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Exquisite Esthetics with No-Preparation Veneers

A Non-Invasive Technique to Preserve Enamel

Dennis J. Wells, DDS, AAACD
Juan J. Rego, CDT, AAACD

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Introduction

Although the concept of minimally invasive dentistry has existed for years, current trends have tended to sacrifice tooth structure to achieve esthetic goals. However, the Internet and increased patient awareness have brought to the forefront the importance of practicing responsible esthetics today. Many clinicians, ceramists, researchers, and patients agree that minimal intervention—treating the disease first and using a surgical approach as a last resort—results in maintaining the greatest amount of healthy tooth structure possible, increasing the overall oral health of each patient.¹

Successful treatment planning and delivery of no-preparation veneers presents several considerations and challenges. Proper assessment of lip fullness, emergence profile, and gingival health are necessary for achieving healthy and highly esthetic restorations. Maintaining gingival health requires proper assessment of the gingival margins before establishing a treatment plan. With no-preparation veneers, restorations are built out on the existing available space, without requiring preparation of the teeth to provide additional space.²

Case Presentation

A 22-year-old female patient presented with concerns about her smile. She was going to participate in a national beauty pageant and was interested in conservative treatment options to enhance her smile. The patient presented with a Class II deep bite occlusion, medium-to-large lip frame (Fig 1), an incisal edge that was shy of the wet/dry border of the lower lip, and uneven spacing between her teeth (Fig 2). She displayed excessive wear in the anterior teeth, coupled with localized recession that indicated bite force issues. After assessing her situation, we obtained preoperative photographs to help in determining the ideal treatment plan (Figs 3a-3c). Because of the patient's age, stated time parameters, and esthetic concerns, we determined that no-preparation veneers, along with occlusal force management, would be an ideal option to achieve her goals.³ The treatment plan consisted of deprogramming the musculature and subsequent equilibration to create a stable home position (Fig 4), followed by placing direct provisional restorations on teeth #4-13 as prototypes for the definitive veneers; and last, placing laboratory-fabricated feldspathic restorations to ensure ideal and patient-approved esthetics. The provisional restorations in this case provided the dentist and ceramist with detailed prototypes to ensure accurate transfer of information from patient to laboratory and back.

Clinical Protocol

Direct Provisional Restorations

Although many clinicians use laboratory-fabricated indirect provisional restorations modeled from a diagnostic wax-up, this option has its drawbacks. The transfer process from model to laboratory to mouth is less than ideal, especially for no-preparation restorations with very thin areas. It also can be difficult to achieve the patient's desired level of characterization or fully demonstrate what is possible with smile design.⁴

In this case, the patient's teeth initially were cleaned with a polishing cup (Enhance, Dentsply Caulk; Milford, DE) to remove any plaque or debris; this was followed by gentle smoothing of the labial incisal line angles with a medium sandpaper disc

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Figure 1: Preoperative full-face image showing a Class II deep bite occlusion and medium-to-large lip frame.



Figure 2: Preoperative 1:2 smile view showing uneven spacing between the patient's teeth.



Figures 3a-3c: Preoperative images (1:2 retracted frontal, right lateral, left lateral) were obtained to help determine the ideal treatment plan.

(3M ESPE; St. Paul, MN) to remove any sharp internal stresses. We then captured two master impressions by using a heavy- and light-body polyvinyl impression material to ensure accuracy for the laboratory. We determined the shade on the basis of the unprepared teeth because the case called for no preparation (Fig 5).

The teeth were spot-etched 1 to 2 mm and rinsed, and then a nanohybrid composite (Tetric EvoCeram, Ivoclar Vivadent; Amherst, NY) was used to create direct custom composite prototypes, which were built one tooth at a time. The same bleach shade was used for each tooth to allow for proper evaluation of any visible underlying tooth transparency by the laboratory.

The direct provisional restorations were contoured and finished. A week later, the patient returned to evaluate the prototypes and to determine the final shade (Fig 6). After the patient and clinician evaluated the provisional veneers and both approved the occlusion and esthetics, photographs of the provisional restorations and the polyvinyl impression were sent to the laboratory to duplicate.

Laboratory Fabrication

The fabrication of the restorations required a restorative material that provided excellent esthetics and exceptional strength, even at the minimal thicknesses that were required to duplicate the approved custom composite prototypes. Platinum foil was folded on the dies and layered using feldspathic ceramics (Vintage, Shofu; Kyoto, Japan). Enamel porcelains in different translucencies were used in the case fabrication because most no-preparation cases are primarily enamel replacement (Fig 7). Once the restorations were contoured to match the custom composite prototypes, they were hand-polished with a fine-grit diamond polish (Diashine, VH Technologies; Seattle, WA) (Fig 8). The platinum foil was removed, and the restorations were etched and returned to the dental office for placement.



