

**From Our Office
to Yours...**

Peri-implant disease is a growing problem in implant dentistry. Infectious in nature, it is caused by the same microflora that have been implicated in periodontal disease.

*Published reports in the **Journal of Periodontology** 2013 and at the EuroPerio 7 in 2012 subdivided the peri-implantitis disease process into two subcategories: peri-implant mucositis and peri-implantitis.*

Peri-implant mucositis is an inflammatory lesion limited to the soft tissues surrounding the implant similar to gingivitis associated with natural teeth. The primary diagnostic symptom is bleeding on probing. Fortunately it is reversible, but it must be treated aggressively to prevent progression to the underlying alveolar bone, just as periodontitis affects natural teeth.

On the other hand, peri-implantitis affects both the peri-implant soft tissues and the supporting bone.

*In this issue of **The PerioDontaLetter**, we discuss the findings of the AAP and the EuroPerio 7 with respect to the causes and treatment of peri-implantitis. As always, we welcome your comments and suggestions in the comanagement of this increasingly common condition.*

Another Look at the Problem of Peri-Implant Disease

Although endosseous implants have demonstrated a very high survival rate, a recent study found that 80 percent of patients had peri-implant mucositis associated with half their implants and 56 percent of patients had peri-implantitis surrounding 43 percent of their implants.

One recent study followed 2,300 implants for ten years and found that patients with severe periodontal disease had eight times the risk of implant failure than patients

with healthy supporting tissue and bone.

Patients with a mixed dentition of teeth and implants have a much higher rate of implant failure if they have generalized periodontal disease than patients with prostheses which are fully implant-supported.

Contrary to earlier beliefs, because implants lack a periodontal ligament attaching into cementum, once infection starts they're actually much more vulnerable to progression than natural teeth.



Figure 1. Failure to remove subgingival cement caused facial bone loss and jeopardized the long term success of the implant and the restoration.

The supporting apparatus of an implant is more vulnerable to periodontal pathogens than teeth. The loss of attachment and bone support around an implant tends to be circular rather than vertical as it is with natural teeth.

Both the AAP and the EuroPerio 7 reports emphasized the importance of excellent oral hygiene to control the biofilm around implants. Well fabricated and contoured restorations enhance the ability to control plaque deposition.

Causes of Peri-Implant Disease

Retention of excess cement around the dental implant collar is a major reason for bone loss because it attracts pathogenic bacteria and the rough surface of the cement provides a nidus

for the deposition and growth of microorganisms which can lead to peri-implant disease.

Cement-associated peri-implantitis is one of the most significant reasons for marginal infection and bone loss. Recognition of excess cement is difficult and not always evident on radiographs and it does not become clinically evident immediately after crown placement.

Studies by Wilson, Cobb and Callan both found cement was an etiologic factor in peri-implant disease. They further observed this phenomenon even in the presence of acceptable restorations and without clinically observable inflammation.

Shapoff and Lahey have discussed numerous factors leading to excess cement and discussed strategies to identify, diagnose and prevent excess cement around implants.

These findings appear to be consistent, irrespective of the implant surface or the type of cement used to secure the restoration. Initial signs of inflammation and peri-implant disease were found as early as four months and as late as nine years after fixed implant restorations were cemented.

The favorable tissue response associated with the removal of subgingival cement is analogous to the improvement in gingival inflammation when calculus is removed from natural tooth roots.

Another major cause of peri-implantitis is excess occlusal forces. Due to the absence of a periodontal ligament, implants are especially vulnerable to excessive occlusal forces such as those commonly seen in the presence of bruxism and malocclusion.

Other causes of peri-implantitis include:

- incompletely-seated abutments
- open crown margins
- over-contouring of restorations
- poorly positioned implants
- narrow zones of keratinized gingiva
- systemic diseases such as diabetes and osteoporosis
- smoking

All of the above contribute to poor plaque control.

