Contouring, Finishing, and Polishing Anterior Composites

The key to beauty and biologic integrity of long-term restorations lies in the final steps of the procedure.

By K. William Mopper, DDS, MS

One of the most important steps in successfully creating bonded restorations is contouring, finishing, and polishing. Proper finishing and polishing greatly increase esthetic results, maximize patients’ oral health, and increase the longevity of restorations. Unfortunately, the proper sequence of polishing steps necessary to achieve optimum results is often overlooked. The purpose of this article is to describe a technique that will help achieve maximum esthetics and biological success when contouring, finishing, and polishing anterior restorations (Table 1 and Table 2).

Finishing and polishing anterior composite restorations is a sophisticated art form. However, proper technique is actually quite simple and extremely efficient once the practitioner understands the concept behind the finish and polishing process.

Step 1: Material Selection

The ability to achieve a good finish and polish on anterior composites is determined by two very important factors—access to the right materials and the artistic ability of the dentist. Having access to the right materials, however, does not mean simply polishing discs and strips. The dentist must also realize that the type of composite(s) used will have a large impact on the restoration’s longevity, durability, polishability, and wear-resistance. Achieving a good understanding of the materials available, and grasping their impact on overall results will maximize restorative success.

Composites

In terms of color stability and polishability, in the author’s opinion microfill is the only composite material that really stands the test of time. A microfill must be used as the final layer in order to obtain the best polish, surface smoothness, and long-term wear resistance. Nanohybrids or nanofills can also be used to replace the enamel layer in composite restorations. These materials initially provide a relatively good surface smoothness and high shine. Over time, however, nanofill composites lose their luster and are less wear-resistant than microfill composites. Microhybrids are the least polishable of the three main composite types. Used as an anterior enamel layer, microhybrids rapidly lose polish and are more susceptible to staining. To achieve a beautiful, long-lasting polish, a microfill composite must be used as the final layer.

Finishers and Polishers Overview

Where do polishers best fit into a practice’s current procedures? One- or two-step polishers can certainly be used when polishing composite restorations quickly. But, if the goal is to achieve the best long-term polish, then it is more desirable to use a comprehensive polishing system.

Different types of composites call for different polishing techniques, depending on the type of restoration and the dentist’s ultimate goals. As a reference, diamond impregnated polishers should be used, followed by an aluminum-oxide polishing paste when polishing nanofill and microhybrid composites. When polishing microfill composites, aluminum-oxide polishers should be used, followed by an aluminum-oxide polishing paste.

Polishing Materials

Thorough and complete finishing and polishing requires the use of a sequential series of finishing and polishing burs, discs, strips, and pastes. Following the proper sequence of materials ensures the long-term health and polishability of restorations. If a part of this process is skipped, the tooth will often be left rough and susceptible to plaque and staining. Either multi-fluted carbides or fine diamonds for gross contouring can be used to begin finishing the restoration.

Discs

Discs can be used for the contouring of all tooth surfaces as well as bulk reduction of excess material. Discs will help contour and finish curved surfaces such as labial proximal line angles, lingual marginal ridges, cervical areas, incisal edges, shaping and finishing of incisal corners, plus finishing and polishing of labial surfaces. They are also excellent for contouring and finishing of posterior marginal ridge areas, and for lingual and buccal surfaces.

**TABLE 1**

<table>
<thead>
<tr>
<th>Why is Finishing and Polishing So Important?</th>
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<td>Proper finishing and polishing is important for several reasons, such as:</td>
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- It ensures the oral health and longevity of restorations. A smooth surface reduces the likelihood of adhesion, which means plaque is less likely to accumulate on a polished surface. This leads to healthier, longer-lasting restorations.
- A smooth tooth surface minimizes gingival irritation and surface discoloration. A polished tooth is more biologically compatible with the gingival tissue, so the health of the gingival tissue is maintained.
- Proper contouring, finishing, and polishing will heighten the marginal integrity of the restoration. Interproximal surfaces have the maximum potential for plaque retention, and polishing these surfaces will significantly lower patients’ risk for secondary caries and periodontal disease.
- A highly polished tooth surface increases the reflective and refractive index of the restoration to create more natural and esthetic smiles. From a visual standpoint, a restoration simply cannot be left unpolished.
- If proper technique is followed, finishing and polishing greatly enhance the longevity, durability, and long-term wear resistance of the restoration.
- Finishing and polishing enhances patient comfort and satisfaction, and patients greatly appreciate the natural beauty and health benefits realized from a properly polished restoration.
Four-Disc Grit Sequence: Aluminum-Oxide Discs

