PERI-IMPLANTITIS: AN OVERVIEW

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ABSTRACT

Peri-implantitis an infection of oral cavity that have an influence on gums around a dental implant. Up to 60% of patients with peri-implantitis experience implant loss. Poor oral hygiene, smoke form of tobacco, increased blood sugar levels, and periodontal records have been circumstances that may cause peri-implantitis. The different sorts of peri-implantitis treatment are non-surgical and surgery. Respective and regenerative therapy of bare surface is the ultimate aim. Objective is to review and present a general idea of the causes, risk factors, categorization, diagnosis, and management of peri-implantitis.

KEY WORDS: Peri-implantitis, implant surface, periodontitis, mechanical method, re-osseointegration.

INTRODUCTION

The dental implant has changed the way that oral rehabilitation is done and has proven itself as a standard procedure in prosthetic rehabilitation [1]. They are a tested, well-recognized form of treatment that aids in restoring impaired dental health and aesthetics after tooth loss [2]. The accessibility and chewing ability for plaque control at the implant sites were both favourable about 90% of patients reported having implants. Despite having, long-term probability peri-implant problems are common and, in several circumstances, it might bring about the failure of the implants and related prosthesis. The tissues surrounding the implant is harmed by peri-implant disorders, which are caused by inflammation [1].

They come in two distinct varieties:

- peri-implant mucositis
- peri-implantitis.

DEFINITION

According to the American Academy of Periodontology, peri-implantitis is an inflammatory process around an implant, including soft tissue inflammation and progressive loss of supporting bone beyond biological bone remodelling.

EPIDEMIOLOGY

After ten years, peri-implantitis conditions are identified in 10%–50% of dental implants [3]. Although there is a paucity of epidemiological data, peri-implantitis have been documented to afflict 28–56% of individuals and 12–43% of the implants. [2]. But a recent study by Mombelli et al. on the incidence of peri-implant infections acknowledged that 20% of people with implants and 10% of all implants possessed peri-implantitis. [3].

ETIOLOGY

Various variables have been engaged with the etiology of peri-implantitis throughout the long term and despite the fact that there has been some proof for and against these elements, it is presently acknowledged that this infection is brought about by microbial contamination and addresses provocative circumstances because of bacterial plaque [4]. Microflora with streptococci and healthy oral bacteria in both implants and teeth, nonmobile rods are more frequent. Periodontal disorders and peri-implantitis have the same groups of periodontopathogens. A. actinomycetemcomitans, P. gingivalis, T. forsythia, P. intermedia, and C. rectus are examples of often seen microflora [2]. A polymicrobial anaerobic infection is known as peri-implantitis. Numerous pathogenic microorganisms, especially Prevotella intermedia, Prevotella nigrescens, Streptococcus constellatus, Aggregatibacter actinomycetemcomitans, Porphyromonas gingivalis, Treponema denticola, and Tannerella forsythia, are frequently seen [3]. Evidence suggests that dental hygiene has effect on implant therapy's long-standing success [2]. Gram-positive cocci and a few gram-negative organisms with stable probing depths of five millimetres or fewer are the main components of the flora in healthy implants. [4].

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Other etiologic factors

1. Para functional habits
2. Inadequate amount of bone resulting in an exposed implant surface at the time of placement

Iatrogenic factors

1. Traumatic surgical techniques
2. Lack of primary stability
3. Premature loading during the healing period

RISK FACTORS

HISTORY OF PERIODONTITIS

Periodontitis is widespread condition. Its severe form is the sixth most common disorder in terms of prevalence. Periodontitis affects virtually 50% of people from the age of 30, according to a recent study undertaken in the United States by Eke et al. [5]. Consider implementing shorter recall intervals, especially with a history of aggressive periodontitis that has been successfully treated and who are at an elevated risk for periodontal and peri-implant disorders [6].

SMOKING

Smoking has been connected to subpar peri-implant outcomes for a long time and its being analysed as latent risk factor for the longevity of osseointegrated dental implants. Complications related to peri-implant bone loss and implant failure was enhanced when smoking was combined with a treatment background of periodontitis [7].

DIABETIC

patients with diabetes has greater occurrence of periodontitis, a slower rate of wound healing, and a lowered resistance to infections [8]. A conclusive finding that diabetes people has greater incidence of peri-implantitis is not currently feasible given the available data [7].

POOR PLAQUE CONTROL

Design choices for implant prostheses may make it difficult for the patient to instinctively clean the area using brushes, interdental brushes, and floss. In order to meet the patients' expectations for aesthetics, phonetics, and function, as well as implant location [9]. The elimination of plaque and calculus as well as the early diagnosis of any disease depend on periodontal maintenance. Considering the patient's constant efforts, practicing proper oral hygiene might be impractical, which may lead to a high recurrence of peri-implantitis cases. [10].

IMPLANT SURFACE

Dental implants themselves may be linked to a wide range of potential risk factors for peri-implantitis. However, there isn't enough solid evidence in the literature to support implant-based factors as a potential risk for peri-implantitis [11]. At 36 months, rough textured implants typically have a survival rate of 95 per cent when compared to machined implants' mean survival rate of 86.7% [10]. No matter what the PD value, Infection, suppuration, and increasing bone loss in implants were the sole symptoms that led to the confirmation of peri-implantitis. [7].

CLASSIFICATION

In order to plan, diagnose, and communicate effective treatments for peri-implant diseases and disorders, the classification of these conditions is necessary [12].

Spiekermann (1984)

The peri-implant defect was classified into 5 types based on the type of bone resorption pattern [12].

