PERI-IMPLANTITIS AND ITS TREATMENT

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ABSTRACT

Peri-implantitis is known to have multifactorial disease. Peri-implantitis which is a site-specific infection is similar to chronic periodontitis with many features common with chronic adult periodontits. Data suggests that, for the maintenance of healthy implant mucosa traditional periodontal infection control including plaque control regimens and mechanical instrumentation are must. While using the anti-infective variation occurs in the type of antibiotic, dosage, duration & time.

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INTRODUCTION

Dental implants have emerged as a good option in managing edentulous and partially edentulous patients who have lost their teeth owing to dental caries, trauma or periodontal disease [², ³]. Placement of implants provides an additional surface for microorganisms to colonize [³]. There can be loss of supportive bone, even after successful accomplishment of osseointegration. The main reason behind such a loss of crestal bone surrounding an
implant can be attributed to local inflammation during the course of peri-implant diseases.

Marginal peri-implant diseases are of 2 types -

1. Peri-implant mucositis (involves only the peri-implant mucosa)
2. Peri-implantitis (also involves the supporting bone)\textsuperscript{[4]}.

ETIOLOGY

1. PERI IMPLANT TISSUE MORPHOLOGY:
The implant surface has a hemidesmosomal type of attachment with the connective tissue and the epithelium which is weak and gets easily susceptible to contamination by the bacteria along with the inclusion of the base which lead to rapid destruction\textsuperscript{[5]}.

2. IMPLANT STRUCTURE:
The implant design is an important factor in the initiation and progression of periimplantitis. If the components are poorly aligned, there can be retention of bacterial plaque, also microorganisms might be enabled to pass inside the transepithelial abutment\textsuperscript{[6]}.

3. MICROBIAL INFECTION:
The new “hard tissue” surface presented to the oral environment. The implant provides a new hard tissue to the oral environment surface onto which the salivary proteins, peptides, and other substances can attach. A pellicle is formed by these substances that provide receptors for the adhesins on Specific species of oral bacteria that form the early colonizers of the implant which include members of the genera \textit{Streptococcus}, \textit{Actinomyces} and \textit{Veillonella}.

CLINICAL FEATURES OF PERIIMPLANTITIS:
Peri-implantitis lesions are often asymptomatic and usually detected at routine recall appointments\textsuperscript{[1]}.

Typical signs and symptoms of peri-implantitis include -

(1) Vertical destruction of the crestal bone, which is often “saucer shaped”,
(2) Per-implant pocket formation of more than 4mm,
(3) Bleeding or suppuration even on slight probing,
(4) Swelling and redness of tissues.
(5) Mobility.

(6) Pain though not very common, but might be present

(7) Hyperplasia of the mucosa in zones which lack keratinised gingiva\(^7,8\). 

**MANAGEMENT OF PERI-IMPLANTITIS INITIAL PHASE OF TREATMENT:**

**Occlusal Therapy**- An analysis for the fit of the prosthesis, the number and position of the implants, and an occlusal evaluation is required if the prime etiology for peri-implant bone loss are excessive forces\(^9\).

**Non-surgical therapy**- The motive behind the non-surgical therapy in peri-implantitis is infection control which is done by debriding the implant surface, and reducing the bacterial load below the threshold level for causing disease\(^10\).

**Mechanical or automatic debridement**- Standard powered air-abrasive systems are based on the air-spray of sodium bicarbonate. Their use is limited to polish and remove tooth stains, but not for instrumentation of implants.

The ultrasonic devices also aim at removing biofilm and calculus during the treatment of peri-implantitis, without implant surface being altered. To achieve this, various modifications of the tips have been put forward such as carbon fiber, silicone or plastic. The lasers are beneficial in the treatment of peri-implantitis because of their properties such as - anti-infective, physical and ablation. The erbium doped yttrium aluminium garnet laser has shown the highest potential in the treatment of peri-implantitis because of its effectiveness in removing subgingival plaque and calculus without significantly damaging the implant surface.

