

A Simple Method to Fabricate Stabilized Record Bases: A Modified Approach Using Casting Wax for the Borders

W. Oh* and H.F. Morris*

Abstract - Retention and stability of a record base is often compromised in the mouth because of blockout procedures performed before adapting a record base material on a definitive cast. This article presents a technique of fabricating a stable and retentive record base, in which a definitive cast does not receive a blockout procedure so that the record base engages the facial undercuts in the cast by means of a green coloured inlay casting wax.

KEYWORDS: Record base, Casting wax, Maxillomandibular relation

INTRODUCTION

The stability and retention of a record base are prerequisites for an accurate registration of the maxillomandibular relation record and intraoral evaluation of wax trial dentures^{1,2}. The record base must also be rigid and transferrable from the cast to the mouth. The blockout and relief procedures are common methods to eliminate the undercuts in the cast and to allow separation of the rigid record base without damaging the cast (Figures 1 and 2)^{3,4}. These laboratory procedures, however, reduce close adaptation between the oral mucosa and the record base and eliminate the border seal thereby compromising the record base^{5,6}.

A record base is often secured intraorally with the use of denture adhesive or resilient material^{7,8}. The use of denture adhesive between the oral mucosa and the record base could result in inaccurate seating of the record base. When using resilient liner, the material may tear and/or rebound from the record base. Small pieces of pink baseplate wax used to form the wax occlusion rims are often dislodged during the laboratory procedure and adhere on the tissue side of the record base. This prevents an accurate positioning of the record base both in the mouth and on the cast. These small pieces of baseplate wax are not readily detectable on the record base because of their translucency against the base.

This article describes a modified method of fabricating a record base, in which the Visible-Light-Cured (VLC) Triad (Dentsply International Inc, York, PA) tray material is adapted on a definitive cast and refined with a green coloured inlay casting wax to engage the undercuts in the cast. This method involves a 2-stage polymerization procedure: initial and partial polymerization occurs with the record base material adapted to the cast and final and complete polymerization with the record base off the cast. The record base is then fitted on the cast, and gaps along the border of the record base are filled with an inlay casting wax to refine the borders. To prevent the wax from sticking to the cast

and being distorted upon removal from the cast, the cast should be well saturated with water (soaking in water) or the stone in the tissue reflection areas may be coated with a wax release agent.

PROCEDURE

1. Adapt the VLC Triad (Dentsply International Inc) tray material to a definitive cast of a maxillary edentulous arch that has been soaked in water, and trim it at 2-3 mm beyond the crest of the ridge using a sharp blade (carbon steel surgical blade number 25; Miltex Inc, York, PA). Extend the cut-edge of the material by compressing and thinning with finger pressure against the cast toward the facial vestibule (Figure 3).

2. Place the record base-cast assembly in polymerizing unit (Triad 2000 Curing Unit; Dentsply International Inc) for 15-20 seconds under visible light with a wave length of 475 nm and a light intensity of 90 mW/cm². This initial curing cycle should be shorter for a larger undercut to facilitate removal of the material.

3. Lift gently the partially polymerized and slightly flexible record base off the cast using a laboratory knife (Buffalo knife, Buffalo Dental Mfg Co Inc, Syosset, NY). Take care to avoid damage to the cast and distortion of the record base. The cast must be sufficiently wet with water for easy separation of the record base from the cast.

4. Return the record base to the polymerizing unit (Triad 2000 Curing Unit) with the tissue side upward and left undisturbed for 4 minutes to complete the polymerization.

5. Relieve sufficiently the tissue side of the facial flanges of the base using a tungsten carbide bur (E-cutter; Brasseler USA, Savannah, GA) to compensate the polymerization contraction and to ensure complete seating of the record base on the cast (Figure 4). Create small holes in the record base over the ridge crest as windows for visual inspection of the accurate seating of the record base (Figure 5). Take care to avoid abrasion of the cast. Reduce the thickness of the facial flange of the base using a tungsten carbide bur (E-cutter) to facilitate arranging of the artificial replacement teeth.

