CHAIRSIDE IMPLANT SERVICES

We Come To You...Chairside!

Winter, 2015

REC = Implant Failure

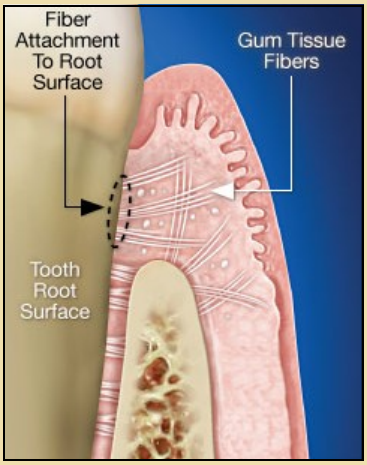
Research shows that Residual Excess Cement (REC) is associated with peri-implant disease in the majority of implants and a major cause of implant failure.[1] Interestingly enough, these failures seem to occur, on average, two years after restoration[2]. Any mass of foreign material adjacent to an implant could affect implant survival. By arbitrarily lining an implant crown with cement and inserting it onto an abutment until visual excess cement is extruded around the margin is certainly a recipe for implant failure (Fig 1). Excess cement is sure to seep subgingivally. Remember, "subgingivally" around an implant can mean in direct contact with the bone because there is no fiber attachment down there.

IMPLANT v. NATURAL TOOTH

A tooth has a highly sophisticated network of fiber bundles (Sharpey's Fibers) that attach the soft tissue to the living cementum, producing compartments that slow down and limit the progression of disease. An implant has a weaker attachment that is more susceptible to trauma, tearing and stripping. Only one compartment exists, which is formed by weaker circumferential fibers that surround the implant like an O-ring. "O-ring" You say? Yes, like those elastic type seals around your cavitron inserts and other components that wear out and require frequent changing or they will leak….usually in two years. Get the connection?! (Pardon the pun).

CEMENTS ARE LIQUIDS

Prior to setting, cements are considered liquids. The applied pressure of inserting a crown causes the liquid cement to flow down the axial wall of the abutment and the excess cement will eventually be extruded out of the crown/abutment margin under great pressure[3]. The pressure may be so great that the vulnerable soft-tissue hemidesmisomal attachment to the implant may be damaged and even detached, which would allow cement to flow well beneath the tissues[4]. (Fig 2 and 3)



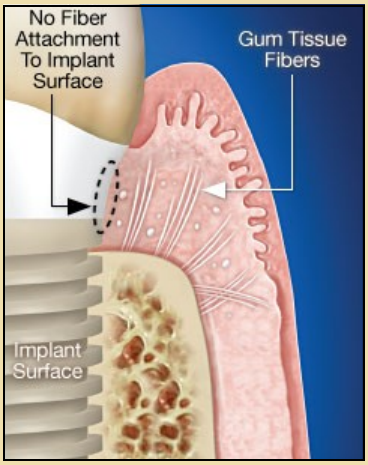


FIG 1

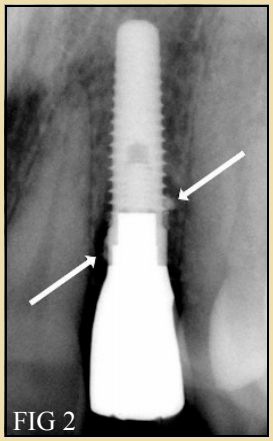
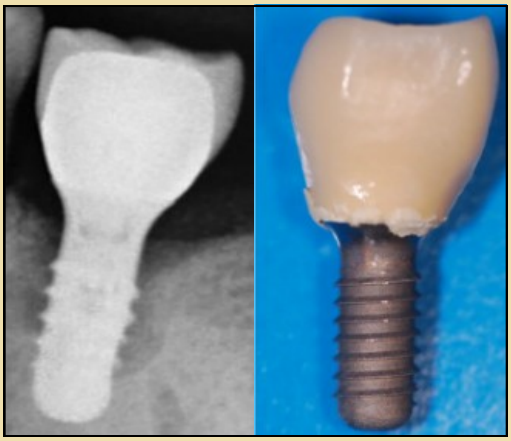


FIG 2



HOW MUCH CEMENT SHOULD WE USE

Excess cement around a supragingival implant crown margin is often times difficult to remove due the emergence profile and difficult access, especially interproximally. Subgingival excess cement is more difficult to remove due to the tight intrasulcular space inherent to the implant periodontia[5]. Furthermore, excess cement that comes in contact with a textured implant surface is practically impossible to remove[6].

So how much cement should we use? Certainly less than we use for a natural tooth. The tight tolerance today with CAD/CAM abutments and crowns compared to the lost wax technique allows for much less cement needed for retention. Also, a cement seal around the margin of an implant crown is not as necessary to seal out dental caries, because titanium is not susceptible to dental caries.

Some recommend that an implant restoration be seated with cement loaded in just the occlusal 1/3 of the restoration. Wadhwani proposes that the restoration with the cement loaded be first placed on a "copy" abutment to express the excess cement outside the mouth, and then carried to the mouth and seated on the final abutment with little to no excess cement. This technique (See back page) significantly reduces the risk of peri-implant disease.

WHICH CEMENT SHOULD WE USE

There are many cements on the market. Years ago they were designed for cementing restorations to teeth, not implants. Durelon from 3M ESPE is a frequently used cement, however, the manufacturer's labeling reports "not suitable for cementing titanium". This is due to possible corrosion of titanium that comes in contact with Durelon. Many dental companies make cements specific for dental implants, ie: Premier Implant Cement, Telio Implant Cement and others. Which is best? There is no answer but when choosing an implant cement, choose one that is radiopaque so that the REC an be identified and removed. Choose a cement that contains zinc, as this has antibacterial properties. The consensus is, there is no ideal cement, but controlling the excess cement is paramount.

