ORIGINAL RESEARCH PAPER
Volume - 12 | Issue - 04 | April - 2023 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

PERI IMPLANT SOFT TISSUE FOLLOWING IMMEDIATE IMPLANT PLACEMENT– REVIEW

Prosthodontics

Dr. Raghunathan J	MDS, Reader, Department Of Prosthodontics, Karpaga Vinayaga Institute of Dental Sciences,Chengalpattu
Dr. Sameera Y	MDS,Senior Lecturer, Department Of Prosthodontics, Karpaga Vinayaga Institute of Dental Sciences,Chengalpattu
Dr. Shreenidhi Utthamambigai N*	CRRI, Karpaga Vinayaga Institute of Dental Sciences, Chengalpattu *Corresponding Author
Dr. Shivaane S	CRRI, Karpaga Vinayaga Institute of Dental Sciences, Chengalpattu
Dr. Deva Dharshini C	CRRI, Karpaga Vinayaga Institute of Dental Sciences, Chengalpattu
Dr. Kanemozhe E	CRRI, Karpaga Vinayaga Institute of Dental Sciences, Chengalpattu

ABSTRACT

An object or substance, such as an alloplastic substance or other tissue, that is partially or entirely inserted or grafted into the body for therapeutic, diagnostic, prosthetic, or experimental purposes is referred to as a dental implant. The term "peri implant soft tissue" refers to the soft tissue that encircles dental implants. Depending on when they are inserted after extraction, implants can be either immediate or delayed. We have covered the categorization, aetiology, pathophysiology, therapy, and diagnosis recommendations for peri implantitis in this study.

KEYWORDS

Peri Implant, Immediate Implant, Soft Tissue

INTRODUCTION

Dental implants is a well accepted treatment for the replacement of teeth in dentistry. On the time of placement of implants following extraction it can be classified as immediate implants and delayed implants. Immediate implant has become a popular treatment concept for both patients and clinicians as it reduces the number of surgical interventions and total treatment time.

And with increase in placement of dental implants there is an increase in prevalence of peri implant disease which is reported. Peri implant soft tissue plays an important role in aesthetic appearance and also in the maintenance and long term stability of implants.

Therefore this article is intended to discuss about peri implantitis and its classification, etiology, pathogenesis, management along with guidelines for its diagnosis.

METHODOLOGY

Among 55 articles, 26 were short listed on the basis of language of article (only English) and articles which has been published in the past 10 years.

70 articles searched through electronic [google scholar ,PubMed] and manual searching of various journals

↓

55 articles were selected according to the title

↓

26 articles from the past 10 years were included in this study

Literature Review

Definition

Peri-implantitis is an implant related disease condition which contributes to significant proposition of implant failure. This condition was first described Levignac in 1965. [1] The term peri-implantitis was coined by Mombelli [2] in 1987 who described the disease as equivalent to chronic periodontitis. Peri implant mucositis is an inflammation of the soft tissues surrounding an endosseous implant in the absence of loss of supporting bone or continuing marginal bone loss.

According to Frank Schwarz 2017, Peri-implantitis is a pathological condition occurring in tissues around dental implants, characterized by inflammation in the peri- implant mucosa and progressive loss of supporting bone mucosa surrounding a dental implant, without additional bone loss after the initial bone remodelling that may occur during healing following the surgical placement of the implant[3]. Whereas 'Peri- implantitis is an inflammatory lesion of the mucosa surrounding an endosseous implant and with progressive loss of supporting peri-implant bone'[4]. It is thought that peri-implant mucositis usually leads to peri-implantitis if not treated on time.

Classification Of Peri Implantitis

For peri-implantitis, numerous classification schemes have been put out in the literature. Yet as of yet, there is no classification that is universally recognised. The peri-implantitis classification schemes are as follows:

1.Froum and Rosen

- Early PD early 4 mm (BOP) 25% of implant length bone loss
- Moderate PD moderate 6 mm (BOP) 25% to 50% of the implant's length of bone is lost
- Advanced PD advanced 8 mm (BOP) 50% of implant length in bone[7]

2.Bogaerde et al proposed 's classification of bone defects near dental implants in 2014 [8] highlights the anatomy of the defect during the healing process.

Closed defects:

They are distinguished by the preservation of the surrounding bone walls.

Open faults:

These are those in which one or more bone walls are absent.

