ACCELERATED TOOTH MOVEMENT

CYCLIC LOADING (VIBRATION) ACCELERATES TOOTH MOVEMENT IN ORTHODONTIC PATIENTS: A DOUBLE-BLIND, RANDOMIZED CONTROLLED TRIAL

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PURPOSE
• To assess the effect of a defined low-level cyclic loading on the rate of orthodontic tooth movement.

METHODS
• Parallel, double-blind, prospective, randomized, controlled trial.
• Enrolled 45 orthodontic patients (age range 12-40 yrs) with fixed appliances and randomized into two groups.
  - AcceleDent® Group (N=22)
  - Sham Control Group (N=23)
• Patients underwent extraction of maxillary first premolars with maximum maxillary posterior anchorage and at least 3mm of extraction space after initial alignment.
• Cyclic loading was applied to the vibration group for 20min/day using the AcceleDent device, which delivered a force of 0.25N (25g) at a frequency of 30Hz.
• Control group was assigned to the same protocol, but the device could not be activated to vibrate.
• Separate canine retraction was performed on a 0.018 in stainless steel archwire and enmasse retraction with a 0.019 x 0.025 SS archwire.
• Average monthly rate of maxillary canine retraction into an extraction space was analyzed.

RESULTS
• The mean rate of movement was significantly higher for the AcceleDent Group versus the Sham Control Group (Figure 1).
  - 1.16 mm/month vs 0.79mm/month (p=0.05)
• Study outcomes indicated that AcceleDent is safe and convenient for patients’ daily use.

AUTHOR CONCLUSIONS
• These results showed that low-level cyclic loading of 0.25N at 30Hz increases the rate of tooth movement when applied as an adjunct to orthodontic treatment.
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**KEY POINT**

This peer-reviewed randomized controlled trial demonstrates that AcceleDent accelerates the rate of tooth movement during orthodontic treatment.