CAD/CAM-Fabricated Restorations for Aesthetic Rehabilitation of the Anterior Maxilla

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The use of CAD/CAM restorations has revolutionized the practitioner's ability to deliver predictable, strong, and aesthetic restorations with minimal effort. The following case presentation demonstrates the application of a CAD/CAM alternative to replace compromised, preexisting restorations in the anterior region. The selected system allowed the technician to develop functional, natural-looking prostheses with aesthetic light transmission, fluorescence, opalescence, and translucency.

FIGURE 1. Preoperative buccal smile view. Note the unaesthetic preexisting restorations and lack of harmony during natural smile.

FIGURE 2. Removal of the preexisting restorations and re-preparation of the teeth were required.

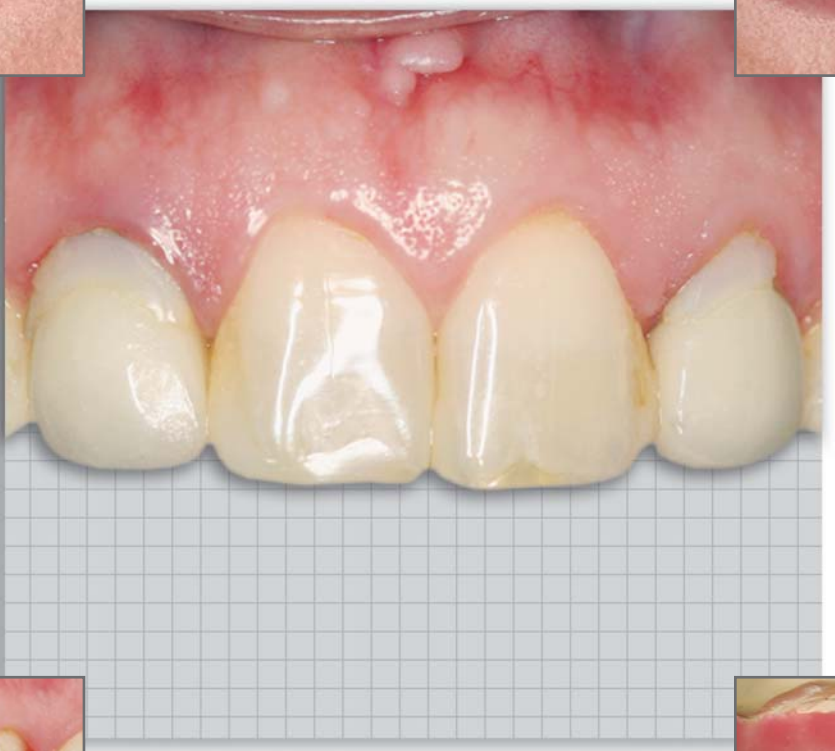

FIGURE 4. Well-defined margins were prepared to facilitate accurate laboratory fabrication of the restorations.

FIGURE 5. The use of a diagnostic waxup allows verification of aesthetics and desired parameters.

FIGURE 3. Preoperative view demonstrates compromised margins and a lack of harmony in the aesthetic zone. Although these eight teeth had been restored in the past, they were all small with decreased tooth width and height. The lateral incisors had already been crowned, and the central incisors and canines were previously restored with composite. The first premolars also had composite treatment as well as large amalgam restorations in the aesthetic zone. It was, therefore, decided to perform a more definitive full-coverage restoration with improved aesthetics.

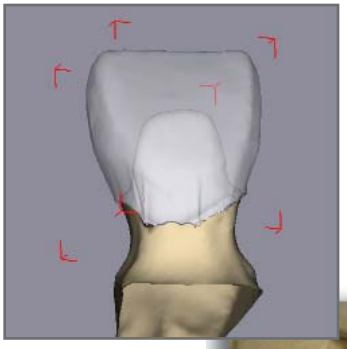

FIGURE 6.
CAD image (es1 Premium, Etkon USA, Arlington, TX) of the planned restorative design.

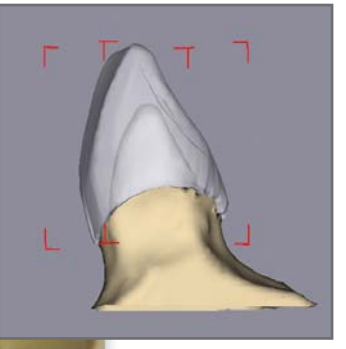

FIGURE 7.
The CAD software was then used to ensure proper width and contours within the proposed restoration.