* DDS, MS

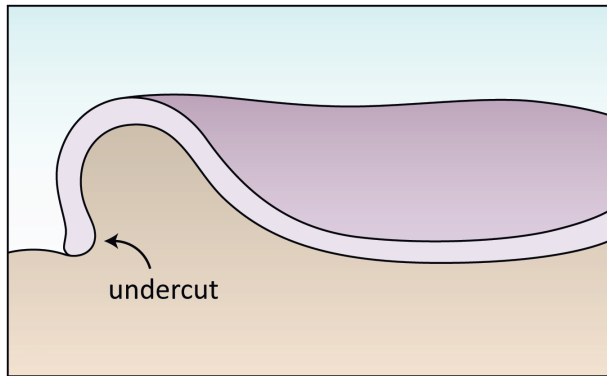


Figure 1. A VLC Triad record base locked in undercut of a definitive cast. Note that the record base cannot be separated from the cast for an intraoral procedure.

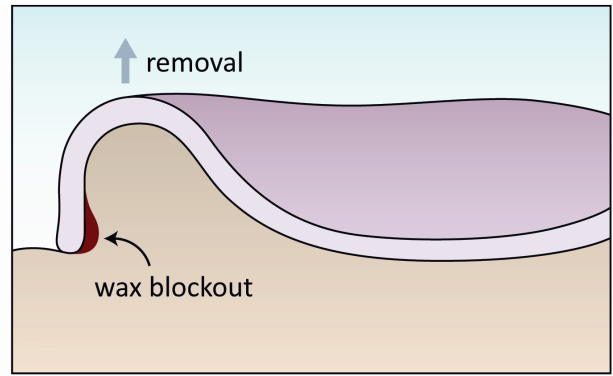


Figure 2. A transferrable record base fabricated on the cast prepared with blackout procedure. Note the incomplete seal along the borders of the record base.

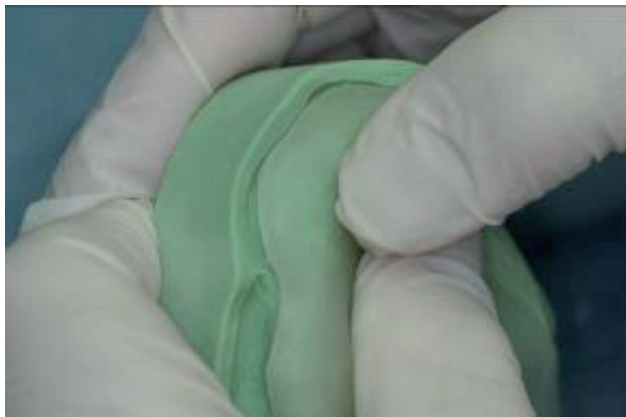


Figure 3. Extension of cut-edge of a VLC Triad material toward the vestibule by thinning with finger pressure against the cast.



Figure 4. Removal of undercuts by grinding the tissue side of the record base.



Figure 5. Record base thinned and fitted on the definitive cast. Note holes used to check an accurate seating of the base on the cast.

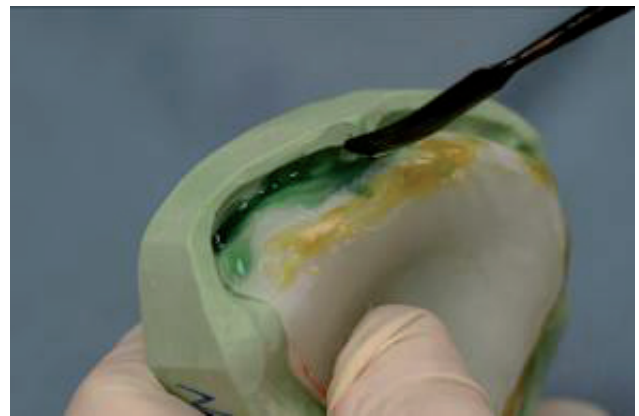


Figure 6. Addition of green color casting wax to borders of record base. Note sticky wax added to seal holes.



