

DENTAL TECHNIQUE

Fabricating crowns that fit both an implant and an existing removable partial denture



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Various techniques for making a crown to fit an abutment tooth and also an existing removable partial denture (RPD) have been described.^{1–11} However, procedures for fabricating a crown to fit both an implant and an existing RPD are lacking. Therefore, this report describes 2 patient treatments in which a crown was custom made to fit an implant and an existing RPD, eliminating the need to send the RPD prosthesis to the dental laboratory for crown fabrication.

TECHNIQUE

A 57-year-old patient presented with a nonrestorable maxillary right canine removable partial denture abutment. The tooth was extracted, an implant was placed along with a healing abutment, and a denture tooth was added to the clasp assembly where the tooth had been extracted. Following implant integration, a crown was fabricated to both fit the RPD and the implant. For esthetic and functional reasons, the patient wanted to be able to wear his RPD while the crown was being fabricated. Therefore, the following technique was used:

1. Remove the healing abutment and attach an open tray impression coping (Biomet 3I; Zimvie) to the implant. Seat the RPD, ensuring the occlusal and incisal rests are fully seated in their respective rest seats. Make sure that the impression coping does not prevent complete seating of the RPD. Place a

ABSTRACT

Fabricating a crown to fit both a tooth and an existing removable partial denture (RPD) using many different techniques has been described. However, in the event of abutment loss, information regarding the clinical and laboratory steps used to fabricate a crown that fits both an implant and an RPD is lacking. This report describes the use of either an impression coping or an interim abutment attached to the implant to which a composite resin interim restoration material is flowed and the RPD then seated to form a resin pattern of the required crown form. The process allows the implant crown to be made without retaining the patient's RPD during crown fabrication. (*J Prosthet Dent* 2025;133:1139-1144)

- piece of wax (Wax Square Ropes; Kulzer GmbH) around the abutment screw to enable removal after polymerization of the interim resin material expressed over the impression coping ([Fig. 1](#)).
2. Inject a resin interim material (Protemp Plus; 3M) around the impression coping while making sure that the RPD is still fully seated so that the clasp, distal guiding plane, and cingulum rest seat will shape the interim material before it begins to harden. Any of the resin material covering the screw access channel, retentive clasp, or RPD framework that would prevent removal of the RPD should be quickly removed. The resin records the form where the retentive clasp, proximal plate, and lingual plate are located ([Fig. 2](#)).
3. After the interim resin has polymerized, remove the RPD and make an implant level impression. This, with the abutment with the attached resin pattern, is sent to the dental laboratory so that the technician can develop the shape of the crown that will be attached to the implant and also fit the existing RPD.
4. On the definitive cast, instruct the dental laboratory technician to make a resin clasp that is indexed into the cast using 2 dimples and is in contact with the

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Figure 1. Open tray impression coping attached to implant and existing RPD seated to be sure coping does not interfere with RPD seating. Wax added around impression coping screw to facilitate screw loosening after formation of resin pattern. RPD, removable partial denture.

clinically formed resin pattern where the clasp should be located (Fig. 3).

5. Make a wax pattern for the crown that fits the resin clasp and a lingual putty (ZETALABOR; Zhermack) index that records the form of the lingual and proximal surfaces and rest seat. The wax pattern will serve as a guide for making a custom abutment and will then be used to form a wax pattern over the custom abutment (Fig. 4).

6. Reduce the wax pattern to create space for porcelain. Cast a metal coping using a metal-ceramic alloy and apply porcelain to the framework. Contour the porcelain so that the facial resin clasp pattern contacts the porcelain at the required location along with the contact of the distal proximal plate and lingual plate with the crown. Upon the patient's return, remove the denture tooth from the clasp assembly and the healing abutment, attach the custom abutment, and cement the crown. (Fig. 5).

For the crown pattern using an interim abutment:

1. After extraction of the nonrestorable maxillary right canine and implant placement, add a denture tooth to the RPD as described previously.
2. After implant healing, attach an interim abutment (Certain; Zimvie) to the implant and use it as an alternative to the impression coping for the retention of the resin pattern. Place a cotton pellet into the screw access channel to prevent resin from filling the channel. Inject a resin interim material (Protemp Plus; 3M) around the impression coping and the fully seated RPD, allowing the clasp, distal guiding plane, and cingulum rest seat to shape the interim material before it begins to harden. Any resin material covering the clasp assembly, framework, or screw access channel should be quickly removed. (Fig. 6).



Figure 2. A, Composite resin interim restoration material expressed around impression coping and RPD seated. Material that flowed over clasp and metal framework quickly removed before resin polymerized. B, Lingual plate adaptation to resin. C, Facial view of resin pattern with location of facial clasp visible in pattern surface. D, Incisal view of RPD rest seat formed in resin pattern. RPD, removable partial denture.

