



## Treatment of peri-implantitis with laser: a promising future?

### *Tratamiento de la periimplantitis con láser: ¿Futuro prometedor?*

Javier Basualdo Allende<sup>1</sup> , Alfredo von Marttens<sup>1</sup> , Eduardo Fernández Godoy<sup>2,3</sup>  

<sup>1</sup>Universidad de Chile, Facultad Odontología, Especialidad de Implantología Buco Máxilo Facial. Santiago, Chile.

<sup>2</sup>Universidad de Chile, Facultad Odontología, Departamento de Odontología Restauradora. Santiago, Chile.

<sup>3</sup>Universidad Autónoma de Chile, Instituto de Ciencias Biomédicas. Santiago, Chile.



■ **Cómo citar:** Basualdo Allende J, von Marttens A, Fernández Godoy E. Treatment of peri-implantitis with laser: a promising future?. Rev Cubana Estomatol. 2020;57(3):e3263

Dear Editor:

Dental implants are widely used worldwide for tooth replacement and have become the gold standard in dentistry.<sup>(1,2)</sup> However, with increased use as come more complications.<sup>(3)</sup> Recent studies have reported that between 2.7 % and 47.1 % of all implants have peri-implantitis.<sup>(4,5)</sup> Two types of inflammatory problems can occur around an implant due to infection: mucositis and periimplantitis. Mucositis is an inflammation of the mucosa surrounding the dental implant with no signs of bone loss after the initial process of bone remodeling. If mucositis is not well resolved, then it can progress to periimplantitis –an inflammatory process in both the mucosa and all the hard tissues surrounding an osseointegrated implant. This also results in a progressive loss of the bone tissue supporting the tooth.<sup>(6)</sup> Periimplantitis is diagnosed via bleeding on probing and radiographic evidence of loss of bone support beyond the bone tissue that is initially lost once the implant and prosthetic crown are installed. Other clinical signs of suppuration include probing depths greater than 5 mm and/or recession of the peri-implant mucosa.<sup>(4,5,6)</sup>

The main objective of periimplantitis treatment is to resolve the inflammation and/or infection, to stop disease progression, to regenerate the peri-implanted surrounding tissues lost and to achieve re-osseointegration on the surface of the affected implant<sup>(6)</sup> by decontaminating the surface and elimination of the biofilm and bacterial endotoxins.<sup>(7)</sup> However, this goal is very difficult to achieve, and non-surgical mechanical therapy alone is only sufficient against mucositis. Moreover, the Sixth European Periodontics Workshop established a consensus that non-surgical therapy when used alone was not effective in the treatment of periimplantitis.<sup>(8)</sup> Periimplantitis is complex to treat, and a recent review concludes that the long-term evidence for regenerative procedures in the treatment of periimplantitis is limited.<sup>(6)</sup>

Different therapies have been described for decontamination of the surface of an implant including: antibiotic therapy (different systemic antibiotics), mechanical therapy (plastic curettes, abrasive air, ultrasound with plastic tips), and chemical therapy (chlorhexidine gel, tetracycline, citric acid, hydrogen peroxide, stannous fluoride and phosphoric acid 35 %). Photodynamic therapy and laser therapy (Er: YAG, ER, CR: YSGG, ND: YAG, CO2 and diode) have also been used.<sup>(9,10,11,12)</sup>

Light amplification by stimulated emission of radiation (laser) therapy is currently receiving special attention due to their versatility. Different applications have been described including incision, soft tissue removal, pigmentation removal, periodontal treatment, decontamination of dental implants, etcetera.<sup>(12)</sup>

Lasers can irradiate the entire surface of an implant –especially in rough and uneven areas where mechanical instruments cannot easily access. The laser not only eliminates bacteria, but also inactivates different bacterial toxins.<sup>(9)</sup> Thus, laser therapy remains a promising dental tool, but longitudinal and better-controlled trials are still needed to validate this approach.<sup>(9,11,12)</sup>

A 2017 study showed a significant reduction in the clinical parameters of periimplantitis (probing depth, bleeding and plaque index) via a Nd: YAG laser in conjunction with a mechanical therapy in a control group at 3 months. However, there was no significant difference at six months. This finding might indicate that patients with periimplantitis require periimplant support therapy every three months, i.e., both mechanical and Nd:YAG laser therapy for the maintenance of their dental implants.

