

Distinguishing Characteristics with Surface Texture

by Dr. Anjee Wonderlick with Luke Kahng, CDT



Fig. 1: The anterior translucency is checked on the incisal 1/3 of tooth #8, using the Chair Side Shade Selection Guide.



Fig. 2: After a period of about five-to-seven seconds, the incisal 1/3 is checked again, and it's noted that the patient has subtle white calcification.



Fig. 3: The surface texture check, performed about five-to-seven seconds later, detailed the patient's vertically uneven, irregular subtle horizontal texture, with a thick groove and horizontally thin pathway.

In the past, the best answer a clinician had for describing preferred lab case outcome was to use descriptive language and draw pictures on a lab slip. Details can be seriously limited with such a low-tech method of communication, as we all know. Photography is very helpful since, like the saying goes, a picture is worth 1,000 words. However, perception might vary from one individual to another as they decipher color and characteristics, whether on a computer screen or in a printed photo. The complication is that each person might be right, depending on lighting, time of day, eye fatigue, etc.

Take, for instance, the color white. There are a multitude of different shades for that color alone – chalky, clear, solid, bluish, grey-white and yellowish; the list goes on and on. The lab technician cannot really make a decision about “white” based on that one word. That is why shade tabs were invented, and in their general way, they are helpful. In fact, we’ve all grown to depend on them as our preferred method of communication. Clinicians and their assistants will always note the patient’s shade on the lab slip using one shade tab color or another – it’s expected.

But even with shade tabs, complications can arise. Sometimes we have a case with some modifications, maybe incisal translucency, distinctive mamelon color or horizontal crack lines. If a restoration is ordered with the color as just A-2, for example, is that going to match? Will it take everything into consideration? In our own experience the answer is no, it’s not possible. That one simple A-2 shade tab does not consider any modifications. Pictures drawn on lab slips, while helpful, can’t really give the whole scenario, either.

From the lab technician’s perspective, all the characteristics that they have to work into the restoration are much easier to manufacture if they are all coded onto the Rx. This way, there will be universal color, modification and characteristics communicated, without variance. The question then becomes, is it possible to easily and efficiently transcribe color and characteristics with one tool? If language, drawing and photography don’t always work the way we’d like them to, what do we do? What will give us that “Aha!” answer we would all like to have when it comes to patient color and characteristics? The following case study showcases special modifications and how they were communicated.

Case Study

The Anterior Translucency of the incisal 1/3, #8, is checked with the LSK121 Chair Side Shade Selection Guide (CSSSG) (Fig. 1), since it is the adjacent tooth for the restorations-to-be on #9 and #10. Again, several seconds later, the incisal 1/3 is checked, this time with a different result: subtle white calcification (Fig. 2). When the vertical surface texture is checked, an uneven, irregular horizontal texture together with a thick groove becomes evident (Fig.3). There is also a thin horizontal pathway that wasn’t clear before. Had the technician checked the patient’s shade only one time,



Fig. 4: In laboratory procedures, dentin is applied with a basic A2 color. GC Initial porcelain translucency modifier is applied to the mesial distal.

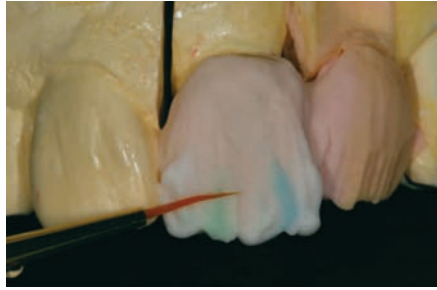


Fig. 5: Enamel opal application mimics the incisal 1/3.

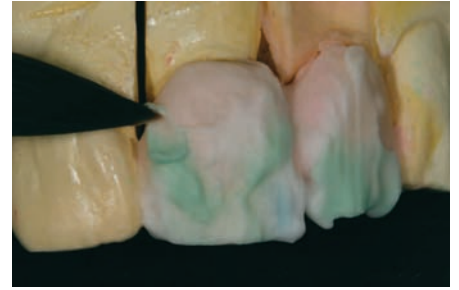


Fig. 6: Enamel effective overlay is next applied all the way to the gingival 1/3 area.



Fig. 7: Translucency modifier is then painted on to cover the facial area.



Fig. 8: After first bake firing, at 890° C, the crowns have an eggshell appearance.

