Implants and periodontitis: should we go there?

Aly Virani explores the considerations and possible complications that must be taken into account when planning implant treatment for periodontal patients

When it comes to implant dentistry and periodontitis, the first thing we should explore is how peri-implant tissues differ from periodontal tissues.

The soft tissues around dental implants contain fewer cells (fibroblasts) and more collagen than found in the periodontal ligament (PDL).

The peri-implant tissues are also less vascular.

The lack of PDL means that the tissues around an implant are less responsive and resilient (Figure 1).

Anatomically, despite other differences, the junctional epithelium around implants and teeth (ie, the epithelial sealing) is identical.

The tissues around a healthy implant are as delicate as the tissues around a successfully stabilised periodontally involved tooth that has experienced previous loss of attachment.

DISEASE DIFFERENCES

Is peri-implant disease the same as periodontal disease?

Like gingivitis, peri-implant mucositis is a reversible inflammatory lesion that resides in the mucosa. Peri-implantitis affects bone in addition to the soft tissues.

Despite having similarities, the anatomical differences mean that peri-implant diseases do differ from periodontal disease.

Peri-implant mucositis

- The speed of onset and progression of mucositis is greater than that of gingivitis
- Peri-implant tissues are less resilient so this reversible condition is more likely to progress to peri-implantitis.

Peri-implantitis

- Differs from periodontitis in extent, composition of cells and progression rate
- The self-limiting protective mechanism of a connective tissue capsule forming around periodontitis lesion is not always present in peri-implantitis lesion
- These lesions display more signs of acute inflammation and show higher numbers of osteoclasts.
- Because of the anatomical differences, peri-implant diseases are more likely to occur than periodontal diseases. They are also likely to progress faster.

RISK FACTORS

The risk factors for peri-implant disease can be grouped into those with significant evidence, those with weak/conflicting evidence and those with limited evidence.

Risk factors with significant evidence:

- Poor oral hygiene

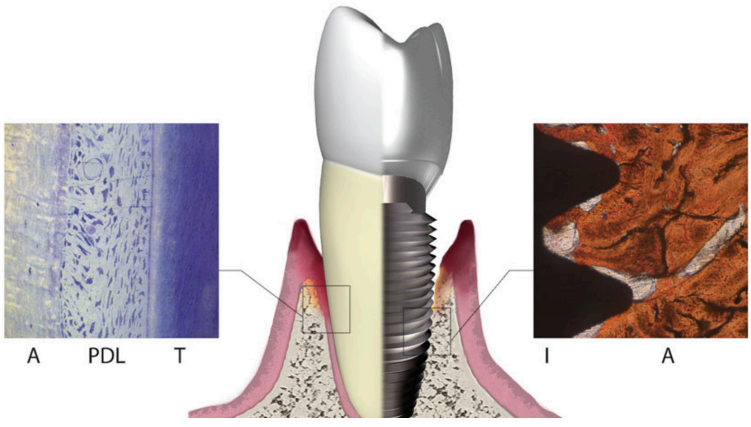

FIGURE 1: *Overview of the histological compositions from periodontal (left) and peri-implant tissues (right). Left slice: periodontal space with PDL-cells, mouse, T = tooth; A = alveolar bone. Right slice: bone-implant-interface, pig, I = implant; A = alveolar bone (vom Orde, Rodiger and Gersdorff, 2011)*

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FIGURES 2A, 2B *and* **2C:** *Implant treatment for a periodontally involved patient*

FIGURE 3: *Oral hygiene is paramount for preventing peri-implant diseases*

FIGURE 4A: *Milled bar from Createch Medical with locators incorporated*

FIGURE 4B: *The milled bar, used with a removable denture with milled sleeve and a spare with locators only*

- History of periodontal disease
- Smoking.

Risk factors with weak/conflicting evidence:

- Genetic traits
- Implant surfaces.

Risk factors with limited evidence:

- Diabetes
- Alcohol consumption >10mg/day.

When it comes to keratinised tissue being a risk factor, there has been no association found between keratinised peri-implant mucosa and peri-implant disease.

However, since 2013, insufficient width of keratinised mucosa has been linked to increased plaque and inflammation. (Although this is theorised to be due to discomfort in performing adequate oral hygiene measures when keratinised tissue is lacking.)

