

Acrylic Strengthened Casts for Removable Partial Denture for Occlusion Equilibration

Won-suk Oh* and Berna Saglik*

This paper was presented at the annual conference of the American College of Prosthodontists, Orlando, Florida, November, 2010.

Abstract - A removable partial denture (RPD) remount cast must resist wear or breakage, present a rigid surface, and ensure a solid support for an accurate equilibration of the occlusion for a RPD. This article describes a procedure of processing a thin layer of tooth colored acrylic resin over the dental plaster to present wear- and fracture-resistant incisal/occlusal surfaces without involving a third material.

KEY WORDS: Removable partial denture, Remount cast, Acrylic resin, Dental plaster

INTRODUCTION

A remount cast fabrication for a removable partial denture (RPD) requires special considerations to avoid wearing or breaking of the stone tooth with repeated occlusal contacts during occlusal equilibration procedure^{1,2} and provide solid support for a RPD^{3,4}. Several methods are currently available to expedite the procedures using gypsum materials¹, low fusing metal alloys², silicone materials³, and combination of those materials⁴. However, some of the methods require multiple steps, and others do not ensure an accuracy of the occlusal equilibration.

The purpose of this short article is to describe a fabrication method of a RPD remount cast, in which a thin layer of acrylic resin is processed over the dental plaster to present wear- and fracture-resistant incisal/occlusal surfaces and solid support for a RPD to ensure an accurate equilibration of the occlusion.

PROCEDURE

1. Fit the mandibular RPD intraorally and make a pick-up impression of the RPD with an irreversible hydrocolloid (Jeltrate; Dentsply Caulk, Milford, DE) impression material using a stock tray. Coat the tissue side of the denture base with a petroleum jelly (Unilever, Greenwich, CT) as a separating medium.
2. Wet the teeth area of the impression surface with acrylic monomer (Jet Tooth Shade; Lang Dental Mfg Co, Wheeling, IL) using a dropper. Add acrylic polymer (Jet Tooth Shade) incrementally using a puffer (Kwik-Kit Dispenser; Hooker Sales Co Inc, FL) into the impression to absorb the monomer and cover the occlusal surface with the resin (Fig. 1).
3. Position the impression upside down in a plastic bag for approximately 2 minutes to allow the resin to flow

down the axial walls of the impression and line the impression surface with a thin layer of the resin (Fig. 2). Block-out the undercut areas on the tissue side of the denture base using wet pumice and pour the impression in a fast-setting dental plaster (Mounting Plaster; Whip Mix Corp, Louisville, KY) to complete the remount cast (Fig. 3 and 4).

4. Mount the cast with the RPD on an articulator (Hanau 96H2; Whip Mix Corp) by means of a record for an occlusal equilibration procedure. Separate the RPD from the cast and polish it for an intraoral placement of the RPD.

DISCUSSION

A RPD remount cast made of a gypsum material provides a solid support for the RPD¹; however, the cast is susceptible to wear and breakage against the opposing teeth. To avoid these problems, the cast surface is often coated with a thin layer of cyanoacrylate cement, but the occlusal contact marks are not easily detectable on the surface layer. A low-fusing metal alloy is widely used in fabricating a RPD remount cast²; however, the separation of the RPD can be a problem when engaging the undercuts in the cast. A silicone material is convenient to use and allows the RPD to overcome the undercuts in the cast^{3,4}; however, the occlusal contact marks are suspect because of its resiliency.

A cast made of tooth colored acrylic resin and dental plaster presents a wear- and fracture-resistant surface against the opposing artificial denture teeth and demonstrates distinct marks of the occlusal contact.⁵ The accuracy of the cast is ensured by incorporating a thin layer of the resin which involves only a minimal contraction of the polymerization, and may inhibit the expansion of the plaster. The acrylic resin shell is secured to dental plaster by engaging undercuts presented by the tooth and tissue contours (Fig. 4). The occlusion can be equilibrated accurately with an aid of distinct occlusal contact marks on the resin surface and solid support of the RPD placed on the rigid dental

* DDS, MS



Figure 1. Application of tooth colored acrylic resin into pick-up impression of mandibular RPD.

