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Photobiomodulation as Oedema Adjuvant in Post-Orthognathic Surgery Patients: A Randomized Clinical Trial

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Abstract

Objective: Photobiomodulation therapy (PBMT) has been used in multiple applications in general medicine as powerful anti-inflammatory, analgesic and reducing oedema in different parts of the body. The aim of this study is to compare the effect on post-surgical oedema after mandibular orthognathic surgery, between two different laser power densities and oral medication with non-steroidal anti-inflammatory.

Materials and methods: In a randomized clinical trial, on 60 patients who were subject to mandibular orthognathic surgery were divided into three groups. All groups received sodium naproxen 250mg every 8hours for 6days. Two groups were irradiated with two different laser application protocols and the other was a control group. In G1 group the irradiation parameters three times per week for two weeks were: 940nm, in continuous mode, 2.5W, 120s, 85.71J/cm², 0.89W/cm², over the right and left side with a distance from the skin surface of 1mm with the whitening handpiece (spot size of 2.8cm²). In G2, the irradiation parameters three times a week for two weeks were: 940nm, in continuous mode, 4.1W, 120s, 68.33J/cm², 0.58W/cm² over the right and left side with a distance from the skin surface of 15mm, with the deep tissue handpiece (spot size of 7.1cm²). In all the groups, millimetric facial measurements were taken from tragus to lateral commissure, and from lateral commissure to gonion in both sides.

Results: All differences between T1 and T6 were significant for the three groups, (paired T, P<0.05). The differences between the groups were generally not significant (P>0.05) except for commissure - right and left gonion when compared G1 vs CG (P<0.05) and G2 vs CG (P<0.05). Initial changes (T1-T2) between groups were significantly different except for the measurement

from commissure to right tragus G1 vs CG (P=0.411) and from commissure to left tragus G2 vs CG (P=0.94). The faster resolution of the oedema occurred in G2 group. PTBM with an energy density of 68.33J/cm² was the most effective adjuvant to oral medication with non-steroidal anti-inflammatory, to decrease post-surgical oedema after mandibular orthognathic surgery.

Keywords: Anti-inflammatoires non stéroïdiens; Chirurgie orthognathique; Non-steroidal anti-inflammatoires; Oedema; Orthognathic surgery; Photobiomodulation; Œdème.

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