

## Letters From Our Readers

**To: Editor, *The Angle Orthodontist***

**Re: Response to: Effect of piezocision on mandibular second molar protraction. Marwan M. Al-Areji; Elham S. Abu Alhaja; Emad F. Al-Maaitah. *Angle Orthod.* 2020; 90: 347-353.**

We thank the author for his interest in our article and the comments raised. However, we think that some points need to be clarified.

In the study, the patients were treated using fixed preadjusted edgewise orthodontic appliances. Tooth alignment started with an 0.014-in. niti archwire followed by a sequence of niti: 0.016-in., 0.018-in., 0.016X0.022-in. and 0.019X0.025-in. archwires before 0.019X0.025-in. stainless steel (SS) rectangular archwire was tied into the slots. Patients were followed with monthly appointments. This stage of treatment was to prepare the patient for the next stage (space closure) and was not included in duration of treatment calculations.

The aim was to assess the effect of piezocision on the rate of mandibular second molar protraction compared with a no piezocision group (control group). Mandibular second molar protraction to close previous first molar extraction space was done using sliding mechanics on 0.019X0.025-in SS arch wire (Friction mechanics). Piezocision was performed immediately before space closure to evaluate its acceleratory effect during this stage of orthodontic treatment. Force was applied immediately after piezocision using NiTi coil spring attached to a miniscrew inserted between the canine and the first premolar roots delivering an average of 150g of continuous and constant force. The amount of force was maintained during the space closure stage by frequent monthly force value measurements.

In the original study published by Dibart et al.<sup>1</sup>, piezocision was used to accelerate orthodontic treatment during the alignment and levelling stage of teeth where non-extraction treatment was adopted in their cases. In their study, during alignment and levelling, niti archwires were used for force delivery where the amount of force delivered depended on the amount of tooth displacement. Changing the archwire every 2 weeks may be needed if archwires were not active (not deflected) which was not the case in our study where niti coil spring was used to close extraction spaces with

constant and continuous force application during the 4 week review.

In addition, the author's comparison of our research output with that conducted by Charavet et al.<sup>2</sup> and Strippoli et al.<sup>3</sup> is not right and not fair because they had completely different study designs:

- In their studies,<sup>2,3</sup> they included non-extraction cases with mild crowding and they performed the piezocision one week after the placement of the appliance during the alignment stage, using self-ligating brackets (frictionless mechanics). To be clearer, they performed piezocision to speed tooth alignment, which is totally different from mandibular first molar space closure with high friction that makes it more difficult to close.
- Treatment duration in our study was calculated from the start of space closure until it is closed whereas this was not the case in the previously mentioned studies<sup>2,3</sup> where there was no space to close.
- In Charavet et al.'s<sup>2</sup> study, they reviewed patients every 2 weeks and they changed the archwire only if it was not active and, in Strippoli et al.'s<sup>3</sup> study, they reviewed the piezocision group every 2-3 weeks.

Additionally, Raj et al.,<sup>4</sup> recently published a randomized clinical trial and they concluded that piezocision-assisted orthodontics reduced treatment time by increasing the rate of canine retraction although they reviewed their patients 1, 3 and 6 months post-operatively. Their positive results, however, may have been related to the fact that they retracted the maxillary canines on 0.016X0.022 SS archwire where more play and less friction are expected.

Although the original protocol of piezocision suggested that patients be seen every 2 weeks to maximize the window during which more tooth movement could take place,<sup>1</sup> the idea of our research was to mimic the situation we have in orthodontic clinics which is to see our patients every 4-6 weeks. Also, seeing the patients every 2 weeks would increase the number of visits to orthodontic clinic which we think is not preferred by most patients.

Based on the above, we do not agree with the suggestion that our results may have changed if we followed the patients every 2 weeks instead of 4 weeks. In our study, orthodontic force was kept constant and continuous throughout the space closure stage of treatment.

Regarding the surgical design, in our study, we placed 2 vertical cuts mesial and distal to the previous first molar extraction space which was the site to where tooth movement was planned. We did not include the second molar distal side as this area in some patients was close to the retromolar area and the procedure would not be performed similarly in all subjects. Adding a third vertical incision in the middle of the space as suggested may or may not reduce the duration of space closure and this needs to be further examined and evaluated.

We would like to remind the author that the surgical cuts performed in our study produced the acceleratory effect of piezocision where the rate of molar protraction was doubled for the first 2-3 months after surgery. This was similar to other studies which evaluated the acceleratory effect of piezocision on canine retraction.<sup>5,6</sup> However, this transient acceleratory effect of piezocision was not enough to reduce the duration of the previous first molar extraction space closure. Regarding friction, the use of full-size SS archwire, long span of extraction space, and previous extraction dense bone may have resulted in the loss of the initial acceleratory effect of piezocision.

In conclusion, the author's attempt to criticize our research study design because it ended with different conclusions from what he would like to see is not scientifically sound. Our conclusions and recommendations were based on evidence found by conducting this research and, to us, his personal opinion that our conclusions and recommendations will add confusion to the existing body of literature is not valid as this was the only study in the literature to report on the acceleratory effect of piezocision on molar protraction where modification of the original study design was inevitable. In our study we investigated the effect of piezocision on the rate of space closure (localized

area; extraction space) whereas, in the original technique, the effect of piezocision was investigated during alignment and levelling (generalized area; all teeth included in the appliance) with no spaces to close.

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