READER'S FORUM

Kim SY, Lim SH, Gang SN, Kim HJ

Crown and root lengths of incisors, canines, and premolars measured by cone-beam computed tomography in patients with malocclusions.

- *Korean J Orthod* 2013;43:271-278

Q1. According to Figures 1 and 2, the crown, root, and total tooth lengths have been measured in a sagittal view. Clinically, we often use the panoramic radiographs for evaluation of the tooth lengths during treatments. In panoramic X-ray, however, the tooth length can be measured in bucco-lingual direction, which is in a different direction from what was used in this investigation. Therefore, my question is if there is any specific reason for the selection of this measurement plane used by the authors.

Q2. Another question is, since root dilacerations may not be in the same plane as its crown, which plane of the view did the authors select for the measurement in such situations? Also, if any crown cusps or edges were worn as a result of attrition, how did the authors install the reference point in the blunt crown tip area?

Q3. The authors stated that weak positive correlations between crown and root lengths were observed only in the mandibular canine and premolars, which may indicate that the root length of patients with malocclusion cannot be estimated accurately from the crown length for most tooth types. In presence of a malocclusion I can assume that the crowns, rather than the roots, tend to be more

overlapped because a malocclusion occurs when teeth erupt abnormally in spite of normal positions of the tooth germs. So, wouldn't it be more difficult to measure the length of the crowns accurately, rather than the roots, in a crowded dentition?

Q4. It was mentioned by the authors that the shorter roots apparent in the present study might be explained by the fact that the sample was comprised of only patients with malocclusions. Do you have any reference for the relationship between malocclusions and root lengths?

Questioned by

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A1. As described in the introduction section of the article, periapical or panoramic radiographs were used in the previous studies to measure root lengths. These studies can be useful when you evaluate the root length using panoramic radiographs. But, it should be noted that the panoramic radiographs tend to show vertical magnification. For those who have a ready access to the cone-beam computed tomography (CT) images, the result of present study should be more relevant.

A2. The exclusion criteria described in the method section included 'severe occlusal attrition'. When the cusp tip or root apex of a tooth cannot be located precisely, the tooth was excluded from the study sample.

A3. Accurate measurement of the crown width can be difficult when the crowns are overlapped, but the crown

length is affected far less. Also, the crown length can be measured more accurately on cone-beam CT images than study models.

A4. I could not find any study in which the root lengths of malocclusion patients versus normal occlusion subjects were compared. This kind of research design requires X-ray taking of normal occlusion subjects, which makes it a difficult study to conduct. But, the causal relationship of malocclusion and root resorption can be inferred from the other study.¹

Reference

1. Hwang CJ, Song YY. A radiographic study on root resorption in the malocclusion patients before orthodontic treatment. *Korean J Orthod* 1999;29:219-36.

Replied by

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