Morphometric Study of the Dental Roots of Permanent Lower Anterior Teeth in Brazilian Individuals

Estudio Morfométrico de las Raíces Dentales de los Dientes Anteriores Inferiores Permanentes de Individuos Brasileños

Nilton Alves*


SUMMARY: The knowledge of dental morphometry, especially of its radicular portion, is of great importance for certain dental specialties, such as, endodonty. Regarding the permanent lower anterior teeth we know that its morphology and root length, are variable. The aim of this study was to analyze the average length of the dental roots of permanent lower anterior teeth in Brazilian individuals. The average root length obtained in this study for the lower central incisors was 13.07 mm; to lower canines the value found was 15.81 mm; the average value for the radicular portion of lower lateral incisors was 13.08 mm. We conclude that the mean value for the length of the radicular portion of permanent lower central incisors is similar to that found for permanent lower lateral incisors, because they have similar anatomical features. Among the lower incisors and lower canines the discrepancy is greater because the lower canines are bulkier. Furthermore, we could conclude that the values obtained in our study may be used as a parameter to characterize the average length of the dental roots of permanent lower anterior teeth in Brazilian individuals.

KEY WORDS: Morphometry; Permanent lower anterior teeth; Dental roots.

INTRODUCTION

The knowledge of dental morphometry, especially of its radicular portion, is of great importance for certain dental specialties, such as, the endodonty (Alves, 2010). The determination of the root canal length must be accurate and reliable since it is one of the most important conditions that influence the success of root canal treatments (Ricucci & Langeland, 1998).

Regarding the permanent lower anterior teeth we know that its morphology and root length, are variable. The dental radiography reveals radicular lengths close to the real. This information associated with theoretical knowledge determines the clinical procedures that must be employed in performing certain dental treatments. Thus, the knowledge of average length of the dental root helps a lot the professional, being a safe route to a successful treatment and to avoid unpleasant situations.

The aim of this study was to analyze the average length of the dental roots of permanent lower anterior teeth in Brazilian individuals.

MATERIAL AND METHOD

Six Hundred and five human teeth extracted from Brazilian individuals were used in this study, distributed as follows: 150 permanent lower central incisors; 200 permanent lower lateral incisors and 255 permanent lower canines. All belonging to Department of Morphology, Faculty of Dentistry of Araraquara - UNESP, Brazil. The permanent lower anterior teeth were previously selected, have been included in the present study only those who had dental roots intact. The measurements were performed with the aid of a digital caliper, Mitutoyo CD-6 CS. The measurements were made considering as total length of the root the distance between the highest point of the cervical line of the tooth and the root apex.

RESULTS

The results shown in Table I represent the maximum, minimum and average values obtained for the permanent lower anterior teeth. In Figure 1 we can observe that the
highest average was found in lower canines, and the average of lower central incisor and lower lateral incisor are very close.

The average value for the radicular portion of lower lateral incisors was 13.08 mm, the same value to that obtained by Picosse, and close to those found by Woefel & Scheid, which was 13.50 mm; Sicher & Tandler and Alves (1962) that found 13.30 mm. Some authors found values lower than ours: Aprile et al. and Figún & Garino obtained 12.50 mm, Black 12.70 mm and Bouland & Lebourg obtained 11.50 mm. The values above were: Diamond, who found 16 mm and Ash Jr., who found 14 mm.

The extreme values cannot be ignored, because it can be found in practice, even been very rare. It was also observed that the canines have longitudinal depressions on both sides of the root, which is often inclined to distal that happens also with the lateral incisors. Not so with the central incisors, which are smaller and have mesial and distal grooves very evident which are considered a risk factor for periodontal disease. In some cases they even separate the root into buccal and lingual portions.

In our study we could conclude that the mean value for the length of the radicular portion of permanent lower central incisors is similar to that found for permanent lower lateral incisors, because they have similar anatomical features. Among the lower incisors and lower canines the discrepancy is greater because the lower canines are bulkier. Furthermore, we could conclude that the values obtained in our study may be used as a parameter to characterize the average length of the dental roots of permanent lower anterior teeth in Brazilian individuals.

**DISCUSSION**

The average root length obtained in this study for the lower central incisors was 13.07 mm. This value is relatively higher in relation to those observed by other authors, such as 11.80 mm by Black (1897); 11.90 mm by Figún & Garino (1988) and Aprile et al. (1975); 12 mm by Sicher & Tandler (1942) and Bouland & Lebourg (1932); 12.50 mm by Ash Jr. (1987). The closest values were found by Woelfel & Scheid (2000), which was 12.60 mm and Picosse (1977), which was 12.65 mm. Already Diamond (1930), found 15 mm, a value higher than those found by other authors.

To lower canines the value found was 15.81 mm, fairly similar to the values found by: Woelfel & Scheid which was 15.90 mm and Ash Jr. which was 16 mm. The value of 15.30 mm was coincidentally found by Black, Aprile et al., Picosse and Figún & Garino, which were not significantly different to that obtained in this study. The major discrepancy was found in relation to the results obtained by Alves (1962) and Sicher & Tandler who found the value of 14 mm for the lower canines. We also observed a lower value on the work developed by Bouland & Lebourg that found 15 mm. Among the authors surveyed, Diamond again had the highest average, which was 20 mm.

The average value for the radicular portion of lower lateral incisors was 13.08 mm, the same value to that obtained by Picosse, and close to those found by Woefel & Scheid, which was 13.50 mm; Sicher & Tandler and Alves (1962) that found 13.30 mm. Some authors found values lower than ours: Aprile et al. and Figún & Garino obtained 12.50 mm, Black 12.70 mm and Bouland & Lebourg obtained 11.50 mm. The values above were: Diamond, who found 16 mm and Ash Jr., who found 14 mm.

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do para los incisivos laterales mandibulares permanentes, hecho que se debe a las características anatómicas similares existentes entre ellos. Entre los incisivos y caninos mandibulares la discrepancia es mayor porque los caninos mandibulares son más voluminosos. Adicionalmente, concluimos que se puede utilizar los valores promedios obtenidos en este estudio como parámetro para caracterizar la longitud promedio de las raíces dentales de los dientes anteriores mandibulares permanentes de individuos Brasileños.

PALABRAS CLAVE: Morfometría; Dientes anteriores inferiores permanentes; Raíces dentales.

REFERENCES


Correspondence to:
Nilton Alves
CIMA Research Group
Faculty of Dentistry
Universidad de La Frontera
Avda. Manuel Montt 112.
Casilla 54-D
Temuco
CHILE

Email: nilton.alves@ufrontera.cl

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