

Peri-Implant Health Management and Complications Canadian Academy of Periodontology - Ottawa, Canada

May 27th, 2017

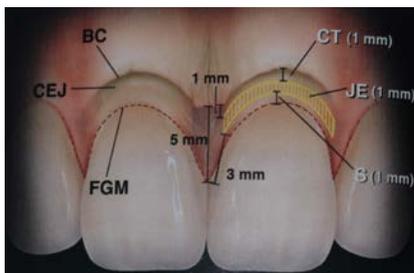
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Osseointegration

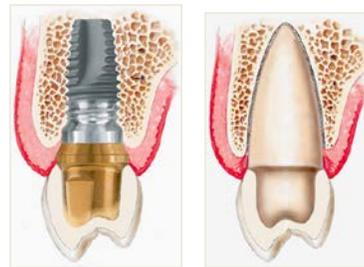
- Direct contact of bone and implant at the light microscope level
- Never occurs on 100% of the implant surface (usually between 30% and 95%)
- Remodeling of bone occurs constantly as part of the normal physiology of bone and continues to occur after the implant has been placed

The American Academy of Implant Dentistry has estimated that 5 million implants are now in Place in the United States and estimated 700,000 new implants are being placed every year

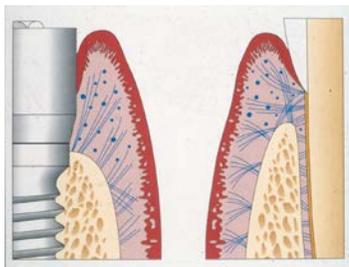
Attachment Mechanism (Biologic Width)



Implant vs. Natural Tooth



Attachment Mechanism



Initial Patient Assessment

Mobility – Implants have no PDL therefore there should be no mobility (check healing abutment)

Plaque Index – Determine if all plaque and calculus is removed from abutments without creating a rough surface which may harbor bacteria

Peri-Implant Tissue Health – Clinical signs such as color, consistency, contour should be noted – which may indicate an adverse reaction in the tissues surrounding the implant

Probing – Controversial – need to establish a baseline and definitely probe if inflammation present

Bleeding – As the only sign may not be an indication of histological changes (remember the attachment mechanism)

Radiographs – One of the most important parameters for determining success of the implant. Can reflect bone volume, density as well as the functional relationship between the implant, prosthesis, and implant-abutment components

Peri-Implant Disease - Diagnosis

1. Peri-Implant Mucositis - similar characteristics to Gingivitis

- No keratinized tissue present
- Inflammatory reaction in the tissues
- Pre-cursor to Peri-Implantitis
- Formation of Biofilm on implant surface
- Reversible – if identified early on (not associated with bone loss)

2. Peri-Implantitis - similar characteristics to Periodontitis

- Keratinized tissue may/may not be present
- Inflammatory reaction in the tissues
- Early, Established and Advanced Lesions
- Apply to all implants with radiographic and clinical bone loss exceeding that of normal bone loss

Classification of Peri-Implantitis (Froum SJ, Rosen PS – 2012 Int J Perio Rest Dent.)

Early

PD \geq 4 mm (bleeding and/or suppuration on probing – 2 sides) Bone loss < 25% of the implant length

Moderate

PD \geq 6 mm (bleeding and/or suppuration on probing – 2 sides) Bone loss 25% to 50% of the implant length

Advanced

PD \geq 8 mm (bleeding and/or suppuration on probing – 2 sides) Bone loss > 50% of the implant length

Patient Assessment - Clinical and Radiographic Evaluation

Mobility – Implants have no PDL therefore there should be no mobility (check healing abutment/prosthetic abutment – hex wrench in Pt. set-up or available)

Plaque Index – Determine if all plaque and calculus is removed from abutments which may harbor bacteria – use to determine SPT frequency

Peri-Implant Tissue Health (BOP – Suppuration) Clinical signs such as color, consistency, and contour should be noted which may indicate an adverse reaction in the tissues surrounding the implant