INCIDENCE OF PERI-IMPLANT DISEASES

There is data to suggest that one in two patients will experience peri-implant disease (including mucositis).

Evidence suggests that at 10 years, one in five patients and one in 10 implants will experience bone loss defined as peri-implantitis.

However, we have to be careful interpreting these numbers, as the thresholds used to define peri-implantitis and the data being reported varies, but depending on who you believe, peri-implant diseases might be much more common than this.

IMPLANTS IN THE PERIO SUSCEPTIBLE

Studies suggest that in the short term (less than five years) and long term (greater than five years), survival rates for dental implants are the same for patients with a history of chronic perio and healthy individuals (Rosenberg et al, 2004).

However, we should ask ourselves if survival equals success, as rates of implants that develop complications do differ.

Also, is five years a suitable follow-up? Are patients aware that this is the timeframe for which good evidence exists?

Perio patients may exhibit greater long-term probing pocket depths, marginal bone loss, incidence of peri-implantitis.

The difference between the two groups of patients is greatest when supportive periodontal therapy is not organised.

PREVENTING PERI-IMPLANT DISEASES

Implant failure has been shown to decrease by 90% in patients who have regular (more than twice a year) maintenance visits compared with no maintenance. Even one visit per year results in a 60% decrease in instances of peri-implant disease.

There is no difference in disease incidence between the perio-susceptible and healthy patients if they are part of a perio maintenance programme.

Compliance is an essential factor. It can decrease three years after implant treatment – motivation and compliance is essential. And, of course, restorations must be cleansable.

There is a better chance of maintaining peri-implant tissue stability at 10 years post treatment if the full-mouth plaque score is kept under 25%.

STEPS TO SUCCESS: IMPLANT TREATMENT ON PERIO PATIENTS

1. Stabilise the periodontal condition

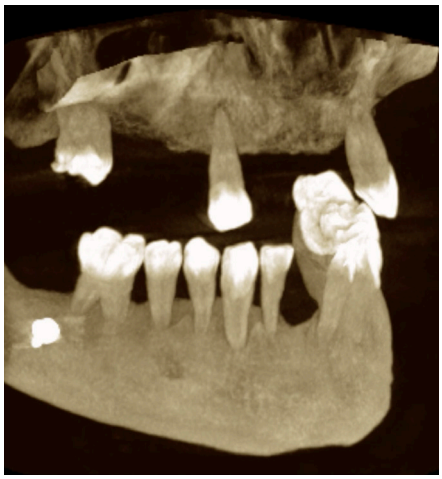
- <10% full mouth bleeding
- No pockets >4mm
- Eliminate risk factors where possible
- This must be done through hard work, or by clearance of the terminal dentition.

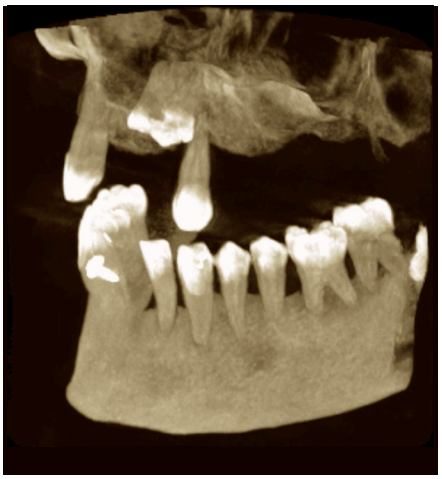
2. Consent to future complications

- Implants do not last forever
- Complications are likely
- Maintenance is necessary (biological and prosthetic, routine and corrective)
- Associated costs.

