Implant Prosthetics for the General Practice

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Educational objectives:
Upon completion of this course, participants should be able to achieve the following:
• Learn how to make a fixture-level impression
• Learn the appointments to complete a bar retained overdenture case
• Learn how to use the Locator abutment for an attachment retained overdenture
• Understand how to use a temporary cement for implants

Abstract
The fundamental building block of implant dentistry is the implant level impression. Once the clinician becomes proficient and comfortable with this procedure, all options for implant restoration become possible. While there are niche implant procedures for restoration of single-implant crowns, the implant-level impression remains the most common starting point for fixed and removable implant prostheses.
Case 1 Example:
In general, there are two methods for restoring the implant: the Direct and Indirect impression procedures. The Indirect Method allows the clinician to transfer the position of the implant to a master cast. The first case illustrates implants replacing two mandibular congenitally missing implants in a 21-year-old female. The surgical dentist placed 4.3 mm diameter Replace Tapered implants from Nobel Biocare (Yorba Linda, CA). A surgical stent/template is used to guide the site and angulation of the implant. Because the implants were sufficiently stabilized at 35 NCm at the time of placement, a transfer impression was made and sent to the commercial dental lab. Crowns (or bridges) are cemented to what is called an abutment. Approximately one week later, temporary crowns were cemented to lab prepared titanium abutments in an infra-occluded manner.

Three months later, the implants were torque tested to confirm their readiness for final restoration. The temporary crowns were removed revealing well defined sulci around the titanium abutments (Fig. 1). At this point, one option is to employ the Direct Impression Method by taking a standard crown impression of the abutments. Retraction cord can be used to expose the prepared margins of the abutments. In this scenario, a master cast is poured, a standard stone die is trimmed and crowns are fabricated in a classic laboratory procedure. This format is well within the general dentist’s skill set and is a valid restorative technique.

The Indirect Impression Method involves taking an implant-level impression. In order to do this, the abutments are removed exposing the top, or platform, of the implants. Impression copings are then placed into the implants and radiographed to confirm complete seating into each implant body (Fig. 2). An implant-level impression is made by applying light-body impression material around each impression coping covered by insertion of a full-arch heavy body tray impression. In this manner, an imprint is made of the impression copings (Fig. 3). The impression copings are then removed from the implants by unscrewing their retaining screws and joined to implant replicas. The combination of copings and replicas are then reinserted into the master impression (Fig. 4). The temporary crowns and titanium abutments were replaced and the patient dismissed.

The master impression with impression copings and replicas was sent to the commercial dental lab where a master cast was poured. New titanium stock abutments were prepared and standard porcelain-fused-to-metal crowns fabricated (Fig. 5). The crowns were tried in at the second appointment, radiographed to confirm accuracy of fit and cemented (Figs. 6 and 7).

Fig. 1: Temporary crowns have been removed from the mandibular bicuspid implants revealing the titanium abutments.

Fig. 2: The platform of the implants exposed on the upper left; the impression copings placed into the implants for the implant level impression on the lower right.

Fig. 3: The master implant level impression using the closed-tray system with a polyvinyl siloxane impression material.

Fig. 4: Impression copings have been joined to implant replicas and reinserted back into the implant level impression for shipment to the lab.

Fig. 5: The lab prepared titanium abutments and final crowns for cementation.

Fig. 6: Radiographic fit checked at the crown delivery appointment.
Case 2 Example:

An implant overdenture is made either as a bar-retained or attachment retained overdenture. An implant-level impression is also the starting point for producing such an overdenture. In this case, four implants were placed in the mandible (Fig. 8). Impression copings were connected into the implants and made ready for the implant-level impression after being radiographed to confirm complete seating into the implant fixtures (Fig. 9). This format is called a “Closed-tray impression” in which the impression copings are imprinted and remain bolted into the implants after the impression is removed from the mouth. They are then removed from the implants, joined to implant replicas, and then re-inserted into the impression. The commercial dental lab poured a master cast and returned it along with a standard baseplate and wax-rim. A centric bite registration was made to mount the case on a semi-adjustable articulator. A fixture level impression uses an impression coping that bolts directly into the implant.

