

TIPS FROM OUR READERS

Computer software-based method of analyzing and communicating the nuances of tooth surface texture with the dental laboratory



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The demand for ceramic-based dental restorations has increased markedly as a result of patient demand for higher-level esthetic results.¹ The key elements in ensuring a proper esthetic outcome are, in order of importance, tooth position, contour form, surface texture, and the 3 components of color: value, chroma, and hue.^{2,3} Of these variables, inaccurate tooth surface characterization most impacts the perceived color of artificial restorations.⁴ The ability of the dentist to adequately communicate the topographical details of tooth surface texture with the dental laboratory, however, remains elusive.

The most common methods used to communicate the characteristic features of surface texture are analog stone

casts and digital photographs. Both of these approaches have limitations, however. Dental castings frequently mask microtexture because of the inherent limitations of the impression material and/or saliva and plaque accumulation. Photographs, while still beneficial, are limited in their ability to provide depth, and the use of high-powered flash often overexposes areas of fine textural detail.⁵ The purpose of this article was to illustrate an expedited approach to editing digital photographs that does not require expensive software and is readily available on most personal computers. These photographs can then be used to effectively communicate the hidden details of tooth surface texture to the dental laboratory.



Figure 1. Original photograph of natural dentition adjacent to tooth planned for definitive ceramic restoration (maxillary right central incisor).

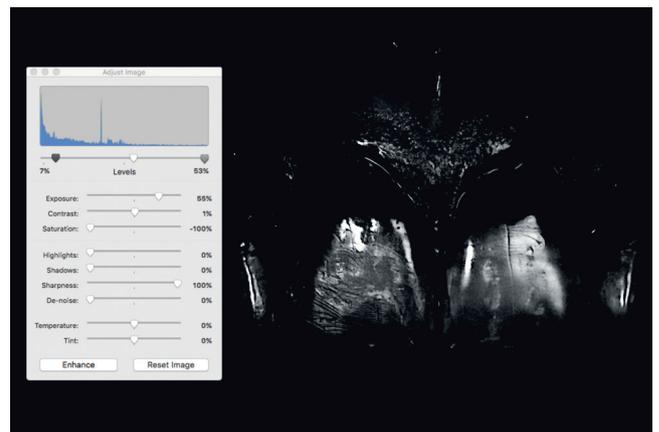


Figure 2. Photograph was manipulated using computer software to enhance tooth surface texture and features not readily visible in original image (Fig. 1).

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Figure 3. Definitive ceramic restoration demonstrates appropriate tooth surface texture matched to adjacent dentition.



Figure 4. Lateral view of same ceramic restoration from Figure 3, illustrating accurate reproduction of microsurface anatomy and detail.

PROCEDURE

1. Capture digital photographic images of the dentition adjacent to the prepared teeth receiving the proposed definitive ceramic restoration (Fig. 1). It is best to underexpose the images by dialing the strength of the flash down to $\frac{1}{2}$ or $\frac{1}{4}$ power or by applying a diffuser, such as white computer paper, over the flash heads.
2. Import the photographs into a presentation-based software program (Keynote v6.6.1; Apple Inc).
3. In Keynote, select "View" in the main menu bar, and in the dropdown menu, select "Show Adjust Image." Alternatively, select the histogram icon from the toolbar labeled "Adjust" to activate an interactive sliding toolbar (Fig. 2).
4. For every photograph, immediately slide the cursor for "Saturation" to the far left (-100%). This will turn the image black and white. Additionally, slide the cursor for "Sharpness" to 100%. This will enhance all of the very fine surface texture details. The settings for "Highlights," "Shadows," "De-noise," "Temperature," and "Tint" should all be left at 0%.

5. Experiment with fine-tuning the settings for "Levels" and "Contrast" to reveal additional tooth surface details.

Figures 3,4 show a definitive ceramic restoration matched to the adjacent dentition.

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