Strategies for Blending: PFM vs Porcelain Veneer

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There is nothing like trying to match a single anterior restoration, as any technician will tell you. It is never an easy process, even within the parameters of custom shading. But fabricating a replacement crown will present an even bigger challenge. There are quite a few questions that arise, such as: How old is the crown? Who made it? What was his technique? What were his habits? Did he cut back on the dentin? What type of porcelain did he use? The only question technicians might be able to answer is the one regarding age, but even that is usually an estimate. This means that technicians have to mimic someone else’s methods—a technician we have never met and probably never will—because that central crown is what must be matched. There is no question that this is a tough situation and will involve some guesswork.

CASE PRESENTATION
A 40-year-old patient presented with loss of a porcelain veneer on central tooth No. 8. Her concern was her smile. Without the veneer, this tooth was not esthetically pleasing (Figure 2). The tooth’s shape was narrow, which would have to be mimicked by the technician when fabricating the new porcelain veneer. After preparation, one can see the design as well as the discoloration in the stump of tooth No. 8 (Figure 3), a consideration in the custom-shade—mapping procedure.

How much opacious dentin would be needed (Figure 4)? The side view demonstrates facial preparation design and dictates the amount of porcelain to apply to the restoration so that it corresponds with the adjacent crown’s side view. Once the patient was seen for a custom-shade appointment, the technician charted the custom-color, porcelain-layering technique (Figure 5). This particular chart has a very basic color blueprint because there was no need for many different applications and no concerns about surface texture because the application of glaze can always be adjusted to match with adjacent teeth.

The first dentin build-up, with platinum foil, was applied using the GC Initial ceramic system (GC America) (Figure 6). Application included opacious dentin on the gingival one third and dentin covering the body and incisal edge. Figure 7 is an “after” shot of the porcelain’s first firing at 890°C. After firing is complete, the next step is to examine opacity and porcelain thickness (where? how much?). If there is not enough, make a note to fill in later as needed. The second build-up with variety enamel supplement was applied using A2 dentin, clear fluorescence color, enamel opaque 3, and a translucency modifier (Figure 8). The second bake stage—also known as bisque bake—with the mimicked surface texture followed. The technician’s pencil marks were to indicate contouring (Figure 9). At this stage, some clinicians prefer to try the nearly completed restoration in the patient’s mouth for fit and to check occlusion and then send the case back to the laboratory for the final polishing and glazing step. That is strictly a matter of preference, of course, and in this case the technician preferred to wait for the finished product.

After the platinum foil was removed, the restoration was polished, glazed, and baked in the porcelain oven for the final time. It was then tried on the model, where the margins and interproximal contact were checked (Figure 10). This could be considered the most important step in the process. The technician should calibrate his or her porcelain oven carefully, as well as make good use of diamond polish and correction powder during the process for optimal results.

The next step can be compared to test driving a car, something everybody does when considering whether or not it is the right type of vehicle. In Figure 11 and Figure 12, the author is comparing the duplicate stump’s shade with the final restoration. This critical stage checks and verifies the finished color, occlusion, and fit—which the same as test driving that car to decide whether or not it is the right one. The clinician was advised to use clear cement to seat the veneer in approximately 3 weeks because of the opacious body that had been applied. Obviously, this communication between technician and clinician saves frustration and time later on.
The laboratory is, of course, the perfect scientific setting to experiment and gain knowledge. By grinding off a natural tooth's enamel all the way to the dentin, a technician can educate himself or herself about the inherent similarities and differences between enamel and dentin (Figure 13). With genuine natural teeth donated by a clinician, the technician can give restorations a “test drive” to verify how they will appear when placed. Valuable lessons can be learned from these ongoing laboratory experiments if the technician’s curiosity leads to self-education. As a continuing student of tooth morphology, an experienced technician knows that the study of the adjacent teeth—both natural and not—must be ongoing. Whether the tooth is convex or concave, a guide must be drawn. Likewise, the dentin’s thickness and enamel opacity must be part of the equation. What about surface texture and translucency or transparency? If a plan has been drawn and followed correctly, in the author’s experience, the restoration will be fired two to three times and no more. That should always be the goal.

The veneer was fitted to match and tested for color agreement (Figure 14). These steps lead to the consideration of porcelain-layering techniques, which is the key to true color harmony. Note here the translucency of the tooth’s coronal portion when it was not blocked on the inside with a natural tooth. An “after” view of the cemented veneer in a rest position (Figure 15) demonstrates the color matching between the two centrals, with a side view of the same in Figure 16. Note how the emergence profile matches in texture and translucency—seamlessly linking the veneer to the PFM crown. For comparison, refer back to Figure 4 for a “before” side view.

A technician who takes pride in his or her work approaches the task at hand with passion. Sometimes, as in this situation, the technician has to be a detective to solve the unknowns in the equation. Having no knowledge about the patient’s past dental history presented a challenge because of the anonymous element it included. But by carefully uncovering what currently existed, it was possible for the technician to deliver a restorative match that pleased everyone concerned.

In this case, the patient was delighted with the final result and the natural look her teeth presented when she smiled. The clinician and technician were happy with the function and longevity that the patient could expect, as well. For best results, it always helps to work as a team—patient, clinician, and technician—together. The plan was outlined and implemented with successful results for all concerned.

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REFERENCES