

which means that the extent of posterior discrepancy will change in an unpredictable manner during aging. Previous studies have reported that during the development of the third molars in the preeruptive period, changes observed in the sagittal projection continue to occur.^{2,3} It is therefore difficult to assess the extent of significant effects of third molar angulation on overbite using such unstable parameters.

Second, only a single researcher (A.A.D.C.) performed cephalometric tracings rather than 2 or more researchers. Although the number of samples was sufficient (131/40), the lack of observer bias control is a critical oversight.

Third, although 2-dimensional tracing is a classic method to assess the direction of third molar eruption, measuring 3-dimensional objects with the use of 2-dimensional images leads to unavoidable errors.⁴ To improve the reliability of such measurements, direction of eruption should be analyzed 3-dimensionally. Because cone-beam computed tomography (CBCT) is already widely used in the clinic, 3-dimensional images can be obtained.

For the reasons mentioned above, we encourage researchers studying third molar eruption to use CBCT 3-dimensional images and several observers.

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Am J Orthod Dentofacial Orthop 2019;155:613-4
0889-5406/\$36.00

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<http://dx.doi.org/10.1016/j.ajodo.2019.02.002>

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Authors' response

We are pleased that our article has generated comments from *AJO-DO* readers. Thank you for your interest and for the opportunity to address your concerns.

Primarily the authors state that the mean age of the study was not ideal because the extent of posterior

discrepancy will change in an unpredictable manner during aging and therefore it would be difficult to assess the extent of significant effects of third molar angulation on overbite with the use of such unstable parameters.

First, open bite severity is usually established at an early age, when even the third molar buds have not been yet formed.¹⁻⁴ Second, the amount of an open bite established in a patient with permanent dentition does not significantly tend to change with time.² Third, the statement that the extent of posterior discrepancy will change in an unpredictable manner during aging may be valid individually but not for a group. Therefore, generally, a group of subjects that have a proportionally greater amount of posterior space discrepancy than another at a mean age of 14.53 ± 2.53 years would tend to show the same comparatively greater proportion later. Besides, Sato uses in his posterior discrepancy explanations, eruptive diagrams of subjects without even the second molars erupted.^{5,6} For these reasons, the age of the subjects was adequate and demonstrated that his theory could not be supported. These facts show that posterior discrepancy can not be assumed to have a cause-effect relationship with open bite severity, because open bite severity is established before development of the third molars. We can only state that posterior discrepancy and third molar angulation are certain characteristics associated with the amounts of overbite. This study showed that most of the characteristics have associations that are opposite to the posterior discrepancy theory.

Regarding the second concern, statistically, there is no problem in having only 1 experienced examiner performing the tracings, as long as the error study does not demonstrate significant errors.⁷ Usually, 2 examiners are used when data are very large to be obtained by only 1 examiner or when reproducibility of a method is tested.⁸⁻¹² Most recent orthodontic investigations have used only 1 examiner.¹³⁻¹⁷ The current error study was adequately performed and showed random errors within acceptable limits and no significant systematic errors.^{7,18}

The sagittal and vertical effects of posterior discrepancy explained by Sato's theory were based on 2-dimensional views.^{5,6} Therefore, it would be more than logical to investigate this theory on the same type of view. If this theory is expanded to 3-dimensional views, then cone-beam computed tomography should be used to investigate them.

Thank you for your comments.

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Am J Orthod Dentofacial Orthop 2019;155:614–5

0889-5406/\$36.00

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<http://dx.doi.org/10.1016/j.ajodo.2019.02.001>

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Impacted maxillary canine orthodontic traction and incisor root resorption

Regarding the article entitled “Influence of impacted maxillary canine orthodontic traction complexity on root resorption of incisors: A retrospective longitudinal study” in the January 2019 issue by Luis Ernesto Arrilola-Guillen, Gustavo Armando Ruiz-Mora, Yalil Augusto Rodriguez-Cardenas, Aron Aliaga-Del Castillo, Mariana Boessio-Vizzotto, and Heraldo Luis Dias-da Silveira (*Am J Orthod Dentofacial Orthop* 2019;155:28-39), the authors clearly revealed that incisor root resorption is not dependent on the severity of canine impactions.

The study was described in the title and the text as a “retrospective longitudinal study.” Retrospective studies use records that are available from the past. The records may be collected in a longitudinal manner by following for a period of time or at a particular point of time. Even if the records were collected by following the sample in the past, the present investigator who is analyzing the past records cannot control the factors as needed and might have to go for a compromise according to the sample available. Longitudinal studies are done by the investigator who can control all the factors. Therefore, I am of the opinion that the words retrospective and longitudinal should not be combined, because doing so leads to confusion for the readers regarding the type of the study. In the existing literature of classification of studies, there are no words coined for studies that are done on past records collected by following the sample for particular period. To avoid confusion, a new word should be given to studies that are done on past records that are collected by following the sample.

Maxillary canines that are impacted are considered to be favorable when they don't impinge on the incisors or when the biomechanics used will allow the canine movement without impinging on the adjacent teeth. Because the authors used treated cases of canine impactions, it is possible that all were favorable canine impactions that might not cause resorption of incisors. All of the unfavorable canine impactions, which might cause root resorption of adjacent teeth, would be treated with the use of alternate treatment plans, such as extraction and replacement or closure of space by retraction of anterior teeth. So there was no chance for the authors to find resorption of adjacent incisors when they included treated cases of canine impaction for their research.