TIME TABLE

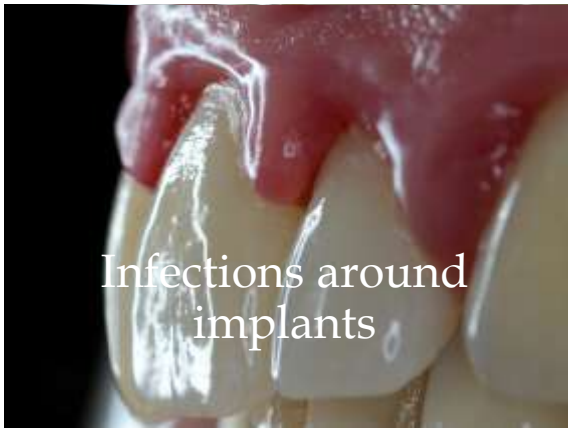
9.30 Introductions and housekeeping

9.40-11.00 Amit Patel

11.00-11.30 break

11.30-12.40 Paul Weston

12.40 Questions



Peri- implant infections

Definitions/ Diagnosis

How common is it ?

Risk factors

Non- surgical approach

Surgical approach

Conclusions

What we are not talking about

- Implant malposition

Implant malposition

What we are not talking about

- Implant malposition

What we are not talking about

Peri-apical infection

What we are not talking about

Peri-apical infection

Peri- implant infections

- Definitions /diagnosis
- How common is it ?
- Risk factors
- Non- surgical approach
- Surgical approach
- Conclusions

Definitions

- Peri-implant Mucositis: Reversible inflammatory process in the soft tissue surrounding a functional implant

- Peri-implantitis: Inflammatory process additionally characterized by loss of peri-implant bone. Bleeding with bone loss
  - ≥1mm of bone loss after the first year of installation together with bleeding and/or suppuration (Sanz and Chapple 2012)

Signs of health

Periodontology 2000, Vol. 27, 2001, 162–182

Signs of peri-implant mucositis

Signs of peri-implantitis

Signs of peri-implantitis

- Bleeding/pus discharge
- Increased probing depths
- Loss of bone radiographically

Signs of peri-implantitis

- Difficult to probe around certain implants

- Radiographs two dimensional, need to assess clinical situation

Where should the bone be?

Where should the bone be?

Peri implant cementitis!

Peri- implant infections

- Definitions/ Diagnosis
- How common is it ?
- Risk factors
- Non- surgical approach
- Surgical approach
- Conclusions

Prevalence of mucositis

Roos-Jansaker 2006

- 79% of implants and 50% of patients

Fransson 2009

- >90% implants

Mir-Mari 2012

- 21.6% [95%CI: 19.1–24.5%] of implants
- 38.8% [95%CI:33.3–45.4%] of patients

Prevalence of peri-implantitis

Mir- Mari 2012

9.1% implants with peri-implantits
Implant in service 6.0 years (± 3.9)
Probing depth 3.5 mm (± 1.6)

Systematic review

10% implants and 20% of patients (Mombelli 2012)

Monday morning patients

Monday morning patients

Peri- implant infections

- Definitions
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- Surgical approach
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Risk factors

Poor Oral hygiene

Heitz-Mayfield 2008

Poor oral hygiene is highly associated with peri-implantitis. Odds ratio of 14.3 and a 95% confidence interval of 9.1–28.7

J Clin Periodontol 2011; 38 (Suppl. 11): 182–187

Risk factors

- Poor Oral hygiene

Risk factors

Smoking

Implant survival in smoker 80-96%
odds ratio 2.03-6.89

Risk of per-implantitis odds ration 3.6-4.6

Dose related?

Heitz-Mayfield 2009
International journal of oral and maxillofacial implant
Volume 24

Risk factors

Previous periodontal disease

Risk factors

Previous periodontal disease

Risk factors

Previous periodontal disease

Implant survival systematic review Ong 2008

study	Follow up	Perio patient	No Perio
Evian 2004	>10 years	79.22%	91.67%
Karoussis 2003	10	90.5%	96.5%
Roos-Jansaker 2006	9-14	16/94 events	2/62 events

Van der Weijden 2005, Schou et al. 2006, Karoussis et al. 2007, Quirynen 2007,

Risk factors

'More implants lost in patients who presented with more periodontal bone loss of the remaining teeth at implant placement'

Roos-Jansaker 2006a

Risk factors

Diabetes

One study linked poor metabolic control and increased risk of peri-implantitis.

