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Effects of supplemental vibrational force on space closure, treatment duration, and occlusal outcome: A multicenter randomized clinical trial

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PlumX Metrics

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Article Info

Introduction

A multicenter parallel 3-arm randomized clinical trial

Kingdom to investigate the effect of supplemental vibratory force on space closure and treatment outcome with fixed appliances.

Feedback

Methods

Eighty-one subjects less than 20 years of age with mandibular incisor irregularity undergoing extraction-based fixed appliance treatment were randomly allocated to supplementary (20 minutes/day) use of an intraoral vibrational device (AcceleDent; OrthoAccel Technologies, Houston, Tex) (n = 29), an identical nonfunctional (sham) device (n = 25), or fixed-appliance only (n = 27). Space closure in the mandibular arch was measured from dental study casts taken at the start of space closure, at the next appointment, and at completion of space closure. Final records were taken at completion of treatment. Data were analyzed blindly on a per-protocol basis with descriptive statistics, 1-way analysis of variance, and linear regression modeling with 95% confidence intervals.

Results

Sixty-one subjects remained in the trial at start of space closure, with all 3 groups comparable for baseline characteristics. The overall median rate of initial mandibular arch space closure (primary outcome) was 0.89 mm per month with no difference for either the AcceleDent group (difference, –0.09 mm/month; 95% CI, –0.39 to 0.22 mm/month; $P = 0.57$) or the sham group (difference, –0.02 mm/month; 95% CI, –0.32 to 0.29 mm/month; $P = 0.91$) compared with the fixed only group. Similarly, no significant differences were identified between groups for secondary outcomes, including overall treatment duration (median, 18.6 months; $P > 0.05$), number of visits (median, 12; $P > 0.05$), and percentage of improvement in the Peer Assessment Rating (median, 90.0%; $P > 0.05$).

Conclusions

Supplemental vibratory force during orthodontic treatment with fixed appliances does not affect space closure, treatment duration, total number of visits, or final occlusal outcome.

Registration

NCT02314975.

Protocol

The protocol was not published before trial commencement.

Funding

AcceleDent units were donated by OrthoAccel Technologies; no contribution to the conduct or the writing of this study was made by the manufacturer.

Highlights

- This was a randomized controlled trial investigating vibrational force and fixed appliance treatment.
- Vibrational force does not increase the rate of space closure.
- Vibrational force does not influence the final treatment outcome.
- Vibrational force does not influence the overall treatment time.

Neil R. Woodhouse and Spyridon N. Papageorgiou contributed equally to this article.

All authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest, and none were reported.

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