Probing – Controversial – need to establish a baseline and definitely probe if inflammation present – UNC probe not > .25 N pressure or a PCP 11 probe with .4 mm tip diameter

Bleeding (BOP) – As the only sign may not be an indication of histological changes (remember the attachment mechanism) wait 15 sec following light probing

Radiographs – One of the most important parameters for determining success of the implant. Can reflect bone volume, density as well as the functional relationship between the implant,

prosthesis, and implant-abutment components (*take at implant placement, prosthesis placement, Implant Maintenance Appointments then annually*)

Patient Assessment

- Radiographic Evaluation
- Overall Clinical Assessment

Long-Term Maintenance Considerations

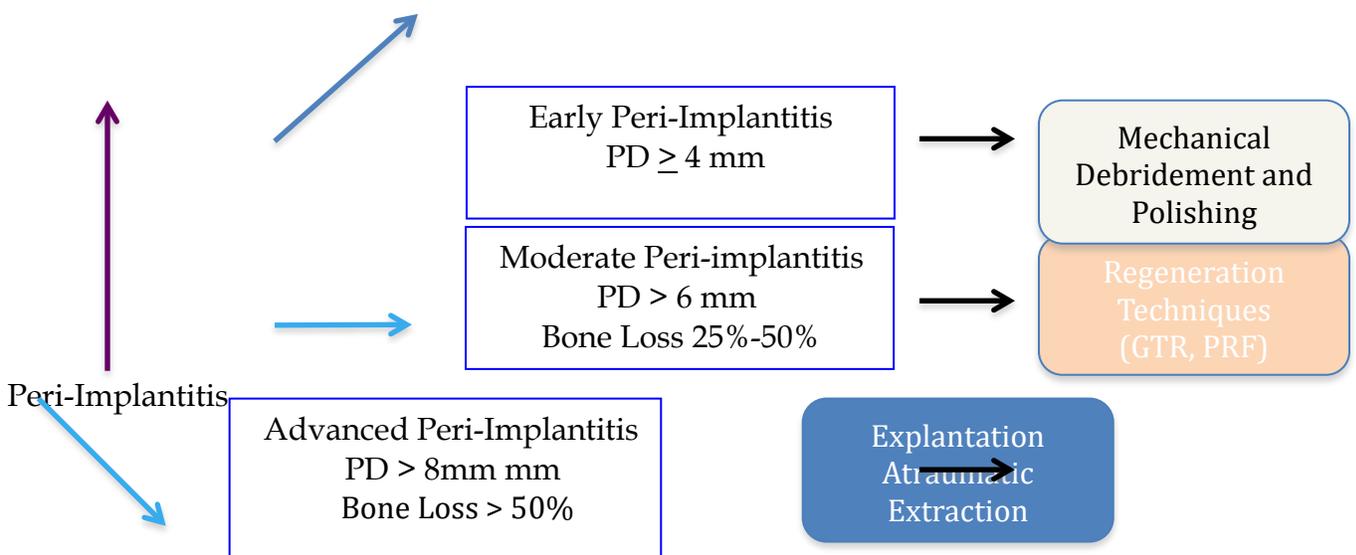
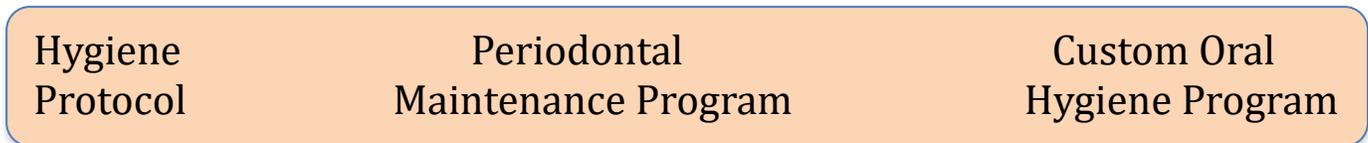
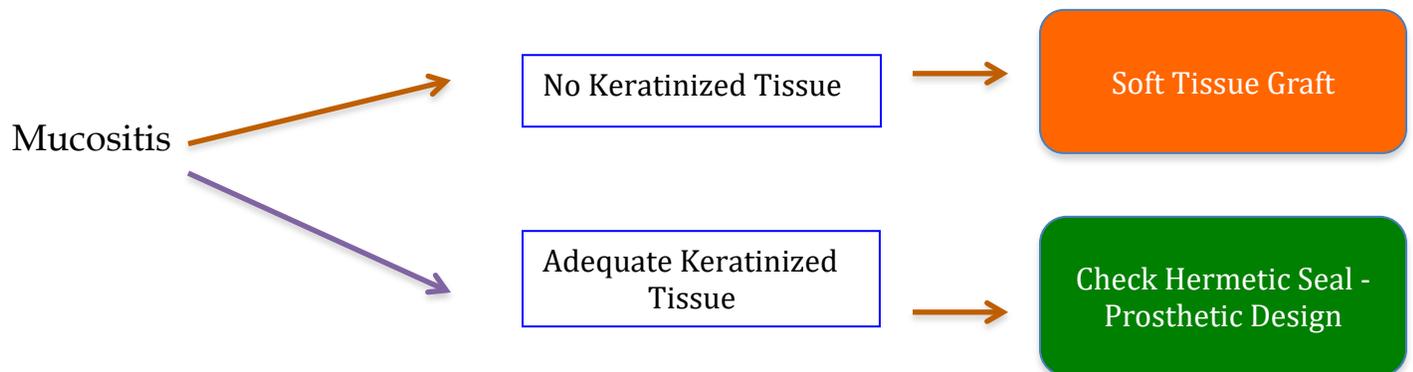
Mucogingival Considerations – Tissue Biotype