The mounted case was returned to the lab for a denture setup. Denture teeth were set in wax and then returned for an intraoral wax try-in (Fig. 10). Following approval of the setup for occlusion, phonetics, and esthetics, a bar was fabricated with a midsection Hader bar/clip and two distal extension ERA attachments (Sterngold Dental, LLC Attleboro, MA) for retention.

The bar was tried in and evaluated for passivity of fit. This is done using the “one-screw test.” The bar is seated onto the implants and secured with only one distal position screw. The bar is evaluated to confirm that it fits intimately and passively in all the other implant positions with just the one screw as retention. Then the screw is changed to the other distal end position and the bar is evaluated again. Once the bar was confirmed to pass this test, the case was returned to the lab and completed with a conventional pack and flask processing technique (Fig. 11).

Case Example 3:

The implant-level impression is the basis for beginning the restorative phase of both the preceding cases. The dental clinician is well versed to restore all types of implant cases using this method. However, a simplified and streamlined method of restoring the single posterior implant crown is illustrated with this final case example.

A single 4.3 mm Replace Tapered implant (Nobel Biocare) was placed in the #12 site on a 60-year-old male by the surgical dentist. Once the implant was deemed fully integrated by torque testing at 35 NCm, a Snappy Abutment was placed into the implant with its retaining screw. A white healing cap was seated over the Snappy Abutment. The patient was then returned to the restorative dentist for final restorative procedures (Fig. 12).
The white healing cap was removed and a yellow impression coping seated onto the Snappy Abutment (Fig. 13). A standard impression using polyvinyl siloxane material picked up the impression coping and was sent to the dental lab (Fig. 14).

The lab inserted an analog of the Snappy Abutment into the impression and poured a master cast. A zirconia coping Procera crown (Nobel Biocare) was fabricated on the abutment analog and returned for delivery at the second restorative appointment (Fig. 15).

This method is termed an abutment level impression and, as seen, does not require removal of any implant components to accomplish impression. Simple application of a snap-on impression cap and its pick-up is all that is required of the restorative clinician. The white healing cap can be replaced for the short interim period while the definitive crown is being fabricated. This has become the most productive and profitable restorative procedure in our office due to its simplicity and relative lack of complications compared to other standard restorative cases.

These implant and abutment level procedures are illustrated in detail in the Dentaltown online education program “Basic Implant Prosthetics: A Primer for the General Dentist.” This program also includes other fixed and removable case examples in addition to a “bullet-proof” formula for determining implant case costs and an appropriate fee for implant options. Laboratory fees, implant components and overhead must be taken into consideration in determining an implant case cost.
1. What are the two basic methods for restoration of dental implants?
   a. Direct and Indirect Methods
   b. Direct and Robust Methods
   c. Indirect and Semi-direct Methods
   d. None of the above

2. The indirect method of restoration allows the clinician to transfer the position of the implant to a:
   a. Laser weld model
   b. Master cast
   c. Opposing model
   d. Split cast model

3. The implant component in this program that is bolted into the implant to make the impression is called:
   a. An implant analog
   b. An implant abutment
   c. A healing abutment
   d. An impression coping

4. Using an impression coping that bolts directly into the implant produces an impression called:
   a. An abutment level impression
   b. A fixture level impression
   c. A precision attachment impression
   d. A tooth level impression

5. In an implant fixture level impression, what component is joined to the impression coping prior to pouring the impression?
   a. Healing abutment
   b. Implant replica
   c. Implant abutment
   d. O-ring

6. What is the appliance made to guide the site and angulation of the implant?
   a. Surgical template/stent
   b. Restorative abutment
   c. Guide drill
   d. Guide pin

7. The implant component to which a crown or bridge is cemented is called:
   a. A healing abutment
   b. A cement medium
   c. An abutment
   d. An impression coping

8. After seating the impression coping into the implants and securing the coping screw, what must be done prior to making the impression?
   a. Check for any debris under the gingivae
   b. Check for tissue inflammation
   c. Radiograph to confirm complete seating of the coping
   d. Find the serial number of the coping

9. An implant overdenture is made either as a:
   a. Bar-retained or attachment retained overdenture
   b. Precision attachment or O-ring overdenture
   c. Tissue borne or bar retained overdenture

10. Which of the following items is not a consideration in determining an implant case cost?
    a. Laboratory bill
    b. Implant components
    c. Overhead
    d. Remake estimate