Evaluation of distances between the mandibular teeth and the alveolar process in Brazilians with normal occlusion

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Introduction: The aims of this study were to evaluate the distances between the mandibular permanent teeth and the alveolar process in Brazilians with normal occlusion and to compare them with normal American values.

Methods: We used 59 mandibular casts from untreated subjects who had permanent dentition and the 6 keys to normal occlusion. A computer program was used to calculate the distances between the dental reference points and the alveolar process for each tooth. The mean values were then compared to the normal values by applying the Student t test at a significance level of 0.05.

Results: The results showed a progressive increase of these distances from the anterior region (incisors) to the posterior region (molars), from 0.00 to 2.49 mm. All measurements had statistically significant differences from the American sample, except for the values for canines and first premolars.

Conclusions: Brazilians with normal occlusion have more lingual crown positions for the incisors, second premolars, and molars compared with Americans with normal occlusion. Although these findings were statistically significant, they are unlikely to be clinically significant.

Read the full text online at: www.ajodo.org, page 308.e1-308.e4.

EDITOR’S SUMMARY

In the effort to achieve greater posttreatment stability, wouldn’t it be useful to know how mandibular teeth relate to the mandible in subjects with normal occlusion? The authors of this study believed that a manner to determine that relationship was by measuring the distances between the dental crowns (FA points) and the alveolar bone (WALA ridge). Once known, it should be possible to idealize the archwire shape to place the teeth on the center of the alveolar bone ridge and over supporting basal bone. A recent study showed a positive correlation between the FA points and WALA ridge, and concluded that this information might be useful as a guide for individualized archwire design.

Fifty-nine mandibular dental casts of Brazilian subjects, ages 12 to 21 years, were selected from the files of a postgraduate orthodontic department in São Paulo, Brazil, because they presented with the 6 keys to normal occlusion as defined by Andrews. You will want to read the online article to fully understand the methods and the mean measurements for the distances of each permanent tooth, from the mandibular central incisors to the second molars. The findings showed more lingual positions of the mandibular teeth in Brazilians with normal occlusion than in a sample of white subjects with normal occlusion in the study by Andrews and Andrews. These differences were small and not clinically significant. The discrepancy between the mean values of the FA points and WALA ridge distances in this study and the results of other authors might be attributed to different methodologies and differences in their samples.
Q & A

**Turpin:** Do you expect that clinicians will use these measurements to achieve more ideal arch forms for their patients?

**Triviño:** Yes. Our findings could provide a method for orthodontists to individualize arch forms for patients. If the goals of orthodontic treatment include positioning teeth over supporting basal bone, the WALA ridge can aid the clinician in achieving this end. This method would, of course, require customized archwires for each patient. The findings of Ronay et al support the concept that the WALA ridge might be a good guide for indirectly identifying the shape of the basal bone of the mandible. By configuring the arch so that the teeth relate regularly to the WALA ridge, the orthodontist has a way to create an ideal width and, to some extent, shape of the arch. This information can have a dramatic influence on the extraction or nonextraction decision.

**Turpin:** Will a greater understanding of the WALA ridge and its significance to the dental arch form lead to greater stability of treatment outcomes?

**Triviño:** This is a difficult question, but one that merits further research. Many factors are related to stability, aside from arch form, including initial crowding or spacing of the teeth, quality of the final occlusion, etiologic factors (tongue), periodontal health, growth, third molars, and so on. All of these are important and cannot always be controlled by the orthodontist. Overexpansion of arches, however, might be an iatrogenic cause of instability that certainly can be controlled. We believe that treating the teeth to positions that are supported by basal bone is at least a good physiologic position for the teeth. The forces of mastication are readily distributed to basal bone rather than alveolar bone; this makes good sense. The extent to which that contributes to long-term stability must be studied. Also of interest would be the extent to which good arch form contributes to the patient’s overall periodontal health in the long term.

**Turpin:** Do you plan any additional studies along these lines to better understand what leads to post-treatment stability?

**Triviño:** Yes. As mentioned before, these types of studies take much planning, a long time to complete, and large sample sizes. We hope to set a protocol now for long-term, prospective trials to look at the questions of stability and periodontal health.