Dentofacial characteristics of patients with Angle Class I and Class II malocclusions

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Objective: The present study assessed some cephalometric measurements of the soft tissue profile in order to observe the behavior of facial convexity in patients with Class I, Class II division 1, and Class II division 2 malocclusions.

Methods: One hundred and thirty pre-treatment cephalometric radiographs of Caucasian patients aged 10-16 years (mean age of 12.6 years) were selected for study and divided into 3 groups. The cephalometric measurements used in the present study were the following: H.SN, Cx, NLA, MLA, UL-SUL-S, LL-S, IMPA, and 1-SN. Analysis of variance and Tukey's test were applied for measurements H.SN, Cx, IMPA, 1-SN, MLA, and NLA, whereas Kruskal-Wallis and Dunn's tests were applied for UL-S and LL-S.

Results: The results showed statistically significant differences for the measurements H.SN, Cx, UL-S, and IMPA between Groups I, II-1 and II-2 ($p < 0.05$). Measurements LL-S and MLA showed statistically significant difference between Groups I and II-1 only ($p < 0.05$). On the other hand, no statistically significant differences were found for measurement NLA among the 3 groups ($p < 0.05$).

Conclusion: Regarding facial characteristics expressed by measurements H.SN, Cx, and UL-S, one could conclude that Class II division 1 and Class II division 2 malocclusions, both differed from Class I malocclusion. In addition, Class II division 1 malocclusion was found to have facial characteristics expressed by MLA, which differentiate it from the Class II division 2 and Class 1 malocclusions. Class I, Class II division 1 and Class II division 2 malocclusions showed no difference in facial characteristics expressed by the measurement NLA, and measurement LL-S was directly related to eversion of the lower lip.

Keywords: Malocclusion. Cephalometry. Angle's classification.

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Editor's abstract

Over the last hundred years the concept of facial beauty has undergone changes in agreement on esthetic values, especially in this last decade. In the facial profile considered ideal at present, the lips are more outstanding when compared with profiles at the beginning of the 20th Century, when thin, less voluminous lips were desirable, one of the reasons could be that fuller lips tend to demonstrate a more youthful appearance. There have been increasing endeavors to compare, relate and define standards and reliable measures for assessing facial esthetics with the purpose of defining reliability in the evaluation of these profiles. Based on this premise, the authors' purpose in this study was to compare measurements related to facial convexity among patients with Class I, Class II division 1 and Class II division 2 malocclusions, among each other, as well as with the standard measurements. For this purpose a random selection of 130 lateral cephalometric radiographs was made, of caucasian patients in the age-range between 10 and 16 years, mean of 12.6 years. The sample was divided into three groups: (I) 50 individuals with Class I malocclusion; (II-1) 50 individuals with Class II malocclusion division 1, and (II-2) 30 individuals with Class II malocclusion, division 2. The method chosen was comparison among cephalometric measurements. The angular measurements evaluated were as follows: Angle of facial convexity (Cx), H.SN, nasolabial (NLA), mentolabial (MLA), 1-SN, IMPA (Fig 1). The linear measurements used were as follows: UL-S and LL-S (Fig 2). The results obtained demonstrated that the measurements H.SN, Cx, UL-S and IMPA showed statistically significant differences between Groups I and II-1 and between Groups I and II-2 ($p < 0.05$). The measurements LL-S and MLA showed statistically significant difference only between Groups I and II-1 ($p < 0.05$). The measurement NLA showed no statistically significant difference among the three groups ($p > 0.05$). Thus the authors concluded that Class II-1, Class II-2 and Class I malocclusions showed different facial characteristics for the measurement 1-SN. Class II-1 malocclusion presented different facial characteristics when compared with Class II-2 and Class I malocclusions with regard to measurement MLA, and that Class II-1 and Class II-2 malocclusions were differentiated from Class I by the facial characteristics expressed by measurements H.SN, Cx, UL-S and IMPA.