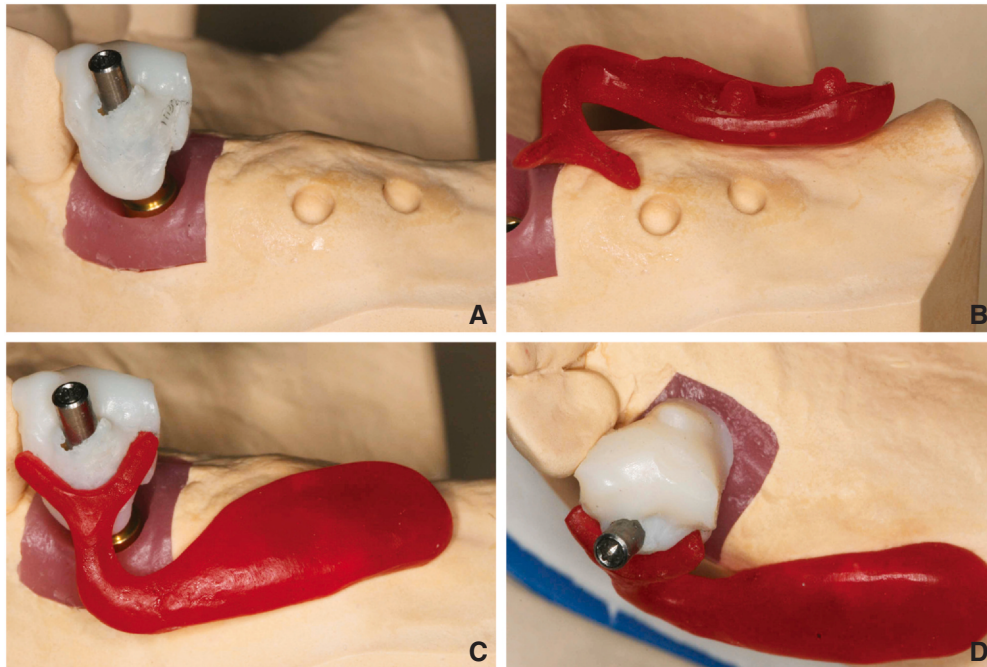


Figure 3. Laboratory workflow. A, Impression coping and resin pattern attached to definitive cast. B, Fabrication of resin clasp indexed to cast using dimples. C, Facial view of resin pattern showing location of facial clasp. D, Incisal view showing replication of removable partial denture seat form in resin pattern.

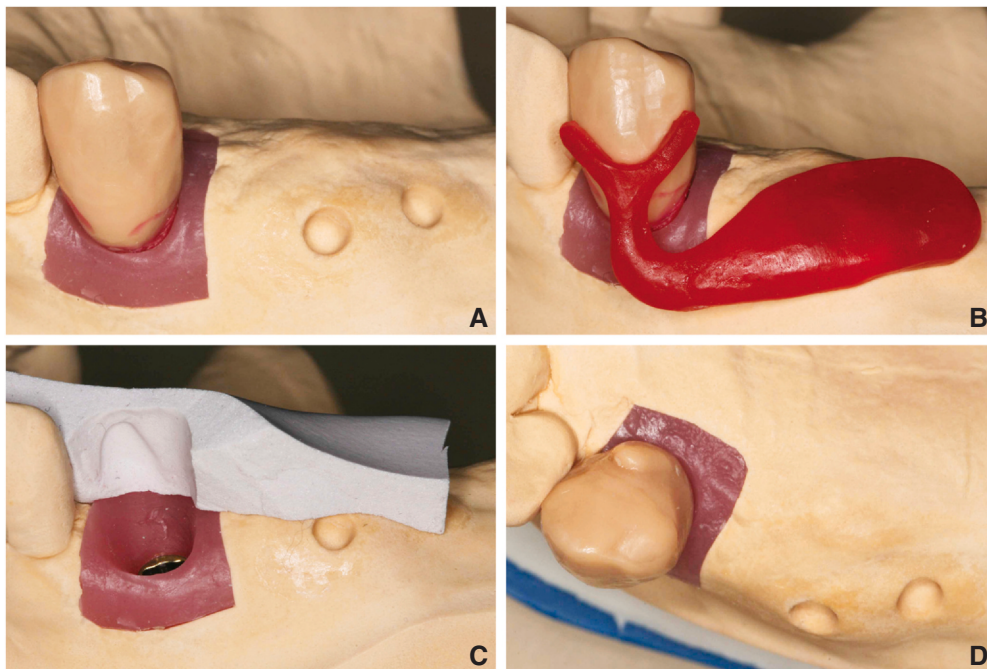


Figure 4. A, Facial view of definitive wax pattern. B, Facial view of wax pattern with resin clasp pattern. C, Silicone putty index of lingual rest seat. D, Incisal view showing removable partial denture rest seat formed in wax pattern.