Class I: Horizontal

Class II: Hay-shaped

Class III a: Funnel-shaped

Class III b: Gap-like

Class IV: Horizontal-circular form

Classification of peri-implantitis [12]

Early Peri-implantitis	PD≥4 mm, Bleeding and/or suppuration on probing, Bone loss <25% of the implant length.
Moderate Peri-implantitis	PD≥6 mm, Bleeding and/or suppuration on probing, Bone loss ranging from 25% to 50% of the implant length.
Advanced Peri-implantitis	PD≥8 mm, Bleeding and/or suppuration on probing, Bone loss >50% of the implant length.

Other classifications

→ Ata Ali et al, 2015

→ Renvert & Claffey, 2013

→ American Academy of Periodontology 2013

→ Carl E Misch & Jon B Suzuki 2014 ..

DIAGNOSIS

For early indications and symptoms of infection to be recognized and treatment to be started before a significant bone loss occurs, sensitive diagnostic procedures must be performed with implants [13].

1. Evidence of vertical destruction of the crestal bone.

2. Formation of a peri-implant pocket (> 4mm).

3. Bleeding or suppuration after gently probing.

4. Tissue redness and swelling.

5. Mobility (insensitive in detecting early implant failure) [14]

TREATMENT FOR PERI IMPLANTITIS

1. NON-SURGICAL

• Mechanical methods

• Antiseptics

• antibiotics

2. SURFACE DECONTAMINATION

• Chemical methods

1. citric acid (CD)

2. Ethyldiaminetetra acetic acid(EDTA)

3. Hydrogen peroxide (HP)

4. Saline

• Lasers

3. SURGICAL TREATMENT

• Resective surgery

• Regenerative surgery

NON-SURGICAL TREATMENT AND SURFACE DECONTAMINATION

The most efficient course of treatment will be a multi-stage protocol that includes the use of systemic antibiotics to treat acute inflammation, mechanical and chemical implant surface preparation in the presence of adequate implant stability, and, if necessary, reconstructive surgery later [15]. To eliminate the biofilm formation of the implant in the peri-implant pocket, use mechanical debridement, scaling/root planning, or both [16]. When probing depth is continued increased to 4-5 mm in addition to plaque and BOP, antiseptic treatment is administered. Chlorhexidine digluconate can be used as a gel or as a daily rinse at a concentration of 0.1%, 0.12%, or 0.2 [5]. Examples include flushing peri-implant pocket once with 0.2% chlorhexidine, using 1% chlorhexidine gel once or more at the beginning of treatment and again at between 90 and 30 days later, and flushing

the implant pocket with 1% chlorhexidine gel and 0.12% chlorhexidine [2]. antimicrobial therapy to get rid of harmful germs in the peri-implant tissue. Followed by the regenerative or reconstructive procedures to create the bone-implant interface [16].

SURGICAL TREATMENT

The previously described non-surgical therapy principles are combined with those of reconstructive and/or regenerative operations in surgical therapy. If non-surgical therapy is ineffective, open debridement surgery combined with reconstructive or regenerative therapy is advised [13].

RESECTIVE THERAPY

Reconstructive treatment for peri-implantitis seeks to increase access and decrease probing depths surrounding diseased implants. In the surgical procedure, problematic peri-implant pockets are reduced or removed, and the mucoperiosteal flap is positioned apically with or without bone recontouring [17]. In order to successfully treat peri-implantitis, an apically positioned flap was used in conjunction with osteoplasty and implantoplasty [1].

IMPLANTOPLASTY

Treatment for peri-implantitis may include implantoplasty [18]. In addition to surgical peri-implantitis treatment, implantoplasty involves mechanically modifying the surface of implant, include removing threads and softening the surface, using diamond or carbide burs. There could be two uses for this complementary strategy. The first is the efficient eliminating biofilm and calcified debris from the supra body implant surface. The second involves smoothing out the implant surface, which might prevent bacterial development and adhesion and enhance both professional and home dental hygiene practices. [19].

REGENERATIVE THERAPY

peri-implantitis regenerative therapies, such as bone grafts/replacements with and without barrier membranes [20]. Re-osseointegration is the growth of new bone in close proximity to an implant surface that has previously been contaminated, without a band of organized connective tissues in between.

Goals of re-osseointegration

1. Make sure there is adequate room for the bone to regenerate from the defect's walls.

2. the infected implant surface should be revitalized [18].

LASERS

The implant surface can be decontaminated using lasers [21]. The use of flap access is optional during laser treatment. Variable results have been obtained using a variety of laser types, including CO2 and Diode lasers, neodymium-doped yttrium aluminium garnet, and erbium-doped yttrium aluminium garnet (Er: YAG) [13]. Er: YAG laser is popular because it can remove calculus and subgingival plaque without harming the implant surface. CO2 308 nm excimer laser therapy has also produced positive outcomes in a range of anaerobic bacteria [2]. Antimicrobial photodynamic treatment is a further method of sterilising the implant surface (aPDT). This entails injecting a non-toxic dye (photosensitizer) into the peri-implant pockets, then illuminating the area with light of the right wavelength, which, when combined with oxygen, promotes the creation of reactive oxygen species, which kills microorganisms [21]

CONCLUSION

Peri-implantitis - an constant state that causes both tissue and implant loss. Plaque build-up and biofilm growth have a substantial impact on the disease's incidence and progression. As a result, dentists should concede and respond with implant patients the indefinable risk of peri-implantitis and the need for follow-up visits to check on oral hygiene, soft

tissue inflammation, and bone abnormalities.

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