

Evaluation of two protocols for low-level laser application in patients submitted to orthodontic treatment

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Editor's abstract

There is a growing utilization of low-level laser (LLL), with a variety of applications protocols in orthodontics to stimulate tooth movement, relieve pain, and accelerate bone regeneration. However, the literature has shown controversial results. The purpose of this study was to verify the effect of two LLL irradiation protocols: daily irradiations and initial irradiations.

This sample comprised 36 Wistar rats with approximately 90 days of age. The animals were randomly divided in control group (CG) and irradiated group (IG), and then divided in six subgroups: CG1, CG2, CG3, IG1, IG2, IG3, according to the presence of orthodontic appliance for tooth movement, LLL irradiation and euthanasia day. The method of punctual irradiation was used on mesial, buccal and lingual surfaces of gingival mucosa of the upper left first molar for 3 minutes per point. At the end of the experimental periods, the calculation of the amount of tooth movement was performed by the difference between the initial and

final distances of the upper central incisor to the mesial surface of the upper left first molar. Additionally, quantitative analysis of periodontium cellular and tissues reactions were performed, and blood vessels on the periodontal ligament were counted.

The groups CG2 and IG1 underwent orthodontic movement for two days and presented an increase of its vascularization, but with no statistically significant difference. The groups CG3, IG2 and IG3 underwent orthodontic movement for seven days; but only IG3, which had irradiation for seven days, presented a statistically significant difference, showing that the daily applications of LLL were capable of keeping a high number of vessels. There was no difference in the amount of tooth movement between groups. Therefore, although an angiogenesis occurred in some irradiated group, the irradiation protocols used did not accelerate tooth movement and did not prevent root resorptions.

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How to cite this article: Marquezan M, Bolognese AM, Araújo MTS. Evaluation of two protocols for low-level laser application in patients submitted to orthodontic treatment. *Dental Press J Orthod.* 2013 Jan-Feb;18(1):33.

Submitted: July 13, 2009 - **Revised and accepted:** April 27, 2010

» The author reports no commercial, proprietary or financial interest in the products or companies described in this article.

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