3. Plan for cleansability

- Removable prostheses may be more appropriate





FIGURES 5A *and* **5B:** *Case study. Pre-treatment CBCT*

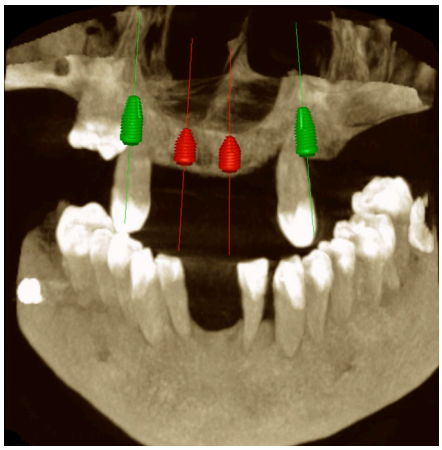


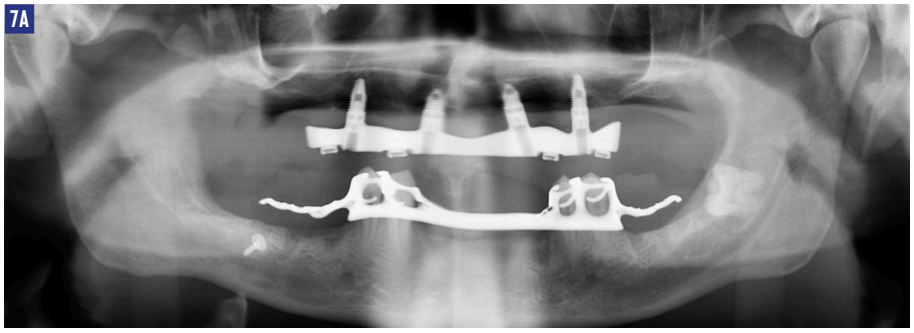
FIGURE 5C: *Pre-treatment CBCT showing implant planning*

- Fixed prostheses must have cleansable surfaces and embrasures
- Cleansability can compromise aesthetics and speech in fixed prostheses.

4. Establish a maintenance programme

- Tailored oral hygiene following prosthesis fit appointment
- Photos and a video taken at this appointment and provided to the patient as a memory aid
- Quarterly hygiene visits with probing and disclosing to be performed at every appointment.

FIGURES 6A *and* **6B:** *Final restorations. Identical removable prostheses: telescopic denture and spare locator denture*



FIGURES 7A, 7B *and* **7C:** *Final result. Maxilla: bar-retained telescopic removable denture. Mandible: cobalt-chrome removable partial denture*

The best of both worlds

Here is what I believe offers gold-standard full-arch prosthetics for the perio patient (Figures 4a and 4b):

- Four implants per edentulous arch
- Milled bar from Createch Medical with locators incorporated, designed to be cleansable
- Removable denture with female milled sleeve and locators
- Spare denture with locators only (cost effective).

CLINICAL CASE

The patient presented with mobile teeth. As an ex-smoker, the patient was well-motivated to make changes. On examination, we found that only four of the remaining teeth had a reasonable medium-term prognosis.

After discussion, the patient chose the following treatment plan: bar-retained denture in the maxilla; stabilisation of remaining teeth followed by chrome denture in the mandible.

The discussion on consent covered the following areas:

- The susceptibility of the patient to peri-implant disease and possible need for expensive further treatment and future loss of implants
- The option to perform guided bone regeneration and place a greater number of implants with a fixed implant restoration
- The alternatives to implant treatment (removable complete dentures)
- The time and financial commitment to preventive supportive periodontal therapy going forward
- The daily commitment required for adequate plaque removal
- The eventual loss of the remaining mandibular teeth, necessitation removable dentures or implant retained prostheses
- The need for maintenance of the implant retained prosthesis (and associated costs).

TREATMENT PLAN

1. Extraction of teeth, immediate F/P acrylic dentures fitted
2. Periodontal treatment (RSD with LA and intensive OHI) with hygiene team until periodontal condition stable:
   - Turesky plaque score = 0, full mouth plaque score <20%
   - No periodontal pockets >4mm
   - Nil bleeding on probing.
3. Placement of four implants in the maxilla
4. Construction mandibular cobalt-chrome partial denture and maxillary milled bar retained telescopic and locator denture with prosthetic dentist
5. Oral hygiene instruction specific to new prosthesis with the hygiene team
6. Ongoing maintenance and monitoring with hygiene team and GDP.

CONCLUSION

When providing perio-susceptible patients with dental implant treatment, periodontal disease, tooth loss and the need to replace teeth go hand-in-hand.

A combination of good planning, patient motivation and some luck can lead to good long-term outcomes

Complications are likely even if compliance is good, but complications are guaranteed if compliance is poor. It's important to note that adequate consent leads to less stress when complications do occur. CD

REFERENCES

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PERI-IMPLANT DISEASE CAUSES

- Poor oral hygiene
- Excess cement
- Inadequate abutment-restoration seating
- Over-contoured restorations
- Implant malpositioning
- Technical complications
- Graft material rejection?
- Implant surface degradation?