Implant Maintenance Protocol

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Introduction

Dental implants have changed dentistry. Several studies on dental implants indicate high success rates—in the upper 90th percentile. We need to bear in mind that these studies take place in highly specialized centers around the world. In the real world, complications are far more common.1,2 Interestingly, a recent study published in The Journal of American Dental Association showed a 19 percent failure rate of implants placed in general-dentistry practices.3 Most of these complications can be attributed to surgical, restorative and treatment-planning errors. A number of studies emphasize the high prevalence of biologic complications of peri-implant mucositis and peri-implantitis, inflammatory conditions in the soft and hard tissues at dental implants.4-6 In this article we will review the current knowledge concerning peri-implant mucositis and peri-implantitis.

Recent data shows that at least 50 percent of all subjects with implants suffer from some form of peri-implant pathology.7 It is our responsibility as periodontists to prevent peri-implant disease. This obligation is not only moral, but also financial. Replacing failing implants is extremely costly for both the clinician and the patient.

This article is an effort to establish an organized protocol for maintenance of our implant patients.

Fig. 1
Custom abutment in place. This is a mandibular second molar. The margin is equigingival.

Fig. 2
PVS used to create a die to be used as a plunger to remove excess cement.

Fig. 3
PVS die set ready to be used.

Fig. 4
Excess cement extruded as die goes in place. Now the die and excess cement can be removed and crown can be cemented.
Who is responsible for implant maintenance?

Everybody who is involved in the patient’s care shares equal responsibility in establishing a maintenance protocol. This includes the surgeon, the restoring dentist and the hygienist.

Upon delivery, the restoring dentist should:

- Ideally use a radio-opaque cement in the case of cement-retained restorations.8
- Follow a clinical protocol that eliminates excess cement at cementation (Figs. 1-4).9

After delivery, acquire a baseline radiograph that can be used to evaluate possible future changes. The radiograph should be perpendicular to the crest as well as the prosthetic margin. A good guide to make sure that you acquired a good radiograph is whether you can see all of the implant’s threads, peaks and valleys. Figure 5 demonstrates a proper radiograph (Fig. 5).


- Peri-implant mucositis has been described as a disease in which the presence of inflammation is confined to the soft tissues surrounding a dental implant with no signs of loss of supporting bone following initial bone remodeling during healing.5
- Peri-implantitis has been characterized by an inflammatory process around an implant, which includes both soft-tissue inflammation and progressive loss of supporting bone beyond biological bone remodeling (Figs. 6 & 7).5
- According to recent data, 80 percent of the subjects (50 percent of sites) are diagnosed with peri-implant mucositis, while 28 percent to 56 percent of the subjects (12 percent to 40 percent of the sites) are diagnosed with peri-implantitis.7
- During probing, implants are to be probed as often as teeth, and in the same visit. Pocket depths are recorded. The pocket depths are used to evaluate the long-term stability of the area and are compared with previous recordings. Due to the fragile nature of the peri-implant architecture, the recommended probing force is 0.15N. Clinically, this corresponds with applying light force.10 The hygienist needs to be trained and calibrated with the dentist on this subject.
- Every other index that is used around teeth is also recorded for implants (PD, GM, CAL, BOP, plaque or suppuration).5 For the CAL measurement, the crown margin may be used as a point of reference, instead of the cement-enamel junction.
- The actual pocket depth is of limited value. It is the change that allows for diagnosis of peri-implant pathology.5
- For probing, a plastic probe is suggested, mainly because it allows for flexibility around the prosthetic components. The use of a metallic probe is acceptable.11 There is no evidence to suggest that probing with a metallic probe damages your implants. In fact, in Europe it is common practice. It is the authors’ opinion that on
implants with platform switching, the use of a flexible plastic probe allows more accurate measurement.

What about the radiographic examination?
- After delivery, acquire a baseline radiograph that can be used to evaluate possible changes in the future. The radiograph should be perpendicular to the crest as well as the prosthetic margin.
- If no signs and symptoms of disease are present, then additional radiographs can be obtained at the same time with healthy dentition.
- If there are signs and symptoms of disease, such as bleeding, suppuration, pain, mobility or pocket depth increase, a radiograph should be acquired to assist with the diagnosis.
- Radiographs are confirmatory instead of exploratory, and should be considered in conjunction with clinical parameters (Fig. 8).

What are the best instruments for use during maintenance visits?
- The research is ongoing in this field.
- Titanium scalers are acceptable for implant debridement. Some plastic scalers leave remnants in the tissues when used against roughened implant surfaces. Currently, there is no evidence on the effect of plastic instrument remnants around implants.
- A soft-tip plastic sleeve placed on the tip of a sonic or ultrasonic scaler can be used, and does not damage the abutment and crown surface. Debridement of micro- or nano-roughened implant surfaces with conventional mechanical scaling is ineffective.

Maintenance visit considerations
Implant patients tend to be more compliant than other patients. Consider increasing recall visits of implant patients to four times a year, especially in the presence of risk factors such as diabetes, smoking and history of periodontal disease.

The dental hygienist should be competent in preventing and recognizing peri-implant disease, treating, and referring to a periodontist.

In the event of diagnosis of peri-implant mucositis, nonsurgical treatment should take place with oral-hygiene instructions, localized debridement and possible use of chemotherapeutic agents such as chlorhexidine gluconate.

Treatment of peri-implant mucositis should be provided in all of the settings, including hygiene.

At this point the patient is considered to be under active treatment, and a re-evaluation visit should be scheduled within 4-6 weeks.

In the event of diagnosis of peri-implantitis, nonsurgical treatment has been shown to be ineffective, and referral should take place.

What about the soft tissue, or is there an elephant in the room?
Studies remain ambivalent on the importance of attached keratinized peri-implant mucosa.

Despite that, our long-term clinical experience and observation have shown that, in patients who present with a multitude of hygiene challenges (e.g., hybrid restorations, or cemented prostheses with deeper margins) the presence of a solid...
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band of attached peri-implant mucosa becomes crucial. Such a zone will allow the patient to clean more effectively, since the tissues will be less movable. Additionally, it will also withstand mechanical cleaning and oral hygiene without any sensitivity, unlike buccal or labial oral mucosa. We have found that the great majority of implants with peri-implantitis present with poor mucosal architecture and lack of attached tissues (Fig. 9, p. 100).

In order to improve the quality of the surrounding tissue, grafting procedures—such as modified apically positioned flaps, free gingival grafts or use of allogenic matrix grafts (Figs. 10-15, p. 100 & 102)—can take place.

These procedures can ideally take place prior to implant placement, although often they can be performed after implant placement, or even after restoration (Figs. 13-15).

During hygiene visits, it is important to note the condition of peri-implant mucosa, and a persistent problem of inflammation should be addressed by referral to a periodontist. In combating peri-implant diseases, what is considered the “golden hour” to avoid a surgical procedure is upon diagnosis of peri-implant mucositis. That is when the condition is reversible.21

References

Fig. 13 Pre-op condition of the buccal surfaces of these restored implants. Bleeding was consistent during all maintenance visits.

Fig. 14 Free gingival palatal graft in place.

Fig. 15 Post-operative healing after 3 months. Area appears stable.