‘Peri-implantitis’

UK IMPLANTOLOGY YEAR COURSE
Module 5

STUART ELLIS BDS MFGDP(UK) DPDS MSc
Course Director
Cavendish House Implant Centre
Cambridge

Aims & Objectives

- What is peri-implantitis?
- Does it even exist?
- Is it a separate disease entity
- The possible causes
- Management of peri-implantitis

What is peri-implantitis?

Definition:

Inflammatory disease of the tissues ‘around the implant’

What is peri-implantitis?

Peri-implant mucositis:

Inflammatory disease of the soft tissues ‘around the implant’

What is peri-implantitis?

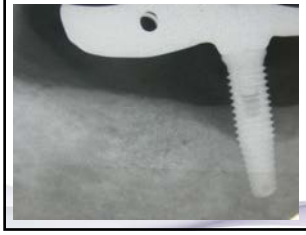
Peri-implantitis:

Loss of hard tissue around implant

What is peri-implantitis?

Peri-implantitis:

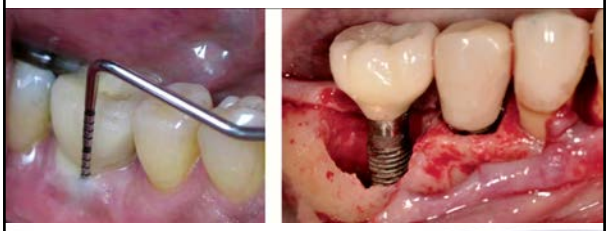
Bone level loss with soft tissue recession



What is peri-implantitis?

Peri-implantitis:

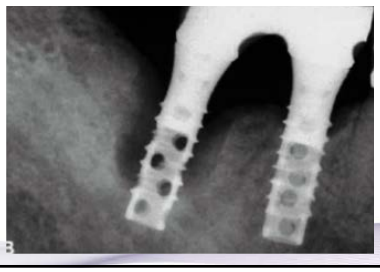
Bone level loss without soft tissue recession



What is peri-implantitis?

Peri-implantitis:

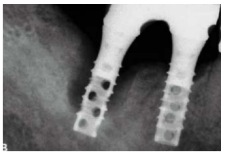
Progression leads to implant loss



What is peri-implantitis?

Peri-implantitis:

The numbers……



10% of implants

20% of patients

Derks and Tomasi 2015
Mombelli et al 2012

What are the risks?

Peri-implant mucositis:

The numbers……

43% of implants

Derks and Tomasi 2015
Mombelli et al 2012

The problem?

- Associated strongly with late term implant loss
- Peak incidence is at 7 years post-surgery
- Aetiology not agreed
- Treatment not agreed
- Prevention not agreed
- Is it even a true distinct disease?

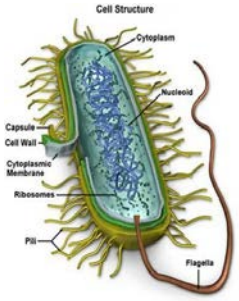
The 3 ‘camps’ on causation and treatment

EFP
EUROPEAN FEDERATION OF PERIODONTOLOGY

ASSOCIATION of CONSULTANTS and SPECIALISTS in Restorative Dentistry

The Periodontal Theory

Peri-implantitis as a 'periodontal disease'

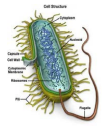


- Caused by bacterial infection
- Similar pathogens to periodontal disease
- Susceptible individuals - ? host response
- PIM in about 80% of patients (50% of sites)
- PI in 28%-56% of patients (12-40% of sites)
- Similar risk factors to periodontal disease

Peri-implantitis as a 'periodontal disease'

Peri-implant diseases: Consensus Report of the Sixth European Workshop on Periodontology

Journal of Clinical Periodontology
Special Issue: The 6th European Workshop on Periodontology.
Volume 35, Issue Supplement s8, pages 282–285, September 2008



Peri-implantitis as a 'periodontal disease'

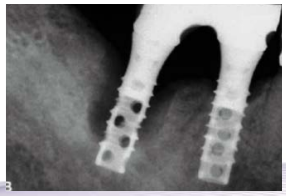
Peri-implant mucositis:

Peri-implant mucositis may be identified clinically by redness and swelling of the soft tissue, but bleeding on probing is currently recognized as the important feature.

