

# Case Report 1

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## Esthetic Provisionalization for a Combined Porcelain Veneer and Anterior Single Crown Case

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### ABSTRACT

This article presents a technique for the fabrication of provisional veneers when a single full-coverage anterior restoration is involved. A case that includes seven porcelain veneers and one all-ceramic crown is discussed.

One of the problems a dentist has with a veneer provisional restoration is the need to provide the patient with a temporary restoration that will cover the prepared areas and satisfy the patient's esthetic needs, while allowing for ease of removal. However, when an anterior crown is involved in a veneer treatment plan, the dentist must create a full-coverage provisional that matches in color and blends esthetically with the temporary veneers to serve as a template for the final restoration.



Fig 1.



Fig 2.



Fig 3.



Fig 4.



Fig 5.



Fig 6.



Fig 7.

**Fig 1 and Fig 2.** Preoperative views. **Fig 3.** Tooth preparation, teeth Nos. 5 through 12. **Fig 4.** Measuring for adequate reduction. **Fig 5.** Provisional crown, tooth No. 9. **Fig 6 and Fig 7.** Provisional crown with veneer cutback.

In the past, dentists have employed various techniques to create functional and esthetic provisional veneer restorations.<sup>1,2</sup> The functional goals have included maintenance of gingival health, protection of the prepared tooth structure, retention of the provisional restoration, and ease of removal when the final veneers are ready to be tried in. Esthetic goals have entailed establishing a pleasing form as determined in the diagnostic wax-up and achieving an acceptable color; this provides a preview of the final restoration.<sup>3-5</sup> These esthetic goals place great demands on the materials to be used, particularly when both crowns and veneers are involved simultaneously.

Historically, these techniques have included indirect and direct acrylic resin provisional veneers, as well as indirect and direct composite provisional veneers.<sup>6,7</sup> Acrylic resin has always had the advantage of ease of modification. However, its disadvantages include shade preservation due to staining, and the need for cementation, which can alter the perceived shade through the thin restoration. The use of composite resin has the added benefits of shade preservation, translucency, and strength.<sup>8</sup> In this case, Herculite XRV™ light-cured hybrid composite resin (Kerr Corporation, [www.kerrdental.com](http://www.kerrdental.com)) was used for its ease of manipulation and excellent esthetics. While this composite resin can be used effectively for constructing provisional veneers, producing a matching temporary crown with this material is more difficult.

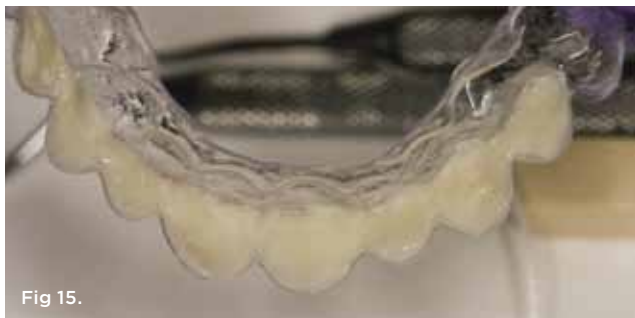
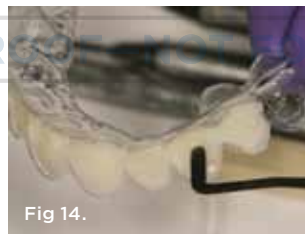
The technique used in this case focuses on the fabrication of provisional veneers in a patient who also needed an anterior crown. Acrylic resin was used for construction of the crown provisional, which was then cut back labially and incisally similar to a veneer preparation and overlaid with composite during the veneer provisionalization.

#### TECHNIQUE

The technique described in the following paragraphs was used in the case of a 50-year-old woman who presented following orthodontics. She desired for her anterior teeth to match in color, and wanted to improve her anterior esthetics (Figure 1 and Figure 2).

