

Masterclass in Clinical Practice

Periodontitis and Dental Implants

with

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Non-surgical therapy of periodontitis: Essential for successful dental Implant therapy



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Introduction

Dental implants have become standard of care to replace lost teeth. Clinicians should however always diagnose the reason for tooth loss before planning the replacement of teeth with implants. Periodontitis remains one of the main reasons for tooth loss and has important implications should implants be planned. This is especially true for the more advanced/severe periodontitis cases.^{1,2} Periodontitis is associated with plaque bacteria and requires excellent plaque control for successful management.¹⁻³ The design of implant restorations and the accessibility for excellent plaque removal is also of importance in preventing peri-implantitis.⁴

Dental implants are surrounded by gingiva and bone much like a natural tooth, and plaque bacteria accumulate on implants and subgingival around the implant (Figure 1). The notion that “implants are for life” is a misconception and implants can develop infection in the surrounding gingiva and alveolar bone just like teeth.

Peri-implant infection is called peri-implant mucositis when no bone loss has occurred and peri-implantitis if there is progressive bone loss.

Implants need to be examined for peri-implant tissue health using a periodontal probe, visual inspection, and palpation of tissues.⁵

Periodontitis and poor plaque control are important risk factors for peri-implant infection and should therefore be diagnosed and treated before placing dental implants. Figure 2 shows a patient with undiagnosed and untreated periodontitis, poor plaque control with caries and root rests with 2 implants placed in 4th quadrant. The implants showed advanced bone loss before any restorations could be placed and will have to be removed.

Types of peri-implant disease:

- *Peri-implant mucositis*

This is much like gingivitis with bleeding on probing, redness of marginal gingiva and suppuration. Clinical signs of inflammation must be present before making the diagnosis of peri-implant mucositis. Implants must be probed as this is the only way to determine presence and progression of disease. Gentle probing will not harm the implant or peri-implant tissues.⁵

- *Peri-implantitis*

This is also a plaque associated disease with signs of inflammation as seen in peri-implant mucositis as well as progressive loss of alveolar bone support around implant. Recession may be seen on the implant, and probing depths increase in peri-implantitis.⁵

Diagnosis of Periodontitis

To diagnose periodontal disease, one should be able to define periodontal health. Periodontal health may be seen in an intact periodontium (where no recession or bone loss is found) or in a reduced periodontium (successfully treated periodontal disease, after crown lengthening or where aggressive brushing has caused loss of attachment).



Figure 1: Extensive accumulation of plaque with bone loss and inflammation around implants in an edentulous patient that has received no maintenance after implant placement.

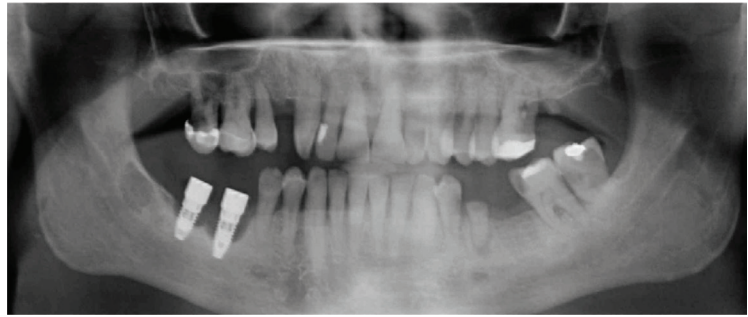


Figure 2: Advanced loss of peri-implant bone in untreated periodontitis case.

Periodontal health in an intact periodontium has no:

- bleeding on probing
- redness or swelling
- patient symptoms
- attachment loss
- bone loss

Bone margins are found 1-3mm from the CEJ.⁶ Periodontal health in a reduced periodontium has the same characteristics except in the presence of attachment and bone loss. Patients with periodontal health after successful treatment of periodontitis, remain at risk of future development of periodontitis. The same cannot be said for patients with reduced periodontium from other reasons.⁶ This is why the supportive treatment phase of periodontitis is so important.

The diagnosis of periodontitis according to consensus includes:²

- Interproximal clinical attachment loss of more than 2-3mm at more than 2 non-adjacent teeth
- Probing depth of more than 3mm with CAL (probe goes beyond the CEJ) at more than 2 non-adjacent teeth will indicate periodontitis if it cannot be ascribed to non-periodontitis causes such as traumatic brushing, caries, 3rd molar removal, etc.

- Interproximal bone loss can usually be seen on radiographs.

Treatment of Periodontitis

According to the American Academy of Periodontology, non-surgical therapy may be successful in most periodontitis cases. Non-surgical treatment or root planing is achieved through debridement of the root surfaces in periodontal pockets to remove plaque bacteria and calculus and to smoothen the roots to remove bacterial toxins. Ultrasonic debridement of roots in periodontitis is as effective as hand instrumentation, but much easier to perform.⁶ There is also less chance of trauma to the soft tissue that may occur during the use of periodontal curettes, especially for the inexperienced clinician. Self-injury with periodontal curettes is a concern, which is not found with ultrasonic instruments.

Root planing requires an intimate knowledge of root morphology and anatomy below the gingival crest. This will enable accurate probing as well as effective debridement (illustrated in the video).