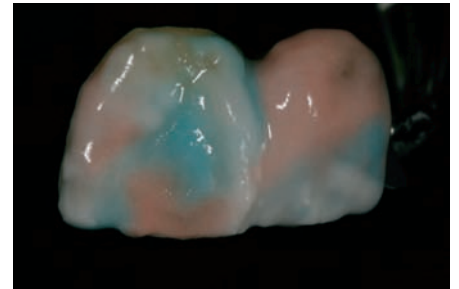


Fig. 9: Final porcelain build-up is applied.

would he have been able to recreate the proper incisal 1/3 color and surface texture? Chances are, no, it would not have matched. Within a 10- to 20-second time period, the patient's entire surface texture had changed, due to dehydration.

The last step in the technician's work, polishing and glazing, if done a certain way, can produce very shiny and pronounced crowns that, in this case, would have stood out once they were cemented. Dehydration is tricky and if we don't recognize its role in shade taking, we may be asked to remake a crown several times.

What about the tools we regularly use to take a patient's shade and translucency? In the case of this patient, with the special attention paid to translucency and surface texture, the Chair Side Shade Selection Guide proved to be invaluable because the modifications could all be measured with one hand-held device. Easily translated to the custom shade sheet by use of code translations, the process did not take long to complete.

In Fig. 4, laboratory processing is demonstrated on the cast model with dentin applied in a basic A-2 color. Translucency Modifier from GC Initial porcelain is applied to the mesial distal section of the tooth with Enamel Opal application next (Fig. 5) to mimic the incisal 1/3. The Enamel Effective is placed over the top, all the way to the gingival level on tooth #10 (Fig. 6) and Translucency Modifier covers the entire facial area (Fig. 7).

After the first bake at 890° C, the crowns have an eggshell exterior (Fig. 8). The final porcelain build-up is layered onto the restorations after the first bake, with their appearance shown in (Fig. 9).

Surface texture must be modified for this patient, as we discussed above. Because he knows this is so, the technician drew lines onto the restorations using different colored pencils to demonstrate grooves that will be displayed in the texture (Fig. 10) once the restorations are complete. The diamond burr created a slight indentation into the porcelain's surface lines to establish the texture

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Fig. 10: The technician will use the marks he has made to create a surface texture illusion.



Fig. 11: With the help of a diamond bur, he is able to create surface texture to match the adjacent teeth.



Fig. 12: A Robinson brush is used to perform his polishing technique using diamond paste by GC Gradia.



Fig. 13: The final restorations are displayed on the cast.



Fig. 14: The finished restorations, post cementation, in the patient's mouth.

effect the technician sought (Fig. 11) and with a Robinson brush, the technician polished the restoration to his satisfaction before sending the case to the clinician (Fig. 12).

The finished product is tried on the cast model (Fig. 13) before being cemented in the patient's mouth (Fig. 14), with harmoniously blended color, surface texture and translucency.

Conclusion

Instead of sending this case back and forth several times, we were able to save time by taking all of the characteristics and putting them into the original restorations. As we mentioned earlier, the patient dehydrated rather quickly and the appearance of her teeth changed as well. So we needed to understand how to interpret her white modification, subtle translucency and surface texture in order to apply the proper porcelain layering technique.

The observant technician who notices this change in appearance will take careful steps to reproduce what he sees. He might have to study the patient's teeth more thoroughly than usual and will probably want to take many photos as well. With so much emphasis on natural looking teeth taking hold in the public's minds, anyone who has heard the concept would not be satisfied with an unnatural looking restoration. And surface texture is an important part of what goes into the final product.

In the end, everyone involved with a patient's case is happier if we don't have to re-do what's already been done. To help the clinician, the patient and ourselves and to save everybody the frustration of a remake, we made every effort to achieve the final goal of a matching restoration the first time. By efficiently noting the characteristics of the patient's smile within the time frame of her visit and by using a tool that said it all, we felt lucky to be rewarded with our, "Aha!" answer and a completed a restoration that worked for everyone! ■

Authors' Bios

Dr. Anjee Wonderlick works in her private practice in Naperville, Illinois. She can be reached via e-mail at awonderlick@ntsource.com.

Luke S. Kahng, CDT, is the owner of LSK121 Oral Prosthetics, a dental laboratory. He has published more than 35 articles in major dental publications. He is the author of the recently published *Anatomy From Nature*, with 50 illustrated pages of full contour wax-ups, stone models and porcelain teeth, all re-created using natural teeth as a guide. His new *Esthetic Guide Book* features 31 patient cases from a single anterior tooth to a full mouth reconstruction. He invented the Chair Side Shade Selection Guide featuring more than 150 zirconia fabricated restorations based on patient enamel and translucency research, with patent pending. For more information about LSK121 Oral Prosthetics, please visit www.lsk121.com.