Using in-office CAD/CAM technology and lithium disilicate to fabricate efficient and predictable restorations

mCME articles in Dental Tribune have been approved by HAAD as having educational content for CME credit hours. This article has been approved for 2 CME credit hours.

By Author John C. Schwartz, DDS

In today’s fast-paced world, instant gratification is expected to be synonymous with worthwhile results. This also applies to dental treatments. While there have been many recent technological innovations specifically for chairside restorations, dentists have faced complications when mastering complex and time-consuming protocols.

The E4D Dentist System (D4D Technologies) eliminates those obstacles by providing outstanding clinical results in a single visit using intuitive, efficient and state-of-the-art technologies. The E4D Dentist System’s three-dimensional software simplifies designing and milling multiple restorations. This provides dentists with more control over the esthetic process.

The E4D in-office CAD/CAM system is equipped with a high-speed intraoral laser scanner for capturing digital impressions, which provides restorations with better-quality fit and function because it incorporates intraoral digital impressions, traditional impressions and models.

The E4D Dentist System streamlines work for dentists, who gain the enhanced confidence of producing reliable restorations for every patient case. Meanwhile, patients receive faster treatment times.

Contributing to efficiency and accuracy is the E4D design software, which facilitates required modifications to finalize restorative designs in record time.

Restorative designs are then sent to the E4D pre-cision milling unit, which incorporates dual spindles and diamond burrs to efficiently form CAD materials into restorations that exhibit exceptional fit, maximal strength and lifelike aesthetics. In fact, restorations fabricated using CAD/CAM processing have demonstrated less chipping or fracturing, which enhances the predictability of the restoration.

Among the materials that can be processed chair-side with the E4D Dentist System is lithium disilicate (IPS e.max CAD, Ivoclar Vivadent), which is available for processing CAD/CAM restorations indicated for placement in the anterior and posterior.

The material is also indicated for an assortment of dental procedures, including partial and full coverage inlays and onlays, thin veneers (0.3 mm) and implant superstructures. Lithium-disilicate glass ceramic trumps traditional ceramic materials because of its durability and high flexural strength values.

Case presentation

A 55-year-old woman presented requesting re-moval of the maxillary left bicuspoid and molar crowns. Her unsightly margins and the gold restorations were visible in her smile (Figs. 1, 2), and the patient had grown weary of their unsettling and lackluster appearance. Her goal was to whiten her dull-looking teeth in order to reflect the brighter color of her natural anterior dentition. In-office CAD/CAM restorations (IPS e.max CAD) were discussed with and agreed to by the patient. The optical qualities of IPS e.max CAD, which include a fairly low refractive index, optimal light transmission and lifelike translucency, would provide natural-appearing and highly esthetic restorations.

Fig. 1 Preoperative, buccal view of the patient’s maxillary left bicuspoid and molar crowns. (Photos/Provided by Dr. John C. Schwartz)

Fig. 2 A preoperative, buccal view of the patient’s maxillary left bicuspoid and molar crowns and gold restorations. (Photos/Provided by Dr. John C. Schwartz)

Fig. 3 The preparations are cleaned and three drops each of Multilink A & B solution are mixed in a well.

Fig. 4 The Monobond Plus Primer was applied with a microbrush for 60 seconds.

Fig. 5 Ceramic Etching Gel is applied for 20 seconds, rinsed with water and dried. In preparation for salinating using Monobond Plus Primer.

Fig. 6 The internal aspects of the crowns are cleaned, etched and silanated.

Fig. 7 Scan of the patient’s prepared teeth with margins identified.

Fig. 8 View of the CAD proposal created utilizing Autogenesis.

Fig. 9 Optimization of CAD proposal to account for occlusion and contact pressure.

Fig. 10 Optimization of CAD proposal with model and occlusion in place.

Fig. 11 Optimization of CAD proposal with model and occlusion in place.
Preparation and digital impression taking

The existing crown restorations were removed and the teeth were prepared for IPS e.max CAD crowns. Preparations included a 2 mm occlusal re-duction and a 1–1.2 mm e.max CAD crowns. Preparations were appropriately stained and glazed. IPS e.max CAD lithium-disilicate blocks (IPS e.max CAD) was ready for seating using universal cement, as well as increase bond strength to the natural tooth preparation. The combination of lithium-disilicate high-translucent (HT) blocks (IPS e.max CAD) enabled easy removal (Fig. 14).

Digital restoration creation

The autogenesis feature in the E4D Dentist System is a state-of-the-art material and technology-solution that enhances the predictability, esthetics and ease-of-use in-office CAD/CAM procedures. Restorations completed with this complementary combination demonstrate excellent fit, function and esthetics (Figs. 15, 16). As a result, dentists can provide progressive, one-day treatments to patients, eliminating more invasive and time-consuming procedures that can require multiple appointments.

By incorporating the essential components of smile design and accurate scanning, the E4D Dentist System helps to ensure the accuracy and predictability of resulting restorations.

References


Contact Information

John C. Schwartz, DDS, MD, Metairie, LA 70002 (800) 346-9030 johnschwartz@dryjohnschwartz.com

When milled from highly esthetic lithium-disilicate blocks (IPS e max CAD), the restorations enable dentists to provide exceptional treatments tailored to the patient’s authentic esthetic characteristics.