

## SUB-GINGIVAL CEMENT EXTRUSION

The concern over sub-gingival cement extrusion around implants is not a new one. However, because the incidence for cement extrusion in relation to peri-implantitis and implant failure is unknown (due to patients with sub-gingival cement who have no ill-response), it is often seen as unimportant.

But it may account for more implant bone loss than often thought, particularly for those that are susceptible. It is not too dissimilar to ones risk for periodontitis or even inflammation from biologic width invasion. There are non-susceptible people who hardly brush their teeth and maybe only have a little gingivitis, and others who brush very well but still have severe bone loss and tooth loss. There are non-responders with amalgams to the osseous crest with no untoward response, and others with restorations with good crown margins which are slightly subgingival, but with severe inflammation and excessive gingival response or bone loss particularly detrimental for anterior restorations.

There is significant difficulty in achieving natural and esthetic soft tissues around anterior implants. There are potentially severe consequences to sub-gingival cement extrusion in those over-responders, particularly if they are young and need an anterior implant restoration to last the rest of their lifetimes. There is further difficulty and increased cost in rebuilding lost tissues once the implant restoration is in place, often requiring removal of the restoration to repair. So because we don't know who those over-responders are, it is critical to treat everyone as over-responders, and **take the simple steps that follow** to prevent sub-gingival cement extrusion. It is what you would want for yourself, right?

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## WHAT IS PERI-IMPLANT DISEASE

Peri-Implant Disease is a broad term, similar to Periodontal Disease, that includes various problems with the tissues surrounding an implant. It is more than just Peri-Implantitis, defined as infection and inflammation around an implant resulting in loss of supporting bone around the implant. It is similar to periodontitis, but affecting an implant rather than the supporting structures of the tooth. Another aspect of Peri-Implant Disease is Peri-Implant Mucositis: the initial stage of inflammation where no bone has been lost (equivalent to gingivitis around teeth), but which can result in bone loss if untreated.

A 2017 Systematic Review article lists a prevalence of up to 20% for Peri-Implantitis, and up to 47% for Peri-Implant Mucositis. Causes include occlusal overload, poor oral hygiene, genetic susceptibility to periodontitis, and cement extrusion. It can present as suppuration on palpation, diffuse inflammation in the keratinized mucosa of the implant, or as a localized fistula in the photograph below, due to cement extrusion as visualized in the radiograph.

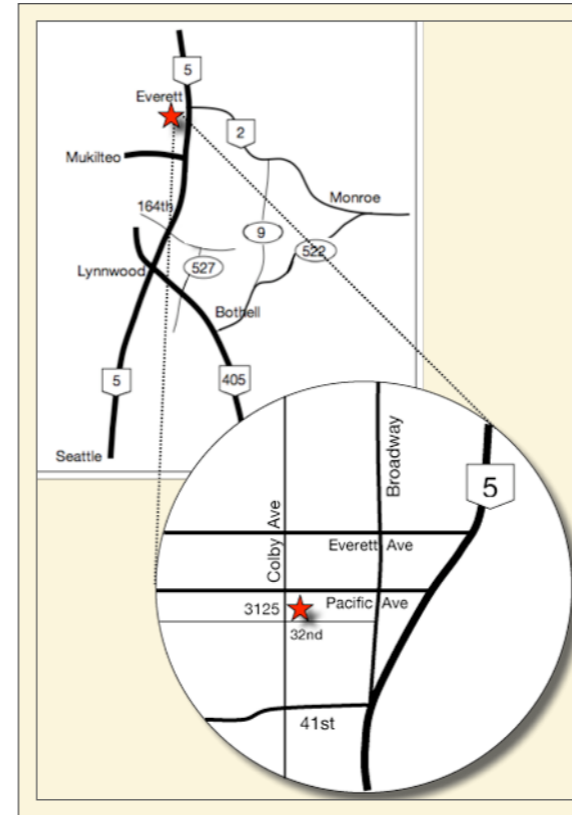


Courtesy: Dr. Darrin Rapoport

This issue of ProbeTips is an update from a 2012 issue on this topic, still highly relevant today, and is dedicated to the relationship that iatrogenic dentistry has to the formation of peri-implant disease: specifically with relation to cement extrusion and its preventable impact on bone loss around implants.

