Stabilized Record Base for Implant Treatment

Susan S. Nimmo, DDS, MPH[1] & Arthur Nimmo, DDS, FACP[2]

[1] Clinical Assistant Professor, Department of Operative Dentistry, University of Florida College of Dentistry, Gainesville, FL
[2] Professor and Chairman, Department of Prosthodontics, University of Florida College of Dentistry, Gainesville, FL

Keywords
Dental implant; record base; maxillomandibular relation records; impression; master cast; visible-light-cured resin; fixed complete denture.

Correspondence
Susan S. Nimmo, Department of Operative Dentistry, PO Box 100415, University of Florida College of Dentistry, Gainesville, FL 32610-0415. E-mail: snimmo@dental.ufl.edu

Accepted September 25, 2009

doi: 10.1111/j.1532-849X.2010.00630.x

Abstract

It is important to obtain an accurate interocclusal record for the restoration of patients undergoing implant treatment. Atrophic alveolar bone in the mandible not only limits the placement of implants, but also contributes to deficient ridge morphology resulting in unstable record bases. Securing the record base to the implants is a useful way to obtain an accurate registration. The technique presented in this article uses two widely spaced implants as the optimal number of implants to stabilize record bases.

Fabrication of a record base over implant healing abutments[1,2] offers vertical stabilization, but occlusal forces may still cause tipping during the interocclusal registration, particularly in the case of bilateral distal extension. Keith and Guillen have suggested the incorporation of a screw connection to a single implant to stabilize a record base for a full-arch restoration.[3] A record base with a screw connection to multiple implants is possible; however, there are some disadvantages of engaging too many implants. Potentially, there is less room for the bite registration material, which may reduce the accuracy of the index. Furthermore, the placement and removal of many small screws increase the risk of ingestion or aspiration. A technique to stabilize a record base using a direct connection to two implants is presented.

Technique

A 55-year-old male patient presented with severe caries, advanced periodontal disease, and atrophic posterior mandibular ridges. Implant-supported fixed complete dentures were treatment planned for both arches. In the initial phase of treatment, immediate dentures were made for each arch. Using surgical guide stents, implants were placed in a single-stage surgery in both arches (Straumann, Andover, MA). Following successful osseointegration, 1.5 mm SynOcta abutments (Straumann) were placed and torqued to 35 Ncm.

Impression copings were placed on the abutments, and an impression was made using a vinyl polysiloxane (VPS) impression material (Aquasil® Caulk, Milford, DE) in a custom tray. Abutment analogs were placed in the impression to pour the master cast (Fig 1).

To make the stabilized record base, the abutment analogs were fitted with impression copings on the distal abutments, and protective caps were positioned on the medial abutments (Fig 2). Alcote (Dentsply, York, PA) was used as a separating medium on the edentulous cast. Tinfoil relief was applied around the copings and over the protective caps. Visible-light-cured material (Triad Tru Tray, Dentsply) was adapted to the cast and light cured (Fig 3). Additional relief around copings was created using a low-speed handpiece with an EF carbide laboratory bur (Brasseler USA, Savannah, GA) (Fig 4). A visible-light-cured flowable resin (Triad Gel, Dentsply) was used to connect the impression copings with the record base to minimize shrinkage that occurs during resin curing (Fig 5).

A wax occlusion rim was luted to the record base, and access was created for the retaining screws (Fig 6). At the maxillomandibular relations appointment, only the two distal protective caps were removed. The record base was placed in the patient's mouth and secured with the retaining screws to make a centric relation record using a VPS bite registration material (Blu-mousse®, Parkell, Edgewood, NY) (Fig 7). With this stable maxillomandibular relation record, the casts were accurately mounted, and a trial tooth arrangement in wax was fabricated in the optimal position (Fig 8).

Discussion

The main advantage of this technique is that the record base retained by two implants is more stable than a record base

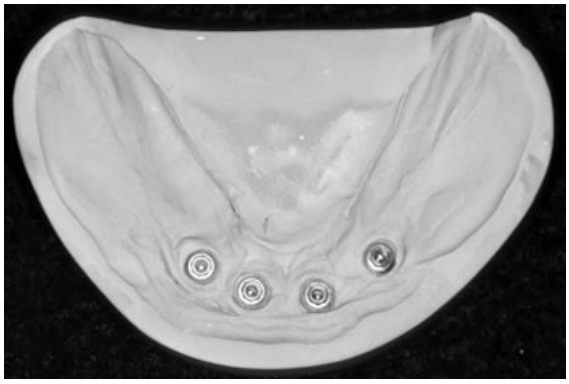

Figure 1 Master cast with abutment analogs.

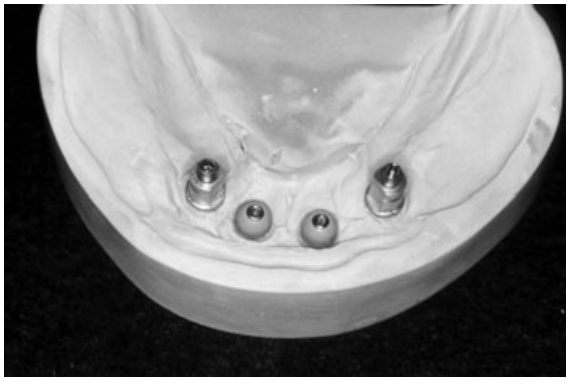

Figure 2 Master cast with impression copings on distal abutments and protective caps on the medial abutments.