The author is an advocate of the four-grit disc sequence, which is designed to gradually reduce the amount of roughness caused by initial abrasion until a smooth glossy tooth surface is achieved. To provide maximum control for the operator, composite finishing should be done under low-speed/high-torque (speed from 0 rpm to 30,000 rpm).

**Coarse**—The coarse grit is the stiffest of all the discs. This grit is used in conjunction with multi-fluted finishing burs for gross contouring and shaping. When used with pressure, the coarse disc makes it easy to blend the composite into the tooth surface, eliminating the white line and raised margins.

**Medium**—The medium grit should be used to continue smoothing the restoration surface. Medium grits remove any remaining imperfections and marks.

**Fine**—This part of the grit sequence is where polish really starts to shine through. The fine grit helps remove the smallest imperfections while adding a nice luster to the restoration.

**Superfine**—The superfine grit further refines the surface smoothness attainable to create a highly polished restoration.

**Diamond Strips**

Diamond strips help start the interproximal finishing process while maintaining the integrity of the interproximal contact. A larger-grit (45-µm strip) should be used for interproximal stripping of natural teeth or for gross removal of material, and smaller grits (15 µm and 30 µm) should be used to start interproximal polishing.

**Aluminum Oxide**

Diamond strips should be used to contour and polish interproximal areas. Use of a high-quality strip will remove tenacious stains and create a high polish at the interproximal without damaging the soft tissue. It is important that the strip is thin and will stay intact as it is drawn through the interproximal contact areas.

**Oxide Cups and Points**

Aluminum-oxide cups should be used to polish gingival margins, achieve labial characterization and anatomy, and effectively reach areas such as the gingival third and the gingival margins of anterior teeth. Aluminum-oxide points should be used to create labial grooves in veneers, to finish and polish occlusal surfaces of posterior teeth, and on lingual surfaces of anterior teeth. An aluminum-oxide polishing paste should be used as the last step in the finishing and polishing process. Polishing paste with felt discs and points can be...
used to bring out the final beautiful polish of composites, metals, porcelain, or natural dentition after prophylaxis.

Step 2: Conceptualization
Before finishing and polishing, the dentist must conceptualize the desired end result. The dentist will not have to work as hard to obtain lifelike results if the restoration is pre-contoured to the correct shape and form before polishing. Many practitioners lose the shape of the restoration because of a lack of attention to the material application phase. Many dentists have a tendency to over-bulk the composite, and end up losing the intended shape. It is much easier to obtain the desired result if the composite is initially placed into the correct anatomical form and only slightly over-contour from the facial aspect.

Step 3: Action
A realistic tooth form should be developed before the pre-contouring phase begins. Now it is time to apply the correct technique during the final phases of the restoration.

Handpiece
Finishing and polishing should be achieved with a low-speed, high-torque handpiece, typically anywhere from 7,000 rpm to 30,000 rpm. A high-speed handpiece may be used to pre-contour, but using anything over 30,000 rpm during finishing and polishing is too high. Low-speed, high-torque is preferable, because it gives the operator complete control.

The best finishing and polishing technique depends on the type of restoration the dentist is presented with. When polishing a Class IV restoration, for instance, the dentist should rely mainly on discs. However, cups and points will help develop more realistic characterization when polishing a veneer. A step-by-step guide to polishing on various restorations is outlined below.

Class III, IV, and Diastema Closures
Starting with a coarse disc or a carbide-finishing bur, the restoration can be completely contoured moving from restorative material to tooth surface, similar to burnishing metal. This can be done in a wet or dry field. The material should be extended well past the long bevel, and the dentist should not come back to the beveled margin. The final restoration should be feather-edged on the tooth surface past the beveled margin. If done properly, any white line or raised margin will completely disappear. At this stage, the disc should be flexed for maximum finishing potential.

