

Laboratory technique for the laminate veneer restoration

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Abstract

The literature has described the clinical aspects of the laminate veneer restoration; however, the laboratory preparation of these veneers has not been detailed. This paper outlines a step-by-step laboratory technique for the construction of a commercially available laminate veneer, Mastique.[®]

Laminate veneers have been successfully used on patients with hypoplasia, tetracycline staining, fluorosis, mottling, endodontic staining, fractured teeth, and cosmetic problems.¹⁻¹³ Although the practitioner has the option of doing these directly at chair-side, most prefer the indirect method. This approach is chosen not only because it permits closer adaptation of the veneer, but also because it does not require as much chair time and it is, therefore, more economically practical.¹¹ To date there have been two alternatives available for indirect veneer fabrication: (1) the custom-made acrylic resin veneer, and (2) the pre-formed plastic veneer (Mastique^{®a} and Den-Mat^{®b}).

The purpose of this paper is to detail the laboratory procedures for the Mastique[®] laminate veneer.

Literature Review

In the past, several authors¹⁻¹³ have described the indications and clinical technique for use of the laminate veneer restoration. Snawder states that the veneer should be adjusted for proper fit with a white stone in a slowspeed handpiece.¹⁰ Barkley, Gaw, and Faunce describe the laboratory process as grinding the veneer with a high-speed stone to create close adaptation.⁵ Faunce, Barkley, and Fleming later mention the need to trim the model properly and to measure the stone teeth with a Boley gauge.⁷ Slightly more insight into the lab technique is elucidated by Carr, Robertson, and Fleming.⁸

^aMastique, L. D. Caulk Company., Milford, DW.

^bDen-Mat, Den-Mat, Inc., Santa Maria, CA.

Avery emphasizes the advantage of closer veneer adaptation when done indirectly in the laboratory.^{11,12} Paterson recommends using alginate impressions and sending working models to a dental laboratory.¹³ Although these authors discuss the laboratory portion of this procedure, it is clear that no one has detailed the step-by-step procedure for this phase of the restoration.

Methods and Materials

The laboratory preparation of the Mastique[®] laminate veneer can be divided into four stages: (1) model preparation, (2) veneer selection, (3) veneer preparation, and (4) modifications.

1. Model Preparation

- A. Trim the model so that the base will not interfere with easy access to the teeth.
- B. With a red pencil, mark the height of the free gingival margin on the buccal and interproximal surfaces of the teeth which will receive veneers (Figure 1). This line will provide a guide toward which the veneer's gingival margin will be trimmed.
- C. Using a #15 scalpel blade, trim away the stone representing the free gingiva. This will expose the remaining portion of the tooth's buccal surface.

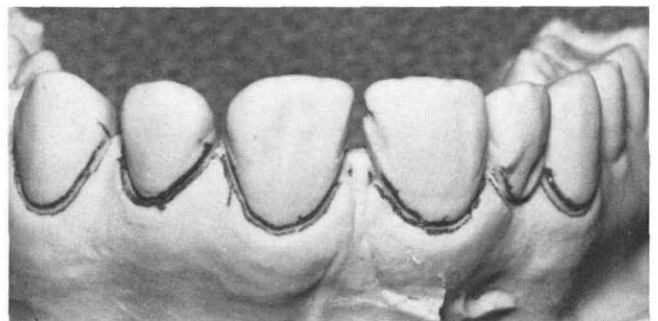


Figure 1. Mark the height of the free gingival margin on the buccal and interproximal surfaces with a red pencil.

The entire buccal surface of the tooth, with the red line scribed to indicate the beginning of the gingival sulcus, can now be visualized. Care should be taken to trim the stone representing the interdental papillae, otherwise the veneers will not seat properly on the model. Beveling this trim at a 30-45° angle allows good access to the tooth and careful placement of the veneer margin (Figure 2).

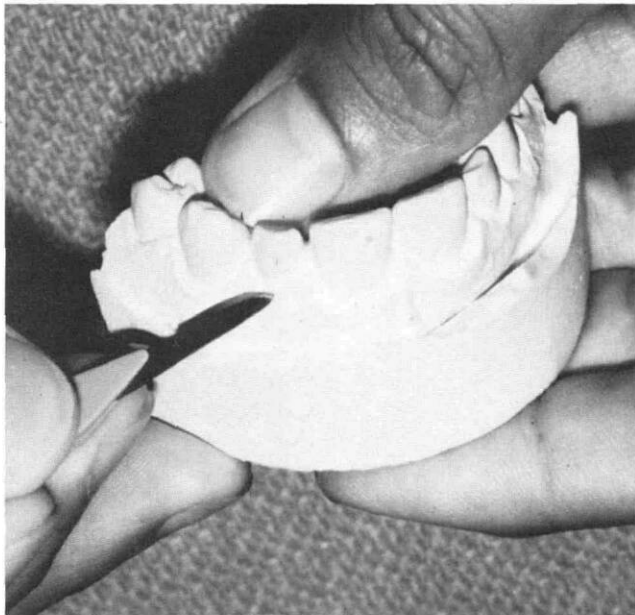


Figure 2. Trim the stone representing the interdental papillae at a 30-45° bevel angle to allow good tooth access and careful placement of the veneer margin.