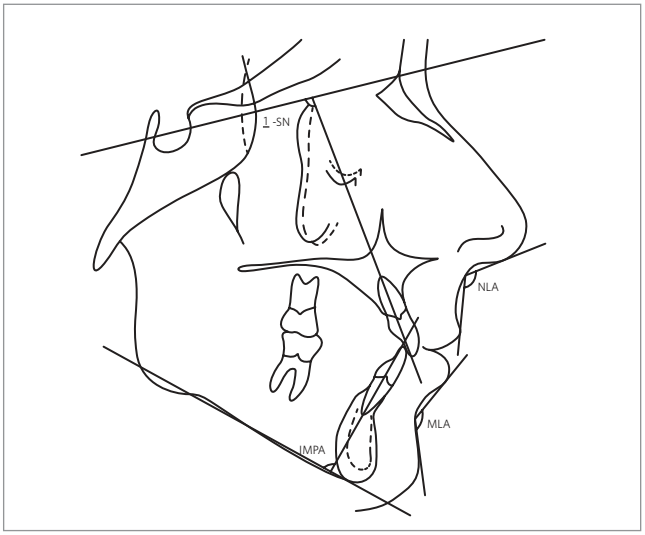

Figure 1 - Representation of the angular measurements for tooth position and labial posture.

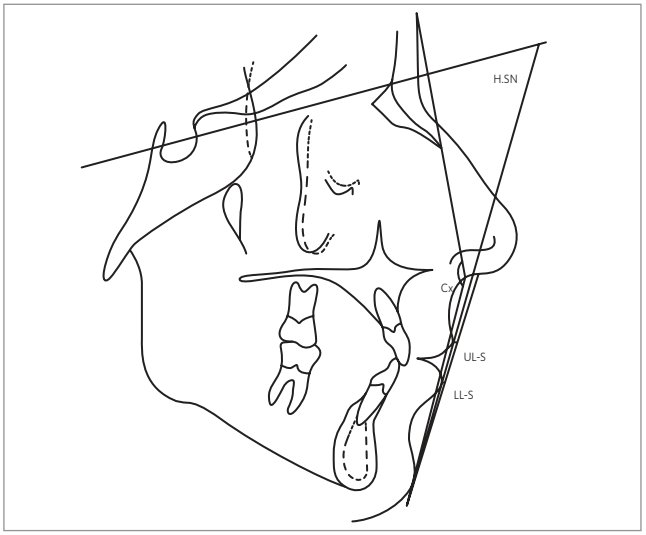

Figure 2 - Representation of angular measurements of facial convexity and linear measurements of labial position.

Questions to the authors

1) Because data were collected in a population from the South East of Brazil, do the authors believe that the results would have differed if the data had been collected in other regions, for example from the North or North East?

Certainly. When considering the facial convexity of individuals with Class I, Class II division 1 or 2, one must consider that this convexity depends on the individuals' ethnic, racial and age factors[1]. A study[2] comparing the pattern of normality of the facial profile of Brazilian individuals from the northeastern region, with those from the southeastern region, showed that individuals from the northeastern region presented less prominent facial middle third, thicker lower lip, more obtuse nasolabial angle, smaller upper lip angle and less protruding maxillary incisors, in comparison with individuals from the southeastern region. These regional evidences are important, not only for diagnosis and orthodontic treatment, but for ortho-surgical planning in these populations.

2) From the authors' point of view, do these results bring anything new to clinical orthodontists?

Over the last hundred years the concept of facial beauty has undergone changes in agreement on esthetic values, especially in this last decade. There are increasing efforts to compare, relate and define patterns and reliable measurements for the evaluation of facial esthetics. In this study it was shown that Class II-1 and Class II-2 malocclusions are differentiated from Class I by the measurements H.SN, Cx, UL-S and IMPA. The revealing result in this study involves evidence that these measurements were not reliable and/or capable of differentiating Class II malocclusions. This reinforces the idea that clinical orthodontists must base themselves on a group of angular and linear measurements that are capable of generating useful and safe information for orthodontic diagnosis of Class I and II malocclusions.

3) What is the next step in this line of research? Are you thinking of evaluating patients with normal occlusion with the aim of determining the measurements of normality in this target population?

There are studies in progress for this target population. But there is a lack of studies in individuals with normal occlusion for the population of the north and northeastern regions. It must be pointed out that the importance of identifying measurements of soft tissue normality in the different facial types arises from the influence that these tissues have on their facial harmony and their dental arches. These measurements are important for individualized orthodontic or ortho-surgical diagnosis and treatment of these regional populations.

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