Using Silicone Impression Material and Acrylic Resin to Fabricate Remount Casts for Removable Partial Dentures

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A technique is described for fabrication of a remount cast for a removable partial denture. This procedure consists of filling the occlusal/incisal third with acrylic resin and injecting polyvinylsiloxane impression material into the irreversible hydrocolloid impression. This technique provides a simple method for making a remount cast and enables the clinician to remove and easily place the partial denture on the cast during occlusal refinement procedures without damage to the removable partial denture or the removable partial.

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CCLUSAL DISCREPANCIES of removable prostheses can be easily detected and corrected when the prostheses are accurately mounted on an articulator.¹ These discrepancies may arise from treatment procedures, such as errors in occlusal registration and relining of a removable partial denture, or from material properties, such as polymerization shrinkage of the acrylic resin. For a removable partial denture with an acrylic resin base, the greatest dimensional change occurs when a processed prosthesis is removed from the master casts.¹ The occlusal relationship after processing may therefore be different from the relationship previously developed. It is important to re-evaluate the occlusion after the dentures have been processed.

Initial correction of occlusal discrepancies on the articulator should be performed prior to the retrieval of the prosthesis from the casts. The

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original casts may be broken when retrieving the prosthesis, especially with removable partial dentures. To remount the prosthesis, a remount cast must be made. For a complete denture, this cast can be made by blocking out the undercut of the denture and pouring plaster or stone into the intaglio surface, or by using a silicone-type material to fill the entire intaglio surface.² Remount casts for removable partial dentures must include any remaining natural teeth or restorations and the prosthesis. Of the techniques described in the literature, making an impression of the partial denture and the remaining teeth simultaneously is the most frequently reported technique. The teeth mold in the impression can be filled with stone,³⁻⁵ metal alloy,⁶ or silicone-type impression material.⁷ When the teeth mold is filled with stone, the stone teeth may be broken upon the removal of the prosthesis, or the prosthesis may be locked in by the stone. To prevent the possible lock in of the prosthesis, certain components of the partial denture, such as clasps or undercuts of the denture base, must be blocked out before pouring the stone. The blockout can be done with wax,⁵ but the disadvantages of using wax include weakening of the abutment teeth on the cast due to decreased stone thickness and distortion of the morphology of the teeth by the wax. Using metal alloy requires special materials and devices, and the prosthesis may still be locked in the cast if there is not adequate block out. Another technique is the use of polyvinylsiloxane registration material to fill the

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teeth mold in the alginate impression.⁷ The main concern of this technique is that the resiliency of silicone teeth on the cast may not be stiff enough for evaluation of occlusal contact or stops during the occlusal adjustment on the articulator. This article presents a simplified technique for making a remount cast for the removable partial denture using dental stone, acrylic resin, and silicone impression material.

Procedure

- 1. Place the removable partial denture in the mouth, and ensure that it is fully seated. Make a facebow transfer if no mounted maxillary cast or remount index is available.
- 2. Load irreversible hydrocolloid (alginate) in an appropriate size stock tray and make an impression of the removable partial denture and remaining teeth.
- 3. After the alginate has set, remove the impression. If the prosthesis does not remain in the impression upon removal, trim the alginate and carefully reinsert it into the impression. Ensure the prosthesis is passively seated (Fig 1).
- 4. Mix the autopolymerizing acrylic resin (Duralay, Reliance Dental, Worth, IL) and fill in the occlusal or incisal 1/3 of the teeth mold. Keep the acrylic resin away from any partial denture components. Insert dowel pins (Knurled dowel pin, Sterngold, Attleboro,



Figure 2. Fill the incisal 1/3 of the alginate teeth mold with acrylic resin. Insert dowel pins before the acrylic polymerizes.

MA) into the acrylic resin before the resin polymerizes (Fig 2).

- 5. Inject low-viscosity polyvinylsiloxane (PVS) impression material (Aquasil LV, Dentsply International, Inc., Milford, DE) into the rest seat area of the teeth mold in the alginate impression up to the gingival level (Fig 3).
- 6. If there are any undercuts on the intaglio surface of the denture base, block them out with the PVS impression material. Create irregularities on the poured silicone materials prior to set, for mechanical retention between the stone and PVS impression material.



Figure 1. Alginate impression with inserted removable partial denture.



Figure 3. Inject PVS impression material into the rest part of the teeth mold.



Figure 4. Fill the gap between the denture and alginate impression material with PVS impression material.



Figure 6. Remount cast, front view.



Figure 5. Remount cast, occlusal view.

- 7. If the alginate does not cover the entire partial denture while making the impression, fill any gaps or deficiencies with PVS impression material (Fig 4).
- 8. After the PVS has set, pour the remainder of the alginate impression with fast-set plaster or type III dental stone.
- 9. Retrieve the cast from the alginate impression after the stone has set (Figs 5 and 6).
- *10.* Articulate the remount cast to the opposing cast using an interocclusal record.

Discussion

Remounting the fabricated removable prosthesis on the articulator not only allows accurate occlusal adjustment, but also offers the clinician an unobstructed view of the articulation. Occlusal discrepancies can be more accurately detected on the articulator rather than in the mouth, especially for tissue borne removable partial dentures.

This technique describes a simplified procedure to prevent the denture from locking in the stone remount cast. It also prevents the breaking of the cast abutment teeth when removing the partial denture. Additionally, this technique creates appropriately rigid occlusal and incisal surfaces for evaluation of occlusal contacts as the equilibration proceeds on the remounted prosthesis. Use of the low viscosity polyvinylsiloxane impression material will result in a better fit while injecting the material into the teeth mold. If the acrylic resin or PVS impression material flows over the metal components, such as the indirect retainer or occlusal rest, it can be trimmed by a sharp instrument after the remount cast is made. This technique can also be used for partial denture repairs or prosthetic tooth replacement. By using the resilient silicone impression material around the precision components of the removable partial denture, the denture can be easily removed from the cast without any distortion. The cast will not deform during the occlusal adjustment on the articulator because of the acrylic resin on the occluding surfaces and the dental stone supporting the majority of the prosthesis.

Summary

A procedure for the fabrication of a removable partial denture remount cast has been described. This simple technique achieves a cast for the accurate placement and removal of the partial denture without breaking the cast or distorting the prosthesis. This is achieved through the use of acrylic resin, resilient silicone impression material, and conventional dental stone.

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