- Clinical cases

Implant Complications – Surgical Repair

- Clinical Cases

Implant Complications – Treatment Algorithm



Implant Maintenance – SPT - Homecare Considerations

1. **Implant Trends** - Substantial increases in the number of dental implants being placed will result in more adverse events: Fx of the Implant Body, Fx of the retention screw, Fx of the Porcelain and the incidence of per-Implant Disease
2. **Smoking** – Exhibit higher rates of failure, Higher rate of Peri-implantitis and a decreased response to therapy when treating Peri-Implantitis
(Rodriguez-Agueta OF, Figueiredo R, Valmageda-Castellon E, Gay-Escoda C. Postoperative complications in smoking patients treated with Implants J. Oral Maxillofac Surg 2011;69:2152-2157)
3. **Cost** – The cost of maintaining dental implants over time was five times greater than the cost associated with maintaining natural teeth
(Atieh MA, Alsabeeba NH, Fagion CM, Duncan WJ. The frequency of peri-implant diseases: a systematic review and meta-analysis J. Perio 2013;84:1586-1598)

Long-Term Maintenance Considerations

Implant Maintenance



Implant Hex Wrench (fits coverscrew and Healing Abutment)-Bubble Rule

Implant Surface Characteristics/Topography - Allow for Minor Surface Changes Caused by Common Instrumentation Methods

(Esposito M, Lausmaa J., Hirsch JM, et al. Surface Analysis of Failed Oral Titanium Implants J. Biomed Mater Res. 1999;48:559-568)

Instrumentation – Hand or ultrasonic instrumentation should be oriented parallel to the long-axis of the implant surface: Plastic, Metal (use with caution), Graphite, and Gold Tips. The preventive Benefits of Biofilm removal outweigh the slight surface alterations due to proper technique

Radiographs – Detect Bone Level (comparison) and residual cement which can act as a vehicle for Biofilm retention– Peri-implant mucositis can be detected at about 6 weeks post restoration placement. Radiographs should be taken at Implant placement, Crown placement, and annually thereafter

Clinical Evaluation – Peri-Implant disease characteristic include Marginal Erythema, BOP, Exudate, Saucer shaped circumferential bone defect

Probing – Should be oriented as parallel as possible to the implant body and measurements should be recorded at all 6 probing sites (UNC Probe)

Long-Term Maintenance Considerations - Implant Maintenance

Peri-Implant Mucositis is similar to Gingivitis and Peri-Implantitis is similar to Periodontitis

Prevention of Peri-Mucositis - Every effort should be made to prevent Peri-Implant Mucositis. Patients should be screened appropriately for risk factors. Need to resolve pre-existing periodontal disease before implant placement. A custom homecare protocol should be established for every implant patient.