Figure 7. Completed record base refined with casting wax.

6. Seal the holes in the record base with a sticky wax (Kerr USA, Romulus, MI) over the cast wet with water. Flow a molten green color inlay casting wax (Carmel Chrome Cobalt Wax; Carmel Group Inc, Montreal, Quebec, Canada) along the border against the cast using a wax spatula (wax spatula number 31; Miltex) to refine the border and seal the gap between the record base and the cast (Figure 6). Allow the wax to harden slightly.

7. Separate gently the record base from the cast. Trim the excess of the casting wax (Carmel Chrome Cobalt Wax) that has flown under the base and finish the wax borders using a laboratory knife (Buffalo knife) (Figure 7). Ensure the accurate seating of the record base on the cast by carving out displaced wax dragged against the cast when separating the base from the cast.

DISCUSSION

The green casting wax is relatively soft and overcomes undercuts in the cast. A gentle lifting technique must be used to avoid distortion of the record base and abrasion of the cast. The partially polymerized facial flange of the record base flexes out and overcomes undercuts in the cast. The gaps between the record base and the cast created during lifting and fitting procedures of the record base are filled with an inlay casting wax to ensure the stability and retention of the record base.

The pink baseplate wax often retains on the tissue side of the record base while fabricating the record base and waxing the trial dentures, which is not readily detectable and compromises the seating of the base. The green coloured casting wax seals the borders of the record base and presents a colour contrast against the translucent or pink record bases. The wax presents a softer surface than the stone and overcomes mild and/or moderate undercuts allowing the record base to snap on the cast without abrading the stone surface. When engaging excessive undercuts, the wax is displaced, which in turn is carved with a laboratory knife for proper fit.

The posterior border of the record base is left unsealed to allow transfer of the vibrating line to the cast by means of the record base. The retention of the record base is secure by engaging undercuts along the facial vestibules. This procedure is also used in fabricating a mandibular record base as the same way as for the maxillary one.

CONCLUSION

A record base refined with a casting wax is stable and retentive by engaging the facial undercuts and ensures an accurate registration of the maxillomandibular relation record.

ADDRESS FOR CORRESPONDENCE:

Dr. Harold F. Morris, Staff Prosthodontist, Dental Services 160, Veterans Affairs Medical Center, Ann Arbor, Michigan, 48105. E-mail: dentalres@provide.net

REFERENCES

1. Akerly, W.B. Recording jaw relationships in edentulous patients. *Dent. Clin. North. Am.*, 1996; **40**:53-70.
2. Consani, R.L., Mesquita, M.F., Sobrinho, L.C., Sinhoret, M.A. Dimensional accuracy of upper complete denture bases: the effect of metallic flask closure methods. *Gerodontology*, 2009; **26**:58-64.
3. Klein, I.E., Soni, A. Stabilized record bases for complete dentures. *J. Prosthet. Dent.*, 1979; **42**:584-587.
4. Nishigawa, G., Maruo, Y., Okamoto, M., Minagi, S. Record base for an edentulous maxillary arch with severe undercuts in the labial aspect of the anterior residual ridge. *J. Prosthet. Dent.*, 2002; **87**:99-101.
5. Boberick, K.G., McCool, J. Dimensional stability of record bases fabricated from light-polymerized composite using two methods. *J. Prosthet. Dent.*, 1998; **79**:399-403.
6. Oh, W., May, K.B. Two-stage technique for optimum fit and stability of light-polymerized record bases. *J. Prosthet. Dent.*, 2008; **99**:410-411.
7. Knight, J.S. Fabrication of a stable record base for severe soft tissue undercuts in the edentulous patient. *J. Prosthet. Dent.*, 1999; **82**:485-486.
8. Antonelli, J.R., Hottel, T.L. The "flexible augmented flange technique" for fabricating complete denture record bases. *Quintessence. Int.*, 2001; **32**:361-364.