Ferreira SD, J Clin Periodontol 2006: 33: 929–935

Peri- implant infections

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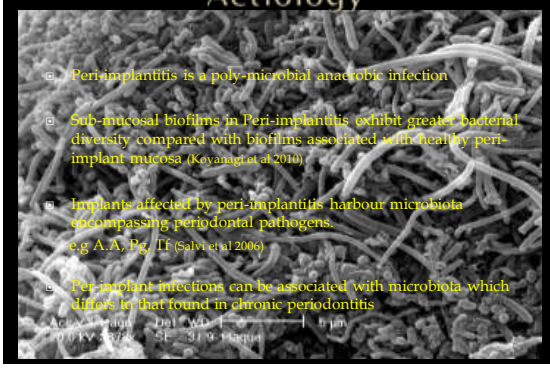
Aetiology



- Peri-implantitis is a poly-microbial anaerobic infection
- Sub-mucosal biofilms in Peri-implantitis exhibit greater bacterial diversity compared with biofilms associated with healthy peri-implant mucosa (Koyanagi et al 2010)
- Implants affected by peri-implantitis harbour microbiota encompassing periodontal pathogens. e.g A.A, P.g, Tf (Salvi et al 2006)
- Peri-implant infections can be associated with microbiota which differs to that found in chronic periodontitis

Treatment of peri implant infections

The removal of the bacterial biofilm from the implant surface constitutes the basic therapy for the prevention and treatment of peri-implantits (Renvert 2008)

Therapies based on available treatment for periodontitis Complicated by:

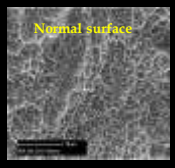
screw shape of implant
surface modifications
design of superstructure

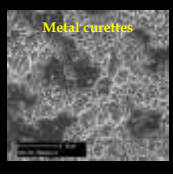
Surface decontamination

- Mechanical debridement
- Air abrasion systems
- Lasers
- Photodynamic therapy
- Local delivery antimicrobials
- Systemic antimicrobials

Mechanical debridement surface modification

- Any damage to the surface induces changes to the chemical oxide layer that may induce increased corrosion. This process impairs the biocompatibility of the implant
- There is a demand for plaque and calculus removal which causes little or no damage





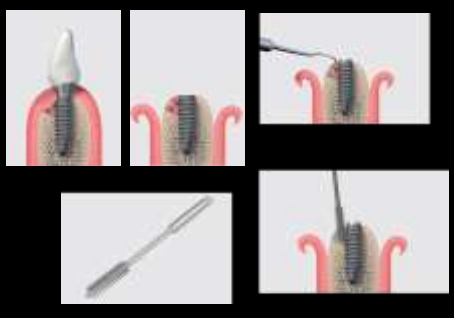
Modification of Ti surface

- Metal instruments increase the Ti surface roughness values
- Titanium curettes increase the surface roughness, although this effect is less pronounced.
- Non-metal devices and rubber cups and air abrasives seem to be the instrument of choice for the treatment of smooth or rough implant surfaces, especially if the primary goal is the preservation of surface integrity
- Air abrasion is the least damaging and most effective decontamination method for all surfaces and is biocompatible *in vitro*. Concerns surrounding the removal of the coating surface and its effect on the re-osseointegration process

louropoulou 2012

Plastic curettes | Titanium curettes | Plastic power driven tips

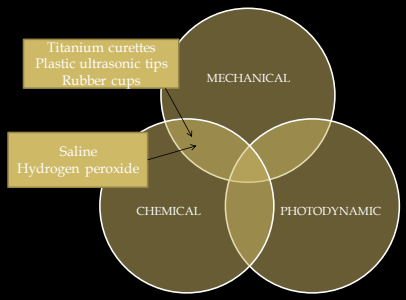
Mechanical cleaning



Mechanical | Chemical | Photo dynamic

Air abrasion

Surface decomtamination



Anti-infective treatment of peri-implant mucositis: a randomised controlled clinical trial

- Heitz-Mayfield Clin Oral Implants Res. 2011 Mar;22(3):237-41
- 29 patients with peri-implant mucositis
- Test: non-surgical debridement + corsodyl gel 4 weeks
- Control: non-surgical deridement + placebo gel
- One month following treatment, 76% of implants had a reduction in BOP. Complete resolution of BOP at 3 months was achieved in 38% of the treated implants

Adjunctive chlorhexidine gel application did not enhance the results compared with mechanical cleansing alone. Implants with supramucosal restoration margins showed greater therapeutic improvement compared with those with submucosal restoration margins

Non-surgical treatment of peri-implant mucositis and peri-implantitis: a literature review.