Peri-implantitis as a 'periodontal disease'

Peri-implantitis:

In peri-implantitis, the mucosal lesion is often associated with suppuration and deepened pockets, but always accompanied by loss of supporting marginal bone.



Peri-implantitis as a 'periodontal disease'

Prevalence of PIM and PI:

There is limited data available related to the prevalence of peri-implant disease. Thus, the search could identify only three cross-sectional reports including two subject samples presenting information on only one implant system.

- PIM in about 80% of patients (50% of sites)
- PI in 28% - 56% of patients (12-40% of sites)

Peri-implantitis as a 'periodontal disease'

Diagnosis of PIM and PI:

Use of gentle periodontal probing and radiographs.

These are generic diseases affecting ALL implant systems

- BOP/suppuration only = peri-implant mucositis
- BOP/suppuration + bone loss after 1 year = peri-implantitis

Peri-implantitis as a 'periodontal disease'

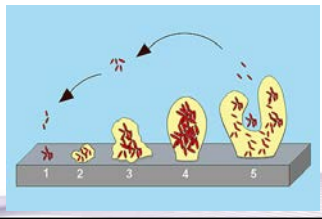
Causation:

PIM and PI are opportunistic bacterial infections

- A change in the environment allows normally present bacteria to cause pathogenic infection.
- Start with biofilm formation

Peri-implantitis as a 'periodontal disease'

- Biofilm matures into a complex structured environment with the intake of nutrient supplies, cross feeding and waste elimination.
- The pathogens within the biofilm are in a so called "protected niche."
- The biofilm offers some resistance to antibiotics so in order to be effective, high doses would be required. Low doses will only contribute to the resistance.



Peri-implantitis as a 'periodontal disease'

Risk factors:

Susceptibility to peri-implant disease. We carry this for life - just as for periodontal disease.

Peri-implantitis as a 'periodontal disease'

Risk factors:

Very similar to periodontal disease

- Poor oral hygiene
- Unhygienic prosthesis design - hard to clean an implant which can not be seen!
- Smoking
- Diabetes
- Previous history of periodontal disease
- Genetic factors
- ? implant surface factors (rough surfaces??)

Peri-implantitis as a 'periodontal disease'

Risk factors:

GOOD evidence of association:

- Poor oral hygiene
- Smoking (cigarette)
- Previous history of periodontal disease

Peri-implantitis as a 'periodontal disease'

Risk factors:

LIMITED evidence of association:

- Alcohol consumption
- Diabetes

Peri-implantitis as a 'periodontal disease'

Risk factors:

POOR/CONFLICTING evidence of association:

- Genetic traits
- Implant surface design/roughness

Peri-implantitis as a 'periodontal disease'

PREVENTION:

Aim is to eliminate/disturb the biofilm:

- Excellent mechanical daily debridement
- Eliminate reservoirs for reinfection (treat rest of mouth!)
- Stop smoking!
- Regular reviews
- Annual PA radiographs

Peri-implantitis as a 'periodontal disease'

TREATMENT:

PERI-IMPLANT MUCOSITIS:

- Standard non surgical perio treatment
- WITH ADJUNCTIVE antimicrobial mouthrinses

CURRENT EVIDENCE SHOWS THAT NON SURGICAL THERAPY FOR THE TREATMENT OF PERI-IMPLANT MUCOSITIS IS UNPREDICTABLE!

Peri-implantitis as a 'periodontal disease'

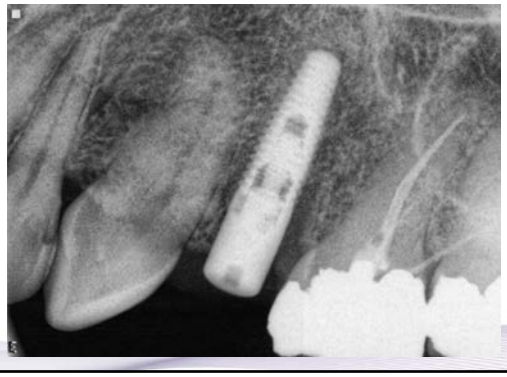
TREATMENT:

PERI-IMPLANTITIS:

- Start with non surgical therapy
- If unstable - commence surgical therapy
- Expose implant surface and debride mechanically
- Disinfect surface (chlorhexidine/dentamycin??)
- GBR defect
- Ensure good access for future OH (eliminate predisposing factors)

(Consensus conference - ADI, London, February 2010)

Peri-implantitis as a 'periodontal disease'



Peri-implantitis as a 'periodontal disease'

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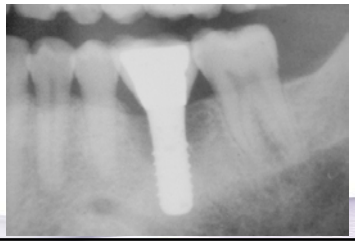
Peri-implantitis as a 'periodontal disease'

The Occlusion Theory

Peri-implantitis as an 'occlusal disease'

HISTORY:

Implant practitioners have noted for decades incidences of 'crater shaped' bone loss around implants under heavy occlusal loading.



Peri-implantitis as an 'occlusal disease'

HISTORY:

Implant practitioners have noted for decades incidences of 'crater shaped' bone loss around implants under heavy occlusal loading.

Peri-implantitis as an 'occlusal disease'

- Patients reported as having excellent OH
- No BOP to probing
- No supporation
- Occlusal interferences and/or parafunctional activity observed

Peri-implantitis as an 'occlusal disease'

- Fibrous 'band' around neck of implant within defect
- Minimal inflammatory cell infiltrate in connective tissue histologically observed in a number of studies
- Few bacteria found in lesions

Peri-implantitis as an 'occlusal disease'

Peri-implantitis as an 'occlusal disease'

- Findings replicated in animal studies - usually monkeys
- Marginal bone loss produced in many monkey studies since 1993
- Isidor F. Loss of osseointegration caused by occlusal load of oral implants. Clin Oral Implants Res 1993;7:143-52.

The 'All Wrong' Theory

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The alternative view

TOMAS ALBREKTSSON (GOTHERBURG):

Studies implicating the bacterial origin and the occlusal biomechanical origin are fundamentally flawed.

The alternative view

BACTERIAL ORIGIN (PERIO THEORY) STUDIES:

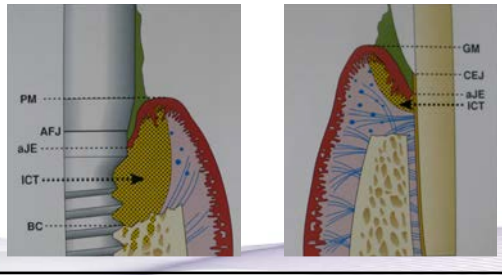
Animal studies and observational cross-sectional studies

- Animal studies using dogs
- Ligatures placed around implants, resulting in 'peri-implantitis' lesions in a few weeks
- Non surgical treatment of peri-implantitis in humans unpredictable with low success rates (unlike treatment of periodontitis)
- Periodontitis normally preceded/accompanied by gingivitis. Not necessary for peri-implantitis
- Histology of lesions differ
- Cross-sectional studies unreliable

The alternative view

Histology of periodontal and peri-implantitis lesions:

Significant differences



The alternative view

Cross-sectional studies:

Incidence of periodontitis related to peri-implantitis. Patients with a history of periodontitis also had a higher incidence of peri-implantitis.

Very few studies with small sample populations

Variables not necessarily showing a cause/effect relationship

The alternative view

The stalk theory of human child birth:

There is a theory held by some people that human babies are delivered by storks.

The alternative view

The stalk theory of human child birth:

There is a theory held by some people that human babies are delivered by storks.

The alternative view

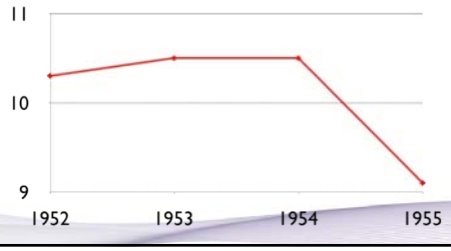
The stalk theory of human child birth - the proof!