SCREW-RETAINED CROWNS

Screw-retained crowns have many advantages. The first being within the scope of this article: no cement, no excess cement, no cement period...eliminating a source of implant failure. Another advantage, screw-retained crowns can be used in cases with 7mm or less of crown height space (measured from the crest of bone to the opposing plane of occlusion).

So why not use screw-retained crowns all the time? On anterior implant sites, the screw access opening may come through the facial due to the inherent position of the premaxilla and the long axis of the implant, so this is unaesthetic and not practical.

For posterior implant sites, the screw access opening may not be in the center of the occlusal surface, weakening the porcelain. The esthetics of an access opening is not as much a concern in posterior sites because it can be masked by layering a translucent composite over an opaque composite.

Cost is sometimes a concern on screw-retained crowns, however solid Bruxir one piece screw retained screw-retained crowns are an economical option in the posterior. Another cost savings tip (as taught to me by Dr. David Kim, Section Director at NYU Implantology) is to prescribe a hole through the occlusal of a cementable crown. Then, cement the

crown onto the abutment extraorally, hence creating your own one-piece screw-retained crown at the same cost as a cementable crown.

RULES OF IMPLANT SCREWS [7]

Some are concerned with screw loosening. However, if torqued correctly, screw loosening is a rare occurrence. In fact, a systematic review of abutment screw loosening in single implant restorations found that abutment screw loosening is "a rare event regardless of the geometry of the implant abutment connection, provided that appropriate anti-rotation features exist and proper torque is employed."[8]

Nobel proposes the following rules: When using screw-retained crowns, always use original brand-name manufacturer's components. Compatible parts may look the same but can not be guaranteed to work the same. Thread pitch and patterns may be different.

Torque the screw as directed. The screw has been designed and tested to that specific torque value. It will stretch and engage precisely. Using a higher or lower torque than prescribed will result in unpredictable joint behavior.

Use of lubricants, ointments and medications affects the implant-abutment joint, especially under vibration. It is not advised and may lead to premature screw loosening

Check that your torque wrench is delivering the correct force required. A recent study showed after repeated use, some devices produce forces far in excess of that needed, some far less. In general, it is recommended that you choose the beam-type torque wrench, as it delivers more consistent force. If you have the toggle-type or breakaway-type, calibrate or replace it annually.

Limit the number of times the screw is tightened and loosened. Each time this is done, the subsequent force needed to undo the screw is reduced. This affects both the screw and the implant to such a degree that after six tightening/loosening events, even if a new screw is used, it does not improve the fastening of the joint. As a general rule, only tighten/loosen the screw a maximum of five times….then use a ne one.

HOW CAN I DECREASE OFF-AXIS SCREW ACCESS OPENINGS

The most predictable way to plan the screw access hole precisely is to practice "true prosthetically-driven implantology". This involves a diagnostic wax up, bone regenerative procedures when necessary, and computer guided surgery. Virtual implant placement is performed with our computer software. That information is carried to the mouth via a CAD/CAM surgical guide. The process is safe, precise and predictable!

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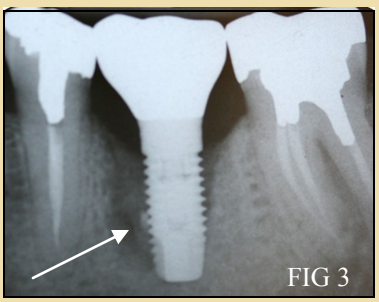

FIG 3

Chandur Wadhwani's Technique for Controlling Residual Excess Cement

TRIAL FIT

- Place the abutment into the implant. Take a radiograph to verify that it is seated correctly. Torque the abutment to the recommended value.
- Try-in crown on final abutment in the mouth, adjust contacts and occlusion as needed.
- Block out the head of the screw by placing PVS over the screw.

FABRICATE A "COPY" ABUTMENT

- Place Teflon tape (plumbers tape) in the crown. (Fig 1)
- Seat the final abutment into the crown to adapt Teflon tape to the internal surface of the crown. This creates a relief space for the film thickness of the cement.
- Fill the crown with a quick setting VPS material, such a Blue Mousse, adding excess to form a handle. (Fig 2)
- After the VPS sets, remove the newly formed "copy" abutment from the crown. Remove and discard the Teflon tape. (Fig 3)
- Examine the VPS "copy" abutment to make sure no there are no bubbles and complete capture of the crown margin. It should produce a copy of the abutment. Redo if incomplete.
- Cut 1-2mm off the tip of the VPS "copy" abutment. (Fig 4)

CEMENT THE CROWN

- Isolate and dry the final abutment in the mouth.
- Place cement in the crown.
- Place the VPS "copy" abutment in the crown to extrude the excess cement. Work quickly as you are now within the working time of your cement. Clean the excess cement. (Fig 5)
- Remove the crown from the VPS "copy" abutment and place the crown on the abutment in the mouth.
- Remove excess cement clinically.
- Take a radiograph to be sure the cement is clean. A bitewing will show the implant platform more clearly without elongation.
- Verify and refine occlusion as needed.


Fig 1


Fig 2


Fig 3


Fig 4


Fig 5

Wadhwani C, Pineyro A. Technique for controlling the cement for an implant crown. J Prosthet Dent 2009;102:57-58

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