The process began with a comprehensive examination with radiographs; impressions for the fabrication of two sets of diagnostic casts; diagnostic photographs; and a review of the patient's medical and dental history, chief complaint, and treatment goals. A diagnostic wax-up was performed on one set of casts (saving the other set as a reference and preoperative record), which helped achieve the patient's treatment goals for improved esthetics. This was presented to the patient for approval.

The wax-up was duplicated in stone for the fabrication of three clear vacuform templates using 0.02-inch clear temporary splint sheet thermoforming material (Henry Schein, [www.henryschein.com](http://www.henryschein.com)). Each template was trimmed up to two teeth distal to the last preparation on each side. The vacuform templates are used



**Fig 8.** Try-in of vacuform matrix. **Fig 9.** Cementing the prepared provisional crown. **Fig 10.** Spot-etching the veneer preparations. **Fig 11.** Gluma application. **Fig 12.** Applying lubricant to the preparations. **Fig 13.** Expressing the composite resin into the vacuform matrix. **Fig 14.** Manipulating the resin. **Fig 15.** Vacuum matrix with composite placed against the labial internal surfaces of teeth Nos. 5 through 12.

as a reduction guide, a provisional fabrication matrix, and a temporary occlusal guard.

At the first clinical treatment visit, the patient's tooth in need of a new full-coverage restoration (tooth No. 9) was prepared by removing the existing crown and creating an ideal preparation for the crown. A provisional crown was constructed and cemented with TempBond<sup>®</sup> NE (Kerr Corporation). At the second clinical visit, teeth

“Polymethyl methacrylate or acrylic resin satisfies the biologic and mechanical properties, as it provides excellent marginal fit, pulp protection, and retention.”

Nos. 5 through 8 and 10 through 12 were prepared for veneers, with the provisional crown on No. 9 left in place as a guide. Following the completion of veneer preparations on the surrounding teeth, the provisional crown No. 9 was removed and measured (prior to removing the temporary cement) with an Iwanson type spring caliper to ensure adequate reduction. One of the vacuform matrices created from the wax-up was used with a periodontal probe inserted into holes made in the stent to measure for adequate reduction of the veneers.<sup>9</sup> An occlusal mirror can also be used for evaluation (Figure 3 through Figure 7).

All preparations were then finalized, and a final impression was made following the placement of retraction cord (Ultrapak<sup>®</sup> No. 00, Ultradent Products, Inc., www.ultradent.com). A vinyl polysiloxane impression material was used for the final impression: a light-bodied material (Imprint<sup>™</sup> 2, 3M ESPE, www.3MESPE.com) was applied intraorally, and a putty material (Express<sup>™</sup>, 3M ESPE) was placed in the tray.

After the impression, the provisional crown was inserted and its labial and incisal surfaces were reduced similar to a veneer preparation, keeping the lingual form intact. The second vacuform shell was tried over the modified provisional crown to ensure the space was adequate for the restorative material (Figure 8). This vacuform shell was then trimmed approximately 1 mm to 2 mm short of the margins. This allowed for hand-sculpting the composite at the margins, which ensured adequate coverage without excess of material at the gingiva.

The modified temporary crown was cemented with non-eugenol temporary cement (TempBond NE), and the excess cement was removed (Figure 9).


All veneer preparations received a dot of etchant, followed by Gluma<sup>®</sup> (Heraeus Kulzer, www.heraeus-dental-us.com) desensitizer for desensitization and preparation cleaning (Figure 10 and Figure 11). A dot of adhesive (OptiBond<sup>®</sup>, Kerr Corporation) was placed and cured on the most posterior veneer preparations for teeth Nos. 5 and 12. (It is the authors' experiences that the most posterior veneer provisional restorations tend to have an increased risk of separating from the teeth during the laboratory phase.) A thin

coat of lubricant (Masque™, Harry J. Bosworth Co., www.bosworth.com) was brushed over all the preparations, particularly on any composite fillings remaining on the teeth, to ensure ease of removal of the provisional (Figure 12).

