Implant hygiene: clues, caveats and cautions

By Professor Laurence J. Walsh

With the increasing use of dental implants for tooth replacement and for stabilization and support of dentures, the need for a comprehensive hygiene approach to dental implants in general practice settings is greater than ever before. Both patients and dental staff need to recognize that long-term success of implant therapy is dependant on home care and professional hygiene, as well as on proper surgical and restorative techniques and careful case selection. For patients whose dentitions have been compromised by dental caries or periodontitis, the lessons of dental plaque biofilms are particularly relevant. While dental implant components do not undergo demineralization in the same manner as natural tooth structure, the microbiota and soft tissue responses seen in peri-implant inflammation bears a striking similarity to periodontitis - a condition underpinned by the response of the host to the same bacteria (anaerobic Gram-negative rods, motile organisms and spirochaetes) present in dental plaque biofilms surrounding teeth.

As described in the classic paper on peri-implant tissue reactions by Lang et al., inflammation in the implant-mucosal unit (mucositis) can, when plaque is allowed to accumulate for prolonged periods of time, progress to peri-implantitis with loss of circumferential coronal bone.

Thus the two questions: how to best provide professional hygiene care and what methods to use as part of regular at-home care? A well trained dental hygienist and/or auxiliary can be instrumental in maximising the compliance, motivation and education of the patient as it relates to maintenance of dental implants. Different protocols for professional care have been suggested, but it is unclear at present which is the most effective. Clinical recommendations from experienced dental specialists and case studies provide valuable clinical information, but would not be considered the pinnacle of the pyramid of scientific evidence.

At-home care

A particular problem is the limited evidence base from randomized controlled trials (RCTs), many of which have relatively short follow-up periods and/or few subjects. A Cochrane search conducted in 2004 yielded 14 RCTs, with follow-up periods from 6-weeks to 5-months. Two trials evaluated the efficacy of powered and sonic toothbrushes, respectively, when compared to manual toothbrushing and showed no statistically significant differences. There was no evidence that the use of powered or sonic toothbrushes was superior to manual toothbrushing.

One trial compared self administered subgingival chlorhexidine irrigation versus a chlorhexidine mouthrinse. The group using chlorhexidine irrigation resulted in statistically significantly lower mean plaque scores and marginal bleeding index than the group using chlorhexidine mouthwash, however the mouthwash was given at a suboptimal dosage. One study compared an essential oil mouthrinse versus placebo mouthwashes, and showed a reduction of 54% in plaque and 34% in marginal bleeding compared with the placebo. This indicates that an essential oil mouthrinse, used twice a day for 30 seconds, as an adjunct to routine oral hygiene is effective in reducing plaque formation and marginal bleeding around implants. The positive benefits of chemical plaque control agents reinforce the value of these as adjuncts to meticulous physical removal of dental plaque for patients with implants.

More recent work has also stressed the convenience and comfort of powered toothbrushes for mechanical oral hygiene, which are effective, as well as safe and comfortable for patients with implant-supported pros-
thesc. Use of powered, counter-rotational and sonic toothbrushes can reduce plaque, gingival inflammation and bleeding, and probing pocket depths around implants.13,14

To keep plaque biofilms thin and non-pathogenic (i.e. with few Gram negative anaerobes), several factors should be considered: the maintenance of a relatively smooth abutment and implant surface; attention to the level of periodontal health in the remaining dentition (to prevent translocation of bacteria from one site to another), and reduction of modifying factors such as smoking. Of note, the link between susceptibility to periodontitis and tors such as smoking. Of note, the link between susceptibility to periodontitis and susceptibility for peri-implantitis may vary according to the implant type and surface topography,15 so each patient will need careful individual assessment and review.

Professional hygiene care

There is extensive literature which explores the effects of exposing implant components to various oral prophylaxis devices and procedures.16–22 From both laboratory and clinical studies, a number of key points emerge:

- Ultrasonic scalers, sonic scalers, and stainless steel scalers: These will roughen and damage titanium surfaces.
- Reinforced resin curettes, graphite-reinforced scalers, titanium-alloy tipped curettes, gold platinum curettes and air-powder abrasive devices: These will, in general, increase surface roughness, but with less damage than ultrasonic and steel scalers.
- Plastic scalers, Eva plastic tips, rubber prophylaxis cups, used dry or with zirconium silicate, tin oxide, or flour of pumice, give little or no surface changes compared with untreated controls on most common implant surfaces.

New devices and methods for professional implant care are constantly being developed, and further work is needed to develop methods which are suitable for cleaning all types of implant surfaces. In the interim, clinicians should focus on the “first do no harm” principle and use instruments with care to prevent roughening implant surfaces during patient care and thereby making at-home plaque control more difficult.

References

12. Vandekerckhove B, Quirynen M, Warren PR, Strate J, van Steenbergh D. The safety and efficacy of a powered toothbrush on soft tissues in patients with implant-supported fixed pros-

Figure 2. Patients with implant-stabilized overdentures need judicious attention to oral hygiene. In this patient who is mid-way through care, circumferential deposits of plaque can be seen on all three abutments.

Figure 3. Attachments can be difficult to clean for elderly and frail patients.