

INVESTIGACIÓN - ODONTOLOGÍA

CLINICAL EVALUATION OF TWO EXTRAORAL PHOTOBIOMODULATION PROTOCOLS FOR NEUROSENSORY RECOVERY AFTER ORTHOGNATHIC SURGERY

Ana Clara Casadoumecq (anaclara.casa@odontologia.uba.ar)

Jesús Fernández Alemán (jesus.fernandez@odontologia.uba.ar)

Romina Chaintiou Piorno (rominachp@hotmail.com)

María Agustina Saizar (agustina.saizar@odontologia.uba.ar)

Paula Rocha (paucebada@gmail.com)

María Candelaria Herrada (mcandeherrada@gmail.com)

Janick Cavalieri (janick.cavalieri@odontologia.uba.ar)

Myrna Carli (myrnacarli@hotmail.com)

Camila Bagdadi (camila.bagdadi@odontologia.uba.ar)

Pablo Rodriguez (pablorodriguez@dentalmedicine.com.ar)

Photobiomodulation (PBM) is gaining ground as a supportive therapy for neurosensory recovery following orthognathic surgery. While existing studies confirm its neuroregenerative potential, little is known about the clinical behavior

of different wavelength combinations and dosimetric strategies in early-stage post-surgical care.

OBJECTIVE

To clinically evaluate and compare the neurosensory outcomes of two extraoral PBM protocols—one based on a single 940 nm wavelength and another using a dual-wavelength 810/980 nm approach—focusing on functional recovery and symptom modulation.

METHODOLOGY

A randomized clinical study included 20 patients presenting persistent neurosensory symptoms (S-LANSS >12) one month after bimaxillary orthognathic surgery.

Group 1 received PBM with 940 nm (4 W, scanning technique, ~10 J/cm² per spot).

Group 2 received PBM with dual 810/980 nm wavelengths (2 W, scanning technique, ~10 J/cm² per spot).

Each protocol was applied twice weekly for 10 weeks. Outcomes were assessed using the S-LANSS pain scale, clinical sensitivity tests, and area mapping techniques.

RESULTS

Both groups exhibited intra-group improvements in total S-LANSS scores and sensitive area reduction. The dual-wavelength group showed earlier improvement in specific symptoms (e.g., pins and needles, altered pressure sensation), though not all inter-group differences reached statistical significance. The scanning application method enabled equivalent per-spot fluence while adapting to different device outputs.

CONCLUSION

Dual-wavelength PBM may offer a more responsive profile in early neurosensory recovery, while both protocols demonstrated clinical benefit. Scanning technique and energy-per-spot control are key factors in treatment design. These findings

support the customization of PBM protocols based on clinical presentation and tissue response.

Palavras-chave: neurosensory impairment; photobiomodulation; laser therapy.