Preventing Peri-Implantitis

- To avoid cross infection of implants, it is critical to prevent implant infection before it starts by managing periodontal infection throughout the mouth.
- Preventing the development of a biofilm and eliminating it from the implant surface should be the first steps in the preservation of peri-implant soft tissue health. This requires thorough oral hygiene

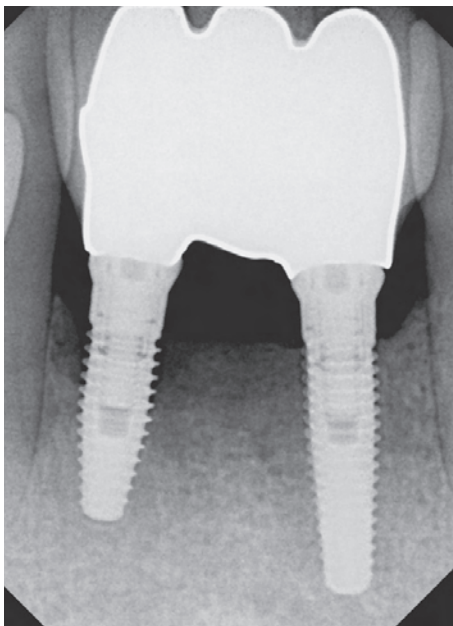


Figure 2 and 3. A radiograph of this implant in December 2011 revealed peri-implantitis has caused significant bone loss. The patient chose to try to maintain the implant without any therapeutic intervention. A radiograph of the implant in April of 2014 shows extreme severe progression of bone loss which has now placed the adjacent canine in serious jeopardy. Treatment considerations have become very complicated.

instruction and strict patient compliance.

- Adequate periodontal disease control is also essential in the partially-edentulous patient to prevent cross contamination from teeth to implants. Recent studies have found that the lack of preventive maintenance in individuals with pre-existing peri-implant mucositis was associated with a high incidence of peri-implantitis.
- When restoring an implant, it is absolutely essential to ensure all excess cement has been removed and the area is cleansable with an oral hygiene product such as an interproximal brush.
- Adjusting the prosthesis to open the embrasure space will allow the patient easy access during home oral hygiene.
- Pontic areas should be convex rather than concave in the area over gingival tissues to ensure plaque and food debris is easily cleansable.

Diagnosing and Treating Peri-Implantitis

As in periodontitis, deeper pockets and exudate always indicate peri-implant disease.

Peri-implant mucositis is often a reversible condition and requires only minimal intervention to treat. Thorough mechanical debridement of the area along with local anti-microbials such as chlorhexidine irrigation or Arestin is usually sufficient to resolve peri-implantitis. A thorough examination of the area should also be com-

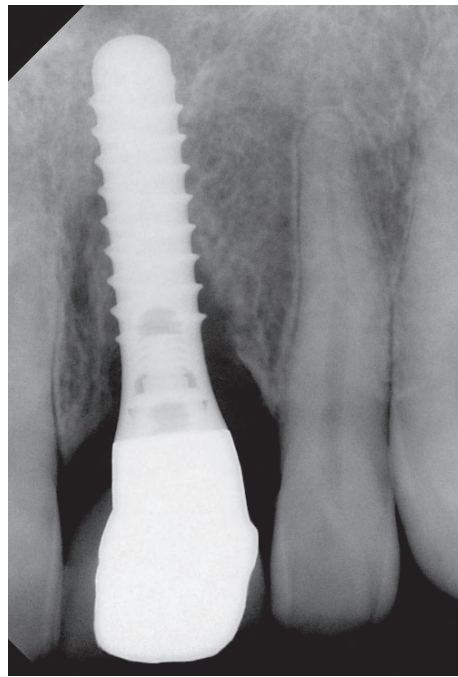


Figure 5. This radiograph reveals the loss of bone to the fourth thread on the distal of the implant caused by peri-implantitis.

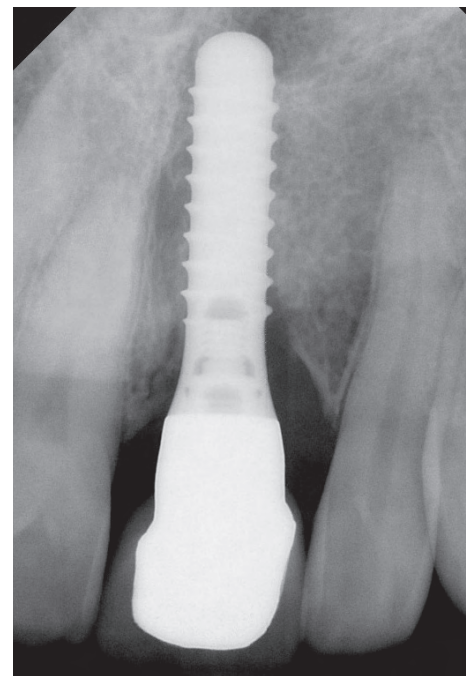


Figure 6. One year following treatment, at least 50 percent of the bone was regenerated to the second thread of the implant.

pleted to ensure there are no local iatrogenic factors contributing to the problem.

