

Peri-Implantitis: Effective Treatment Regimens

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ABSTRACT

Peri-implantitis is a site-specific infectious disease that causes an inflammatory process in soft tissues, and bone loss around an osseointegrated implant in function. The etiology of the implant infection is conditioned by the status of the tissue surrounding the implant, implant design, degree of roughness, external morphology, and excessive mechanical load. Treatment will differ depending upon whether it is a case of peri-implant mucositis or peri-implantitis. This review article deals with the various treatment options in the management of peri-implantitis.

Keywords: Dental implant, peri-implantitis, peri-implant mucositis

Introduction

Peri-implantitis is an inflammatory process resulting in loss of supporting bone whereas peri-implant mucositis has been defined as a reversible inflammatory change of the peri-implant soft tissues without bone loss (Albrektsson & Isidor 1994). These two descriptions of inflammation around implants are congruent with inflammation around natural teeth. The development of an adherent layer of plaque (of the biofilm) on the implant seems to be critical to the development of peri-implant diseases and could possibly be responsible for altering the biocompatibility of implant surfaces. The concept that bacteria play a major role in the etiology of peri-implant mucositis and peri-implantitis is well documented in the literature of implants. Peri-implant diseases have been associated with a predominantly Gram-negative anaerobic microflora (Pontoriero et al. 1994, Augthun & Conrads 1997, Salcetti et al. 1997, Mombelli & Lang 1998, Leonhardt et al. 1999, Quirynen et al. 2002, 2006). Reduction of the bacterial load to a level allowing healing is difficult to accomplish with mechanical means alone. Therefore, adjunctive therapies like antibiotics, antiseptics and laser treatments have been proposed in order to improve the non-surgical treatment options of peri-implant mucositis and peri-implantitis. The following signs and symptoms are typical for peri-implantitis lesions: radiological evidence of vertical destruction of the crestal bone. There is usually a saucer shaped defect and there is osseointegration of the apical part of the fixture; vertical bone destruction associated with the formation of a peri-implant pocket; bleeding and suppuration on probing; possible swelling of the peri-implant tissues, and hyperplasia. Pain is an unusual feature, which,

if present, is usually associated with an acute infection. The diagnosis of peri-implantitis needs careful differentiation from peri-implant mucositis, primary failures to achieve tissue integration, and problems lacking an inflammatory component. The diagnostic parameters used for assessing peri-implantitis include clinical indices, using a rigid plastic probe for peri-implant probing, bleeding on probing (BOP), suppuration, mobility, peri-implant radiography, and microbiology.

MANAGEMENT MODALITIES OF PERI-IMPLANTITIS-

1. 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.^[11] sub-mucosal debridement alone, accomplished by utilizing either an ultrasonic device or carbon fiber curettes, is not sufficient for the decontamination of the surfaces of implants with peri-implant pockets ≥ 5 mm and exposed implant threads. So it seems reasonable to suggest that mechanical or ultrasonic debridement alone may not be an adequate modality for the resolution of peri-implantitis.

2. Implant surface decontamination

Four methods were experimented:

(1) air-powder abrasive technique followed by citric acid application

(2) air-powder abrasive technique

(3) gauze soaked in saline followed by citric acid application

(4) gauze soaked alternately in 0.1% chlorhexidine and saline.

Photodynamic therapy is a non-invasive method that could be used to reduce microorganisms in peri-implantitis.^[16] 2% chlorhexidine or 3% hydrogen peroxide can be used as topical antiseptics. Decontamination of affected implants with titanium plasma-sprayed or sandblasted/acid-etched surfaces may most easily and effectively be achieved by applying gauze soaked alternately in chlorhexidine and saline.^[12]

3. Anti-infective therapy

The study by Schwarz et al.^[18] demonstrated that the treatment of peri-implant infection by mechanical debridement with plastic curettes combined with antiseptic (0.2% chlorhexidine) therapy may lead to statistically significant improvements in bleeding on probing, peri-implant probing pocket depth, and clinical attachment level at 6 months compared with baseline. Patients suffering from localized peri-implant problems in the absence of other infections may be candidates for treatment by local drug-delivery devices. Local application of antibiotics by the insertion of tetracycline fibers for 10 days^[5] can provide a sustained high dose of the antimicrobial agent precisely into the affected site for several days.

The use of minocline microspheres as an adjunct to mechanical therapy is beneficial in the treatment of peri-implant lesions, but the treatment may have to be repeated.

4. Surgical technique

Surgical resection is generally confined to implants placed in non-aesthetic sites.[22]A randomized comparative clinical trial by Romeo et al.[24,25] concluded that resective surgical procedures coupled with implantoplasty could have a positive influence on the survival rates of rough-surfaced implants. The study by Schwarz et al.[26] demonstrated that both nanocrystalline hydroxyapatite and guided bone regeneration provided clinically significant improvements in clinical parameters following 6 months of non-submerged healing. The application of the combination of natural bone mineral and collagen membrane seemed to correlate with greater improvements in those clinical parameters and, hence, was associated with a more predictable and enhanced healing outcome.

Discussion

The long-term success of oral implants depends on the maintenance of healthy tissue around them. Periimplantitis is a plaque-induced progressive marginal bone loss. It is observed on radiographs of implants that are surrounded by soft tissues exhibiting clinical signs of inflammation. Roos-Jansaker and colleagues reported periimplantitis rates of 16 percent for machined implants, with higher rates expected for roughened implants. Peri-implantitis is progressive, and studies with multiple-year follow-up are required to determine whether treatment is successful. Researchers have proposed different treatment strategies for this condition, including mechanical debridement techniques with or without local or systemic antibiotic therapy, resective surgery, grafting techniques and implant polishing.

Conclusion

Prognosis of the affected implant will be contingent upon early detection and treatment of peri-implant mucositis and peri-implantitis. Even though the studies dealing with different treatment modalities of peri-implantitis are not comparable, an overall picture of some clinical improvement emerges with the use of anti-infective therapies, in terms of resolution of inflammation and bone healing. This observation, coupled with our knowledge of the indisputable role of periodontal pathogens in the etiology of peri-implantitis, indicates that some form of anti-infective therapy must be coupled with any other strategy for dealing with this problem.

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