**Adjunctive use of antimicrobial products**

Antiseptics and Antibiotics, have been included as adjunctives for improvement in the results of nonsurgical debridement as reduction of bacterial load becomes difficult with mechanical means alone.

Chlorhexidine-based products are used in different formulations and regimes-

0.2% chlorhexidine to be used repeatedly to irrigate peri-implant pocket in one session;

1% chlorhexidine gel to be used once with a disposable syringe;

1% chlorhexidine gel during treatment followed by its use 30 and 90 days post treatment\(^11\).
Different protocols using locally or systematically delivered antimicrobials have been evaluated -

Minocycline (1mg) in a single unit dose and polyglycolide-co-dl-lactide (3mg) placed submucosally at each treatment site, at treatment and followed by 30 and 90 days post treatment;
Minocycline microspheres (1mg) in a single dose;
Minocycline microspheres (1mg) at treatment and 180 and 270 days post treatment;
The systemic antibiotics which have been used are not supported by controlled clinical trials evaluating their effect [11].

Subgingival irrigation

The decontamination of the titanium surface can not be done just with mechanical debridement as there are many problems to it besides surface roughness and configuration. So, irrigation with antiseptic solutions and / or physiologic saline might help in reducing the bacterial load, thus aiding in infection control by innate and adaptive host responses [6].

Many clinicians support the use of subgingival irrigation of the peri-implant space with antiseptic agents [12].

SURGICAL THERAPY

There are 2 main objectives of surgical treatment of periimplantitis- 1) improvement in the cleanability of the implant surface 2) modification in the anatomy of soft and hard perimplant tissue to achieve re-osseointegration [10].

DECONTAMINATION

Mechanical Decontamination

It includes physical removal of tissue deposits (hard and soft) from the exposed implant surface. Instruments used for mechanical debridement usually are the curettes, ultrasonic devices with special tips and air-powder abrasive systems.

Implantoplasty, a more aggressive approach has been introduced in which smoothening of the implant surface was carried out resulting in a polished smooth surface more suitable for oral hygiene practices. It is carried out with burs and stones under copious irrigation because there is a rise in temperature and an extensive local contamination with titanium [10].

Chemical decontamination

Chemical treatment is useful in that it decontaminates the implant surface by direct application of appropriate substances.
Experimental studies using citric acid, hydrogen peroxide, chlorhexidine and/or saline have shown more or less similar results \cite{10}.

**Lazer decontamination**

The lasers used have wavelengths in the range of 635 to 10,600 nm \cite{13}.

**SURGICAL TECHNIQUES**

The different surgical techniques employed for the treatment of periimplantitis are-

i. **Access Flap Surgery**

This flap intervention aims at conserving all the soft tissues around the affected implant and to thus focusing mainly on the decontaminating the implant surface.

ii. **Apically Positioned Flaps**

This surgical method helps in enhancing self-performed oral hygiene and pocket reduction around the affected implants \cite{11}.

iii. **Resective Therapy**

*Indications for Resective Therapy*-

Horizontal bone loss (moderate to enhanced), bone defects (One and two walled), implant position in non-aesthetic area. Identification of the type of osseous defect is necessary should before the treatment modality is planned. For the correction of horizontal bone loss and vertical bone defects (moderate) and for reducing overall pocket depth, apically displaced flap techniques and osseous resective therapy are used \cite{13}.

iv. **Regenerative surgical techniques**

In this technique, for maintaining the total amount of soft tissues intracrevicular incisions are often performed.

**CONCLUSION**

Since periodontitis and peri-implantitis are opportunistic infections, they require antiinfective therapy. Clinical principles for the debriding and the maintenance of an infection-free oral cavity remain the same. The application of these principles may be difficult because of implant surface characteristics and limited access to the microbial habitats. So, surgical access may be required more frequently, and at an earlier stage, in periimplantitis treatment than in periodontal therapy.

**Declaration of Conflicting Interests:**

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