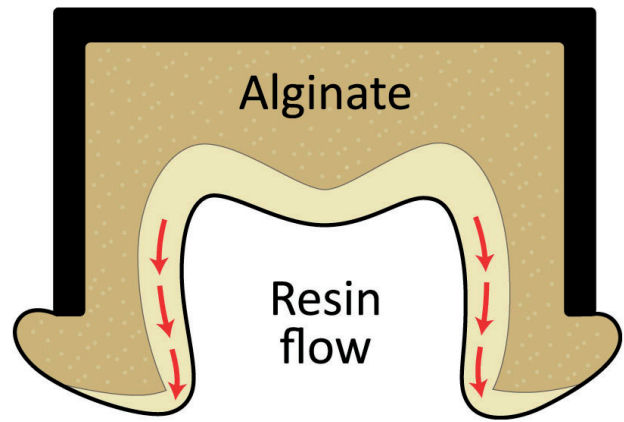


Figure 2. Illustration describing flow dynamics of acrylic resin along axial walls of impression.



Figure 3. RPD remount cast demonstrating wear- and fracture-resistant surface of acrylic resin on solid foundation of plaster.

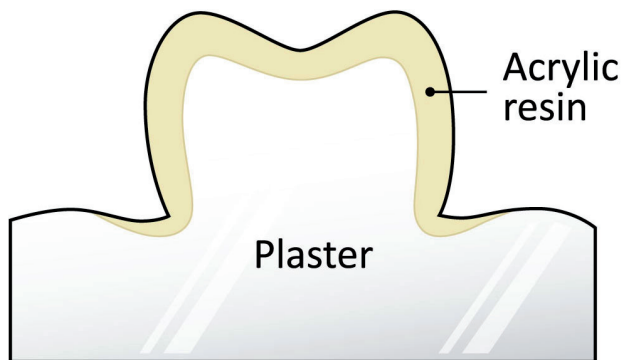


Figure 4. Illustration of cross-sectional view demonstrating of thin layer of acrylic resin shell lining dental plaster to formulate resin-plaster tooth.

plaster. The separation of the RPD from the cast is not problematic even when the metal framework of the RPD is locked into the undercuts of resin and/or plaster with an aid of a sharp knife or a carbide bur.

CONCLUSION

A RPD remount cast made of a thin layer of tooth colored acrylic resin over the dental plaster presents a wear- and fracture-resistant surface and provides a solid support for an RPD to ensure an accurate equilibration of the occlusion.

ADDRESS FOR CORRESPONDENCE

Dr Won-suk Oh, Dept of Biologic and Materials Sciences, Division of Prosthodontics, University of Michigan School of Dentistry, 1011 North University, Rm K1014A, Ann Arbor, MI 48109-1078

REFERENCES

1. Lauciello, F.R. Technique for remounting removable partial dentures opposing maxillary complete dentures. *J. Prosthet. Dent.*, 1981; **45**:336-340.
2. Kratochvil, F.J. *Partial removable prosthodontics*. Philadelphia: W.B. Saunders, 1988; 157-163.
3. Billy, E.J., Shotwell, J. Combination stone and resilient material for removable partial denture remount cast described and compared with two other remount cast procedures. *J. Prosthet. Dent.* 1994; **71**:417-419.
4. Hsu, Y.T., Farmer, J.B. Using silicone impression material and acrylic resin to fabricate remount casts for removable partial dentures. *J. Prosthodont.* 2005; **14**:137-40.
5. Oh, W., Saglik, B. Remount cast fabrication for occlusal equilibration against artificial denture teeth. *J. Prosthet. Dent.* 2009; **101**:350-351.