

A close-up photograph of a dental veneer, a thin, white, shell-like piece of ceramic, being held delicately by a pair of metal tweezers. The tweezers are positioned on the left side of the frame, with the veneer held between their tips. The background is a soft, out-of-focus grey, making the white veneer stand out prominently.

“Thin Is In”

Lab-assisted Minimal Prep Cases

by John Nosti, DDS, FAGD, FACE

Whether it is on the cover of *People Magazine*, discussed on network television shows or seen in banner ads on the Internet, ads for veneers are bombarding the population on a daily basis. The patients' knowledge about cosmetic dental procedures has changed dramatically in the past 10 years. In prior times, it would be pressed to find a patient who could tell you what a veneer was. Today patients are calling and asking for them by name: Lumineers, DaVinci Veneers, Durathin, Emprethin and Empress Veneers. Veneers have been used in dentistry for many years and their strength, durability and color stability have proven to withstand the test of time.^{1,2}

Along with patients' knowledge, their aesthetic demands have increased as well. As dentists, we have found ourselves in a situation where patients are requesting "not to have their teeth drilled," while expecting the end result of a cut back and layered ceramic that typically requires removal of tooth structure.

In the past there have been very few options for dentists to provide ultra-thin minimal and no-preparation veneers. Powder and liquid or "stacked" veneers have been one of the original ultra-thin restorations available. Their advantages have been the ability to modify opacities within the same restoration, ability to add internal coloring and layering and working with an artistic ceramist to fabricate them. Disadvantages have been marginal integrity, wear compatibility, strength and the difficulty in fabrication.²

1. Jiradee GG, Dvorak B. Five-Year clinical performance of porcelain laminate veneers. *Quintessence Int.* 2002; May; 33(5):185-9.

2. Quaresugh AC, Burke FJ. The effect of different ceramic materials on the fracture resistance of dentin bonded crowns. *Quintessence Int.* 1997; March; 28(3): 197-203.



Lumineers has had the market cornered in branding over the past few years and dentists have felt this is their only option to satisfy their patients' desires for minimally invasive dentistry. The advantages of Lumineers are name recognition and manufacturers marketing. The disadvantages in the past have been lack of doctor-ceramist interaction, no choice in ceramist and lack of vitality. With less than optimal results, dentists and ceramists alike have pushed to provide materials that will satisfy the patients' minimally invasive demands while providing the results dentists strive to achieve.

In the past four to five years, the ultra-thin pressed ceramic was born. The ceramist is able to press to full contour, cut back and layer, and finish down the restoration to .2-.3mm. The advantages of pressed ceramics are strength, the ability to design contours prior to becoming glass, the ability to measure the thickness throughout the lab process, marginal integrity, wear compatibility and the ability to work with an artistic ceramist. The disadvantages are, except for the incisal edge, there is a monochromatic shade present. It is difficult to cover gray teeth, and it is difficult to find a ceramist with the knowledge to fabricate them.

Guidelines and case selection for minimal to no-preparation veneers are as follows:

Proper pre-operative arch alignment required, color change, lengthening, closing small interproximal spaces, collapsed buccal corridor, wear (when knowledge of source is present) and direct resin bonding cases. Contraindications are

rotation or crowding, buccally displaced teeth, severely lingualized teeth, bell-shaped or flared teeth, severely discolored teeth in relatively normal arch form.^{3,4,5}

Case Presentation

A 26-year-old female, (Figs. 1-4) presented to the office with the desire for a more attractive and more feminine smile. Her dental history: peg laterals with direct resin bonding.

Upon the clinical exam it was noted that her teeth had a straight vertical position. This is an ideal situation for conservative treatment, considering teeth should have an inclination to them facially. This also allows the teeth to appear darker since they do not reflect light properly. She had spacing present, narrow buccal corridor, disliked the color of her teeth, as well as had a few teeth that were rotated facially. Teeth facially placed are a contraindication for "no-prep" veneers.

A complete examination was performed including a full-mouth series of radiographs, periodontal charting, occlusal analysis with T-scan III and joint vibration analysis to verify the health of the temporomandibular joint. Upon the completion of the examination, aesthetic options were discussed, including minimal to no-preparation veneers.

1. Hershkov, DS. *Minimal Preparation Veneers*. Clinical Mastery Series, July 2009.
2. Hershkov, DS. *Porcelain Veneers: optimizing esthetics while maintaining canine guidance*. *Cosmetol. Contour. Edin. Dent.* 1995 Dec;16(12):1190-1194.
3. Swartz, ME. *Minimally Invasive porcelain veneers: indications for a conservative esthetic dentistry treatment modality*. *Gen. Dent.* 2007; 55(7):686-694.