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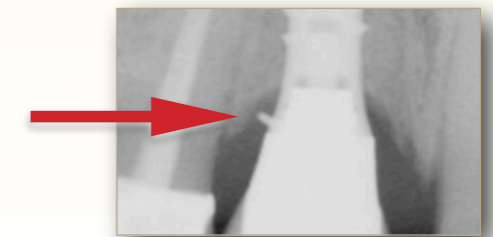
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# PROBE TIPS

A QUARTERLY PERIODONTAL  
NEWSLETTER

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## Peri-Implant Disease from Subgingival Cement



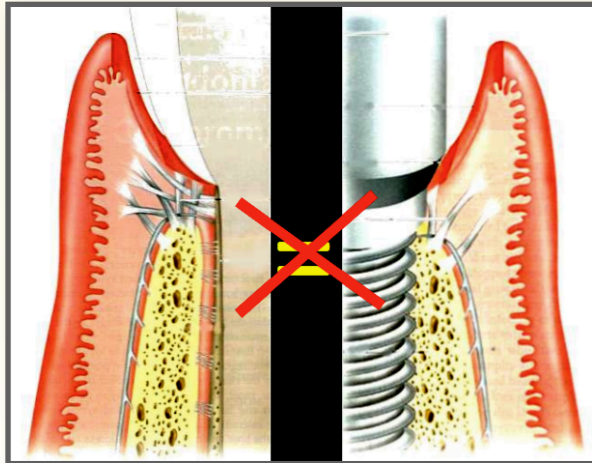
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# Implant Crown Cementation Recommendations

## TOOTH VS. IMPLANT SOFT TISSUE CONNECTION

It is important to recognize that soft tissue around a tooth is not the same as the soft tissue around an implant. Around a tooth, there is a firm connection of gingival fibers at right angles into the cementum (Sharpey's Fibers) with approximately a 1-3mm sulcus depth before this connective tissue attachment begins. The connection of the gingiva to the implant surface is weaker and is made through hemidesmosomal attachment. The sulcus depth is also generally much deeper, particularly interproximally, and reaches an average of 5-6mm rather than 3mm.



In addition, the way we restore teeth is different to the way we restore implants. Crown margins around teeth are usually only 1mm subgingival. But crown margins around implant stock prosthetic abutments may lie 6mm or more sub-gingivally, especially interproximally. Using custom prosthetic abutments brings the inter proximal margin more coronally.

## GENERAL CONSIDERATIONS

*Cement Retained vs. Screw Retained:*

Generally, the soft tissues respond more favorably to screw retained versus cement retained implant restorations because of the lack of potentially open margins or cement extrusion. Ideally, all implant crowns would be screw retained.

However, screw retained restorations may fall short esthetically if the screw access is too visible, or occlusally if the access is in a critical area related to occlusal load. Therefore, because it is most like traditional crown and bridge, most clinicians choose cement retained implant restorations. Because of the increased risk for cement extrusion based on the differences in connective tissue attachment around an implant versus a tooth, the following recommendations are provided.

## RECOMMENDATIONS FOR CEMENT TYPE

If the cement cannot be seen radiographically, it is difficult to know that it is there. Different cements have different levels of radio-opacity. In addition, if the material is very hard, it may not be possible to remove from the implant surface non-surgically. Surgical flap reflection will cause soft tissue loss that may have taken months of healing and shaping, as well as pain and financial burden to the patient to achieve.

- Ideally Use Temp-Bond
  - Radiographically visible and soft.
- Avoid Premier Implant Cement
  - Not visible radiographically, and strongly adherent to implant surfaces.

## RECOMMENDATIONS FOR REDUCING CEMENT EXTRUSION

- Gently pack cord to block extrusion of cement sub-gingivally, and assist in pulling out sub-gingival cement when removed.
- Do not overfill the crown with cement, but coat the internal surface with a thin film only.
- Fabricate custom prosthetic abutments to bring the abutment/crown finish line closer to the gingival margin, and ideally supra-gingivally in non-esthetic areas (palatally or posteriorly).
- Use esthetic materials such as zirconia or gold, or use porcelain at the abutment/crown margin (see below), to bring the finish line to the gingival margin without risk of grey shadow in the gingiva from a titanium margin.



Courtesy: Dr. Wadwhani

## RECOMMENDATIONS FOR IMPROVING CROWN RETENTION

Softer cements, which are recommended due to ease of cleaning, sometimes have lesser crown retention, therefore consider the following before resorting to stronger resin based cements:

- Consider air abrasion of the abutment surface prior to cementation.

•Partially fill the screw access with Teflon (plumbers) tape since leaving the screw access partially unfilled allows space for cement to overflow there and not into the sulcus. (Do not use cotton pellets which increase bacterial colonization.)

•Consider implementing 'vent holes' (see adjacent) in the abutment to allow cement to 'lock' onto the abutment, as well as reduce marginal cement extrusion.



Courtesy:  
Dr. Wadwhani

## RECOMMENDATIONS FOR POST- CEMENTATION CLEANING

Hard instruments can scratch the implant or abutment surface, which may possibly lead to areas where bacteria can colonize and cause inflammation and bone loss, therefore:

•Use an explorer to gently clean subgingival cement. An ultrasonic on low power with a rubber tip is another option.



## REFERENCES

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