

BASIC Level 1 Practitioner Certification



Chapter 5 – Place the Prosthesis

Notes:

Because dental implants are now an important and distinct part of prosthodontic dentistry, general dentists must be well versed in all aspects of the treatment option. The appropriate placements of the single tooth implant in acceptable bone for healthy patients is not an exception to this knowledge of all aspects.

Who is better trained (except the prosthodontist) and experienced to attend to the prosthetic crown (bridge) and abutment then the generalist? Oral surgeons and periodontists don't place the final prosthetic for correct function and esthetics.

What are the major actions of this activity?

| Major Action: | Overview: | Tools, equipment, materials, etc |
|---|--|---|
| a. Ensure Osseointegration | Perform radiographic, mobility, and percussive checks | Radiographic equipment, Basic Torque Wrench, any metal instrument |
| b. Make Occlusal Adjustments (Protocol) | Make any necessary adjustments to contacts and occlusion of restoration | High-speed diamonds and polishing wheels |
| c. Cement the restorative (Protocol) | Cement the restoration using normal crown and bridge procedures | Dual Cure Resin Cement and microbrushes |
| d. Follow up after the Post Prosthetics Placement | Establish protocol for follow-up care and maintenance of implant and restoration | |

How do I do this?

a. Ensure Osseointegration

The time the prosthesis is placed is strictly up to the degree of Osseointegration and is determined by the doctor taking into account such factors as:

1. Length and diameter of implant
2. Thickness of cortical bone
3. Type of bone (D-1 is best for stability but may be poor for healing)
4. Amount of bone surrounding implant body, 75%, 85%, or 95%
5. Lack of discomfort and pain
6. Radiographic integrity
7. Solid sound with percussion procedure upon implant top
8. Lack of mobility of implant

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The basic checks that should be performed to verify osseointegration are: Radiographic Integrity Check, Mobility Check, Percussive check

Notes:

a.1 Lack of pain

The patient usually states that all feels normal and that they have not had any pain whatsoever. Those implants that do not osseointegrate due to excess heating of bone, micromovement, pressure necrosis or health reasons will usually show pain or irritation within three weeks of placement.

These cases are usually mobile and must be removed after pre-antibiotic medication, anesthetic and thorough currattage of the channel along with placement of synthetic bone for fill-in purposes. Use perio pack over augmented site for protection and continue antibiotics for 7-10 days.

a.2 Radiographic Integrity

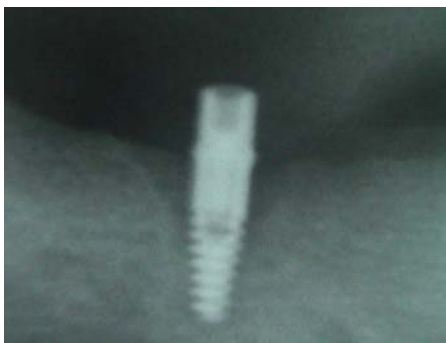
One of the primary checks for osseointegration is a check for radiographic translucency around the implant. As you can see from the pictures, with an integrated implant the bone will appear between all of the threads of the screws and will have a look consistent with the bone surrounding area.

An unintegrated implant will appear to have a darker translucent area around the implant. The clinician will need to make the determination as to whether or not to salvage the implant or leave it in for a longer duration. (Remember that in D3 or D4 bone the time for osseointegration can be 6-8 months or longer.)

Typically if an implant does not pass one of these checks, it will fail all of them. It is rare that if an implant fails the radiographic check that it will pass the mobility or percussive check.



Osseointegrated Implant



Unintegrated Implant

a.3 Percussive Check

Although the mechanics behind this test are fairly simplistic, the information it provides is somewhat subjective and must be learned through practice.

To perform the percussive test, remove the Healing Cap and Emergence Profiler. Then, using the handle of any metal dental instrument, tap moderately on the implant fixture.

A well integrated implant is rigidly held in place and will not move when tapped. This will produce a solid “thump” sound. With an unintegrated implant the percussion will disburse the as the implant moves microscopically and will produce a dull “thud” sound.

There is some subjectivity to this test, but with minimal practice you will learn to recognize the desired sound.

a.2 Mobility Check (Rarely Used)

The check for mobility involves using the torque wrench located in the blue Placement Instruments box. To check the mobility remove the Healing Cap (and Emergence Profiler if used) using the Cap Tool. Insert the Implant Driver/Carrier into the polygonal recess of the implant. Next, place the torque wrench over the Implant Driver/Carrier so that the metal “arrow” located at the end of one of the arms is pointing in the clockwise direction.

Gently apply force to the hump on the outside of the wrench. If you are able to apply enough force that the “arrow” is able to touch the inside of the opposite arm, you can be assured that the implant is not moving and is integrated. About 20 Ncm is being applied.



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Notes:

b. Make Occlusal Adjustments

It needs to be revisited and remembered that the implant body, after osseointegration has taken place, does not have the benefit of a PDL. So, there needs to be careful attention given to occlusal relationships.

