A Simple Method for Making Diagnostic Casts for Dental Implants Using Acrylic Abutments

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Abstract:
The use of multiple implants in the same jaw requires a detailed knowledge of abutment angulation. The position and angulation of the abutments play an important role in treatment planning and fabrication of the custom tray. Therefore diagnostic casts that contain cover screws may cause problems during implant therapy.

The current article describes a technique for making a preliminary cast with acrylic custom abutments in order to help the clinician select an appropriate impression technique and evaluate the location and angulations of the implant bodies. This method can also aid the technician to provide adequate and proper space for the fabrication of an open custom tray.

Key Words: Dental implants; Implant abutments; Screw-type impression; Acrylic abutments; Prosthetic treatment

INTRODUCTION
The use of osseointegrated dental implants was first developed by Branemark [1]. The success of the prosthodontic phase of implant therapy depends on careful pretreatment diagnosis, evaluation and planning, as well as proper execution of the surgical phase [2]. Numerous implant systems have been introduced that use various materials and come in different shapes with distinctive surface features. Similarly multiple materials and techniques have been established to provide ideal restoration of the implants. A tapered impression coping was presented by the Branemark system (tapered impression cap, Estheticone, Nobelpharma, Sweden) for fabrication of a preliminary impression [3]. This system allows for evaluation of the implant angulation and helps the technician make open custom trays with proper placement of the openings. Most manufacturers discontinued producing such components, but their application may be required in several situations [4]. The present article describes a simple method for the fabrication of preliminary casts with custom abutments that simulate the position of abutments for making a custom tray. This technique can be used with any implant system that provides diagnostic (planning or trying) abutments.

PROCEDURE
1. Remove the healing caps and place the diagnostic (plastic) abutments (Institute Straumann AG, Waldenburg, Switzerland) on the body of the implants (Fig. 1).
2. Fabricate a preliminary impression using a silicone impression material (Speedex, Coltène/Whaledent, and Feldwiesentrresse, Swit-
Fig. 1: ITI diagnostic abutments (7mm) were placed on the implants.

Fig. 2: A dowel pin has been embedded in the resin pattern in the impression holes for reinforcement.

Fig. 3: Preliminary cast with acrylic abutments.

Fig. 4: Individual tray with perforations for further placement of impression copings.

zentland) with a putty-wash method and a stock tray (GC, GC United Kingdom Ltd. Newport Pagnell, UK).

3. Place a dowel pin (Risa, Risa Dental GmbH, Engen, Germany) into each of the spaces that were previously occupied by the diagnostic abutments. Make acrylic abutments by application of auto-polymerizing acrylic resins (Duralay, Reliance, Dental Manufacturing Co., Worth, Ill., USA) to the holes, using the bead brush technique [5,6]. Reinforcement is provided by the dowel pin (Fig. 2).

4. Pour the remainder of the impression with a Type III dental stone (Quickstone®, Whip Mix Corporation, Louisville, KY) and allow to set, according to the recommended setting time.

5. Separate the cast from the impression after the complete setting of the stone (Fig. 3).

6. Adapt two sheets of base plate wax (Truwax®, Baseplate Wax, Dentsply International, York, PA) around the acrylic abutments.

7. Make an open custom tray with holes placed in the correct position, using conventional procedures [3]. After polymerization of the acrylic resin, the holes can be enlarged with a carbide bur (Carbide bur 703, Mani Inc., Tochigi-Ken, Japan) depending on the diameter of the impression components (Fig. 4).
DISCUSSION
Evaluation of the angulation of abutments on preliminary casts helps the clinician select a suitable impression technique, e.g. screw-retained vs. non screw-retained. The screw-retained impression method offers several advantages, especially when numerous implants have been placed in the dental arch with different angulations. This method saves clinical chair time for adjusting the holes before making the impression. Furthermore, evaluation of the abutments on the diagnostic cast can help predict the location of the occlusal screw exposure which in return helps the prosthodontist select the type of the definitive restoration (cemented vs. screw-retained prosthesis).

REFERENCES