3.Peri-implantitis staging according to ATA-ALI definition

- Stage I BoP and/or SUP and bone loss that is less than 3 mm beyond the remodelling of the biological bone
- Stage II BoP and/or SUP and bone loss that is between 3 mm and 5 mm beyond the remodelling of the biological bone
- Stage III BoP and/or SUP and bone loss that is less than 5 mm beyond the remodelling of the biological bone Stage IV BoP and/or SUP and bone loss that is more than 50% of the implant length beyond the biological bone

Remodelling[9]

ZHANG L ET AL proposed a classification system for peri-implant bone defects (pibds) in patients with lower implant-supported overdentures based on the morphologies of their panoramic radiography images.

In general, they are arranged in decreasing order of incidence.
[11]

- Saucer-like flaws
- Defects with wedge shapes
- Flat defects
- Undercut defect
- A slit-like defect

Etiology

Peri-implantitis results from an imbalance between the host response and oral biofilm at the implant surfaces. Formation of a bacterial biofilm around the implant is considered as a main etiological factor in the development of peri-implantitis[5]. Gram negative anaerobic bacteria found in bacterial biofilm includes Fusobacteria, Spirochetes, and black-pigmenting organisms such as Prevotella Intermedia[6].

Just as periodontitis, periimplantitis also considered a multifactorial disease, two major etiological factors are:

Bacterial Infection:

Peri-implantitis present with the mixed and variable microbial pattern, although predominated by gram-negative bacteria.[17] Microbiota associated with failing dental implants is similar to flora commonly associated with periodontally involved teeth.

Gram negative bacteria and spirochetes are the responsible bacteria for establishing peri implantitis in humans. Some of them are listed below. Prevotella intermedia, Prohormonas gingivalis(PG), Aggregatbacter actinomycetemcomitans(AA), Bacteroides forsythus, Treponema denticola(TD), Prevotella nigrescens, Peptostreptococcus micros and Fusobacterium nucleatum.[21,22]

Excessive Mechanical Stress:

It has been postulated that mechanical overloading a contributing factor for peri-implant bone loss and late implant failure. Occlusal overload is influenced by prosthetic design.[20]The location of implant, the dimension of the implant, proportion of the prosthesis are some of the factors leading to occlusal overload. The location of implant, the dimension of the implant, proportion of the prosthesis are some of the factors leading to occlusal overload.[21]

Pathogenesis:

The soft tissue that surrounds dental implant is known as peri implant. Epithelial tissue acts as barrier simulate junctional epithelium around teeth. Collagen type 1 is the main constituent part of supra crestal connective tissue of the peri implant mucosa. Peri implant tissues are interspersed with type five collagen in higher amounts[22].

The mucosa that encircles the implant has more of collagen and fewer fibroblasts as opposed to gingival tissues. Junctional epithelium is approximately 2mm long .The factors responsible for the peri implant soft tissue health are the biologic width and the position of the crestal bone from the contact point. [23]

Guidelines For Diagnosing Peri Implantitis:

Mobility:

- Abutment loosening
- Adjust prosthesis
- Loss of osseointegration
- Remove implant .

Soft tissue condition:

- soft tissue condition
- Evaluate BOP/PD/SUPP in 4 to 6 sites.
- PD >5mm+BOP/SUPP
- Evaluate BOP/PD/SUPP in 4 to 6 sites.
- PD >5mm+BOP/SUPP
- Take a radiograph.

Radiographic bone level evaluation(mesial and distal):

- Amount of bone loss (ABL)=1.5+0.2*years of implant in function
- Pathological bone loss=Present amount of bone loss-ABL
- Slight peri-implantitis PBL :0.5-1mm
- Moderate peri implantitis PBL:1.1-1.5mm
- Severe peri implantitis PBL:>1.5mm

Implant prognosis

- Rate of bone loss=ABL/years of implant in function

Soft Tissue Assessment Following Immediate Implant Placement:

In recent years, the demand for immediate implant placement (IIP) has considerably increased especially in the anterior region for aesthetic reasons. Immediate implant placement refers implant placement after extraction of the teeth in a fresh extraction socket facilitates for final facilitates improved final aesthetic outcome by decreasing the amount of bone resorption that naturally follows tooth extraction. Advantage of immediate implant placement is soft tissue healing[26]