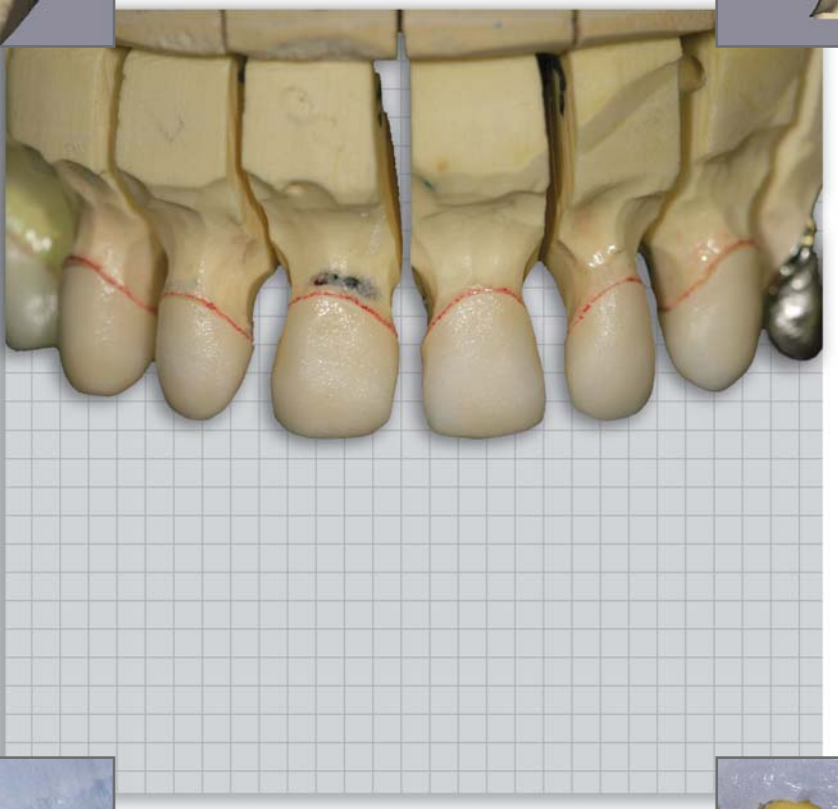

FIGURE 8. The zirconia copings (Etkon USA, Arlington, TX) were then examined to verify the presence of sufficient space. The development of a more aesthetically pleasing restoration required several layers of porcelain to mask the internal coloring and dark stump shades. With this in mind, the technician was required to verify that sufficient space was available to facilitate intraoral placement of the definitive restorations.

FIGURE 9.
A full-contour waxup was then created to allow proper buildup during the laboratory phase.

FIGURE 10.
An A1-shaded porcelain material was layered to add dimension to the dentin regions. A cervical translucent was then placed.

FIGURE 11.
The porcelain buildup included the application of enamel effect #12 and a translucent modifier.

FIGURE 12.
Appearance of the final porcelain layering (GC Initial ZR, GC America, Islip, IL) on tooth #9(21) prior to firing.

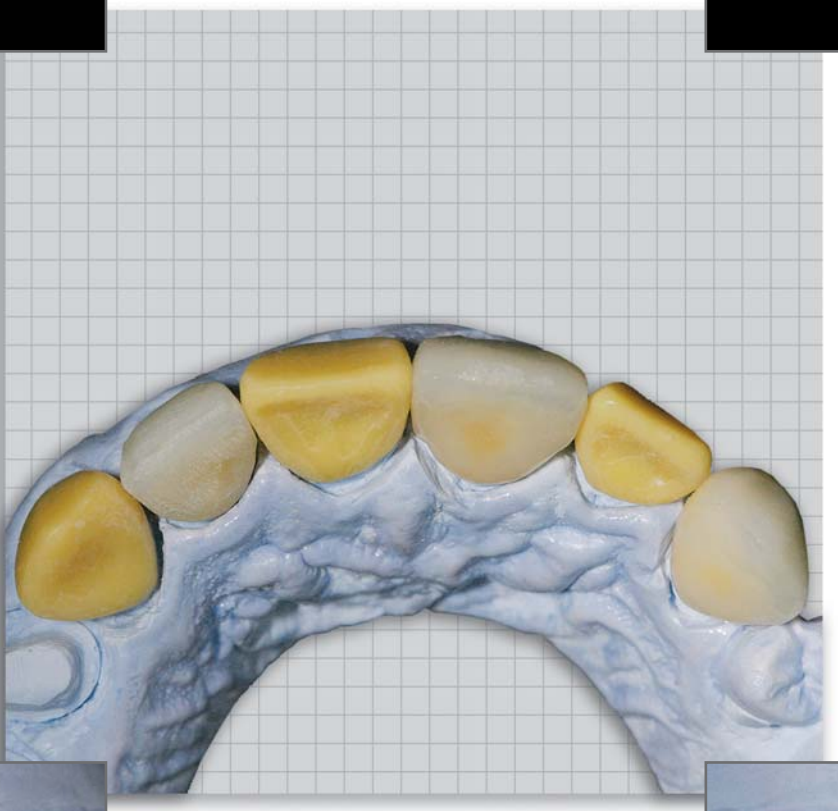

FIGURE 13. Occlusal view of the restorations prior to glazing. In the final evaluation, the clinician would verify occlusion in centric relation and centric occlusion. This ensured a precise and comfortable fit for the patient.

FIGURE 14.
Application of an enamel layer using an artist's brush.

FIGURE 15.
Surface texture and characterization were verified prior to the addition of final luster.

FIGURE 16. Note the natural-looking internal characterizations evident in the restorations.

FIGURE 17. The final porcelain restorations prior to delivery.

FIGURE 19. Appearance of the patient's post-operative natural smile.

FIGURE 18. Postoperative appearance demonstrates natural integration and improved aesthetics. The patient was satisfied with the resultant aesthetics and function provided by the restorations. The occlusion was designed for even intensity contacts in a fully seated joint position along with anterior guidance with posterior disclusion in lateral movements. Both the right and left temporomandibular joints were a Piper 3B (lateral pole displacement that does not recapture upon opening). Given the medial pole steadiness, occlusal stability was anticipated.

FIGURE 20. Postoperative appearance. Note the harmonious length and contour evidenced by the restorations.

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