Figure 4: Bite balancing achieved by using a composite ball.



Figure 5: The shade was determined on the basis of the unprepared teeth because the case called for no preparation.



Figure 6: Determining the final shade.

Placement and Finishing

Once the restorations were received from the laboratory, we inspected them for overall integrity and accuracy by placing them on the master model for comparison.

The patient returned, and the provisional restorations were removed and compared with the final restorations. The teeth were then cleaned, rinsed, and dried. The definitive veneers were tried in with clear try-in gel to verify esthetics, fit, contacts, and shade. During the try-in phase, the gingival length of #9 and #10 extended up to the receded gingival margin and was determined to be a visual issue. At that point, we decided to shorten the gingival margin of #9 and #10 slightly to create the illusion that they were not longer than the contralateral teeth. Having this option is one more advantage of the no-preparation veneer, and the patient still retains all future options for grafting.

After the successful try in, the teeth were again cleaned, rinsed, and dried. From this point forward, the veneers were no longer transferred by hand but rather by using a veneer-placement handpiece (LUMIGrip, DenMat; Lompoc, CA) to prevent contaminating the margins and to prevent dropping the veneer as it was handed from the assistant to the doctor (Fig 9).⁵



Figure 7: Enamel porcelains in different translucencies were used for layering.



Figure 8: Polished restorations.



Figure 9: Using a veneer-placement handpiece for handling the veneer before seating.

A rubber dam was placed in the patient's mouth. A clear luting cement (Variolink, Ivoclar Vivadent) was used to seat the restorations because of its low viscosity and minimal required application pressure. The veneers were seated and gently tacked into place.

After initial cement cleanup, the composite was completely polymerized.⁶ Using a "mosquito" diamond (Axis Dental; Coppell, TX) and tissue retractors, we finished the margins into an infinity margin to slenderize the restorations' gingival margins (Fig 10). The veneers were recontoured slightly by using a diamond disc (Fig 11). Because of the very thin nature of the no-preparation veneers, it was important that the composite be completely polymerized in order to avoid fractures. The margins were then polished with various porcelain polishing cups and points to create the initial smooth surface (Fig 12).

In preparation for the final polish, a 2- to 4-mm layer of flowable block-out resin (LC Block-Out Resin, Ultradent; South Jordan, UT) was placed over the gingival margin for protection. Then a bristle brush (Abbott Robinson Brushes, Keystone Industries; Cherry Hill, NJ), along with polishing paste (Diashine), was used to achieve the original laboratory gloss and glaze (Fig 13). The use of continuously blown air on the teeth, combined with slow revolutions per minute and light pressure during final polishing, guarded against overheating the teeth. Once the desired polish and luster were achieved, the flowable block-out resin was removed (Fig 14), demonstrating that the soft tissue was protected adequately by the flowable block-out resin (Fig 15).⁷ The patient returned one week later for final photographs (Figs 16a-16c).



Figure 10: Creating an infinity margin.



Figure 11: Recontouring the incisal edge.



Figure 12: Polishing using a rubber cup.



Figure 13: Bristle brush with polishing paste used to create final luster and polish.



Figure 14: The flowable block-out resin was removed.



Figure 15: Final restorations demonstrate that the soft tissue was protected adequately by the flowable block-out resin.



Figures 16a-16c: Final restorations at the one-week follow-up appointment (1:2 retracted frontal, right lateral, left lateral).



Figures 17a & 17b: The patient's restored smile reveals a highly esthetic result achieved with no-preparation veneers.

Summary

Minimally invasive treatments continue to increase in popularity, and although there is some controversy over the direction of no-preparation restorations, this case demonstrates the highly esthetic results that can be achieved with no-preparation veneers when specific treatment-planning protocols are followed. The patient's restored smile demonstrates a remarkable achievement in minimally invasive dentistry (Figs 17a & 17b). Although no-preparation veneers present a challenge esthetically and functionally, maintaining healthy tooth structure provides patients with increased restorative longevity and success. With skilled dental professionals and thorough treatment planning (including provisional restorations and high-strength material), highly esthetic and functional restorations can be achieved.

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“The patient's restored smile demonstrates a remarkable achievement in minimally invasive dentistry.”



Dr. Wells is an AACD Accredited Member. He maintains a private practice in Brentwood, Tennessee.



Mr. Rego is an AACD Accredited Member and the co-owner of Smile Designs by Rego in Santa Fe Springs, California.

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