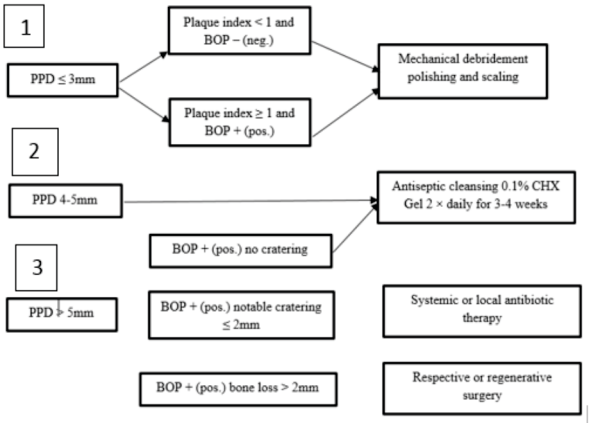
Management

Based upon the clinical and radiographic diagnosis, certain protocols for preventive and interceptive therapeutic measures have been proposed for implants diagnosed with peri implantitis.

Oral implants without plaque and calculus with healthy peri-implant tissue there may be absence of BOP, suppuration, Probing depth should not exceed greater than 3mm to be considered as clinically stable and these sites should not be exposed to therapeutic measures.Lang et al (2004) reported that the system of supportive therapy is cumulative and consists of few steps. The major clinical parameters used are presence of biofilm, presence or absence of bleeding on probing (BOP), presence or absence of suppuration, increased peri-implant probing depth and evidence [24]

The indications of appropriate treatment for the management of peri-implantitis lead to the development of treatment protocols.CIST (Cumulative Interceptive Supportive Therapy) Protocol by Mombelli and Lang(1998)[24] The indications of appropriate treatment for the management of peri-implantitis lead to the development of treatment protocols.

CIST (Cumulative Interceptive Supportive Therapy) Protocol by Mombelli and Lang(1998)[24]



AKUT protocol

Stage	Result	Therapy
	PD<3mm, no plaque or BOP	No therapy
A	PD<3 mm, plaque and/or BOP	Mechanical cleaning, polishing
B	PD 4-5 mm, no radiographic bone loss	Mechanical cleaning, polishing, OHI + local antiinfective therapy
C	PD> 5mm, radiographic bone loss <2 mm	Mechanical cleaning, polishing, microbiological test, local and systemic anti‑infective therapy
D	PD > 5 mm, radiographic bone loss >2 mm	Resective or regenerative surgery

PD- Probing Depth; BOP- Bleeding on Probing; OHI- Oral hygiene instructions

Maintenance

Maintenance therapy after implant placement is of utmost important for effective functioning of implants without any disease. It is classified into two categories.

At Home Implant Care

Brushing, soft manual tooth brush, motorized tooth brush, sonic tooth brush, end tuffed brush, interproximal cleaning/circumferencial cleaning, floss, foam tips, locally applied therapeutics, chlorhexidine digluconate, water irrigation.

Professional Hygiene Care

Scaling and curettage, plastic instrumens, plastic instruments reinforced with graphites, gold plated curette, ultrasonic or sonic

scalers covered with plastic sleeve, polishin, rubber cup with non-abrasive polishing plate, locally applied therapeutics, arestin, periochip, atridox, subgingival irrigation.

CONCLUSION

In this study we have briefly discussed about peri implantitis and peri implant mucositis and its classification, etiology, pathogenesis, guidelines for diagnosis and management of peri implantitis. The importance of soft tissue healing in areas of esthetic concern led to increase in preference of immediate implants.

REFERENCES

[1] J Ata-Ali F Ata-Ali L Bagan A classification proposal for peri-implant mucositis and peri-implantitis: a critical update Open Dent J20159393510. 2174/1874210601509010393

[2] L V Bogaerde A proposal for the classification of bony defects adjacent to dental implants Int J Periodontics Restor Dent2004242647

[3] Poli PP, Cicciu M, Beretta M, Maiorana C. Peri-implant mucositis and peri-implantitis: A Current understanding of their diagnosis, clinical implications, and a report of treatment using a combined therapy approach. Journal of Oral Implantology. 2017; 43(1):45-50.

[4] Renvert S, Persson GR, Pirih FQ, Camargo PM. Peri-implant health, peri-implant mucositis, and peri-implantitis: Case definitions and diagnostic considerations. Journal of clinical periodontology. 2018;45:S278-85.

[5] Heitz-Mayfield LJ, Salvi GE. Peri-implant mucositis. Journal of clinical periodontology. 2018;45:S237-45.

