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Effect of low-level laser therapy (LLLT) on orthodontic tooth movement.

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Abstract

The aim of this study is to evaluate the effects of low-level laser therapy (LLLT) on (1) the velocity of orthodontic tooth movement and (2) the nitric oxide levels in gingival crevicular fluid (GCF) during orthodontic treatment. The sample consisted of 20 patients (14 girls, six boys) whose maxillary first premolars were extracted and canines distalized. A gallium-aluminum-arsenide (Ga-Al-As) diode laser was applied on the day 0, and the 3rd, 7th, 14th, 21st, and 28th days when the retraction of the maxillary lateral incisors was initiated. The right maxillary lateral incisors composed the study group (the laser group), whereas the left maxillary lateral incisors served as the control. The teeth in the laser group received a total of ten doses of laser application: five doses from the buccal and five doses from the palatal side (two cervical, one middle, two apical) with an output power of 20 mW and a dose of 0.71 J /cm². Gingival crevicular fluid samples were obtained on the above-mentioned days, and the nitric oxide levels were analyzed. Bonferroni and repeated measures variant analysis tests were used for statistical analysis with the significance level set at $p \leq 0.05$. The application of low-level laser therapy accelerated orthodontic tooth movement significantly; there were no statistically significant changes in the nitric oxide levels of the gingival crevicular fluid during orthodontic treatment.

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