In 1955, the population of the White Stalk in Sweden dropped dramatically in just a single season.

The alternative view

The stalk theory of human child birth - the proof!

In 1955, the Swedish live human birth rate (per 1,000 women) fell dramatically.



The alternative view

University of Gothenburg 2008 audit:

Is peri-implant bone loss a poor healing adaptation response caused by poor surgical technique?

- Found that 40% of their own implant failures occured with just one surgeon
- The same surgeon also had a much higher rate of long term 'peri-implant' bone loss

(Chvartsaid et al 2008)

The alternative view

Things to think about:

Peri-implantitis is an incorrect term…….

- Should be called 'peri-implant disease'
- Differentiate between peri-implant mucositis and peri-implant bone loss
- NOT a separate disease entity
- A clinical sign with a number of potentially separate causes (just like a cough!)

Time for a name change?

Peri-implant osteolysis

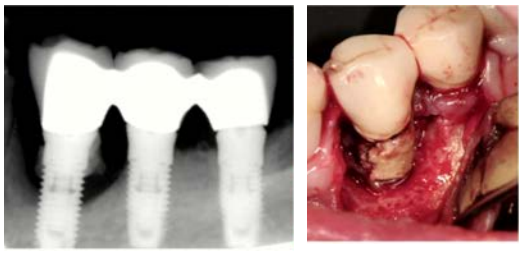
The alternative view

Possible causes of peri-implant osteolysis:

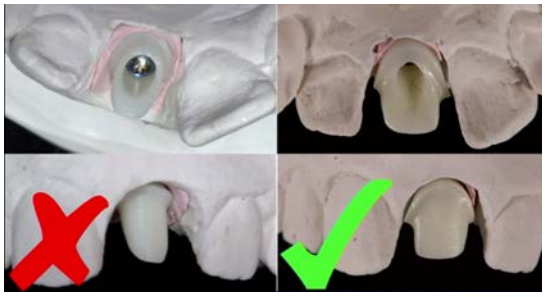
Peri-implantitis is an incorrect term…….

- Bacterial
- Occlusal overloading (bruxists etc)
- Poor surgical technique (overheating???)
- Poor implant positioning
- Foreign body response
- Allergy?????

Foreign body response



Crown margins



Screw retention

Screw retention

Orthopaedics

Osteolysis:

Similar bone loss pattern observed around orthopaedic implants

Clinical Implications

Guidelines

EFP Prevention Workshop

Conclusion

Clinical Implications:

- Regular reviews (at least annually)
- Always examine **gently** with a periodontal probe - assess PD **changes**, BOP, suppuration
- Annual PA radiographs
- Warn patients about peri-implant disease in initial consent and about need to continual long term monitoring
- Monitor oral hygiene
- Review occlusion - especially in tooth wear cases
- Warn smokers and diabetics
- Use gentle drilling technique with copious irrigation

TREATMENT

Peri-implant mucositis:

- Oral hygiene assessment and instruction
- Implant surface debridement
- Adjunct antimicrobial treatment (Dentamycin etc)
- ? adjustment of prosthesis design around implant abutment

TREATMENT

Peri-implant bone loss:

- Address occlusal issues, tooth wear etc
- Commence non-surgical therapy
- If not responding lift flap for surgical access
- Debride & disinfect implant surfaces
- Augment defects with GBR techniques – Fortoss Vital™ is good for this
- Ensure good access for cleaning postoperatively
- Warn patient prognosis unpredictable

Consensus Report of the Sixth European Workshop on Periodontology - 2009

Lindhe & Meyle concluded :

Long-term studies on the treatment of peri-implantitis were not available. Limited evidence from one single case series indicates that surgical treatment including implant surface decontamination and systemic antibiotics resolved a number of lesions. During the 5 years of follow-up, however, 7 implants in 4 patients were lost and 4 implants exhibited disease progression. In 6 sites, new bone formation could be observed.

Cochrane Review 2012

There is no reliable evidence suggesting which could be the most effective interventions for treating peri-implantitis.

Cochrane Review 2012

Follow-up longer than 1 year suggested recurrence of peri-implantitis in up to 100% of the treated cases for some of the tested interventions.

THE END