observed between the posterior occlusal plane, and the position of the mandible. The articular angle, the angle of the sella, the anterior cranial length, and the inclination of the clivus didn't appear to be corelated to the mandibular position.

Table 2. Correlation of the variables: Articular angle (A), Angle of the sella (S), anterior cranial longitude (ACL), and inclination of the clivus (INCL. CLIV.) with regards to the mandibular position (SNB)

X-rays (n = 68)	SNB	A	S	LCA	INCL. CLIV.	
		Spearman's Rho	-0.192	0.110	0.230	-0.243
		Sig. (bilateral)	0.247	0.511	0.165	0.142

5. Discussion

Previous studies established a relation between the posterior occlusal plane and the mandibular position [2-4], which coincides with the findings of the present study. Coro proved that there is significant correlation between the mandibular position in the three spatial coordinates, and mandibular morphology [5].

6. Conclusions

There is a significant relation between the posterior occlusal plane and the mandibular position. This relation was not observed in any of the other studied measurements. As the occlusal plane is a fundamental factor when it comes to oral rehabilitation, knowing its relation to mandibular position allows us to make timely diagnostics and thus prevent malocclusions and future articular problems.

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Data availability

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

Conflict of interest

The authors declare that they have no conflict of interest.

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