[6] Kýran B, Toman M, Buduneli N, Lappin DF, Toksavul S, Nizam N. Intraoral versus extraoral cementation of implantsupported single crowns: Clinical, biomarker, and microbiological comparisons. Clinical implant dentistry and related research. 2018;20(2):170-9

[7] H Tenenbaum O Bogen F Séverac R Elkaim J L Davideau O Huck Long-term prospective cohort study on dental implants: clinical and microbiological parametersClin Oral Implants Res20172818694

[8] A Monje H L Wang J Nart Association of preventive maintenance therapy compliance and peri-implant diseases: a cross-sectional studyJ Periodontol20178810103041

[9] P Papaspyridakos T Barizan Bordin Y J Kim C Defuria S E Pagni K Chochlidakis Implant survival rates and biologic complications with implant-supported fixed complete dental prostheses: A retrospective study with up to 12-year follow-upClin Oral Implants Res201829888193

[10] M Katafuchi B F Weinstein B G Leroux Y W Chen D M Daubert Restoration contour is a risk indicator for peri-implantitis: A cross-sectional radiographic analysisJ Clin Periodontol201845222532

[11] R Cosgarea A Sculean J A Shibli G E Salvi Prevalence of peri-implant diseases-a critical review on the current evidenceBraz Oral Res2019331e06310.1590/1807-3107bor-2019.vol33.0063

[12] L Francetti N Cavalli S Taschieri S Corbella Ten years follow-up retrospective study on implant survival rates and prevalence of peri-implantitis in implant-supported full-arch rehabilitationsClin Oral Implants Res201930325260

[13] F Schwarz K Becker N Sahm T Horstkemper K Rousi J Becker The prevalence of peri-implant diseases for two-piece implants with an internal tube-in-tube connection: a cross-sectional analysis of 512 implantsClin Oral Implants Res20172812432

[14] K Nishimura T Itoh K Takaki R Hosokawa T Natio M Yokota Periodontal parameters of osseointegrated dental implants. A 4-year controlled follow-up studyClin Oral Implants Res199782728

[15] A Monje R Pons A Insua J Nart H L Wang F Schwarz Morphology and severity of peri-implantitis bone defectsClin Implant Dent Related Res201921463543

[16] S Kühl S Zürcher N U Zitzmann A Filippi M Payer D Dagassan-Berndt Detection of peri-implant bone defects with different radiographic techniques-a human cadaver studyClin Oral Implants Res201627552934

[17] F Schwarz K Becker N Sahm T Horstkemper K Rousi J Becker The prevalence of peri-implant diseases for two-piece implants with an internal tube-in-tube connection: a cross-sectional analysis of 512 implantsClin Oral Implants Res20172812432

[18] G Charalampakis Å Leonhardt P Rabe G Dahlén Clinical and microbiological characteristics of peri-implantitis cases: A retrospective multicentre studyClin Oral Implants Res20122391

[19] M M Fürst G E Salvi N P Lang G R Persson Bacterial colonization immediately after installation on oral titanium implantsClin Oral Implants Res2007185018

[20] A Mombelli N P Lang Microbial aspects of implant dentistry 2000 Periodontology 199447480

[21] J Lindhe J Meyle Peri-implant diseases: Consensus report of the Sixth European Workshop on PeriodontologyJ Clin Periodontol20083582827

[22] Chavrier CA, Couble ML. Ultrastructural and immunohistochemical study of the interstitial collagenous components of the healthy human keratinized mucosa surrounding implants .Intl Journal of Oral and Maxillofac Implants

[23] Maynard JG ,Wilson RD .Physiologic dimension of periodontium to the restorative dentist .J periodontal 1979;50:170-74

[24] A Mombelli N P Lang The diagnosis and treatment of peri‑implantitis Periodontol 199817638209

[25] G Schenk T F Flemmig T Betz J Reuther B Klaiber Some clinical and radiographical features of submerged and non-submerged titanium implants. A 5-year follow-up studyClin Oral Implants Res19978542733

[26] Sanz M., Lindhe J., Alcaraz J., Sanz-Sanchez I., Cecchinato D. The effect of placing a bone replacement graft in the gap at immediately placed implants: a randomized clinical trial. *Clinical Oral Implants Research* . 2017;28(8):902–910. doi: 10.1111/clr.12896. [PubMed] [CrossRef] [Google Scholar]