With the operatory light off, the hybrid composite resin was placed inside the vacuform shell. The composite was carefully expressed toward the labial and incisal internal areas of the shell where the provisional material was desired. Care was taken to place enough material to cover these surfaces, although not in excess to extend onto the tissue (Figure 13 through Figure 15).

The vacuform shell with the composite resin inside was seated over the teeth and compressed down, incisally and facially. With an explorer, any excess was removed at the margins. While the dentist held the vacuform shell against the teeth, the dental assistant cured the composite through the shell, one tooth at a time (Figure 16 and 17). The shell was then gently removed from the teeth. Additional composite was then added to all the margins and hand-sculpted to ensure that the margins were sealed and there was no excess of material extending onto the teeth or tissues (Figure 18).

The composite was trimmed, creating interproximal detail and ensuring the creation of adequate gingival embrasures for periodontal health and incisal embrasures for esthetics using composite finishing burs (Brasseler USA, www.brasselerusa.com) and discs (SuperSnap® Rainbow technique kit, Shofu, www.shofu.com) (Figure 19 through Figure 21).



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On approval by the patient, photographs and an alginate impression were taken of the provisional. A stone cast was made from this impression. These records along with the preoperative casts and photographs or digital images were sent to the laboratory technician for the construction of the final porcelain veneers and crown. All of these records provided guidance for optimal laboratory communication.

The patient then returned for try-in of the final veneers and crown. Following careful assessment of the marginal fit, function, and esthetics, the restorations were inserted (Figure 22 and Figure 23). The patient returned a few days later for a reevaluation of the esthetics and occlusion. At that time, a nightguard appliance was fabricated to protect the veneers.

While the dentist held the vacuform shell against the teeth, the dental assistant cured the composite through the shell, one tooth at a time (Figure 16 and 17). The shell was then gently removed from the teeth. Additional composite was then added to all the margins and hand-sculpted to ensure that the margins were sealed and there was no excess of material extending onto the teeth or tissues (Figure 18).

**DISCUSSION**  
A provisional restoration must satisfy three essential requirements, which can be classified as biologic, mechanical, and esthetic.<sup>10</sup> Polymethyl methacrylate or acrylic resin satisfies the biologic



Fig 16.

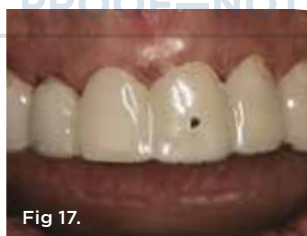


Fig 17.



Fig 18.

**Fig 16.** Inserting the vacuform matrix over the preparations. **Fig 17.** Composite is cured through the matrix. **Fig 18.** Adding to the margins of the provisional.

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Fig 19.



Fig 20.



Fig 21.



Fig 22.



Fig 23.

**Fig 19.** Evaluating the occlusion and esthetics. **Fig 20 and Fig 21.** The veneer provisional following polishing. **Fig 22 and Fig 23.** The porcelain veneers and crown on day of insertion.

and mechanical properties, as it provides excellent marginal fit, pulp protection, and retention.<sup>11,12</sup> Composite resins (in this case triethylene glycol dimethacrylate or Herculite XRV) can provide superior esthetic properties, including translucency and color stability.<sup>8,10</sup>

In the technique presented herein, the provisional crown was completed first to ensure that circumferential marginal adaptation was achieved. Following veneer preparation on both the adjacent teeth and the acrylic provisional crown, composite resin was adapted facially to all units using a vacuform template created from the diagnostic wax-up.

By taking advantage of the best properties of the two provisional materials, a successful provisional prosthesis was achieved, satisfying all the demands of a provisional restoration. The provisional then becomes a blueprint for the ceramicist to complete the restoration in porcelain.

## CONCLUSION

Provisional veneer fabrication has often challenged dentists, especially when an adjacent single anterior crown is involved. This article presents an innovative technique for fabricating provisional restorations in such a situation that satisfies esthetics, functional demands, and retention by utilizing the strengths of two different provisional materials.

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