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FINAL POLISHING
Gingival torquing opened the contact to start the interproximal finishing. Use of both wide and narrow superfine diamond finishing strips (Cosmedent’s FlexiDiamond Strips). Running these strips once or twice through the contact will smooth the contact area.

This view shows that there is still more finishing and polishing to be done to further refine the embrasure space. Here, the use of the medium-grit (FlexiDisc) is preferred. Continuing the polishing with a fine disc. Polishing the lingual surface with a superfine disc.

Polishing the lingual surface with a superfine cup. Finishing and characterizing the labial surface with a superfine point. Application of an aluminum-oxide polishing paste (Enamelize, Cosmedent) with a felt buff (FlexiBuff, Cosmedent). Polishing the lingual surface with Enamelize and Felt FlexiPoint (Cosmedent).

This is the incisal view of the finished restoration. Note the symmetry of the labial surfaces, the contour at the embrasures surfaces, the contact, and the beautiful blend of the polished material into the tooth surface.
The different grit sizes—medium, fine, and superfine—should be continued through in succession. An enamel-like luster rapidly appears. The interproximal process should be started with diamond strips to maintain the integrity of the contact. One or two times through the interproximal should be sufficient, followed with the fine-superfine aluminum oxide strip on dry surface until no resistance is felt, and a smooth surface is apparent.

For the final polish, an aluminum oxide polishing paste with felt discs and points should be used. This is the step that really brings out the amazing final polish.

**Class V**

On occlusal or incisal margins, 5/8” or 1/2” coarse disc should be used past the long bevel. Discs are always preferred on exposed margins. To start finishing from restoration to tooth surface, a coarse disc is used, followed by medium and then fine; finishing with the superfine disc to achieve maximum polish. The 3/8” disc should be used at the gingival margin.

Although this is a small diameter, the 3/8” can be flexed to gain access to hard-to-reach areas. The gingival half of the restoration can be polished nicely using flexible cups, but rubber must be kept off the occlusal and incisal margins.

If Class V restoration invades the proximal surfaces, the diamond strips and aluminum oxide strips should be used in the narrow width for polishing these surfaces. An aluminum-oxide polishing paste with felt discs and points is recommended for the final polish.

**Full Resin-Bonded Veneer**

The coarse disc or contouring bur is used to start contouring and finishing. The coarse and medium discs can be used to complete the contouring of the veneer. It is desirable to maintain the character and anatomy placed in the facial surface. This cannot be done with discs, but cups and points are very useful for this purpose. To characterize, the cup is placed flat on the tooth surface, flexed slightly, and run with pressure up and down the tooth surface. Blunting off sharp edges on a green stone prior to characterizing prevents scarring and over-characterization.

After a grooved surface has been developed, augmenting with rubber points highlights the grooves. Polishing the surface is completed with fine and then superfine polishing discs. To polish the interproximal surfaces, diamond and aluminum-oxide strips are used as previously described. For the final polish, an aluminum-oxide polishing paste with felt discs and points is used.

**Maintenance of Composite Restorations**

Excessive staining is removed in the usual fashion. A small amount of aluminum-oxide polishing paste is then applied to each surface and polished. To remove interproximal staining, each interproximal should be packed with polishing paste, and a wide, fine/superfine polishing strip is used to polish the surface.

**Conclusion**

The proper contouring, finishing, and polishing of anterior restorations is a key component to the long-term success of bonded restorations. This article outlines the importance of three different phases in the finishing and polishing process. First, the appropriate restorative materials, from composites to polishes, must be carefully selected to help get the job done right. Then, the dentist must conceptualize the desired end result, and set up the restoration accordingly. And, finally, the proper finishing and polishing technique must be executed in order to achieve maximum restorative success.

For a clinical example of the technique described, the author provides a complete case pictured in Figure 1 through Figure 29.

**Disclosure**

The author is part owner of Cosmedent.

**References**