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Perspective

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Lasers in Implant Dentistry

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Dental implants have been widely used in clinical practice for the replacement of missing teeth in the rehabilitation of fully and partially edentulous patients and have become an option in comprehensive periodontal treatment plan. Various lasers have been applied in the field of implant dentistry for uncovering the submerged implant (second stage) prior to placement of the healing abutment. Use of lasers in these procedures may have several advantages which are improved hemostasis, production of a fine cutting surface with less patient discomfort during the postoperative period, and favorable and rapid healing following abutment placement, thus permitting a faster rehabilitative phase.

Role of Laser in osseo- integration

Researchers have suggested using the Er:YAG laser to prepare fixture holes in the bone tissue in order to achieve faster osseo -integration of the placed implants and to produce less tissue damage in comparison to conventional bur drilling. Kesler., *et al.* (2006) reported a statistically significantly higher percentage of early bone-to implant contact following use of the Er:YAG laser in comparison with the conventional methods.

Thus, the favorable results of the application of lasers in the first- and second-stages of implant surgery suggest their potential in the field of implant dentistry. However, the use of lasers is generally limited to the second-stage soft-tissue procedures.

Application of lasers in peri-implantitis

Several researchers have recently investigated and proposed the application of lasers in the treatment of peri-implantitis. Conventional mechanical instruments, such as steel curettes or ultrasonic scalers are not completely suitable for granulation tissue removal and implant surface debridement because they readily damage the implant titanium surfaces and thus may interfere with the process of bone healing. Therefore, non-metal mechanical means for implant debridement such as the use of plastic curettes and carbon fiber curettes, have been recommended.

However, these methods are apparently ineffective or complete debridement of the bone defect as well as the contaminated implant surface. Mechanical debridement around implants may also be difficult and time-consuming. In addition, implants with micro-structured surfaces have been clinically employed to improve anchorage to alveolar bone and to increase the bone-to-implant contact, resulting in better osseo-integration. Accordingly, in the case of peri-implantitis complete removal of contaminants such as bacteria and their products and soil tissue cells from the rough surface, has become much more difficult when using mechanical debridement alone.

Therefore, the use of adjunctive chemical agents (such as irrigation or polishing with local disinfectants) and local or systemic antibiotic therapy have been performed with considerable success.

However, the emergence of bacterial resistance to antibiotics, owing to frequent doses of antibiotics, is a matter of concern. In this context, there is significant interest in the development of an alternative antimicrobial treatment modality. Thus, a great deal of attention has recently been focused on novel therapeutic methods using lasers. Lasers were proposed for the treatment of peri-implant infections, based on their successful application with positive results as an adjunctive or alternative treatment for periodontal diseases which will improve the prognosis of dental treatment. Lasers have been expected to resolve the difficulties and problems of conventional mechanical treatment in future.