2. Veneer Selection

- A. Mark the veneer holder provided in the Mastique® kit to indicate which side will be for the right and left. This will prevent confusion when working with the veneers.
- B. Using a Boley gauge, with sharp tips to permit the closest possible measurements, determine and record the width of the tooth. Then, measuring to the red line that was scribed, determine and record the length.
- C. Referring to the veneer mould chart provided in the top of the Mastique® kit, select the veneer. The chart indicates the length of the veneer from the incisal edge to the cemento-enamel junction; this measurement does not include the gingival cuff portion of the veneer. The indicated width is taken from the outer aspect of the veneer's mesial and distal surfaces. Choose a veneer which is slightly wider (approximately 0.1 - 0.2, if possible) and slightly longer than the tooth. The width is the more important of these two measurements. A longer veneer can be trimmed down; it is more difficult to make a veneer wider.
- D. Use the Boley gauge to verify the dimensions of

the selected veneer. This step is especially important when several persons are using the same kit.

- E. Place the veneer on the tooth to estimate if length and width will be sufficient with the cemento-enamel junction at the red line. If the selected veneer does not provide a good general fit, then, referring to the mould chart, select another size. When the right veneer is found, place it on the marked veneer holder and record the chosen mould.

3. Veneer Preparation

Before beginning to trim and grind the veneer, the operator should have firmly fixed in his mind the image of a finished veneer. The veneer should fit passively on the model; it should not require pressure to adapt closely. The gingival margin should be at the line drawn to indicate the free gingival margin. (Figure 3). Interproximally, the veneer should extend as deeply into embrasures as the neighboring teeth will permit, but not beyond the contact. Incisally, it is acceptable for the veneer to be long, since this can easily be trimmed back when the veneer is placed in the patient's mouth.

- A. Using an orthodontic marking pencil, mark the cemento-enamel junction line on the veneer. This line indicates the point to which the veneer will be initially trimmed. To accomplish this trimming use a fine sand or fine garnet E. C. Moore^c disc, or a medium Sof-Lex^d disc. It may be necessary to return to trim this area to its final length and configuration after the mesial and distal margins of the veneer have been shaped.

The mesial and distal areas must be reduced to a point where they do not contact the adjacent teeth. When preparing veneers on the model, care must always be taken to ensure that each veneer seats on its tooth alone and is not impinging on neighboring teeth or gingiva. As the mesial and distal areas are trimmed, the operator may find that shaping of the gingival margin is again

^cE. C. Moore Company. Dearborn, MI.

^dSof-Lex® — 3-M Company. Minneapolis, MN.

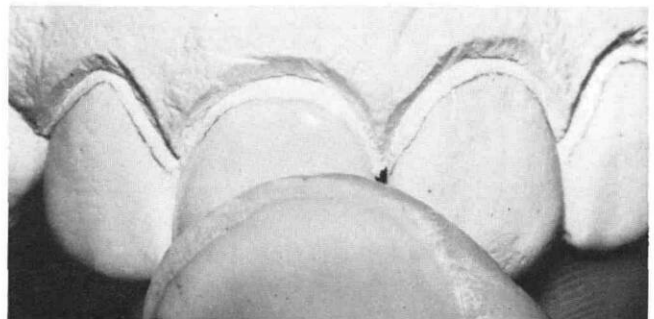


Figure 3. The gingival margin should be at the line drawn to indicate the free gingival margin.

necessary. This interplay back and forth may be repeated until the fit is satisfactory. These gingival, mesial, and distal areas may need slight additional modification after the inside of the veneer is ground in.

- B. Prior to grinding the laminate, note those areas on the lingual surface of the laminate that are thick. These areas are most noticeable and most critical at; the incisal point angles, along the inner aspect of the mesial and distal surfaces, along the incisal edge, and occasionally at the gingival margin. They will require thinning in order to achieve a well-fitting laminate, one which is thicker in the middle than at the periphery. To grind in the inner aspect of the veneer use a #6 lab bur. This bur is suggested, rather than the one provided in the Mastique® kit, because the #6 bur cuts much more efficiently than the kit bur. As the operator becomes more adept at veneer preparation, he may, in fact, choose to use a #8 lab bur. Caution should be taken when using this size, however, because it grinds the veneer very rapidly.
- C. After grinding out the thickest areas, try the veneer on the model. Additional thinning might be necessary, and adjustments in trimming margins, as previously stated, might also be needed. Trimming and grinding should continue until the veneer is closely adapted to the model.
- D. Trim and grind the next veneer as the first. When this veneer fits its individual tooth, the operator should try it on the model while the neighboring veneer is in place. If trimming is done on the labial surface of the veneer, the operator must remember to buff it smooth with acrylic polishing compound on a Robinson bristle brush using gentle pressure. If buffing is performed, care must also be taken to remove all debris or contaminants from the veneer's inner and outer surfaces.
- E. After trimming and grinding are complete, one further step should be taken. Using the white stone provided in the Mastique® kit, grind the entire inner surface of each veneer. This procedure removes the glazed inner surface which is created during veneer manufacture, thereby increasing the surface area interface between the veneer and the shader paste; this will increase the bond between the veneer and the composite. While performing this step, the veneer should be examined from both the inside and the outside. This will provide the best possible assessment of acrylic uniformity on the veneer's inner surface.

4. Modifications

Even with proper selection and preparation, there will be times when the veneer does not fit ade-

quately. When this situation occurs, heat adaptation, as described by Carr, Robertson, Fleming,⁸ and Avery¹¹ provides the desired closely fit veneer. Care should be taken to examine the veneer after heat molding, since this operation may increase the mesio-distal width of the veneer. If this increase has occurred, the mesial and distal margins of the veneer may be modified to the previously acceptable form.

Summary

This paper has detailed the laboratory preparation necessary to create consistently outstanding laminate veneer restorations. The procedures can be modified with an individual operator's own refinements. Initially, preparation of six veneers may take up to 60 minutes; however, after some experience, the laboratory time may be reduced to as little as 20 to 30 minutes. Special care in laboratory preparation of veneers, complemented by meticulous clinical technique, will permit the operator to create a superior restoration.

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