Once infection and bone loss starts, implants become ailing and failing implants and treatment is challenging.

If the disease has progressed to peri-implantitis and bone loss is evident,

initial treatment is the same as it is for the treatment of peri-implant mucositis: mechanical debridement, antimicrobials and strict oral hygiene protocols, including chlorhexidine mouthwash.

Open flap curettage with curettes and ultrasonic tips can and should be

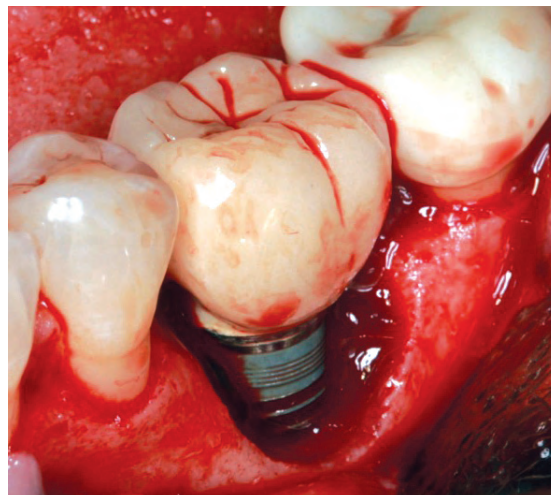


Figure 4. Peri-implantitis resulted in severe bone loss around this implant necessitating explantation and ridge augmentation.



Figure 7 and 8. This patient presented with failing implants with pocket depths up to 9mm. Following laser therapy most of the bone was regenerated and pocket depth was reduced to 3-5mm.

used to remove the bacteria once the implant body is exposed in peri-implantitis. They can be used with care on smooth abutments with peri-implant mucositis. It is more important to remove the subgingival biofilm than to be concerned about small scratches on the implant abutment.

Numerous other methods can also be used to debride a plaque-contaminated abutment or implant surface including sonic and ultrasonic scalers; lasers; air-powder abrasion and various chemical solutions such as citric acid, hydrogen peroxide and saline.

One study using access flap surgery with the application of a chemical agent for decontamination showed favorable results.

Administration of systemic or local antibiotics should also be considered to reduce the number of pathogens present. Adjunctive local or systemic antibiotics have been shown to reduce bleeding on probing and probing

depths in combination with mechanical debridement. Culturing and/or DNA probes will identify the pathogenic bacteria and define which antibiotic will likely have the best result.

Unfortunately, to date, studies suggest that nonsurgical treatment of peri-implantitis is unpredictable and the use of chemical agents alone such as chlorhexidine has only limited effects on clinical and microbiological parameters.

Open flap curettage with bone grafting and membrane has been tried with variable results.

Once an implant becomes mobile, it should be removed and the site regrafted before replacing the implant.

In April 2013, the American Academy of Periodontology reported that “the treatment of peri-implantitis is not predictable, at times complex, difficult to perform, and non-surgical therapy has proven to be ineffective.”

With the unpredictability of conven-

tional therapies, some clinicians have turned with some success to treating peri-implantitis with laser therapy. Based on preliminary reports, this may be the most promising approach to managing these conditions in the future.

Utilizing laser treatment, clinicians have reported success in removing infection and in some cases shown evidence of bone regeneration on radiographs. Laser therapy is also being used to assist in the cleaning of the implant surface during bone grafting therapy. To date, these results are anecdotal.

While this approach to treatment appears promising, research is needed to determine the appropriate utilization of lasers in treating the ailing implant.

Conclusion

Control of periodontal disease in other areas of the mouth prior to implant placement is critical to preventing cross-infection of the implant.

Improved methods of cementation technique, shallow subgingival margins with the use of custom abutments and early and frequent follow-up visits in a shared maintenance approach will minimize the irreversible effects of cement peri-implantitis. Clearly, the best approach is prevention.