## REFERENCES

1. Trullenque-Eriksson A, Guisado Moya B. Retrospective long-term evaluation of dental implants in totally and partially edentulous patients: part II: periimplant disease. *Implant Dent.* 2015;24(2):217-21.
2. Jensen SS, Bosshardt DD, Gruber R, Buser D. Long-term stability of contour augmentation in the esthetic zone: histologic and histomorphometric evaluation of 12 human biopsies 14 to 80 months after augmentation. *J Periodontol.* 2014;85(11):1549-56.
3. Pjetursson BE, Sailer I, Makarov NA, Zwahlen M, Thoma DS. All-ceramic or metal-ceramic tooth-supported fixed dental prostheses (FDPs)? A systematic review of the survival and complication rates. Part II: Multiple-unit FDPs. *Dent Mater.* 2015;31(6):624-39.
4. Albrektsson T, Buser D, Sennerby L. Crestal bone loss and oral implants. *Clin Implant Dent Relat Res.* 2012;14(6):783-91.
5. Lin GH, Kapila Y, Wang HL. Parameters to Define Peri-Implantitis: A Review and a Proposed Multi-Domain Scale. *J Oral Implantol.* 2017;43(6):491-6.
6. Khoshkam V, Suarez-Lopez del Amo F, Monje A, Lin GH, Chan HL, Wang HL. Long-term Radiographic and Clinical Outcomes of Regenerative Approach for Treating Peri-implantitis: A Systematic Review and Meta-analysis. *Int J Oral Maxillofac Implants.* 2016;31(6):1303-10.
7. Subramani K, Wismeijer D. Decontamination of titanium implant surface and re-osseointegration to treat peri-implantitis: a literature review. *Int J Oral Maxillofac Implants.* 2012;27(5):1043-54.
8. Berglundh T, Armitage G, Araujo MG, Avila-Ortiz G, Blanco J, Camargo PM, et al. Peri-implant diseases and conditions: Consensus report of workgroup 4 of the 2017 World Workshop on the Classification of Periodontal and Peri-Implant Diseases and Conditions. *J Clin Periodontol.* 2018;45 Suppl 20:S286-s91.
9. Arisan V, Karabuda ZC, Arici SV, Topcuoglu N, Kulekci G. A randomized clinical trial of an adjunct diode laser application for the nonsurgical treatment of peri-implantitis. *Photomed Laser Surg.* 2015;33(11):547-54.
10. Suarez-Lopez Del Amo F, Yu SH, Wang HL. Non-Surgical Therapy for Peri-Implant Diseases: a Systematic Review. *J Oral Maxillofac Res.* 2016;7(3):e13.
11. Abduljabbar T, Javed F, Kellesarian SV, Vohra F, Romanos GE. Effect of Nd:YAG laser-assisted non-surgical mechanical debridement on clinical and radiographic peri-implant inflammatory parameters in patients with peri-implant disease. *J Photochem Photobiol B.* 2017;168:16-9.
12. Natto ZS, Aladmawy M, Levi PA, Jr., Wang HL. Comparison of the efficacy of different types of lasers for the treatment of peri-implantitis: a systematic review. *Int J Oral Maxillofac Implants.* 2015;30(2):338-45.

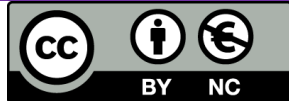
## Conflict of interests

The authors of this paper to declare that they are not conflict of interests.

Recibido: 23/03/2020

Aceptado: 31/03/2020

Publicado: 10/07/2020



Este artículo de *Revista Cubana de Estomatología* está bajo una licencia Creative Commons Atribución-No Comercial 4.0. Esta licencia permite el uso, distribución y reproducción del artículo en cualquier medio, siempre y cuando se otorgue el crédito correspondiente al autor del artículo y al medio en que se publica, en este caso, *Revista Cubana de Estomatología*.