
Nolan, FF. The effects of transcutaneous electrical stimulation on the orthodontic movement of teeth. Masters thesis, The University of Texas, Health Science Center at Houston, Dental Branch, 49 pages, 1985.

This is a pilot study using 4 mongrel dogs weighing 30 - 40 pounds to determine if 49 daily treatments of 1 hour or 20 minutes of Alpha-Stim stimulation of 500 μ A at 0.5 Hz, treated under anesthesia, would accelerate orthodontic tooth movement. Maxillary first premolars were extracted and second premolars protracted bilaterally on edgewise sectional archwires using power chains of approximately 150 grams of elastic force. 1 side received Alpha-Stim therapy in each dog using CES electrodes clipped over the buccal and palatal gingiva distal to the protracting premolar and mesial to the extraction site, while the other side acted as a control. Each day, the amount of tooth movement was measured. Clinical tooth movement was enhanced in the 1 hour of therapy per day dog with 4.5 mm of movement on the treated side compared to 3 mm on the control side, but no significant differences in movement were found in the 20 minute per day specimens. X-ray comparisons showed no difference between the test and control sides in either group. Histological examinations revealed enhanced cellular activity in the 1 hour per day dog only. The electron microprobe on the scanning electron microscope determined that the Ca/P ratios were higher on the electrically stimulated sides than on the control sides. No adverse findings were reported.