3. Like the technique described previously, the resin pattern forms the location of the retentive clasp, proximal plate, and lingual contact of the major connector. After the interim resin polymerizes,

remove the RPD and make an implant-level impression. Send the resulting implant level impression and abutment with the attached resin pattern to the dental laboratory so that the



Figure 5. A, Facial view of definitive metal-ceramic crown. B, Lingual view of rest. C, Adaptation of the resin clasp pattern to facial porcelain. D, Frontal view of implant crown and existing RPD. E, View showing adaptation of RPD metal framework and definitive crown. RPD, removable partial denture.



Figure 6. A, Interim abutment and screw. B, Resin interim restoration material placed around interim abutment and removable partial denture seated. Material that flowed over clasp and metal framework quickly removed before resin polymerized. C, Adaptation of retentive clasp to polymerized composite resin interim restoration material.

technician can develop the shape of the crown to be attached to the implant and fit the existing RPD.

4. To fabricate the crown with the desired form, make facial and lingual putty indices with the resin pattern attached to the cast. Trim the facial putty index to produce a finger-like extension that identifies the location of the I-bar clasp. Fabricate the crown

using the putty indices as guides to the required crown morphology (Fig. 7).

5. Seat the screw-retained crown and tighten the abutment screw to the recommended torque. Fill the access channel with a medical grade polytetrafluoroethylene (PTFE) tape and then composite resin (Fig. 8).

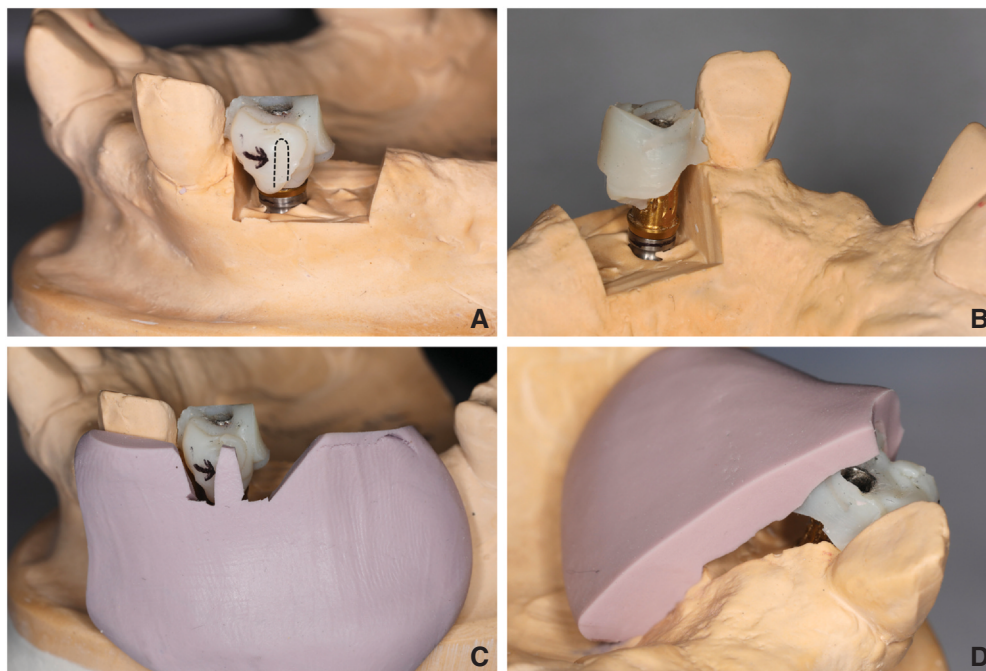


Figure 7. Laboratory workflow. A, Resin pattern for crown attached to definitive cast. Black arrow pointing to dashed outline of I-bar clasp location. B, Lingual view showing replication of palatal contour of the removable partial denture framework. C, Fingerlike projection of putty index showing location of the I-bar clasp; D, Side view showing adaptation of putty index to palatal contour of resin pattern and distal guide plane.



Figure 8. A, Clinical view of definitive crown without RPD. B, View showing adaptation of implant crown to existing RPD. C, Occlusal view of RPD showing adaptation of lingual plate to implant crown. RPD, removable partial denture.

SUMMARY

Patients with a removable partial denture may lose an abutment as a result of caries, periodontal diseases, or fracture but wish to maintain the function of their current prosthesis. A suggested approach is to place an implant in the area where the abutment is missing to fabricate a crown that fits both the implant and the current RPD. In the described technique, a crown was made that fitted both the implant and existing RPD by using an impression or an interim abutment. When using this technique, exercise caution to ensure precise fitting of the RPD components; impressions made with improperly fitted RPDs will result in crowns that fit ill-fitting RPDs. Furthermore, make sure to monitor the flow of the composite resin interim material (Protemp

Plus; 3M) during injection, as it can obstruct the screw access or flow over the RPD.

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Saud Alajmi: Conceptualization, Writing - original draft, Writing - review and editing. **Charles Goodacre:** Conceptualization, Methodology, Validation, Investigation, Supervision.

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