Renvert S, Roos-Jansåker AM, Claffey N.
J Clin Periodontol. 2008 Sep;35(8 Suppl):305-15

- Mechanical non-surgical therapy could be effective in the treatment of peri-implant mucositis lesions
- Adjunctive use of antimicrobial mouth rinses enhanced the outcome of mechanical therapy of mucositis lesions
- In peri-implantitis lesions non-surgical therapy was not found to be effective
- Adjunctive local or systemic antibiotics were shown to reduce bleeding on probing and probing depths

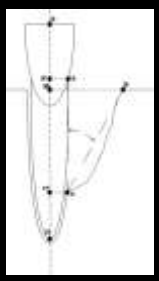
Peri- implant infections

Definitions
How common is it ?
Risk factors
Non- surgical approach
Surgical approach
Conclusions

Surgical treatment of peri-implantitis

- Resective surgery ± antibiotics
- Regenerative surgery ± antibiotics
- Methods to clean implant surface
  saline
  Corsodyl
  Hydrogen peroxide
  Laser
  Air abrasion systems
  Photo dynamic therapy

Defect factors when considering regeneration



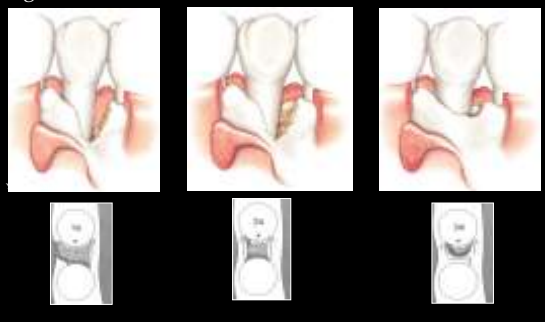
The deeper the defect the greater the amount for clinical improvement. Deep and shallow defects have the same potential for regeneration. Approximately 75% of the defect depth.

Defects with an angle of ≤25 degrees gained more attachment than defects ≥35 degrees (Cortellini 1999).

Number of residual bony walls is closely related to outcomes in regenerative surgery. Less of an impact if membranes used (Selvig 1993), (Tonetti 1993,1996).

Intrabony defects

Single-wall defect | Two-wall defect | Three-wall defect



What does the surgical treatment achieve?

- All methods of surface debridement achieve resolution of the inflammatory lesion but fail, in themselves, to achieve significant reosseointegration along the previously contaminated implant surface.
- Histological results demonstrated a connective tissue capsule separating the implant surface from the adjacent bone in most cases except at the most apical extent of the defect.

(Grunder et al. 1993, Ericsson et al. 1996, Persson et al. 1996, 1999, 2001, 2004, Wetzel et al. 1999, Shibli et al. 2003, Schwarz et al. 2006a.

A follow-up study of periimplantitis cases after treatment

- Charalampakis G, A follow-up study of peri-implantitis cases after treatment. J ClinPeriodontol 2011

- Retrospective study to follow patient cases in a longitudinal manner after peri-implantitis treatment.
- Followed 245 patients after treatment for a period ranging from 9 months to 13 years.
- University of Gothenburg

A follow-up study of periimplantitis cases after treatment

- Charalampakis G, A follow-up study of periimplantitis cases after treatment. J ClinPeriodontol 2011

Table 2. Peri-implantitis treatment-related characteristics

Variables	Subcategory	N*	%†
Type of treatment (*N* = 274)	Non-surgical	46	16.8
	Surgical	228	83.2
Surgical treatment	Access flap without antibiotics	48	17.5
	Access flap with antibiotics	111	40.5
	Apical repositioned flap without antibiotics	9	3.3
	Apical repositioned flap with antibiotics	27	9.9
	Reconstructive surgery without antibiotics	1	0.4
	Reconstructive surgery with antibiotics	32	11.7
Follow-up after treatment (*N* = 245)	9 months–1 year	96	39.2
	2–3 years	104	42.4
	4–6 years	40	16.3
	>6 years	5	2
Treatment result (*N* = 245)	Success	111	45.3
	Failure	134	54.7