Treatment of periodontitis in a conservative non-surgical manner cannot harm the patient. It can only improve the situation. Unwanted side-effects of the treatment will be



Figure 3: Scaling tip on left is used for gross debridement and the two diamond tips on the right for root planing and getting a smooth subgingival root surface.



Figure 4: One 100mg capsule per 1 ml water for a 10% doxycycline solution.



Figure 5: Doxycycline capsules dissolved in water should be left for a few minutes for the suspended particles to settle at the bottom.

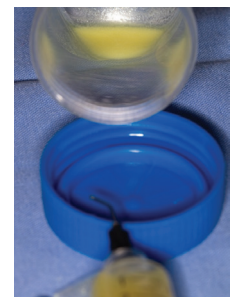


Figure 6: The clear liquid is drawn up in the syringe leaving solid particles behind, which will block the irrigating needle if care is not taken in this process.



Figure 7: Pre-operative view of early onset periodontitis.



Figure 8: Palatal view of the same case showing bleeding and suppuration after probing.



Figure 9: Early onset case 3 years after root planing with ultrasonic scaler and irrigation with doxycycline 10%. Patient was seen every 4 months for scaling and motivation.

temperature sensitivity and recession of gingiva. This is however an indication that the treatment has been successful and during the healing, gingiva will recede and expose root surfaces that may be sensitive. Sensitivity is temporary and can be treated while recession of gingiva is permanent. Patients must be informed of the unwanted effects of the treatment beforehand and once they understand why this happens; most patients will accept it.

I prefer to perform the gross debridement with a scaling tip as the first step, followed by proper root planing with a diamond tip (Figure 3) (see video).

This is then followed-up with sub-gingival irrigation of the pockets with a 10% Doxycycline solution for 5 minutes (Figures 4-6).

Doxycycline 100mg dissolved in 1ml water gives a 10% solution and I use 20-30ml on a full periodontal treatment. This is a very toxic low pH solution, so one should take great care to have very effective suction to prevent any of the solution going down the throat and to irrigate small areas at a time. My advice is to do one quadrant at a time until you become more confident before doing two quadrants simultaneous, left and right sides separately to facilitate effective suction. A continuous 5-minute irrigation is done for the entire area before moving on to the next.

Risk of periodontitis for dental implants

As peri-implantitis is a plaque induced infection, plaque control is important in preventing this. It follows that periodontitis will place a high bacterial burden on the peri-implant tissues and should be treated before placing any implants.

Peri-implant mucositis may precede peri-implantitis like gingivitis precedes periodontitis. Peri-implantitis may lead to severe implant complications and implant loss, so patients should be monitored as it has been shown that patients with

poor plaque control, not on a maintenance programme, are more likely to develop peri-implantitis. Peri-implantitis develops at a faster rate than periodontitis and should therefore be treated as early as possible.⁵

There is consensus that strong evidence exists for the following risk factors for peri-implantitis:

- a history of severe periodontitis
- poor plaque control
- those not on a maintenance supportive programme after dental implants are placed.⁵

Conclusion

Effective plaque control is essential in preventing peri-implant disease. This implies that periodontal disease should be treated before dental implants are placed and implant restorations/prostheses need to be designed to facilitate effective plaque control. This will include designing the suprastructure to allow maintenance procedures. Screw retention makes it possible to remove the crown/bridge/prosthesis for maintenance if needed and should be used wherever possible.

Periodontitis should be treated before placing dental implants and patients need to be informed of the risk of poor plaque control and not staying on the maintenance programme for the periodontitis.

Patients who are edentulous may have had severe periodontitis and should be treated in the same manner by placing them on a maintenance programme to monitor plaque control and performing subgingival debridement where necessary. The treatment of periodontitis falls within the scope of practice of all dental healthcare workers and the video demonstrates how to perform non-surgical periodontal treatment. The results will speak for themselves if the treatment is carried out with proper care (Figures 7-9).

Treating a severe case of periodontitis will lead to much



Figure 10: Preoperative view of 4th quadrant in periodontitis patient.



Figure 11: Bleeding may be profuse during root planing.



Figure 12: Five days after root planing with excellent healing and patient still using Chx 0.2% rinse.



Figure 13: One year later and tissue has stabilized due to excellent plaque control by patient.

bleeding but will settle down by the time subgingival irrigation is complete. After root planing the patient is placed on chlorhexidine 0.2% mouthwash and asked to rinse vigorously for 10 days. The patient is followed up 5-10 days after root planing to give detailed plaque control instructions. The reason for this is patients do not respond well when instructions are given at the time of treatment due to the stressful situation. Once they see how fast the periodontium heals and treatment is behind them, they respond much better on what is required of them to maintain the health of periodontium (Figures 10-13).

Should a patient not respond to this treatment, referral to a periodontist may be indicated, alternatively re-treatment may improve the situation. Severe periodontitis with pockets deeper than 8mm will be more difficult to debride effectively and may indicate a genetic susceptibility. Smoking, although not conclusive, may be detrimental to implant health and certainly to periodontal health. Such factors should also be addressed in striving for periodontal and peri-implant health.

It is also accepted that keratinized attached gingiva is necessary for periodontal and peri-implant health and makes plaque control measures easier to perform.

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