(e) ISSN Online: 2321-9599

(p) ISSN Print: 2348-6805

# REVIEW ARTICLE

## TREATMENT OF PERI-IMPLANTITIS: A COMPREHENSIVE REVIEW

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**ABSTRACT:**
Peri-implantitis or Periimplantitis is considered as an inflammatory reaction that affects the hard and soft tissue, which results in damage of supportive bone and pocket formation surrounding the functioning osseointegrated implant. Hence; we planned the present review to highlight the treatment aspects of peri-implantitis.
**Key words**: Dental implant, Peri- implantitis

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This article may be cited as: Rashid R. Treatment of Peri-Implantitis: A Comprehensive Review. J Adv Med Dent Scie Res 2017;5(7):51-52.

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| Quick Response Code | Website: www.jamdsr.com |
| | DOI: 10.21276/jamdsr.2017.5.7.13 |

## INTRODUCTION

Dental implants have become an indispensable established therapy in dentistry in order to replace missing teeth in different clinical situations. Success rates of 82.9% after 16 years follow-up have been reported. Under care and attention of indications, anatomical and intra-individual limiting factors, insertion of dental implants seems to represent a "safe" treatment option. Nevertheless, in the last decades increasing evidence raised on the presence of peri-implant inflammations representing one of the most frequent complications affecting both the surrounding soft and hard tissues which can lead to the loss of the implant. Therefore, strategies for prevention and treatment of peri-implant disease should be integrated in modern rehabilitation concepts in dentistry.[1- 3]

## LOCAL DEBRIDEMENT

The implant should be cleaned by instruments softer than titanium, such as polishing with a rubber cup and paste, floss, interdental brushes, or using plastic scaling instruments. These have been shown not to roughen the implant surface unlike metal and ultrasonic scalers. Although implant surface damage can almost be prevented by using either ultrasonic scalers with a nonmetallic tip or resin/carbon fiber curettes, the presence of implant threads and/or implant surface roughness may compromise the access for cleaning.[4, 5]

## MECHANICAL TREATMENTS

Karring et al. (2005) compared the treatment results obtained with the Vector® ultrasound system and with carbon fiber curettes. After 6 months of follow-up, no significant differences were found between the two techniques, and neither proved sufficient to treat peri-implantitis. Same results were obtained by Persson et al. (2010) with titanium curettes and with ultrasonic device. After 6 month of follow up, no differences were found to reduce microbiota neither proved sufficient to treat peri-implantitis.[6, 7]

## SURGICAL TECHNIQUES

Surgical treatment of peri-implantitis lesions may be performed in cases with considerable pocket formation (larger than 5 mm) and bone loss. Surgical techniques can be divided into resective and regenerative surgery. These techniques is used depending upon the type of bony defects whereas Schwarz et al. (2014) have demonstrated that combined surgical procedure is effective in controlling advanced peri-implantitis lesion.[8]

Surgical resection is generally confined to implants placed in non-aesthetic sites. Surgical flap helps in comprehensive debridement and decontamination of the affected implant. Surgical therapy was carried out, using: (1) autogenous bone grafts covered by membranes, (2) autogenous bone grafts alone, (3) membranes alone, and (4) a control access flap procedure showed that defects treated with membrane-covered autogenous bone demonstrated significantly larger amounts of bone regeneration and reosseointegration than those treated with the other three procedures. However, membrane exposure is a frequent complication after such procedures. Exposure of porous e-PTFE membranes may result in bacterial penetration and lead to infection.[9]

## LASER IN THE TREATMENT OF PERI-IMPLANTITIS

The efficacy of different laser wavelength to eliminate bacteria from implants' surface had been demonstrated in vitro. Deppe and coworkers used a XeCl 308 nm excimer laser irradiation with a constant energy of 0.8 J/cm and a constant frequency of 20 Hz on peri-implantitis-associated bacteria in vitro. They have been able to show that 200 pulses were sufficient to reduce the replication of these anaerobic microorganisms for more than 99.9%.[10-12]

Implant surface characteristics (e.g., surface roughness) play an important role in the osseointegration and long-term survival of dental implants. The Er:YAG laser has a high absorbability in water. This laser is capable of removing the microbe-infiltrated oxide layer from the surface of dental implants without compromising the implant surface characteristics or surrounding alveolar bone.[13]

The CO2 laser is increasingly being used in implant dentistry because it is minimally absorbed at the implant surface and has a reduced risk of causing temperature-induced tissue damage. Irradiation of titanium surfaces using a CO2 laser led to increased osteoblast attachment to implant surfaces, thereby augmenting bone formation (Romanos et al., 2006). Similarly, Stubinger et al. (2005) found that application of CO2 laser as an adjunct to mechanical debridement augmented new bone formation in peri-implant defect sites.[14]

In emerging experimental technique for treating PI is the laser-assisted PI protocol. The LAPIP technique is an implant-specific modification of the laser-assisted new attachment protocol (LANAP). Both protocols use a neodymium-doped YAG (Nd:YAG) laser-ablation step to remove inflamed sulcular tissues and decontaminate the implant surface, followed by nonsurgical periodontal therapy. The LAPIP technique is designed to create a blood clot that allows the defect area to heal apico-coronally by preventing down-growth of the gingival epithelium.[13,15,16]

## CONCLUSION

Surgical treatment options include resection and augmentative procedures. Resective surgery can be used in order to eliminate peri-implant defects, to re-establish hygienic abilities and to reduce or even stop peri-implantitis progression. Promising results are expected from regenerative approaches.

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**Source of support:** Nil **Conflict of interest:** None declared