Digital dentistry is exploding. From digital radiography to digital impressing, we have seen a dramatic shift in the way we capture images. We are using digital technology to capture and visualize data on a much larger scale. Suddenly we have the opportunity to identify and critique the small details that were often lost using traditional final impressions.

What has not changed, however, is the essential necessity of maintaining the fundamentals of crown and bridge dentistry: comprehensive treatment planning, proper preparation design and soft-tissue management, along with proper margin placement and identification. As technology evolves, we see that it has become even more critical that we have visual access and identification of the margins prior to scanning. With the traditional impression technique, the injection of a low viscosity material into the sulcus may physically force some of the soft tissue out of the way.

Digital scanners can only capture what they see

For years, retraction of soft tissue has meant packing a cord into the sulcus before taking the final impression. This is often a daunting task as we battle inflamed and bleeding gingival tissue. In areas where access is difficult, proper isolation becomes more of a challenge. This report will offer alternative methods for effective ways to optimize clarity and manage soft tissue when using digital impressing.

The most effective way to achieve clear visualization of the margin is to prepare the tooth using supragingival margins. The reality is that teeth that are being prepared for a crown often have old restorations with subgingival margins. The health of tissue in these areas is often compromised. In most cases, there is at least a portion of the prepared tooth that falls below the free gingival margin. When subgingival margins are present, the tissue must be separated from the edge of the preparation to allow clear visualization for the digital scan. Unclear margins may be undetected in traditional impressions; however, with digital scanning the quality of retractions and margin clarity can be identified immediately in a single scan. The clarity of a scan is determined by the quality of retraction and its ability to reveal a clear margin.

In areas of inflammation or subgingival margins, the use of a soft-tissue laser may be extremely effective. A soft-tissue diode laser such as Odyssey Navigator (Ivoclar Vivadent) provides a simple method to trough the marginal areas. It is an invaluable tool to assist in the removal of unhealthy, inflamed gingival tissue that is covering the margin or creating exces-
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sive bleeding. It then stimulates the cells to regrow in a healthier environment. A peroxide solution can be used to remove tissue debris left after using the laser.

In areas of moderate to minor inflammation, a retraction paste such as the Traxodent Hemodent Paste Retraction System (Premier Dental) is very effective in providing hemostasis and physical separation of the tissue from the margin of the preparation. Traxodent Hemodent Paste Retraction System is a viscous paste that is injected into the sulcus, and a specially designed, firm cotton roll is placed over the paste. The patient applies firm biting pressure to the cotton for two to five minutes, and the paste is easily rinsed from the tissue and tooth structure. A clear view of the margin is readily achieved.

__Procedure__

A patient presented with an old crown with a poor distal margin on tooth #14. A treatment plan was developed to replace the crown with an IPS e.max CAD (Ivoclar Vivadent) restoration using E4D Dentist (D4D Technologies). The tooth was prepared using Premier Two Striper Burs (Premier Dental).

Figure 1 shows the prepared tooth and surrounding inflamed gingival tissue. One of the most effective ways to achieve retraction, isolation and hemostasis is to use the Odyssey Navigator with Traxodent Hemodent Paste Retraction System. The diode laser effectively and efficiently removed the unhealthy tissue (Fig. 2).

The retraction paste maintained hemostasis, provided retraction of the healthy tissue and was easily rinsed from the sulcular area (Fig. 4). Clear visualization of the margin by a digital impressing system was readily achieved (Fig. 5).

__Clinical observations__

The proper marginal fit of a final restoration is determined by the ability of the operator to identify the margins of a preparation. The quality of the retraction dictates how well the margin can be identified in a digital scan. Removing unhealthy tissue by using a diode laser and minimizing the trauma to the healthy tissue through the use of retraction paste provides the optimal environment to capture a scanned image.

__Conclusion__

The entire process of fabricating a quality final restoration begins with proper and complete tissue management. Whether the restoration is being fabricated using the technology of E4D Dentist to capture a digital image or using traditional methods, exposing the margin is the key to accuracy.

Using the Odyssey Navigator diode laser in combination with Traxodent Hemodent Paste Retraction System, E4D Dentist can readily capture the image and create a model with clear margins. When used together, the healthy and unhealthy tissue are managed in the ideal way to minimize patient discomfort and allow the tissue to heal under the optimal conditions.

__about the author__

Santine Anderson, DDS, is a general dentist in Ann Arbor, Mich. She is a graduate of the University of Michigan School of Dentistry and Albion College, where she earned a BS in chemistry. She began her career during undergraduate school while working for The Dental Advisor. Anderson brings clinical knowledge and experience to the dental profession through lectures, editorials and clinical case reports. You may contact her at dranderson@enspiredental.com.