I. Hygiene continuing care appointment

Assessment is critical:

- Visual soft tissue assessment
- Palpate/probe for signs of infection
- Assess for calculus and cement
- Assess for mobility or pain (occlusion)
- Assess bone level

When not associated with bacterial plaque and the bleeding on probing is negative, no treatment is needed. When the probing depth is up to 3 mm, there is accumulation of bacterial plaque and/or bleeding upon probing, the plaque must be removed mechanically followed by surface polishing with rubber cups and non-abrasive paste.

Excess cement that remains following crown placement not only directly irritates the surrounding mucosa, it also contributes to poor plaque control. The rough surface of cement accumulates plaque biofilm and promotes biofilm proliferation. Mechanical scaling and root planing have been shown to successfully reverse the effects of peri-implant mucositis. Utilization of irrigants can be used and placed on a cotton pellet to safely remove the biofilm without damaging the implant surface.

A variety of plastic and graphite scaling instruments are available in addition to titanium curettes. Remember the principle "Like vs. Like". Use Titanium instruments on the titanium surface. Titanium instruments are compatible with either HA or TPS surface coatings.

II. Patient homecare protocol

Biofilms initially form supragingivally and migrate subgingivally. It is critical that the patient understand that their homecare objective is to maintain the biofilm at a sub inflammatory level (prior to migration subgingivally - subgingival pathogens can be suppressed for months) for 3 months (continuing care appointment) at which point the hygienist can disrupt the supragingival biofilm formation. The customized homecare protocol should be as simple as possible.

1. Patient should brush the affected implant 2-3x day using either a specific rinse (*Irrigation Therapy*) or Colgate Total toothpaste (contains Triclosan), which has both an anti-inflammatory and antibacterial agent.
2. Rinse 2x/ day (morning and night) for 30 sec using Listerine (containing alcohol). Listerine kills bacteria on the mucous membranes, the tongue and posterior areas of the mouth in addition to the teeth.

3. Flossing (Super floss) and utilization of Tepe interproximal brushes and Tepe soft pics

Irrigation Therapy:

1. NaOCl - .25% Sodium Hypochlorite - (5ml (1 tsp.) Bleach 4 oz. water (125ml) less sensitive to crevicular enzymes, more cytotoxic to peri-implant pathogens, disrupts subgingival biofilm
2. CloSyS - Clorastan™ patented formula of stabilized Chlorine Dioxide, penetrates oral biofilm, kills pathogenic bacteria without harming the oral ecology, does not kill osteoblasts and fibroblasts
3. Chlorhexidine - inactivated by the organic serum components of the crevicular fluid, shown to inhibit fibroblast proliferation in vitro, can be neutralized by ingredients in toothpaste
4. Providone Iodine - Excellent antiseptic but must be in contact with subgingival bio-film for 5 min, also inactivated in blood
5. H₂O₂ - Hydrogen Peroxide - 50:50 3% peroxide/water solution, inactivated by the salivary enzymes relatively rapidly therefor requiring multiple irrigation treatments

Plaque Control - Establish criteria that monitor implant health and determine inflammatory complications as part of an ongoing periodontal maintenance program. Customize oral hygiene regimens to reflect the type of restoration taking into considerations contour and accessibility. Record Plaque index at each visit.

Recall Frequency - Dependent upon the severity of the Peri-implant disease - More frequent recall visits may be indicated - different from natural teeth - attachment mechanism. Determine level of frequency based on biofilm formation and modify the regiment 3-4 x a year may be indicated

Implant Maintenance Brochure



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Encode Technology - refer to Compendium article - Dr. Derhalli

iTero Scanner
Electronic Impression Device
Active Scanning Technology