Various materials and procedures may be used in this attention including: Marking papers and tapes, occlusal waxes, shimstock, sprays, etc., Whichever method or combination is utilized, the doctor must be fully aware of extrinsic mandibular movement and positioning, orthotic appliance wear, and to load sharing responsibilities of adjacent teeth.

Due in large part to the lack of this ligamental attachment, excess lateral forces can be especially harmful to the existing osseointegration, and can result in implant loss over time. It appears however that well directed and correct vertical occlusal pressure to the adjusted prosthesis can be beneficial in maintaining osseointegration. Again – excess lateral interference in working and balancing movements and position and protrusive/retrusive interference pressures can be extremely harmful.

Shimstock testing should show resistance freedom in all positions except CR/CO and then only moderate resistance upon “hard” closure. Otherwise, the implant tooth will always “feel high” to the patient – a sure sign for the need for further attention. If the patient wears an orthotic or retainer of any type, be certain that the fit around the implant prosthesis has been adjusted to eliminate any adverse stress (occlusal, buccal and lingual).

If these reminders aren't looked after, then all the osseointegration time may have been wasted and the result being a failed implant after prosthetic placement.



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c. Cement the restorative (Protocol)

Notes:

From the most current information available, resin dual cure cements are our choice for greatest strength and adhesion properties. Our tests reveal that the cements will show resistance to displacement numbers in the range of 53 to 55 Kg exerted on the abutment before loss of the adhesion to the implant body occurs (1 lb = .454 Kilograms). We also have accomplished cementation observation testing using clear, see-through, internal polygonal analogs in order to observe directly the cement flow and spread onto the adjacent surfaces. The better the flow and more complete the surface coverage, the stronger the bond. From these observations it was determined that the best and most complete surface flow and coverage results were obtained using the following protocol:

The smallest micro brush (Super-fine Micro brush by Microbrush® Corporation) is used to carry a very small amount of mixed dual cure resin cement just into the top 1/3 of the implant using a circular motion so that this top 1/3 of the interior polygonal recess of the Omni-Tight™ implant body is “lubricated” lightly.

The same brush is used to carry, from the same mix, an additional small amount of resin cement to the post portion of the laboratory adjusted post and core abutment and it is “lubricated” 4/5 of the way up the stem from the apex towards the platform. It is best to hold this component with an instrument. Orient the abutment in the instrument for easy direct seating into the implant with the orientation mark facing facially or buccally. Practice this seating movement as you are doing the occlusal adjustment protocol. Several “dry runs” will assure correct placement at final cementation time. This is a must do or the prosthetic will not seat correctly and an impression of the abutment and remake of the crown will be necessary.

After these “dry runs” and cement application, the abutment is seated fully into the implant resulting in complete cement flow and coverage of all principal surfaces and no excess cement exiting the implant through the machined vent provision. It should be noted that if any “push back” is noted while cementing the abutment, then positive pressure should be applied for several seconds until the cement fills all of the internal recess of the implant. This very rarely happens and is due to an excess of cement utilized. Positive pressure removes the hydraulic phenomenon. In the vast majority of cases there is no “push back” noted because of the machined vent design of the post, and internal architecture of the implant, and the small amounts of cement necessary for the procedure due to machined tolerances.

The crown prosthesis is now internally “lubricated” with the same mix of cement using a new regular sized Microbrush®. The “lubrication” term is stressed because we do not wish to cause hydraulic lock potential or excess cement residue to cause peri-cementitis. The regular sized Microbrush® is wiped clean and is again used to remove any slight amount of cement that may be present after the complete seating of the already adjusted crown prosthesis. It will be noted that the laboratory-adjusted post and core abutment and crown are cemented with the same mix of dual cure resin cement. This “same mix” cementation allows for the complete and correct prosthesis parts orientation at the time of final placement. It goes without saying that all correct occlusal adjustment and contact verification is accomplished before utilizing this cementation protocol.

d. Follow up after the Post Prosthetics Placement

After placement of the crown(s), the patient must be put on a systematic recall system for routine evaluation. The recalls should be at three-month intervals for the first year, then at the times of routine dental prophylaxis. Some patients may still require more frequent follow-up.

Each recall visit should include the following:

- Evaluate the patient's oral hygiene (input from hygienist). Periodontal problems can of course cause implant failure. The patient's hygiene must be meticulous and renewed motivation initiated if necessary.
- Evaluate the Gnathological movements to make sure there is no excessive stress on the implant(s)
- Test the continued stability of the implant. Radiographs should be taken to evaluate evidence of any excessive bone resorption around the implant body.
- Evaluate the Periodontal. A gingival index, including the evaluation of pocket depth around the circumference of the implant should be performed.
- ✓ **Reinforce the need for oral hygiene.** As the patient is dismissed with the prosthetics in place, a short heart to heart talk about oral hygiene procedures must be initiated. Flossing, micro brushing, rinsing, must be stressed now and with each follow-up appointment.