A follow-up study of periimplantitis cases after treatment

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Antibiotics used

Table 3. Antibiotic regimen chosen based on baseline microbial analysis

Variables	Subcategory	N*	%†
Type of antibiotic during surgery	Amoxicillin + metronidazole	80	47.1
	Metronidazole	34	20
	Ciprofloxacin	19	11.2
	Tetracycline	11	6.5
	Amoxicillin + tetracycline	7	4.1
	Penicillin V	6	3.5
	Amoxicillin	5	2.9
	Clindamycin	5	2.9
	Clindamycin + metronidazole	1	0.6
	Amoxicillin + clavulanic acid	1	0.6
	Azithromycin	1	0.6

A follow-up study of periimplantitis cases after treatment

- Charalampakis G, A follow-up study of peri-implantitis cases after treatment. J Clin Periodontol 2011

Conclusions

- Peri-implantitis successfully resolved in 45% of cases
- Peri-implant health may not be easy to establish
- Smoking and smoking dose were found to be significantly correlated to failure of peri-implantitis treatment ($p<0.05$)
- Early disease development was also significantly associated with failure ($p<0.05$)

Conclusions from surgical treatment

- Access surgery combined with implant surface decontamination for treatment of peri-implantitis has scarcely been investigated. The only study available also included the use of systemic antibiotics and found that resolution occurred in about 60% of the treated sites.
- No single method of surface decontamination (chemical agents, air abrasives and lasers) was found to be superior.
- So far it is not known if the adjunctive use of systemic antibiotics in surgical therapy of peri-implantitis is required.
- Regenerative procedures such as bone graft techniques with or without the use of barrier membranes resulted in various degrees of success. However, it must be stressed that such techniques do not address disease resolution but rather merely attempt to fill the osseous defect.

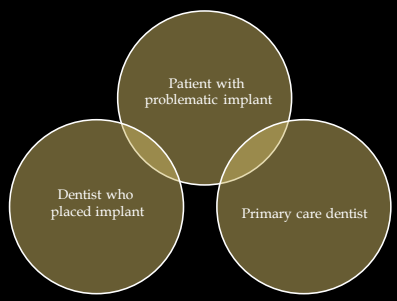
Claffey N, Clarke E, Polyzois I, Renvert S: Surgical treatment of peri-implantitis. J Clin Periodontol 2008; 35 (Suppl. 8): 316–332.

Cochrane systematic review

Treatment of periodontitis.
Esposito M, Grusovin MG, Worthington HV 2012

- no reliable evidence suggesting which could be the most effective interventions for treating peri-implantitis
- The use of adjunctive antibiotic therapy (Atridox) to manual debridement was associated with probing attachment level (PAL) and probing pocket depth (PPD) improvements in the range of 0.6 mm after 4 months in patients who had severe forms of peri-implantitis
- The use of a Bio-Oss and Bio-Gide was associated with PAL and PPD improvements of about 1.4mm after 4 years in infrabony defects deeper than 3 mm when compared to nanocrystalline hydroxyapatite (Ostim) in one trial
- In four other trials evaluating local antibiotics, the Vector system and a laser therapy, respectively, no statistically significant differences were observed when compared with subgingival debridement

Who does what and who pays?



Peri- implant infections

Definitions
How common is it ?
Risk factors
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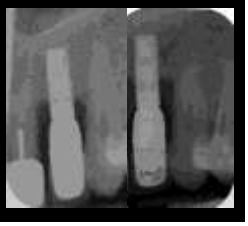
Conclusions

Preventative

- Ensure good Oral Hygiene
- Get the patient to quit smoking
- Treat existing periodontitis
- Provide good maintenance programme
- Place implants with caution in high risk patients

Recommendations

- Probe and record probing depths around implants
- Take peri-apical radiographs at baseline and every two years thereafter
- Identify the disease early
- Refer



Recommendations

Mucositis

- Improve oral hygiene/ smoking cessation
- Debride area/ consider adjuncts

Peri-implantitis

- Don't dilly dally
- Non-surgical treatment not effective bur reduces inflammation
- Regenerative surgery in aesthetic zone or favourable defect. Bury implant
- Resective surgery to allow patient access to clean