

4. Brezniak N, Wasserstein A. Root resorption revisited: The paradigm of force effect on root resorption: is a "paradigm shift" needed in order to learn more about the phenomenon? *Angle Orthod* 2019; 89:518-20.

## Authors' response

**T**hank you for your interest. We are pleased you have shared your experiences with us.

In this study, performed by means of a noninvasive method such as microtomography, it was determined that crater-shaped root resorption may occur less in bone-borne rapid maxillary expansion treatment. It is clear that it is not possible to determine the apical region shortening via microscopic computed tomography. We mentioned this handicap in the discussion. However, changes in the root surfaces were too many to be underestimated in any of the treatment methods. In the literature, there are other studies investigating root resorption in this way.<sup>1-4</sup> In addition, tooth extractions of patients were done after waiting for 3 months in a passive retention period.<sup>5</sup> This retention period is sufficient for the cement apposition.<sup>6</sup> In other words, in those teeth extracted after the cement apposition occurred, it was determined that there was more resorption despite repair as in the studies that you refer to. Even after a period of retention, how was it expected to cement apposition in the tooth that had undergone fixed orthodontic treatment and was actively being applied with orthodontic force when craters had not been repaired yet?

Considering that these craters are insignificant, the first rule taught to us is "primum non nocere." Our primary aim in this study was to bring out and to choose a treatment that minimizes the resorption craters that might occur even if there is an insignificant condition. We think that the treatment method that would minimize the resorption craters on the root surface would be preferred by clinicians. In our study, we found a significant difference between the 2 different methods. Suppose that the resorption craters would be completely repaired by cement apposition in both groups if the retention period had been long enough. However, we extracted these teeth too early to examine that. Even in this case, which one of these 2 treatment methods would be more preferable for clinicians? If we need to explain this by giving a general example, consider this: Liver enzymes would be adversely affected in a patient with liver dysfunction as a result of the use of paracetamol-containing analgesics. There

is even a danger of serious liver failure in this patient.<sup>7</sup> As a result of various studies, if a new paracetamol derivation that has significantly similar effect without adverse effects to the liver would be produced, this new drug would be an alternative not only in liver patients but also in healthy people. Researchers will not consider that the liver is healthy and can be repaired anyhow so it does not need a drug that reduces the temporary negative effects. As in this example, minimizing the mandatory process could be a preferable option. Moreover, it should be noted that the orthodontically induced inflammatory root resorption process has many predisposing factors.<sup>8</sup>

The end of the first paragraph on page 189 of our published article should have been written more clearly. Our results could confirm the hypothesis of the mentioned researchers, indirectly. The reason for the reduction of root resorption craters could be the low force applied to the teeth, and the effects on the teeth may be reduced in this way. When we looked at the whole article, we thought that this indirect meaning was clear.

We have no doubt that the authors of this letter have a lot of knowledge about root resorption. We are very pleased that our manuscript was read and criticized by authors who have such experience and knowledge. We will try to improve ourselves by considering the mentioned issues in later studies. We thank them for their contributions.

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## Relationship between rapid expansion of the maxilla and root resorption

Congratulations to Mucahid Yildirim and Mehmet Akin for their exhaustive and careful research, entitled “Comparison of root resorption after rapid maxillary expansion transmitted by bone and tooth evaluated with the use of microtomography,” published in the February 2019 issue (*Am J Orthod Dentofacial Orthop* 2019;155:182-90).

First, the authors present a modified rapid maxillary expansion appliance for the rapid expansion of the maxilla without taking into account the amount of expansion required and the number of activations before installation in each patient according to their respective bone base. These characteristics could be taken into account in future studies because they can modify the degree of resorption.<sup>1</sup>

Second, the authors do not specify the facial biotype of the patients (dolichofacial, mesofacial, or brachifacial). In a dolichofacial patient the musculature is lax, whereas in a brachifacial patient, musculature is strong. There could be a variation in the side that the dental expansion is performed, because the degree of dental movement in the rapid dental expansion can vary with respect to the type of musculature of each patient treated.<sup>2</sup>

Third, although the concluding comment is encouraging, many of the conclusions seek to generalize the degree of resorption with the use of this modified RME appliance and the small sample size.

The idea of proposing a new modified circuit breaker can be useful to reduce adverse effects during expansion, but to have a correct range of root resorption we must take into account adequate and concrete planning.

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## Authors' response

Thank you for your interest in our article.

Ours was a thesis study. We counted the activation of the hyrax screw for each patient. Average activation of the screw was 35. It was not written in the article because these differences do not affect the results. Control and study groups consisted of the same patients because of the split-mouth design. For this reason, all parameters (age, sex, applied forces, activation counts, retention time) are the same in both groups so that the differences in screw activation counts do not affect the comparison.

This split-mouth design study group consisted of 20 patients. Right and left sides of all patients were expanded by means of 2 different methods, and 40 teeth were examined for our study. When we investigated previous studies in the literature, sample sizes were usually smaller than ours in micro-CT studies.<sup>1-3</sup> We treated patients who had the indication for RME treatment and 2 maxillary premolar extractions. You can appreciate that collecting this group was very hard.

Conclusions of the study were written without certainty. We tried to explain our results as a whole in the conclusions. Our native language is not English, however; the article was edited by a professional English editing service (Editage English Editing Services).

“Bone-supported appliances for RME treatment may decrease the amount of potential root resorption, which represents an advantage compared with tooth tissue-borne appliances” was the last sentence of the manuscript and it does not mean certainty.

Thank you for your valuable feedback and suggestions. We are trying to improve ourselves by taking into consideration such valuable experience and guidance.

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