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To communicate the desired length and position of her teeth for the final restorations, a mock-up was done by adding Accolade flowable composite to the incisal edges of the anterior six teeth. To communicate the buccal corridor position, flowable composite was added to the facial of the premolars and molars.

Polyvinyl siloxane impressions were taken of the mock-up and of her teeth pre-operatively. A facebow transfer was completed using the Kois Dento-Facial Analyzer, and a centric relation bite was taken to communicate proper jaw position and facilitate mounting to the articulator. Photos were taken of the patient pre-operatively of the mock-up and with shade tabs of her existing dentition.

A diagnostic wax-up was completed to determine proper length, width and facial position of the teeth, as well as determine adequate thickness for the final restorative material. It was determined that slight preparation was required to achieve the results the patient desired (Fig. 5). A reduction tray was fabricated (Fig. 6), similar to reduction copings, to allow minimal reduction to achieve the proper result. This allows the exact minimal reduction to be completed to achieve the desired outcome. This lab-assisted preparation tray takes the guesswork out of removing too much facially placed tooth structure for the desired result.

From here on the dentist has two options. 1) Have the ceramics fabricated to the reduction position and to prep and

seat the final restorations at the next visit. This is a viable option because the only reduction is in the body of the tooth structure. There is no change of structure where the margins are planned. 2) Prepare the tooth structure using the reduction guide and take another impression following the completed enamel reduction.

During the second consult appointment, the reduction tray was seated (Fig. 7), and the minimal reduction that was required was completed (Fig. 8). No anesthesia was required during this enamel-reduction process. A new final impression was taken once the enamel reduction process was complete. The cosmetic wax-up was transferred to the patient's mouth to communicate the final planned position of the restorations. A siltech putty matrix was lined with Luxatemp Bleach shade and placed to position over the patient's unprepared and prepared teeth and let to set for 1.5 minutes. The excess was trimmed and polished with carbide finishing burs, and Ivoclar Astropol polishing points. The occlusion was verified, and final positions communicated with the patient. A final shade was determined. Impressions were taken of the temporaries in place, a facebow transfer was repeated and bite records repeated. Photographs were taken of the temporaries (Fig. 3) with shade tabs to communicate the desired final shade to the laboratory.

Emprethin minimal and no-preparation ultra-thin veneers were fabricated (Fig. 9). Emprethins are pressed ceramics,



Fig. 10



Fig. 11



Fig. 12



Fig. 13



which despite their ultra-thin final result, are cut back and layered to provide a more realistic natural appearance and incisal characteristics unlike many monochromatic counterparts. The strength of pressed ceramics has proven to be superior to that of powder liquid in many studies.

At her third visit, the restorations were tried in with Variolink Veneer try-in paste and she was allowed to view what the final result would be prior to insertion. Once approved, the restorations were etched with phosphoric acid, silanated, and the internal aspect painted with excite bonding agent, and Variolink veneer cement. Each tooth was etched for 30 seconds due to uncut enamel, and bonding agent was placed in two to three coats. The veneers were placed and cured for 60 seconds. The occlusion was verified and adjustments made with the T-Scan III occlusal analysis system in all excursive movements, centric, and the final polish was completed.

The patient is extremely happy with the final result (Figs. 10-13) and her overall treatment sequence. She is a practicing dental assistant and was told by other practitioners that her only option for a more attractive smile would be aggressive veneer preparation or return into orthodontic treatment.

She was aware of other no-preparation veneer materials on the market and was extremely happy with the vitality the Emprethins provided.

Minimally invasive dentistry can be a viable option whether you are attempting to rebuild a worn dentition to optimum function and anterior guidance, or providing your patient with an outstanding smile. With both the doctor and lab having sound knowledge of guidelines, materials and case selection, your patient will be happy with the results for many years to come. ■

**Emprethins are a trademark of GoldDust Dental Lab*

Author's Bio

Dr. John Nosti practices full time in Mays Landing and Somers Point, New Jersey, with an emphasis on functional cosmetics, full-mouth rehabilitations and TMJ dysfunction. Dr. Nosti's down-to-earth approach and ability to demystify occlusion and all-ceramic dentistry has earned him distinction among his peers. He is privileged to instruct and mentor live-patient and hands-on programs with the Clinical Mastery Series and Dr. David Hornbook. He has lectured nationally on occlusion, rehabilitations and technology. He is a member of the American Dental Association, American Academy of Cosmetic Dentistry and American Academy of Craniofacial Pain. Dr. Nosti also holds fellowships in the Academy of General Dentistry and the Academy of Comprehensive Esthetics.