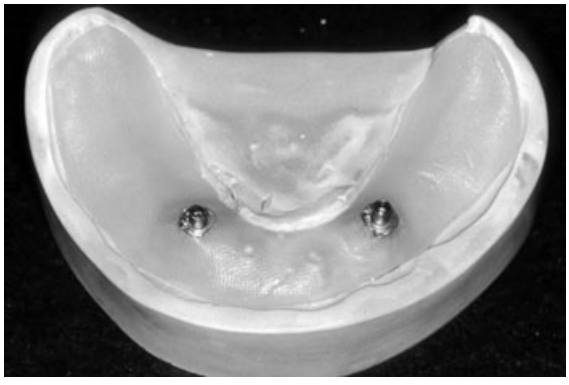

Figure 3 Visible-light-cured material (Triad TruTray®) applied to cast with tinfoil relief around copings.

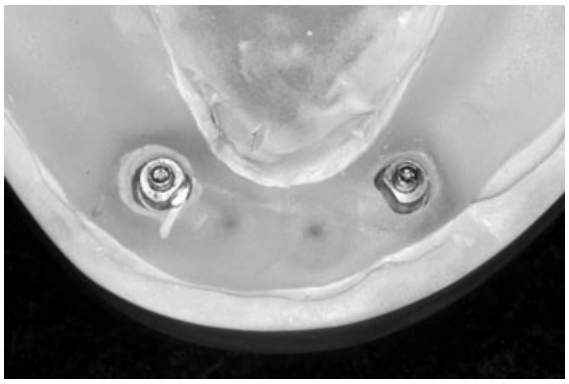

Figure 4 Record base after light curing with additional relief around copings.

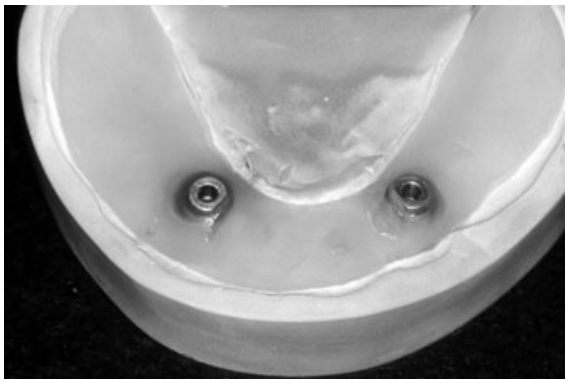

Figure 5 Visible-light-cured resin (Blue Triad Gel®) is added to connect impression copings to record base.

retained by one or none. Particularly in the atrophic mandibular ridge, the anatomy is not conducive to stability or retention of the record base in the process of obtaining a centric relation record. Traditionally, the record base is stabilized manually while simultaneously guiding the patient into a centric relation position. There is a tendency for the musculature to resist forces and introduce the potential for error in the record. The added stability of the record base helps resist tipping of the record base as the patient closes. The interocclusal registration is used to accurately mount the casts prior to fabrication of the metal framework. Once the trial set up is complete, the centric relation record can be verified even more accurately.

The addition of more implant connections, beyond two, does not add significantly to the stability and would require more chairside time. Also, with additional screw access openings, the record base may be more fragile and have less occlusal surface available for the interocclusal record. The technique presented also allows for the opportunity to retrieve the impression copings once the case is completed, for use in future cases after sterilization of the copings. This technique may be used with most commercially available implant systems. A disadvantage of this technique is the additional time and cost to incorporate the impression copings into the record bases.

Conclusion

Several variations of the described technique have been reported in the literature for the stabilization of the record base in obtaining an accurate bite registration for mounting master casts

Figure 6 Occlusion rim on record base with access for retaining screws.

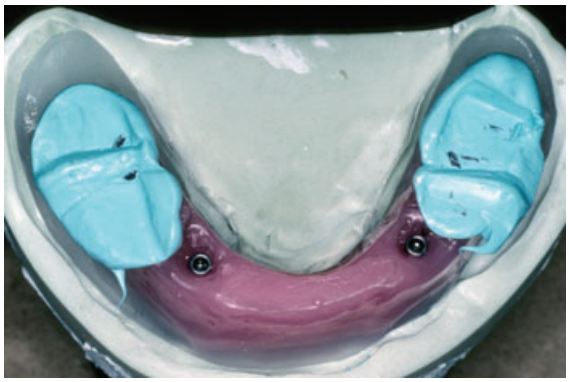

Figure 7 Centric relation record on master cast.

Figure 8 Trial tooth arrangement in wax.

in implant treatment. The precision of the mounting allows the dentist and the technician to replicate the position and function of the jaws and fabricate a restoration with optimal occlusion. Accuracy in the initial record minimizes the need for multiple remounts and chairtime for adjustments.

References

1. Loney RW: Stabilized record bases for implant-retained overdentures. J Prosthet Dent 1994;72:16-22
2. Rungcharassaeng K, Kan JYK: Fabricating a stable record base for completely edentulous patients treated with osseointegrated implants using healing abutments. J Prosthet Dent 1999;81:224-227
3. Keith SE, Guillen GE: Enhanced stability for implant-supported overdenture record bases. J Prosthet Dent 1998;79:359-360

Copyright of Journal of Prosthodontics is the property of Wiley-Blackwell and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.